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Mark A. Sowa
Senior Environmental Coordinator

CERTIFIED MAIL #: 7015 1730 0001 2996 5671

December 9, 2015

William F. Durham, Director
WVDEP, Division of Air Quality
601 57th Street SE
Charleston, WV 25304

Re: EQM Gathering Opco, LLC – Saturn Compressor Station
Facility ID No: 017-00027
Permit No. R13-3150
Class II Administrative Update

Dear Mr. Durham:

EQM Gathering Opco, LLC (EQM) is submitting this Class II Administrative Update application to the West Virginia Department of Environmental Protection (WVDEP) for an existing compressor station located in Doddridge County, West Virginia (Saturn Compressor Station). The Station currently operates under R13 Permit No. R13-3150.

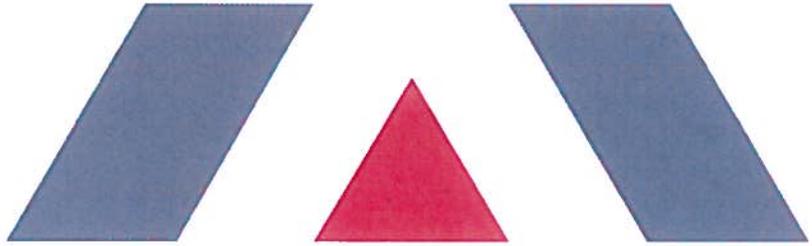
This application seeks to increase the permitted throughput limits for thermal oxidizers TO-1, TO-2, and TO-3, increase the dehydration capacity for the existing dehydration units (RSV-2 and RSV-3), permit thermal oxidizer TO-4 as a non-emergency unit, permit the installation of five (5) new methanol storage tanks, update the storage tank inventory to reflect actual equipment installed at the facility, and remove two (2) stabilizer heaters (HTR-1 and HTR-2).

Please contact me at 412-395-3654 or via email at msowa@eqt.com for payment of the application fee by credit card or if you have any questions regarding this application.

Sincerely,

A handwritten signature in blue ink that reads "Mark A. Sowa".

Mark A. Sowa
Senior Environmental Coordinator



PROJECT REPORT
EQM Gathering Opco, LLC > Saturn Compressor Station

R-13 Class II Administrative Update

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

December 2015

Trinity 
Consultants

Environmental solutions delivered uncommonly well

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1. INTRODUCTION

EQM Gathering Opco, LLC (EQM) is submitting this Class II Administrative Update application to the West Virginia Department of Environmental Protection (WVDEP) for an existing compressor station located in Doddridge County, West Virginia (Saturn Compressor Station). The Station currently operates under R13 Permit No. R13-3150.

This application seeks to increase the permitted throughput limits for thermal oxidizers TO-1, TO-2, and TO-3, increase the dehydration capacity for the existing dehydration units (RSV-2 and RSV-3), permit thermal oxidizer TO-4 as a non-emergency unit, permit the installation of five (5) new methanol storage tanks, update the storage tank inventory to reflect actual equipment installed at the facility, and remove two (2) stabilizer heaters (HTR-1 and HTR-2).

1.1. FACILITY AND PROJECT DESCRIPTION

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

The station currently consists of the following equipment:

- > Five (5) Caterpillar G3608 compressor engines, each rated at 2,370 bhp and equipped with an oxidation catalyst;
- > Two (2) Caterpillar 3616 compressor engines, each rated at 4,735 bhp and equipped with an oxidation catalyst;
- > Five (5) C200 Capstone microturbines, each rated at 200 kW;
- > Three (3) fuel gas heaters, each rated at 0.38 MMBtu/hr (heat input);
- > One (1) triethylene glycol (TEG) dehydration unit rated at 65 million standard cubic feet per day (MMSCFD) with associated reboiler, controlled by a thermal oxidizer;
- > Two (2) TEG dehydration units each rated at 120 MMSCFD with associated reboilers, each controlled by a thermal oxidizer;
- > Four (4) 8,820 gallon produced fluid storage tanks; and
- > Several miscellaneous storage tanks.

In anticipation of increased gas flow to the facility, EQM is proposing the following:

- > Increase the capacity of the existing TEG dehydration units (RSV-2 and RSV-3) from 120 MMSCFD to 130 MMSCFD
- > Increase the permitted waste gas throughput limits to the thermal oxidizers that control the dehydrators at the facility (see permit condition 10.1.2) to 4,022 scfh for TO-1 and 9,210 scfh for each TO-2, and TO-3¹; and
- > Install five (5) 300 gallon methanol storage tanks.

Additionally, this application:

- > Request that the department update the responsible legal entity for the facility to EQM Gathering Opco, LLC.
- > Permit thermal oxidizer TO-4 as a non-emergency flare with the potential to operate 8,760 hours per year (potential emissions for this unit have been revised accordingly);
- > Request that the department revise the installation dates for several sources (HTR-3, HTR-4, and T10) in the emission unit table (See Attachment I);
- > Requests that the department remove the following equipment from the permit:

¹ Gas throughput limits to the thermal oxidizers are based on the gas flow rates for the flash tank off gas stream and the regenerator overheads stream plus a 25% compliance margin. Emissions calculations are not affected by this change as the MMBtu/hr heat input rating was already sufficiently established.

- Two (2) stabilizer heaters, each rated at 1.54 MMBtu/hr (heat input).
- > Requests that the department remove the following storage tanks from the permit
 - One (1) 250 gallon Used 50/50 Ethylene Glycol and Water Tank (T07);
 - One (1) 2,000 gallon Lube Oil Tank (T20);
 - One (1) 2,000 gallon Cylinder Oil Tank (T21);
 - One (1) 4,200 gallon Used Oil Tank (T22); and
 - One (1) 2,000 gallon Methanol Storage Tank (T25).
- > Request that the department update the monitoring requirements for TO-1, TO-2, and TO-3 in the current permit which read as follows:

Condition No. 10.2.2. The permittee shall monitor the throughput to the enclosed flare combustors (TO-1, TO-2, and TO-3) on a monthly basis.

EQM is proposing to demonstrate compliance with the monitoring requirement for the thermal oxidizers by calculating waste gas throughputs on a monthly basis using GRI GLYCalc. EQM respectfully requests that the permit condition be modified to read as follows

Condition No. 10.2.2. The permittee shall monitor the throughput to the enclosed flare combustors (TO-1, TO-2, and TO-3) on a monthly basis using GLYCalc calculations. Calculations must be based on actual monthly wet gas throughput (MMscf/month), and operating parameters such as lean glycol circulation rate (gpm), absorber temperature and pressure, and number of hours operated per month

A process flow diagram is included as Attachment F.

1.2. SOURCE STATUS

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

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

Other additional pollutant emitting facilities should be aggregated with the Saturn Compressor Station for air permitting purposes if and only if all three elements of the "stationary source" definition above are fulfilled. The Saturn Compressor Station has been determined to be a separate stationary source with respect to permitting programs, including Title V and Prevention of Significant Deterioration, and has not been aggregated with other EQM properties.

The Saturn Compressor Station's site-wide potential to emit currently exceeds the Title V major source thresholds for several pollutants. Refer to Attachment D for detailed discussion regarding applicable requirements and compliance demonstration methodology.

1.3. R-13 APPLICATION ORGANIZATION

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

- > Section 2: Sample Emission Source Calculations;
- > Section 3: R-13 Application Form;
- > Attachment A: Business Certificate;
- > Attachment B: Map;

- > Attachment C: Installation and Start Up Schedule;
- > Attachment D: Regulatory Discussion;
- > Attachment E: Plot Plan;
- > Attachment F: Detailed Process Flow Diagram;
- > Attachment G: Process Description;
- > Attachment I: Emission Units Table;
- > Attachment J: Emission Points Data Summary Sheet;
- > Attachment K: Fugitive Emissions Data Summary Sheet;
- > Attachment L: Emissions Unit Data Sheets;
- > Attachment M: Air Pollution Control Device Sheets
- > Attachment N: Supporting Emission Calculations;
- > Attachment O: Monitoring/Recordkeeping/Reporting/Testing Plans
- > Attachment P: Public Notice; and
- > Application Fee.

2. SAMPLE EMISSION SOURCE CALCULATIONS

The characteristics of air emissions from the Saturn Compressor Station, along with the methodology for calculating emissions, are briefly described in this section of the application. Detailed emission calculations are presented in Appendix N of this application.

Emissions from the proposed project will result from the storage of methanol, operation of the dehydrator units, and combustion of gases in the thermal oxidizers. The methods by which emissions from each of these source types is calculated are summarized below. There will be no emissions increase from the existing units at the facility (i.e fugitive, compressor engines, reboilers, heaters, and microturbines).

- > **TEG Dehydration Units:** Potential emissions of HAPs, VOC, and methane from the dehydration unit are calculated using GRI-GLYCalc. Emissions of other criteria pollutants are calculated for natural combustion in the flare are calculated using U.S. EPA's AP-42 factors for external combustion of natural gas.²
- > **Thermal Oxidizers:** Potential emissions from the thermal oxidizers for all criteria pollutants and HAPs are calculated using U.S. EPA's AP-42 factors for natural gas combustion equipment.³ These calculations assume a site-specific heat content of natural gas. Greenhouse gas emissions are calculated according to 40 CFR 98 Subpart C.⁴
- > **Methanol Storage tanks:** Working and Breathing losses from from the methanol storage tanks were calculated using EPA Tanks. 4.09d.

² U.S. EPA, AP-42, Fifth Edition, Volume I, Chapter 1.4, *Natural Gas Combustion*, Supplement D, July 1998.

³ U.S. EPA, AP 42, Fifth Edition, Volume I, Chapter 1.4, *Natural Gas Combustion*, Supplement D, July 1998.

⁴ 40 CFR 98 Subpart C, *General Stationary Fuel combustion Sources*, Tables C-1 and C-2.

3. R-13 APPLICATION FORMS

The WVDEP permit application forms contained in this application include all applicable R-13 application forms including the required attachments.



WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF AIR QUALITY

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

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

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

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

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

- ADMINISTRATIVE AMENDMENT MINOR MODIFICATION
 SIGNIFICANT MODIFICATION

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

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

Section I. General

| | | | |
|--|--|---|--|
| 1. Name of applicant (as registered with the WV Secretary of State's Office): EQM Gathering Opco, LLC | | 2. Federal Employer ID No. (FEIN): 32-0422322 | |
| 3. Name of facility (if different from above): Saturn Compressor Station | | 4. The applicant is the: <input type="checkbox"/> OWNER <input type="checkbox"/> OPERATOR <input checked="" type="checkbox"/> BOTH | |
| 5A. Applicant's mailing address: 625 Liberty Avenue, Suite 1700 Pittsburgh, PA 15222 | | 5B. Facility's present physical address: | |
| 6. West Virginia Business Registration. Is the applicant a resident of the State of West Virginia? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO - If YES, provide a copy of the Certificate of Incorporation/Organization/Limited Partnership (one page) including any name change amendments or other Business Registration Certificate as Attachment A . - If NO, provide a copy of the Certificate of Authority/Authority of L.L.C./Registration (one page) including any name change amendments or other Business Certificate as Attachment A . | | | |
| 7. If applicant is a subsidiary corporation, please provide the name of parent corporation: | | | |
| 8. Does the applicant own, lease, have an option to buy or otherwise have control of the <i>proposed site</i> ? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO - If YES, please explain: Applicant owns the site - If NO, you are not eligible for a permit for this source. | | | |
| 9. Type of plant or facility (stationary source) to be constructed, modified, relocated, administratively updated or temporarily permitted (e.g., coal preparation plant, primary crusher, etc.): Natural gas gathering facility | | 10. North American Industry Classification System (NAICS) code for the facility: 211111 | |
| 11A. DAQ Plant ID No. (for existing facilities only): 0017-00027 | | 11B. List all current 45CSR13 and 45CSR30 (Title V) permit numbers associated with this process (for existing facilities only): R13-3150 | |

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

12A.

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

From Parkersburg, WV take US-50 East for approximately 42 miles. Turn left onto Wilhelm Run Road and continue onto Stone Valley Road for approximately 1.6 miles. Take a sharp left into the entrance to the station.

12.B. New site address (if applicable):

12C. Nearest city or town:

12D. County:

Central Station

Doddridge

12.E. UTM Northing (KM): 4,349.752

12F. UTM Easting (KM): 515.528

12G. UTM Zone: 17

13. Briefly describe the proposed change(s) at the facility:

This application seeks to increase the limit of gas throughput to the enclosed combustors (TO-1, TO-2, and TO-3), request to revise monitoring requirements for the enclosed combustors (TO-1, TO-2, and TO-3), increase the capacity of dehydration units RSV-2 and RSV-3 to 130 MMSCFD, revise potential emissions for TO-4 to reflect the potential to operate 8,760 hours per year, permit the installation and operation of five (5) 300 gallon methanol tanks, update the storage tank inventory to reflect actual equipment installed at the facility, and remove two (2) stabilizer heaters (HTR-1 and HTR-2).

14A. Provide the date of anticipated installation or change: Upon permit issuance

- If this is an **After-The-Fact** permit application, provide the date upon which the proposed change did happen:

14B. Date of anticipated Start-Up if a permit is granted:

Upon permit issuance

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

15. Provide maximum projected **Operating Schedule** of activity/activities outlined in this application:

Hours Per Day 24 Days Per Week 7 Weeks Per Year 52

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

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

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

Section II. Additional attachments and supporting documents.

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

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

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

- Indicate the location of the nearest occupied structure (e.g. church, school, business, residence).

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

23. Provide a **Process Description** as **Attachment G**.

- Also describe and quantify to the extent possible all changes made to the facility since the last permit review (if applicable).

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

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

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

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

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

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

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

- | | | |
|--|--|--|
| <input type="checkbox"/> Bulk Liquid Transfer Operations | <input type="checkbox"/> Haul Road Emissions | <input type="checkbox"/> Quarry |
| <input type="checkbox"/> Chemical Processes | <input type="checkbox"/> Hot Mix Asphalt Plant | <input type="checkbox"/> Solid Materials Sizing, Handling and Storage Facilities |
| <input type="checkbox"/> Concrete Batch Plant | <input type="checkbox"/> Incinerator | <input checked="" type="checkbox"/> Storage Tanks |
| <input type="checkbox"/> Grey Iron and Steel Foundry | <input type="checkbox"/> Indirect Heat Exchanger | |
| <input checked="" type="checkbox"/> General Emission Unit, specify: Dehydration Unit | | |

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

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

- | | | |
|--|---|--|
| <input type="checkbox"/> Absorption Systems | <input type="checkbox"/> Baghouse | <input checked="" type="checkbox"/> Flare |
| <input type="checkbox"/> Adsorption Systems | <input type="checkbox"/> Condenser | <input type="checkbox"/> Mechanical Collector |
| <input type="checkbox"/> Afterburner | <input type="checkbox"/> Electrostatic Precipitator | <input type="checkbox"/> Wet Collecting System |
| <input type="checkbox"/> Other Collectors, specify | | |

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

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

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

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

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

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

YES NO

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

Section III. Certification of Information

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

- | | |
|--|---|
| <input type="checkbox"/> Authority of Corporation or Other Business Entity | <input type="checkbox"/> Authority of Partnership |
| <input type="checkbox"/> Authority of Governmental Agency | <input type="checkbox"/> Authority of Limited Partnership |

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

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

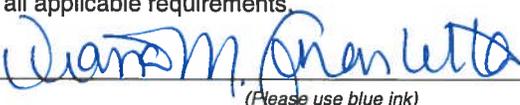
35A. **Certification of Information.** To certify this permit application, a Responsible Official (per 45CSR§13-2.22 and 45CSR§30-2.28) or Authorized Representative shall check the appropriate box and sign below.

Certification of Truth, Accuracy, and Completeness

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

Compliance Certification

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

SIGNATURE  DATE: 12/8/15
(Please use blue ink) (Please use blue ink)

| | | |
|---|--------------------------|---|
| 35B. Printed name of signee: Diana Charletta | | 35C. Title: Sr. Vice President |
| 35D. E-mail: dcharletta@eqt.com | 36E. Phone: | 36F. FAX: |
| 36A. Printed name of contact person (if different from above): Mark A. Sowa | | 36B. Title: Sr. Environmental Coordinator |
| 36C. E-mail: msowa@eqt.com | 36D. Phone: 412-395-3654 | 36E. FAX: |

PLEASE CHECK ALL APPLICABLE ATTACHMENTS INCLUDED WITH THIS PERMIT APPLICATION:

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

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

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

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

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

ATTACHMENT A

Business Certificate

**WEST VIRGINIA
STATE TAX DEPARTMENT
BUSINESS REGISTRATION
CERTIFICATE**

ISSUED TO:
**EQM GATHERING OPCO, LLC
625 LIBERTY AVE 1700
PITTSBURGH, PA 15222-3114**

BUSINESS REGISTRATION ACCOUNT NUMBER: 2311-9555

This certificate is issued on: **04/8/2015**

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

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

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

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

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

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

ATTACHMENT B

Map

ATTACHMENT B - AREA MAPS



UTM Northing (KM): 4,349.752
UTM Easting (KM): 515.528
Elevation: ~790 ft

ATTACHMENT C

Installation and Start Up Schedule

ATTACHMENT C

Schedule of Planned Installation and Start-Up

| Unit | Installation Schedule | Startup Schedule |
|--|-----------------------|-------------------------|
| 130 MMSCFD (RSV-2) Dehydration Unit – <i>Modified throughput increase</i> | 2016 | Upon issuance of permit |
| 130 MMSCFD (RSV-3) Dehydration Unit – <i>Modified throughput increase</i> | 2016 | Upon issuance of permit |
| Five (5) 300 gallons Methanol Tanks (T27A-T27E) | 2016 | Upon issuance of permit |
| One (1) 250 gallon Used 50/50 Ethylene Glycol and Water Tank (T07) | To be Removed | Upon issuance of permit |
| One (1) 2,000 gallon Lube Oil Tank (T20) | To be Removed | Upon issuance of permit |
| One (1) 2,000 gallon Cylinder Oil Tank (T21) | To be Removed | Upon issuance of permit |
| One (1) 4,200 gallon Used Oil Tank (T22); | To be Removed | Upon issuance of permit |
| One (1) 2,000 gallon Methanol Storage Tank (T25). | To be Removed | Upon issuance of permit |
| Two (2) Stabilizer Heaters (HTR-1 and HTR-2) | To be Removed | Upon issuance of permit |

ATTACHMENT D

Regulatory Discussion

ATTACHMENT D - REGULATORY APPLICABILITY

This section documents the applicability determinations made for Federal and State air quality regulations. The monitoring, recordkeeping, reporting, and testing plan is presented in Attachment O. In this section, applicability or non-applicability of the following regulatory programs is addressed:

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

This review is presented to supplement and/or add clarification to the information provided in the WVDEP R13 permit application forms, which fulfill the requirement to include citations and descriptions of applicable statutory and administrative code requirements.

In addition to providing a summary of applicable requirements, this section of the application also provides non-applicability determinations for certain regulations, allowing the WVDEP to confirm that identified regulations are not applicable to the Saturn Compressor Station. Note that explanations of non-applicability are limited to those regulations for which there may be some question of applicability specific to the operations at the Saturn Compressor Station. Regulations that are categorically non-applicable are not discussed (e.g., NSPS Subpart J, Standards of Performance for Petroleum Refineries).

Prevention of Significant Deterioration (PSD) Source Classification

Federal construction permitting programs regulate new and modified sources of attainment pollutants under Prevention of Significant Deterioration (PSD) and new and modified sources of non-attainment pollutants under Non-Attainment New Source Review (NNSR). PSD and NNSR regulations apply when a major source makes a change, such as installing new equipment or modifying existing equipment, and a significant increase in emissions results from the change. The Saturn Compressor Station is currently not a major source with respect to the PSD program since its potential emissions are below all the NNSR/PSD thresholds. As such, NNSR/PSD permitting is not triggered by this construction activity. EQM will monitor future construction activities at the site closely and will compare any future increase in emissions with the NNSR/PSD thresholds to ensure these activities will not trigger this program.

Title V Operating Permit Program

Title 40 of the Code of Federal Regulations Part 70 (40 CFR 70) establishes the federal Title V operating permit program. West Virginia has incorporated the provisions of this federal program in its Title V operating permit program in West Virginia Code of State Regulations (CSR) 45-30. The major source thresholds with respect to the West Virginia Title V operating permit program regulations are 10 tons per year (tpy) of a single hazardous air pollutant (HAP), 25 tpy of any combination of HAP, and 100 tpy of all other regulated pollutants.¹ As a result of the project associated with the facility's existing construction permit, potential emissions of NO_x, VOC, formaldehyde and total HAP will each exceed their respective major source thresholds for Title V. Therefore, the Saturn Compressor Station is a major source with respect to the Title V Program. In accordance with 40 CFR 70.5(a)(1), EQM will submit a Title V operating permit application within 12 months of start-up of the authorized equipment under the previous construction permit request.

¹ On June 23, 2014, the U.S Supreme Court decision in the case of *Utility Air Regulatory Group v. EPA* effectively changed the permitting procedures for GHGs under the PSD and Title V programs.

New Source Performance Standards

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

NSPS Subparts K, Ka, and Kb

These subparts apply to storage tanks of certain sizes constructed, reconstructed, or modified during various time periods. Subpart K applies to storage tanks constructed, reconstructed, or modified prior to 1978, and Subpart Ka applies to those constructed, reconstructed, or modified prior to 1984. Subpart Kb applies to volatile organic liquid (VOL) storage tanks constructed, reconstructed, or modified after July 23, 1984 with a capacity equal to or greater than 75 m³ (~19,813 gallons). The natural gas liquids tanks at the station have a capacity greater than 19,813 gallons. However, these are pressurized vessels that operate without emissions to the atmosphere, and are specifically exempted from the rule under §60.110b(d)(2). The existing and proposed methanol tanks, produced fluids tanks, and other miscellaneous tanks at the Saturn Compressor Station have a capacity of 19,813 gallons or less. As such, Subparts K, Ka, and Kb do not apply to the storage tanks at the station.

Subpart 0000—Crude Oil and Natural Gas Production, Transmission, and Distribution

Subpart 0000 – *Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution*, applies to affected facilities that commenced construction, reconstruction, or modification after August 23, 2011. This NSPS was published in the Federal Register on August 16, 2012, and has been subsequently amended. The list of potentially affected facilities includes:

- > Gas wellheads
- > Centrifugal compressors located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment
- > Reciprocating compressors located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment
- > Continuous bleed natural gas-driven pneumatic controllers with a bleed rate of > 6 scfh located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment (excluding natural gas processing plants)
- > Continuous bleed natural gas-driven pneumatic controllers located at natural gas processing plants
- > Storage vessels in the production, processing, or transmission and storage segments
- > Sweetening units located onshore that process natural gas produced from either onshore or offshore wells

The Saturn Compressor Station is not a gas wellhead, nor is it a natural gas processing plant. Therefore, the only potentially applicable requirements for the equipment at the station are those for new storage vessels, reciprocating compressors, and pneumatic controllers, where construction commenced after August 23, 2011. The only equipment being addressed in this application are storage vessels.

The produced water storage vessels for the Saturn Compressor Station commenced construction after the applicability date, and are potentially subject to requirements of Subpart 0000. Subpart 0000 applies to storage vessels with VOC emissions equal to or greater than 6 tpy. The storage vessels at the facility have VOC emissions less than 6 tpy and, therefore, are not subject to Subpart 0000.

Note EPA has proposed revisions to Subpart 0000. EQM will review the revisions once finalized and comply as applicable.

Non-Applicability of All Other NSPS

NSPS are developed for particular industrial source categories. Other than NSPS developed for natural gas processing plants (Subparts 0000) and associated equipment (Subpart K-Kb), the applicability of a particular NSPS to the Saturn Compressor Station can be readily ascertained based on the industrial source category covered. All other NSPS are categorically not applicable to the proposed project.

National Emission Standards for Hazardous Air Pollutants (NESHAP)

Regulatory requirements for facilities subject to NESHAP standards, otherwise known Maximum Available Control Technology (MACT) Standards for source categories, are contained in 40 CFR Part 63. 40 CFR Part 61 NESHAP standards are defined for specific pollutants while Part 63 NESHAPs are defined for source categories where allowable emission limits are established on the basis of a MACT determination for a particular major source. A major source of HAP is defined as having potential emissions in excess of 25 tpy for total HAP and/or potential emissions in excess of 10 tpy for any individual HAP. Part 63 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. Based on potential emissions for all equipment at the station, potential HAP emissions are above the major source thresholds and therefore the facility is a major source of HAP. The potential applicability of specific MACT standards to the Saturn Compressor Station is discussed below.

> 40 CFR Part 63 Subpart HH – Oil and Natural Gas Production Facilities

40 CFR 63 Subpart HH - Oil and Natural Gas Production Facilities

The proposed increase in throughput for the dehydration units does not meet the definition of reconstruction as the increase does not require a capital expenditure (i.e., it is only changing the throughput limit in the permit). Therefore, the proposed increase in throughput does not change the source status of the unit. EQM will comply with the requirements of Subpart HH as outlined in the current permit.

West Virginia SIP Regulations

The Saturn Compressor Station is potentially subject to regulations contained in the West Virginia Code of State Regulations, Chapter 45 (Code of State Regulations). The Code of State Regulations fall under two main categories: those regulations that are generally applicable (e.g., permitting requirements), and those that have specific applicability (e.g., PM standards for manufacturing equipment).

45 CSR 4: To Prevent and Control the Discharge of Air Pollutants into the Air Which Causes or Contributes to an Objectionable Odor

According to 45 CSR 4-3:

No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public.

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

45 CSR 6: Control of Air Pollution from the Combustion of Refuse

45 CSR 6 applies to activities involving incineration of refuse, defined as “the destruction of combustible refuse by burning in a furnace designed for that purpose. For the purposes of this rule, the destruction of any combustible liquid or gaseous material by burning in a flare or flare stack, thermal oxidizer or thermal catalytic oxidizer stack shall

be considered incineration.” The thermal oxidizers 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.

EQM has requested that the permit be revised to allow for the tracking of flow to the unit via GLYCalc outputs, rather than monitoring the flow.

45 CSR 16: Standards of Performance for New Stationary Sources

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

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

According to 45 CSR 17-3.1:

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

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

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

45 CSR 21-28 applies to any fixed roof petroleum liquid storage tank with a capacity greater than 40,000 gallons located in Putnam County, Kanawha County, Cabell County, Wayne County, and Wood County. The capacity of each storage tank at Saturn is less than 40,000 gallons and the facility is not located in a listed county. Therefore, 45 CSR 21-28 does not apply to the storage tanks at this station.

45 CSR 34: Emissions Standards for Hazardous Air Pollutants

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

Non-Applicability of Other SIP Rules

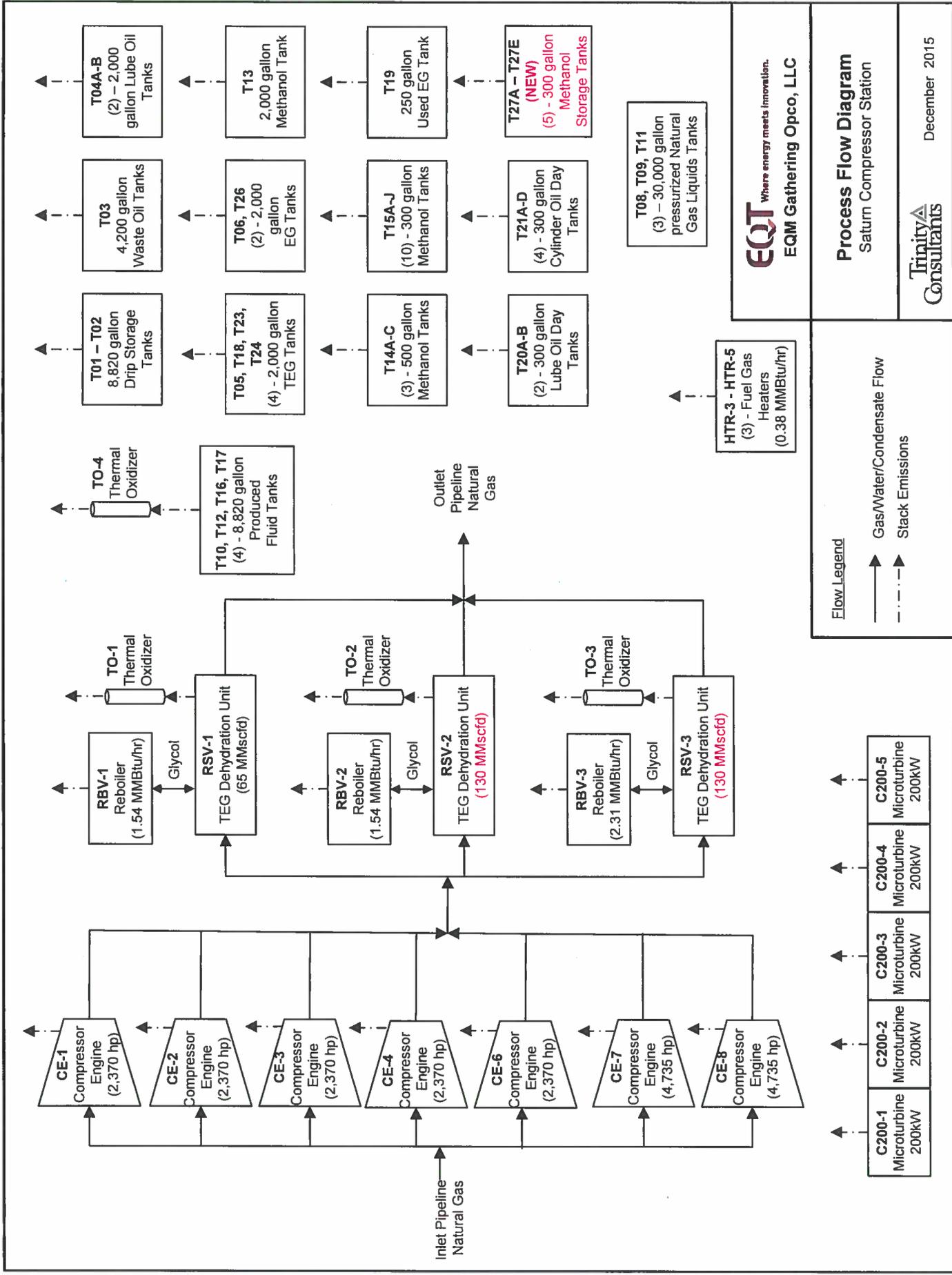
A thorough examination of the West Virginia SIP rules with respect to applicability at the Saturn Compressor Station reveals many SIP regulations that do not apply or impose additional requirements on operations. Such SIP rules include those specific to a particular type of industrial operation that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

ATTACHMENT E

Plot Plan

ATTACHMENT F

Detailed Process Flow Diagram



EQT Where energy meets innovation.
EQM Gathering Opco, LLC

Process Flow Diagram
 Saturn Compressor Station

Trinity Consultants

December 2015

Flow Legend

— Gas/Water/Condensate Flow
 - - - Stack Emissions

- CE-1 Compressor Engine (2,370 hp)
- CE-2 Compressor Engine (2,370 hp)
- CE-3 Compressor Engine (2,370 hp)
- CE-4 Compressor Engine (2,370 hp)
- CE-6 Compressor Engine (2,370 hp)
- CE-7 Compressor Engine (4,735 hp)
- CE-8 Compressor Engine (4,735 hp)
- RBV-1 Reboiler (1.54 MMBtu/hr)
- RBV-2 Reboiler (1.54 MMBtu/hr)
- RBV-3 Reboiler (2.31 MMBtu/hr)
- RSV-1 TEG Dehydration Unit (65 MMscfd)
- RSV-2 TEG Dehydration Unit (130 MMscfd)
- RSV-3 TEG Dehydration Unit (130 MMscfd)
- TO-1 Thermal Oxidizer
- TO-2 Thermal Oxidizer
- TO-3 Thermal Oxidizer
- T01 - T02 8,820 gallon Drip Storage Tanks
- T03 4,200 gallon Waste Oil Tanks
- T04 Thermal Oxidizer
- T05, T18, T23, T24 (4) - 2,000 gallon TEG Tanks
- T06, T26 (2) - 2,000 gallon EG Tanks
- T08, T09, T11 (3) - 30,000 gallon pressurized Natural Gas Liquids Tanks
- T10, T12, T16, T17 (4) - 8,820 gallon Produced Fluid Tanks
- T113 2,000 gallon Methanol Tank
- T114-A-C (3) - 500 gallon Methanol Tanks
- T115-A-J (10) - 300 gallon Methanol Tanks
- T119 250 gallon Used EG Tank
- T120-A-B (2) - 2,000 gallon Lube Oil Tanks
- T120-B (2) - 300 gallon Lube Oil Day Tanks
- T120-D (4) - 300 gallon Cylinder Oil Day Tanks
- T127A - T27E (NEW) (5) - 300 gallon Methanol Storage Tanks
- HTR-3 - HTR-5 (3) - Fuel Gas Heaters (0.38 MMBtu/hr)

ATTACHMENT G

Process Description

ATTACHMENT G - PROCESS DESCRIPTION

This project involves increasing the permit throughput limits and revising the monitoring requirements for the existing thermal oxidizers (TO-1, TO-2, and TO-3); permitting thermal oxidizer TO-4 as a non-emergency unit, increasing the capacity of dehydration units RSV-2 and RSV-3 to 130 MMSCFD (each), installation of five (5) new 300 gallon methanol storage tanks, updating the storage tank inventory to reflect actual equipment installed at the facility, and removal of two (2) stabilizer heaters (HTR-1 and HTR-2).

Additionally, the following changes are requested with this permit update:

- Change the legal entity name from "EQT Gathering, LLC" to EQM Gathering Opco LLC; and
- Change the installation date shown in permit condition 1.0 Emissions Units Table as follows: HTR-3 Fuel Gas Heater installed in 2010; HTR-4 Fuel Gas Heater installed in 2014, and T10 Produced Fluids Tank installed in 2012.

The Saturn Station is an existing natural gas gathering facility that consists of natural gas-fired compressor engines, triethylene glycol (TEG) dehydrators, microturbine generators, fuel gas heaters, and storage tanks. Natural gas enters the station via a distribution pipeline system and is first compressed using one of seven (7) natural gas-fired compressors. The compressed natural gas stream is then processed through one of three TEG dehydration units with associated reboilers and controlled with enclosed flares. The dehydration units introduce TEG to the gas stream in a contact tower to absorb water vapor from the gas to a level not exceeding 7 pounds per million cubic feet (lb/MMcf). The glycol is then sent to the natural gas-fired reboiler where water is evaporated from the glycol and exhausted. The glycol is then sent back to the contact tower. The natural gas stream from the contact tower flows into the pipeline to be transported further along the distribution system via the sales pipeline. The station is also equipped with storage tanks for storage of liquids associated with the engines, dehydration unit, and pipeline fluids.

A process flow diagram is included as Attachment F.

ATTACHMENT I

Emission Units Table

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

| Emission Unit ID ¹ | Emission Point ID ² | Emission Unit Description | Year Installed/ Modified | Design Capacity | Type ³ and Date of Change | Control Device ⁴ |
|-------------------------------|--------------------------------|---------------------------|-----------------------------|-----------------|--------------------------------------|-----------------------------|
| CE001 | E001 | Compressor Engine | 2010 | 2,370 hp | Existing | C001 Oxidation Catalyst |
| CE002 | E002 | Compressor Engine | 2010 | 2,370 hp | Existing | C001 Oxidation Catalyst |
| CE003 | E003 | Compressor Engine | 2010 | 2,370 hp | Existing | C001 Oxidation Catalyst |
| CE004 | E004 | Compressor Engine | 2011 | 2,370 hp | Existing | C001 Oxidation Catalyst |
| CE006 | E006 | Compressor Engine | 2012 | 2,370 hp | Existing | C001 Oxidation Catalyst |
| CE007 | E007 | Compressor Engine | 2014 | 4,735 hp | Existing | C002 Oxidation Catalysts |
| CE008 | E008 | Compressor Engine | 2014 | 4,735 hp | Existing | C002 Oxidation Catalysts |
| C2001 | C2001 | Microturbine | 2014 | 200 KW | Existing | None |
| C2002 | C2002 | Microturbine | 2014 | 200 KW | Existing | None |
| C2003 | C2003 | Microturbine | 2014 | 200 KW | Existing | None |
| C2004 | C2004 | Microturbine | 2014 | 200 KW | Existing | None |
| C2005 | C2005 | Microturbine | 2014 | 200 KW | Existing | None |
| HTR-1 | HTR-1 | Stabilizer Heater | 2010 | 1.54 MMbtu/hr | Remove | None |
| HTR-2 | HTR-2 | Stabilizer Heater | 2010 | 1.54 MMbtu/hr | Remove | None |
| HTR-3 | HTR-3 | Fuel Gas Heater | 2010 | 0.38 MMbtu/hr | Existing | None |
| HTR-4 | HTR-4 | Fuel Gas Heater | 2014 | 0.38 MMbtu/hr | Existing | None |
| HTR-5 | HTR-5 | Fuel Gas Heater | 2014 | 0.38 MMbtu/hr | Existing | None |

| | | | | | | |
|--------|--------|--|------|-------------------|---|----------------------------|
| RSV-1 | TO-1 | Dehydration Unit | 2010 | 65 MMscfd | Existing | TO-1 (Thermal Oxidizer) |
| TO-1 | TO-1 | Thermal Oxidizer | 2010 | 3.62 MMBtu/hr | Modification; Increase limit | NA |
| RBV-1 | RBV-1 | Reboiler | 2010 | 1.54 MMBtu/hr | Existing | None |
| RSV-2 | TO-2 | Dehydration Unit | 2012 | 130 MMscfd | Modified - Increased Throughput | TO-2 (Thermal Oxidizer) |
| TO-2 | TO-2 | Thermal Oxidizer | 2012 | 3.62 MMBtu/hr | Modification; Increase limit | NA |
| RBV-2 | RBV-2 | Reboiler | 2012 | 1.54 MMBtu/hr | Existing | None |
| RSV-3 | TO-3 | Dehydration Unit | 2014 | 130 MMscfd | Modified - Increased Throughput | TO-3 (Thermal Oxidizer) |
| TO-3 | TO-3 | Thermal Oxidizer | 2014 | 3.62 MMBtu/hr | Modification; Increase limit | NA |
| RBV-3 | RBV-3 | Reboiler | 2014 | 2.31 MMBtu/hr | Existing | None |
| TO-4 | TO-4 | Pipeline Enclosed Flare (Non Emergency Use) | 2015 | 41.00 MMBtu/hr | Modification - Increase utilization | None |
| T01 | T01 | Condensed water, lube oil, and trace natural gas liquids Tank | 2010 | 8,820 gallon | Existing | None |
| T02 | T02 | Condensed water, lube oil, and trace natural gas liquids Tank | 2010 | 8,820 gallon | Existing | None |
| T03 | T03 | Waste Oil Tank | 2010 | 4,200 gal | Existing | None |
| T04A/B | T04A/B | Lube oil Tanks | 2010 | 2,000 gal each | Existing | None |
| T05 | T05 | TEG Tank | 2010 | 2,000 gal | Existing | None |
| T06 | T06 | 50/50 Ethylene Glycol & Water Tank | 2010 | 2,000 gal | Existing | None |
| T07 | T07 | Used 50/50 EG/water Tank | 2010 | 250 gal | Remove | None |
| T08 | T08 | Natural gas liquids Tank | 2010 | 30,000 gal | Existing | None |
| T09 | T09 | Natural gas liquids Tank | 2010 | 30,000 gal | Existing | None |

| | | | | | | |
|---------|---------|-------------------------------------|---------------|-----------------|----------|------|
| T10 | TO-4 | Produced fluids Tank | 2012 | 8,820 gallon | Existing | None |
| T11 | T11 | Natural gas liquids Tank | 2011 | 30,000 gal | Existing | None |
| T12 | TO-4 | Produced fluids Tank | 2012 | 8,820 gallon | Existing | None |
| T13 | T13 | Methanol Tank | 2010 | 2,000 gal | Existing | None |
| T14A-C | T14A-C | Methanol Tanks | 2010 | 500 gal each | Existing | None |
| T15 A-J | T15 A-J | Cylinder Oil Tanks | 2010 | 300 gal each | Existing | None |
| T16 | TO-4 | Produced Fluids Tank | 2014 | 8,820 gallon | Existing | None |
| T17 | TO-4 | Produced Fluids Tank | 2014 | 8,820 gallon | Existing | None |
| T18 | T18 | Triethylene Glycol Tank | 2014 | 2,000 gallon | Existing | None |
| T19 | T19 | Used Ethylene Glycol Tank | 2014 | 250 gallon | Existing | None |
| T20 | T20 | Lube Oil Tank | Not Installed | 2,000 gallon | Remove | None |
| T20A/B | T20A/B | Lube Oil Day Tanks | 2014 | 300 gallon each | Existing | None |
| T21 | T21 | Cylinder Oil Tank | Not Installed | 2,000 gallon | Remove | None |
| T21A/D | T21A/D | Cylinder Oil Day Tanks | 2014 | 300 gallon each | Existing | None |
| T22 | T22 | Used Oil Tank | Not Installed | 4,200 gallon | Remove | None |
| T23 | T23 | New Triethylene Glycol Storage Tank | 2014 | 2,000 gallon | Existing | None |
| T24 | T24 | Used Triethylene Glycol Tank | 2014 | 2,000 gallon | Existing | None |
| T25 | T25 | Methanol Storage Tank | Not Installed | 2,000 gallon | Remove | None |
| T26 | T26 | Used Glycol Storage Tank | 2014 | 2,000 gallon | Existing | None |
| T27A-E | T27A-E | Five (5) Methanol Storage Tanks | TBD | 300 gallon each | New | None |

¹ For Emission Units (or Sources) use the following numbering system: 1S, 2S, 3S,... or other appropriate designation.

² For Emission Points use the following numbering system: 1E, 2E, 3E, ... or other appropriate designation.

³ New, modification, removal

⁴ For Control Devices use the following numbering system: 1C, 2C, 3C,... or other appropriate designation.

ATTACHMENT J

Emission Points Data Summary Sheet

**Attachment J
EMISSION POINTS DATA SUMMARY SHEET**

Table 1: Emissions Data

| Emission Point ID No. (Must match Emission Units Table & Plot Plan) | Emission Point Type ¹ | Emission Unit Vented Through This Point (Must match Emission Units Table & Plot Plan) | | Air Pollution Control Device (Must match Emission Units Table & Plot Plan) | | Vent Time for Emission Unit (chemical processes only) | | All Regulated Pollutants - Chemical Name/CAS ³ (Speciate VOCs & HAPS) | Maximum Potential Uncontrolled Emissions ^{4,a} | | Maximum Potential Controlled Emissions ⁵ | | Emission Form or Phase (At exit conditions, Solid, Liquid or Gas/Vapor) | Est. Method Used ⁶ | Emission Concentration ⁷ (ppmw or mg/m ³) |
|---|----------------------------------|---|-------------------------|--|--------------------|---|-------------|--|---|--------|---|--------|---|-------------------------------|--|
| | | ID No. | Source | ID No. | Device Type | Short Term ² | Max (hr/yr) | | lb/hr | ton/yr | lb/hr | ton/yr | | | |
| CE001 - CE005 (Each Engine) | Upward Vertical Stack | CE001 - CE005 | Compressor Engine G3608 | C001 | Oxidation Catalyst | NA | NA | NOx CO PM ₁₀ /PM _{2.5} SO ₂ VOC CO ₂ e HAP | 2.61 | 11.44 | 2.61 | 11.44 | Gas/Vapor | O ^{A,B,C} | NA |
| | | | | | | | | | 1.01 | 4.41 | 1.01 | 4.41 | | | |
| CE007 - CE008 (Each Engine) | Upward Vertical Stack | CE007 - CE008 | Compressor Engine | C002 | Oxidation Catalyst | NA | NA | NOx CO PM ₁₀ /PM _{2.5} SO ₂ VOC CO ₂ e HAP | 5.22 | 22.86 | 5.22 | 22.86 | Gas/Vapor | O ^{A,B,C} | NA |
| | | | | | | | | | 2.01 | 8.80 | 2.01 | 8.80 | | | |
| C2001 - C2005 (Each unit) | Upward Vertical Stack | C2001 - C2005 | Microturbine | NA | NA | NA | NA | NOx CO PM ₁₀ /PM _{2.5} SO ₂ VOC CO ₂ e HAP | 0.08 | 0.35 | 0.08 | 0.35 | Gas/Vapor | O ^{A,B,C} | NA |
| | | | | | | | | | 0.22 | 0.96 | 0.22 | 0.96 | | | |
| HTR-3 - HTR-5 (Each Heater) | Upward Vertical Stack | HTR-3 - HTR-5 | Fuel Gas Heater | NA | NA | NA | NA | NOx CO PM ₁₀ /PM _{2.5} SO ₂ VOC CO ₂ e HAP | 0.03 | 0.15 | 0.03 | 0.15 | Gas/Vapor | O ^{B,C} | NA |
| | | | | | | | | | 0.03 | 0.13 | 0.03 | 0.13 | | | |
| RBV-1 - RBV-2 (Each Reboiler) | Upward Vertical Stack | RBV-1 - RBV-2 | Reboiler | NA | NA | NA | NA | NOx CO PM ₁₀ /PM _{2.5} SO ₂ VOC CO ₂ e HAP | 0.14 | 0.60 | 0.14 | 0.60 | Gas/Vapor | O ^{B,C} | NA |
| | | | | | | | | | 0.11 | 0.50 | 0.11 | 0.50 | | | |
| RBV-3 | Upward Vertical Stack | RBV-3 | Reboiler | NA | NA | NA | NA | NOx CO PM ₁₀ /PM _{2.5} SO ₂ VOC CO ₂ e HAP | 0.20 | 0.89 | 0.20 | 0.89 | Gas/Vapor | O ^{B,C} | NA |
| | | | | | | | | | 0.17 | 0.75 | 0.17 | 0.75 | | | |

| TO-1 | Upward Vertical Stack | RSV-1 | Dehy | TO-1 | Thermal Oxidizer | NA | NA | VOC HAP NOx CO PM/PM ₁₀ /PM _{2.5} SO ₂ CO ₂ e | 23.85 6.74 0.30 0.25 0.02 0.00 424 | 104.47 29.52 1.30 1.09 0.10 0.01 1,855 | 1.19 0.34 0.30 0.25 0.02 0.00 424 | 5.22 1.48 1.30 1.09 0.10 0.01 1,855 | Gas/Vapor | O ^{D,B} | NA |
|-------------------------------|-----------------------|--------------------------|---------------------|------|------------------|----|----|---|--|--|--|---|-----------|------------------|----|
| TO-2 | Upward Vertical Stack | RSV-2 | Dehy | TO-2 | Thermal Oxidizer | NA | NA | VOC HAP NOx CO PM/PM ₁₀ /PM _{2.5} SO ₂ CO ₂ e | 42.54 10.62 0.30 0.25 0.02 <0.01 424 | 186.34 46.54 1.30 1.09 0.10 0.01 1,855 | 2.13 0.53 0.30 0.25 0.02 0.01 424 | 9.32 2.33 1.30 1.09 0.10 0.01 1,855 | Gas/Vapor | O ^{D,B} | NA |
| TO-3 | Upward Vertical Stack | RSV-3 | Dehy | TO-3 | Thermal Oxidizer | NA | NA | VOC HAP NOx CO PM/PM ₁₀ /PM _{2.5} SO ₂ CO ₂ e | 10.62 0.30 0.25 0.02 <0.01 423.57 | 186.34 46.54 1.30 1.09 0.10 0.01 1,855 | 2.13 0.53 0.30 0.25 0.02 0.01 423.57 | 9.32 2.33 1.30 1.09 0.10 0.01 1,855 | Gas/Vapor | O ^{D,B} | NA |
| T27A-E (Each Tank) | Upward Vertical Stack | T27A-E | Methanol Tanks | NA | NA | NA | NA | VOC HAP | 0.00 0.00 | 0.01 0.01 | 0.00 0.00 | 0.01 0.01 | Gas/Vapor | O ^F | NA |
| T2714A-C (Each Tank) | Upward Vertical Stack | T14A-C | Methanol Tanks | NA | NA | NA | NA | VOC HAP | 0.00 0.00 | 0.01 0.01 | 0.00 0.00 | 0.01 0.01 | Gas/Vapor | O ^F | NA |
| T13 (Each Tank) | Upward Vertical Stack | T13 | Methanol Tanks | NA | NA | NA | NA | VOC HAP | 0.01 0.01 | 0.03 0.03 | 0.01 0.01 | 0.03 0.03 | Gas/Vapor | O ^F | NA |
| TO-4 (Each Tank) | Upward Vertical Stack | T10, T12, T16, T17 | Produced Water Tank | NA | NA | NA | NA | VOC HAP CO ₂ e | 0.93 0.03 6.22 | 4.06 0.13 27.25 | 0.93 0.03 6.22 | 4.06 0.13 27.25 | Gas/Vapor | O ^E | NA |
| TO-1, TO-2, TO-3 (Each Flare) | Upward Vertical Stack | TO-1, TO-2, TO-3 | Thermal Oxidizer | NA | NA | NA | NA | NOx CO PM/PM ₁₀ /PM _{2.5} SO ₂ CO ₂ e | 0.30 0.25 0.02 0.01 424 | 1.30 1.09 0.10 0.01 1,855 | 0.30 0.25 0.02 0.00 424 | 1.30 1.09 0.10 0.01 1,855 | Gas/Vapor | O ^B | NA |
| TO-4 | Upward Vertical Stack | T10, T12, T16, T17, TO-4 | Thermal Oxidizer | NA | NA | NA | NA | VOC NOx CO PM/PM ₁₀ /PM _{2.5} SO ₂ CO ₂ e | 3.71 3.37 2.83 0.26 0.02 4,810 | 16.25 14.75 12.39 1.12 0.09 21,069 | 3.71 3.37 2.83 0.26 0.02 4,810 | 16.25 14.75 12.39 1.12 0.09 21,069 | Gas/Vapor | O ^{B,E} | NA |

- A - Vendor sheets
- B - AP-42
- C - Emissions calculated according to 40 CFR 98 Subpart C
- D - GlyCalc
- E - API E&P Tanks Software
- F - EPA Tanks 4.0.9d

Note: Emissions from the existing miscellaneous storage tanks at the station have previously been deemed to have insignificant emissions.

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

¹ Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.
² Indicate by "C" if venting is continuous. Otherwise, specify the average short-term venting rate with units, for intermittent venting (ie., 15 min/hr). Indicate as many rates as needed to clarify frequency of venting (e.g., 5 min/day, 2 days/wk).

- ³ List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS₂, VOCs, H₂S, Inorganics, Lead, Organics, O₃, NO, NO₂, SO₂, SO₃, all applicable Greenhouse Gases (including CO₂ and methane), etc. **DO NOT LIST** H₂, H₂O, N₂, O₂, and Noble Gases.
- ⁴ Give maximum potential emission rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).
- ⁵ Give maximum potential emission rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).
- ⁶ Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).
- ⁷ Provide for all pollutant emissions. Typically, the units of parts per million by volume (ppmv) are used. If the emission is a mineral acid (sulfuric, nitric, hydrochloric or phosphoric) use units of milligram per dry cubic meter (mg/m³) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO_x, use units of ppmv (See 45CSR10).
- ⁸ Engine emissions shown are controlled.

ATTACHMENT K

Fugitive Emissions Data Summary Sheet

Attachment K

FUGITIVE EMISSIONS DATA SUMMARY SHEET

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

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

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

| FUGITIVE EMISSIONS SUMMARY | All Regulated Pollutants - Chemical Name/CAS ¹ | Maximum Potential Uncontrolled Emissions ² | | Maximum Potential Controlled Emissions ³ | | Est. Method Used ⁴ |
|---|---|---|------------------------|---|------------------------|-------------------------------|
| | | lb/hr | ton/yr | lb/hr | ton/yr | |
| Haul Road/Road Dust Emissions Paved Haul Roads | NA | --- | --- | --- | --- | --- |
| Unpaved Haul Roads | NA | --- | --- | --- | --- | --- |
| Storage Pile Emissions | NA | --- | --- | --- | --- | --- |
| Loading/Unloading Operations | NA | --- | --- | --- | --- | --- |
| Wastewater Treatment Evaporation & Operations | NA | --- | --- | --- | --- | --- |
| Equipment Leaks | VOC CO ₂ e HAP | NA | 11.15 1,098 0.35 | NA | 11.15 1,098 0.35 | O ^A |
| General Clean-up VOC Emissions | NA | --- | --- | --- | --- | --- |
| Other | NA | --- | --- | --- | --- | --- |

A - Protocol for Equipment Leak Emission Estimates, EPA 453/R-95-017, Table 2-1, November 1995 and 40 CFR 98 Subpart W

¹ List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS₂, VOCs, H₂S, Inorganics, Lead, Organics, O₃, NO, NO₂, SO₂, SO₃, all applicable Greenhouse Gases (including CO₂ and methane), etc. DO NOT LIST H₂, H₂O, N₂, O₂, and Noble Gases.

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

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

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

ATTACHMENT L

Emissions Unit Data Sheet

Attachment L
EMISSIONS UNIT DATA SHEET
STORAGE TANKS

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

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

I. GENERAL INFORMATION (required)

| | |
|--|---|
| 1. Bulk Storage Area Name Saturn | 2. Tank Name Methanol Tanks |
| 3. Tank Equipment Identification No. (as assigned on <i>Equipment List Form</i>) T27A-E | 4. Emission Point Identification No. (as assigned on <i>Equipment List Form</i>) T27A-E |
| 5. Date of Commencement of Construction (for existing tanks) TBD | |
| 6. Type of change <input checked="" type="checkbox"/> New Construction <input type="checkbox"/> New Stored Material <input type="checkbox"/> Other Tank Modification | |
| 7. Description of Tank Modification (if applicable) Not applicable | |
| 7A. Does the tank have more than one mode of operation? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (e.g. Is there more than one product stored in the tank?) | |
| 7B. If YES, explain and identify which mode is covered by this application (Note: A separate form must be completed for each mode). | |
| 7C. Provide any limitations on source operation affecting emissions, any work practice standards (e.g. production variation, etc.): None | |

II. TANK INFORMATION (required)

| | |
|--|--|
| 8. Design Capacity (specify barrels or gallons). Use the internal cross-sectional area multiplied by internal height. 300 gallons (each) | |
| 9A. Tank Internal Diameter (ft) 3.17 | 9B. Tank Internal Height (or Length) (ft) 6 |
| 10A. Maximum Liquid Height (ft) N/A | 10B. Average Liquid Height (ft) N/A |
| 11A. Maximum Vapor Space Height (ft) N/A | 11B. Average Vapor Space Height (ft) N/A |
| 12. Nominal Capacity (specify barrels or gallons). This is also known as "working volume" and considers design liquid levels and overflow valve heights. 300 gallons (each) | |

| | |
|---|--|
| 13A. Maximum annual throughput (gal/yr) 3,600 (each) | 13B. Maximum daily throughput (gal/day) ~ 9.8 |
| 14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume) ~12 (each) | |
| 15. Maximum tank fill rate (gal/min) TBD | |
| 16. Tank fill method <input type="checkbox"/> Submerged <input type="checkbox"/> Splash <input type="checkbox"/> Bottom Loading | |
| 17. Complete 17A and 17B for Variable Vapor Space Tank Systems <input checked="" type="checkbox"/> Does Not Apply | |
| 17A. Volume Expansion Capacity of System (gal) | 17B. Number of transfers into system per year |
| 18. Type of tank (check all that apply): <input checked="" type="checkbox"/> Fixed Roof <input type="checkbox"/> vertical <input checked="" type="checkbox"/> horizontal <input type="checkbox"/> flat roof <input type="checkbox"/> cone roof <input type="checkbox"/> dome roof <input type="checkbox"/> other (describe) <input type="checkbox"/> External Floating Roof <input type="checkbox"/> pontoon roof <input type="checkbox"/> double deck roof <input type="checkbox"/> Domed External (or Covered) Floating Roof <input type="checkbox"/> Internal Floating Roof <input type="checkbox"/> vertical column support <input type="checkbox"/> self-supporting <input type="checkbox"/> Variable Vapor Space <input type="checkbox"/> lifter roof <input type="checkbox"/> diaphragm <input type="checkbox"/> Pressurized <input type="checkbox"/> spherical <input type="checkbox"/> cylindrical <input type="checkbox"/> Underground <input type="checkbox"/> Other (describe) | |

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

| | | |
|---|-----------------|------------------------|
| 19. Tank Shell Construction: <input type="checkbox"/> Riveted <input type="checkbox"/> Gunitite lined <input type="checkbox"/> Epoxy-coated rivets <input type="checkbox"/> Other (describe) | | |
| 20A. Shell Color | 20B. Roof Color | 20C. Year Last Painted |
| 21. Shell Condition (if metal and unlined): <input type="checkbox"/> No Rust <input type="checkbox"/> Light Rust <input type="checkbox"/> Dense Rust <input type="checkbox"/> Not applicable | | |
| 22A. Is the tank heated? <input type="checkbox"/> YES <input type="checkbox"/> NO | | |
| 22B. If YES, provide the operating temperature (°F) | | |
| 22C. If YES, please describe how heat is provided to tank. | | |
| 23. Operating Pressure Range (psig): | | |
| 24. Complete the following section for Vertical Fixed Roof Tanks <input type="checkbox"/> Does Not Apply | | |
| 24A. For dome roof, provide roof radius (ft) | | |
| 24B. For cone roof, provide slope (ft/ft) | | |
| 25. Complete the following section for Floating Roof Tanks <input type="checkbox"/> Does Not Apply | | |
| 25A. Year Internal Floaters Installed: | | |
| 25B. Primary Seal Type: (check one) <input type="checkbox"/> Metallic (Mechanical) Shoe Seal <input type="checkbox"/> Liquid Mounted Resilient Seal <input type="checkbox"/> Vapor Mounted Resilient Seal <input type="checkbox"/> Other (describe): | | |
| 25C. Is the Floating Roof equipped with a Secondary Seal? <input type="checkbox"/> YES <input type="checkbox"/> NO | | |
| 25D. If YES, how is the secondary seal mounted? (check one) <input type="checkbox"/> Shoe <input type="checkbox"/> Rim <input type="checkbox"/> Other (describe): | | |
| 25E. Is the Floating Roof equipped with a weather shield? <input type="checkbox"/> YES <input type="checkbox"/> NO | | |

| | | |
|---|--|--|
| 25F. Describe deck fittings; indicate the number of each type of fitting: | | |
| ACCESS HATCH | | |
| BOLT COVER, GASKETED: | UNBOLTED COVER, GASKETED: | UNBOLTED COVER, UNGASKETED: |
| AUTOMATIC GAUGE FLOAT WELL | | |
| BOLT COVER, GASKETED: | UNBOLTED COVER, GASKETED: | UNBOLTED COVER, UNGASKETED: |
| COLUMN WELL | | |
| BUILT-UP COLUMN - SLIDING COVER, GASKETED: | BUILT-UP COLUMN - SLIDING COVER, UNGASKETED: | PIPE COLUMN - FLEXIBLE FABRIC SLEEVE SEAL: |
| LADDER WELL | | |
| PIP COLUMN - SLIDING COVER, GASKETED: | PIPE COLUMN - SLIDING COVER, UNGASKETED: | |
| GAUGE-HATCH/SAMPLE PORT | | |
| SLIDING COVER, GASKETED: | SLIDING COVER, UNGASKETED: | |
| ROOF LEG OR HANGER WELL | | |
| WEIGHTED MECHANICAL ACTUATION, GASKETED: | WEIGHTED MECHANICAL ACTUATION, UNGASKETED: | SAMPLE WELL-SLIT FABRIC SEAL (10% OPEN AREA) |
| VACUUM BREAKER | | |
| WEIGHTED MECHANICAL ACTUATION, GASKETED: | WEIGHTED MECHANICAL ACTUATION, UNGASKETED: | |
| RIM VENT | | |
| WEIGHTED MECHANICAL ACTUATION GASKETED: | WEIGHTED MECHANICAL ACTUATION, UNGASKETED: | |
| DECK DRAIN (3-INCH DIAMETER) | | |
| OPEN: | 90% CLOSED: | |
| STUB DRAIN | | |
| 1-INCH DIAMETER: | | |
| OTHER (DESCRIBE, ATTACH ADDITIONAL PAGES IF NECESSARY) | | |

| | |
|---|--------------------------------------|
| 26. Complete the following section for Internal Floating Roof Tanks <input type="checkbox"/> Does Not Apply | |
| 26A. Deck Type: <input type="checkbox"/> Bolted <input type="checkbox"/> Welded | |
| 26B. For Bolted decks, provide deck construction: | |
| 26C. Deck seam: <input type="checkbox"/> Continuous sheet construction 5 feet wide <input type="checkbox"/> Continuous sheet construction 6 feet wide <input type="checkbox"/> Continuous sheet construction 7 feet wide <input type="checkbox"/> Continuous sheet construction 5 × 7.5 feet wide <input type="checkbox"/> Continuous sheet construction 5 × 12 feet wide <input type="checkbox"/> Other (describe) | |
| 26D. Deck seam length (ft) | 26E. Area of deck (ft ²) |
| For column supported tanks: | 26G. Diameter of each column: |
| 26F. Number of columns: | |

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

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

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

| | | | |
|--|--|--|--|
| 34. Average daily temperature range of bulk liquid: | | | |
| 34A. Minimum (°F) | | 34B. Maximum (°F) | |
| 35. Average operating pressure range of tank: | | | |
| 35A. Minimum (psig) | | 35B. Maximum (psig) | |
| 36A. Minimum Liquid Surface Temperature (°F) | | 36B. Corresponding Vapor Pressure (psia) | |
| 37A. Average Liquid Surface Temperature (°F) | | 37B. Corresponding Vapor Pressure (psia) | |
| 38A. Maximum Liquid Surface Temperature (°F) | | 38B. Corresponding Vapor Pressure (psia) | |
| 39. Provide the following for <u>each</u> liquid or gas to be stored in tank. Add additional pages if necessary. | | | |
| 39A. Material Name or Composition | | | |
| 39B. CAS Number | | | |
| 39C. Liquid Density (lb/gal) | | | |
| 39D. Liquid Molecular Weight (lb/lb-mole) | | | |
| 39E. Vapor Molecular Weight (lb/lb-mole) | | | |

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

VI. EMISSIONS AND CONTROL DEVICE DATA (required)

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

Carbon Adsorption¹

Condenser¹

Conservation Vent (psig)

Vacuum Setting Pressure Setting

Emergency Relief Valve (psig)

Inert Gas Blanket of

Insulation of Tank with

Liquid Absorption (scrubber)¹

Refrigeration of Tank

Rupture Disc (psig)

Vent to Incinerator¹

Other¹ (describe):

¹ Complete appropriate Air Pollution Control Device Sheet.

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

| Material Name & CAS No. | Breathing Loss (lb/hr) | Working Loss | | Annual Loss (lb/yr) | Estimation Method ¹ |
|---|---------------------------|--------------|-------|------------------------|--------------------------------|
| | | Amount | Units | | |
| See Attachment N: Emission Calculations | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

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

Remember to attach emissions calculations, including TANKS Summary Sheets if applicable.

**Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL**

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): RBV-3, RSV-3

1. Name or type and model of proposed affected source:

130 MMscfd dehydration unit with 2.31 MMBtu/hr heat input reboiler

2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.

3. Name(s) and maximum amount of proposed process material(s) charged per hour:

130 million standard cubic feet per day of natural gas

4. Name(s) and maximum amount of proposed material(s) produced per hour:

Does not produce a material – removes water from wet natural gas

5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants:

External combustion of natural gas

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

| | | |
|---|----|---------------------------|
| 6. Combustion Data (if applicable): | | |
| (a) Type and amount in appropriate units of fuel(s) to be burned: | | |
| Reboiler - Natural gas -1,889 scf/hr; 16.55 MMscf/yr (Assumes 1223 Btu/scf) | | |
| (b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash: | | |
| Pipeline quality natural gas with negligible H ₂ S and ash content. | | |
| (c) Theoretical combustion air requirement (ACF/unit of fuel): | | |
| Unknown | @ | °F and psia. |
| (d) Percent excess air: Unknown | | |
| (e) Type and BTU/hr of burners and all other firing equipment planned to be used: | | |
| 2.31 MMBtu/hr input (1.5 MMBtu/hr output duty rating), natural gas fired external combustion heater | | |
| (f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired: | | |
| NA | | |
| (g) Proposed maximum design heat input: | | |
| 2.31 | | × 10 ⁶ BTU/hr. |
| 7. Projected operating schedule: | | |
| Hours/Day | 24 | Days/Week |
| | | 7 |
| | | Weeks/Year |
| | | 52 |

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

| @ | Unknown | °F and | psia |
|---------------------|---------|--------|------------|
| a. NO _x | 0.19 | lb/hr | grains/ACF |
| b. SO ₂ | 0.001 | lb/hr | grains/ACF |
| c. CO | 0.16 | lb/hr | grains/ACF |
| d. PM ₁₀ | 0.01 | lb/hr | grains/ACF |
| e. Hydrocarbons | 86.11 | *lb/hr | grains/ACF |
| f. VOCs | 42.54 | *lb/hr | grains/ACF |
| g. | | | grains/ACF |
| h. Specify other(s) | | | |
| HAP | 10.62 | *lb/hr | grains/ACF |
| Benzene | 1.40 | lb/hr | grains/ACF |
| | | lb/hr | grains/ACF |
| | | lb/hr | grains/ACF |

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

*Controlled emissions

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

MONITORING
 See attachment D.

RECORDKEEPING
 See attachment D

REPORTING
 See attachment D

TESTING
 See attachment D

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
 None.

**Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL**

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): RBV-2, RSV-2

| |
|--|
| <p>1. Name or type and model of proposed affected source:</p> <p>130 MMscfd dehydration unit with 1.54 MMBtu/hr heat input reboiler</p> |
| <p>2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.</p> |
| <p>3. Name(s) and maximum amount of proposed process material(s) charged per hour:</p> <p>130 million standard cubic feet per day of natural gas</p> |
| <p>4. Name(s) and maximum amount of proposed material(s) produced per hour:</p> <p>Does not produce a material – removes water from wet natural gas</p> |
| <p>5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants:</p> <p>External combustion of natural gas</p> |

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

| | | |
|---|------|---------------------------|
| 6. Combustion Data (if applicable): | | |
| (a) Type and amount in appropriate units of fuel(s) to be burned: | | |
| Reboiler - Natural gas -1,258 scf/hr; 1102 MMscf/yr | | |
| (b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash: | | |
| Pipeline quality natural gas with negligible H ₂ S and ash content. | | |
| (c) Theoretical combustion air requirement (ACF/unit of fuel): | | |
| Unknown | @ | °F and psia. |
| (d) Percent excess air: Unknown | | |
| (e) Type and BTU/hr of burners and all other firing equipment planned to be used: | | |
| 1.54 MMBtu/hr input (1.00 MMBtu/hr output duty rating), natural gas fired external combustion heater | | |
| (f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired: | | |
| NA | | |
| (g) Proposed maximum design heat input: | | |
| | 1.54 | × 10 ⁶ BTU/hr. |
| 7. Projected operating schedule: | | |
| Hours/Day | 24 | Days/Week |
| | | 7 |
| | | Weeks/Year |
| | | 52 |

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

| @ | Unknown | °F and | psia |
|---------------------|---------|--------|------------|
| a. NO _x | 0.13 | lb/hr | grains/ACF |
| b. SO ₂ | 0.001 | lb/hr | grains/ACF |
| c. CO | 0.11 | lb/hr | grains/ACF |
| d. PM ₁₀ | 0.01 | lb/hr | grains/ACF |
| e. Hydrocarbons | 86.11 | *lb/hr | grains/ACF |
| f. VOCs | 42.54 | *lb/hr | grains/ACF |
| g. | | | grains/ACF |
| h. Specify other(s) | | | |
| HAP | 10.62 | *lb/hr | grains/ACF |
| Benzene | 1.40 | lb/hr | grains/ACF |
| | | lb/hr | grains/ACF |
| | | lb/hr | grains/ACF |

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

*Controlled emissions

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

MONITORING
See attachment D.

RECORDKEEPING
See attachment D

REPORTING
See attachment D

TESTING
See attachment D

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty
None.

ATTACHMENT M

Air Pollution Control Device

44. Proposed Monitoring, Recordkeeping, Reporting, and Testing

Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:
See Attachment O

RECORDKEEPING:
See Attachment O

REPORTING:
See Attachment O

TESTING:
See Attachment O

MONITORING: Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.

RECORDKEEPING: Please describe the proposed recordkeeping that will accompany the monitoring.

REPORTING: Please describe any proposed emissions testing for this process equipment on air pollution control device.

TESTING: Please describe any proposed emissions testing for this process equipment on air pollution control device.

45. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.

HC – 100%
VOC – 100%
HAP – 100%

46. Manufacturer's Guaranteed Control Efficiency for each air pollutant.

HC – 95%
VOC – 95%
HAP – 95%

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

44. Proposed Monitoring, Recordkeeping, Reporting, and Testing

Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:

See Attachment O

RECORDKEEPING:

See Attachment O

REPORTING:

See Attachment O

TESTING:

See Attachment O

MONITORING:

Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.

RECORDKEEPING:

Please describe the proposed recordkeeping that will accompany the monitoring.

REPORTING:

Please describe any proposed emissions testing for this process equipment on air pollution control device.

TESTING:

Please describe any proposed emissions testing for this process equipment on air pollution control device.

45. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.

HC – 100%

VOC – 100%

HAP – 100%

46. Manufacturer's Guaranteed Control Efficiency for each air pollutant.

HC – 95%

VOC – 95%

HAP – 95%

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

See attached

44. Proposed Monitoring, Recordkeeping, Reporting, and Testing

Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING:

See Attachment O

RECORDKEEPING:

See Attachment O

REPORTING:

See Attachment O

TESTING:

See Attachment O

MONITORING:

Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.

RECORDKEEPING:

Please describe the proposed recordkeeping that will accompany the monitoring.

REPORTING:

Please describe any proposed emissions testing for this process equipment on air pollution control device.

TESTING:

Please describe any proposed emissions testing for this process equipment on air pollution control device.

45. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.

HC – 100%

VOC – 100%

HAP – 100%

46. Manufacturer's Guaranteed Control Efficiency for each air pollutant.

HC – 95%

VOC – 95%

HAP – 95%

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

See attached

ATTACHMENT N

Supporting Emission Calculations

EOM Gathering Opco - Saturn Compressor Station
Facility-Wide Emissions Summary

| Saturn Station | | | | | | | | | | | | |
|-----------------------------|-----------------------------|-----------------------------|--------------------|-----------------|-------------|-------------|-------------|-------------|---------------------|-------------|-------------|---------------------|
| Emission Unit ID | CAT 3608 Compressor Engines | CAT 3616 Compressor Engines | Stabilizer Heaters | Fuel Gas Heater | Reboiler | Dehydrator | Flare | Reboiler | Dehydrator | Flare | Reboiler | Dehydrator |
| | CE001 - CE005 | CE007 - CE008 | HTR-1 - HTR-2 | HTR-3 - HTR-5 | RBV-1 | RSV-1 | TO-1 | RBV-2 | RSV-2 | TO-2 | RBV-3 | RSV-3 |
| Equipment Status | Existing | Existing | Removed | Existing | Existing | Existing | Existing | Existing | Existing - Modified | Existing | Existing | Existing - Modified |
| Fuel Type/Fluid | Natural Gas | Natural Gas | Natural Gas | Natural Gas | Natural Gas | Natural Gas | Natural Gas | Natural Gas | Natural Gas | Natural Gas | Natural Gas | Natural Gas |
| Capacity | 2,370 | 4,735 | 1.54 | 0.38 | 1.54 | 65 | 3.00 | 1.54 | 130 | 3.00 | 2.31 | 130 |
| Unit | HP | HP | MMBtu/hr | MMBtu/hr | MMBtu/hr | MMSCFD | MMBtu/hr | MMBtu/hr | MMSCFD | MMBtu/hr | MMBtu/hr | MMSCFD |
| # of Emission Units | 5 | 2 | 0 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Hours per Year | 8760 | 8760 | 8760 | 8760 | 8760 | 8760 | 8760 | 8760 | 8760 | 8760 | 8760 | 8760 |
| Pollutant | tpy | tpy | tpy | tpy | tpy | tpy | tpy | tpy | tpy | tpy | tpy | tpy |
| PM ₁₀ | 3.90 | 3.12 | 0.00 | 0.03 | 0.04 | --- | 0.10 | 0.04 | --- | 0.10 | 0.06 | --- |
| PM _{2.5} | 3.90 | 3.12 | 0.00 | 0.03 | 0.04 | --- | 0.10 | 0.04 | --- | 0.10 | 0.06 | --- |
| SO _x | 0.23 | 0.18 | 0.00 | 0.00 | 0.00 | --- | 0.01 | 0.00 | --- | 0.01 | 0.00 | --- |
| CO | 22.03 | 17.60 | 0.00 | 0.35 | 0.46 | --- | 1.09 | 0.46 | --- | 1.09 | 0.70 | --- |
| NO _x | 57.21 | 45.72 | 0.00 | 0.41 | 0.55 | --- | 1.30 | 0.55 | --- | 1.30 | 0.83 | --- |
| VOC | 43.82 | 41.08 | 0.00 | 0.02 | 0.03 | 5.22 | --- | 0.03 | 9.32 | --- | 0.05 | 9.32 |
| CO ₂ | 50,461.25 | 40,417.86 | 0.00 | 590.73 | 787.64 | 263.65 | 1,853.33 | 787.64 | 6.87 | 1,853.33 | 1,182.65 | 6.87 |
| CH ₄ | 567.55 | 467.27 | 0.00 | 0.01 | 0.01 | 1.72 | 0.03 | 0.01 | 5.05 | 0.03 | 0.02 | 5.05 |
| N ₂ O | 0.09 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| CO _{2e} | 64,675.53 | 52,120.22 | 0.00 | 591.34 | 788.46 | 306.55 | 1,855.24 | 788.46 | 133.16 | 1,855.24 | 1,183.87 | 133.16 |
| Formaldehyde | 7.78 | 4.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total HAPs (including HCHO) | 15.35 | 10.09 | 0.00 | 0.01 | 0.01 | 1.48 | --- | 0.01 | 2.33 | --- | 0.02 | 2.33 |

Company Name: **EOM Gathering Opco**
 Facility Name: **SATURN COMPRESSOR STATION**
 Project Description: **R-13 PERMIT CLASS II ADMINISTRATIVE UPDATE**

CAT 3608 ENGINE
CE001 - CE006 (each engine)

| Source Designation | Compressor |
|--|-------------|
| Manufacturer | Caterpillar |
| Model No. | G3608 |
| Stroke Cycle | 4-stroke |
| Type of Burn | Lean |
| Year Installed/Date Manufactured | 2010 |
| Fuel Used | Natural Gas |
| Higher Heating Value (HHV) (Btu/scf) | 1,223 |
| Rated Horsepower (bhp) | 2,370 |
| Specific Fuel Consumption (Btu/bhp-hr) | 7,516 |
| Maximum Fuel Consumption at 100% Load (scf/hr) | 14,570 |
| Heat Input (MMBtu/hr) | 17.81 |
| Stack Designation | TBD |

OPERATIONAL DETAILS

| | |
|---|--------|
| Potential Annual Hours of Operation (hr/yr) | 8,760 |
| Potential Fuel Consumption (MMscf/yr) | 127.63 |

CRITERIA AND MANUFACTURER SPECIFIC POLLUTANT EMISSION FACTORS

| Pollutant | Emission Factors ^a | Units |
|--------------------------------|-------------------------------|----------|
| NO _x | 0.50 | g/bhp-hr |
| CO | 0.19 | g/bhp-hr |
| SO ₂ | 5.88E-04 | lb/MMBtu |
| PM ₁₀ (Filterable) | 7.71E-05 | lb/MMBtu |
| PM _{2.5} (Filterable) | 7.71E-05 | lb/MMBtu |
| PM Condensable | 9.91E-03 | lb/MMBtu |
| PM Total | 9.99E-03 | lb/MMBtu |
| VOC | 0.32 | g/bhp-hr |
| Formaldehyde (HCHO) | 0.07 | g/bhp-hr |
| CO ₂ | 441 | g/bhp-hr |
| CH ₄ | 4.96 | kg/MMBtu |
| N ₂ O | 1.00E-04 | kg/MMBtu |

CRITERIA POLLUTANT EMISSIONS

| Pollutant | Potential Emissions | |
|--------------------------------|----------------------|------------------------|
| | (lb/hr) ^b | (tons/yr) ^c |
| NO _x | 2.61 | 11.44 |
| CO | 1.01 | 4.41 |
| SO ₂ | 0.01 | 0.05 |
| PM ₁₀ (Filterable) | 0.00 | 0.01 |
| PM _{2.5} (Filterable) | 0.00 | 0.01 |
| PM Condensable | 0.18 | 0.77 |
| PM Total | 0.18 | 0.78 |
| VOC | 2.00 | 8.76 |
| Formaldehyde (HCHO) | 0.36 | 1.56 |
| CO ₂ | 2,304 | 10,092 |
| CH ₄ | 25.92 | 113.51 |
| N ₂ O | 0.00 | 0.02 |

Company Name: EQM Gathering Opco
 Facility Name: SATURN COMPRESSOR STATION
 Project Description: R-13 PERMIT CLASS II ADMINISTRATIVE UPDATE

CAT 3608 ENGINE
CE001 - CE006 (each engine)

HAZARDOUS AIR POLLUTANT (HAP) POTENTIAL EMISSIONS

| Pollutant | Emission Factor (lb/MMBtu) ^a | Potential Emissions | |
|----------------------------------|--|----------------------|------------------------|
| | | (lb/hr) ^b | (tons/yr) ^c |
| HAPs | | | |
| Acenaphthene | 1.25E-06 | 2.23E-05 | 9.75E-05 |
| Acenaphthylene | 5.53E-06 | 9.85E-05 | 4.31E-04 |
| Acetaldehyde | 8.36E-03 | 1.49E-01 | 6.52E-01 |
| Acrolein | 5.14E-03 | 9.16E-02 | 4.01E-01 |
| Benzene | 4.40E-04 | 7.84E-03 | 3.43E-02 |
| Benzo(b)fluoranthene | 1.66E-07 | 2.96E-06 | 1.30E-05 |
| Benzo(e)pyrene | 4.15E-07 | 7.39E-06 | 3.24E-05 |
| Benzo(g,h,i)perylene | 4.14E-07 | 7.37E-06 | 3.23E-05 |
| Biphenyl | 2.12E-04 | 3.78E-03 | 1.65E-02 |
| 1,3-Butadiene | 2.67E-04 | 4.76E-03 | 2.08E-02 |
| Carbon Tetrachloride | 3.67E-05 | 6.54E-04 | 2.86E-03 |
| Chlorobenzene | 3.04E-05 | 5.42E-04 | 2.37E-03 |
| Chloroform | 2.85E-05 | 5.08E-04 | 2.22E-03 |
| Chrysene | 6.93E-07 | 1.23E-05 | 5.41E-05 |
| 1,3-Dichloropropene | 2.64E-05 | 4.70E-04 | 2.06E-03 |
| Ethylbenzene | 3.97E-05 | 7.07E-04 | 3.10E-03 |
| Ethylene Dibromide | 4.43E-05 | 7.89E-04 | 3.46E-03 |
| Fluoranthene | 1.11E-06 | 1.98E-05 | 8.66E-05 |
| Fluorene | 5.67E-06 | 1.01E-04 | 4.42E-04 |
| Methanol | 2.50E-03 | 4.45E-02 | 1.95E-01 |
| Methylene Chloride | 2.00E-05 | 3.56E-04 | 1.56E-03 |
| n-Hexane | 1.11E-03 | 1.98E-02 | 8.66E-02 |
| Phenanthrene | 1.04E-05 | 1.85E-04 | 8.11E-04 |
| Phenol | 2.40E-05 | 4.28E-04 | 1.87E-03 |
| Pyrene | 1.36E-06 | 2.42E-05 | 1.06E-04 |
| Styrene | 2.36E-05 | 4.20E-04 | 1.84E-03 |
| Toluene | 4.08E-04 | 7.27E-03 | 3.18E-02 |
| 1,1,2,2-Tetrachloroethane | 4.00E-05 | 7.13E-04 | 3.12E-03 |
| 1,1,2-Trichloroethane | 3.18E-05 | 5.66E-04 | 2.48E-03 |
| 2,2,4-Trimethylpentane | 2.50E-04 | 4.45E-03 | 1.95E-02 |
| Vinyl Chloride | 1.49E-05 | 2.65E-04 | 1.16E-03 |
| Xylene | 1.84E-04 | 3.28E-03 | 1.44E-02 |
| POLYCYCLIC ORGANIC MATTER | | | |
| Naphthalene | 7.44E-05 | 1.33E-03 | 5.80E-03 |
| 2-Methylnaphthalene | 3.32E-05 | 5.91E-04 | 2.59E-03 |
| PAH | 2.69E-05 | 4.79E-04 | 2.10E-03 |
| TOTAL HAP | | 0.70 | 3.07 |

^a 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. NO_x, VOC, CO and Formaldehyde emission factors are based on manufacturer's guarantees for the oxidation catalyst. Greenhouse gas emission factors are based on 40 CFR Part 98, Subpart C, Tables C-1 and C-2 for natural gas combustion.

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

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

Company Name: **EQM Gathering Opco**
 Facility Name: **SATURN COMPRESSOR STATION**
 Project Description: **R-13 PERMIT CLASS II ADMINISTRATIVE UPDATE**

CAT 3616 ENGINE
CE007 - CE008 (each engine)

| Source Designation | Compressor |
|--|-------------|
| Manufacturer | Caterpillar |
| Model No. | G3616 |
| Stroke Cycle | 4-stroke |
| Type of Burn | Lean |
| Year Installed/Date Manufactured | 2014 |
| Fuel Used | Natural Gas |
| Higher Heating Value (HHV) (Btu/scf) | 1,223 |
| Rated Horsepower (bhp) | 4,735 |
| Specific Fuel Consumption (Btu/bhp-hr) | 7,520 |
| Maximum Fuel Consumption at 100% Load (scf/hr) | 29,124 |
| Heat Input (MMBtu/hr) | 35.61 |
| Stack Designation | TBD |

OPERATIONAL DETAILS

| | |
|---|--------|
| Potential Annual Hours of Operation (hr/yr) | 8,760 |
| Potential Fuel Consumption (MMscf/yr) | 255.13 |

CRITERIA AND MANUFACTURER SPECIFIC POLLUTANT EMISSION FACTORS

| Pollutant | Emission Factors ^a | Units |
|----------------------------|-------------------------------|----------|
| NO _x | 0.50 | g/bhp-hr |
| CO | 0.19 | g/bhp-hr |
| SO ₂ | 5.88E-04 | lb/MMBtu |
| PM ₁₀ | 9.99E-03 | lb/MMBtu |
| PM _{2.5} | 9.99E-03 | lb/MMBtu |
| PM Total | 9.99E-03 | lb/MMBtu |
| VOC | 0.41 | g/bhp-hr |
| Formaldehyde (HCHO) | 0.04 | g/bhp-hr |
| CO ₂ | 442 | g/bhp-hr |
| CH ₄ (THC-NMHC) | 5.11 | g/bhp-hr |
| N ₂ O | 1.00E-04 | kg/MMBtu |

CRITERIA POLLUTANT EMISSIONS

| Pollutant | Potential Emissions | |
|---------------------|----------------------|------------------------|
| | (lb/hr) ^b | (tons/yr) ^c |
| NO _x | 5.22 | 22.86 |
| CO | 2.01 | 8.80 |
| SO ₂ | 0.02 | 0.09 |
| PM ₁₀ | 0.36 | 1.56 |
| PM _{2.5} | 0.36 | 1.56 |
| PM Total | 0.36 | 1.56 |
| VOC | 4.69 | 20.54 |
| Formaldehyde (HCHO) | 0.46 | 2.02 |
| CO ₂ | 4614 | 20,209 |
| CH ₄ | 53.34 | 233.64 |
| N ₂ O | 0.01 | 0.03 |
| CO _{2e} | 5,950 | 26,060 |

Company Name: **EOM Gathering Opco**
 Facility Name: **SATURN COMPRESSOR STATION**
 Project Description: **R-13 PERMIT CLASS II ADMINISTRATIVE UPDATE**

CAT 3616 ENGINE
CE007 - CE008 (each engine)

HAZARDOUS AIR POLLUTANT (HAP) POTENTIAL EMISSIONS

| Pollutant | Emission Factor (lb/MMBtu) ^a | Potential Emissions | |
|----------------------------------|--|----------------------|------------------------|
| | | (lb/hr) ^b | (tons/yr) ^c |
| HAPs | | | |
| Acenaphthene | 1.25E-06 | 4.45E-05 | 1.95E-04 |
| Acenaphthylene | 5.53E-06 | 1.97E-04 | 8.62E-04 |
| Acetaldehyde | 8.36E-03 | 2.98E-01 | 1.30E+00 |
| Acrolein | 5.14E-03 | 1.83E-01 | 8.02E-01 |
| Benzene | 4.40E-04 | 1.57E-02 | 6.86E-02 |
| Benzo(b)fluoranthene | 1.66E-07 | 5.91E-06 | 2.59E-05 |
| Benzo(e)pyrene | 4.15E-07 | 1.48E-05 | 6.47E-05 |
| Benzo(g,h,i)perlyene | 4.14E-07 | 1.47E-05 | 6.46E-05 |
| Biphenyl | 2.12E-04 | 7.55E-03 | 3.31E-02 |
| 1,3-Butadiene | 2.67E-04 | 9.51E-03 | 4.16E-02 |
| Carbon Tetrachloride | 3.67E-05 | 1.31E-03 | 5.72E-03 |
| Chlorobenzene | 3.04E-05 | 1.08E-03 | 4.74E-03 |
| Chloroform | 2.85E-05 | 1.01E-03 | 4.44E-03 |
| Chrysene | 6.93E-07 | 2.47E-05 | 1.08E-04 |
| 1,3-Dichloropropene | 2.64E-05 | 9.40E-04 | 4.12E-03 |
| Ethylbenzene | 3.97E-05 | 1.41E-03 | 6.19E-03 |
| Ethylene Dibromide | 4.43E-05 | 1.58E-03 | 6.91E-03 |
| Fluoranthene | 1.11E-06 | 3.95E-05 | 1.73E-04 |
| Fluorene | 5.67E-06 | 2.02E-04 | 8.84E-04 |
| Methanol | 2.50E-03 | 8.90E-02 | 3.90E-01 |
| Methylene Chloride | 2.00E-05 | 7.12E-04 | 3.12E-03 |
| n-Hexane | 1.11E-03 | 3.95E-02 | 1.73E-01 |
| Phenanthrene | 1.04E-05 | 3.70E-04 | 1.62E-03 |
| Phenol | 2.40E-05 | 8.55E-04 | 3.74E-03 |
| Pyrene | 1.36E-06 | 4.84E-05 | 2.12E-04 |
| Styrene | 2.36E-05 | 8.40E-04 | 3.68E-03 |
| Toluene | 4.08E-04 | 1.45E-02 | 6.36E-02 |
| 1,1,2,2-Tetrachloroethane | 4.00E-05 | 1.42E-03 | 6.24E-03 |
| 1,1,2-Trichloroethane | 3.18E-05 | 1.13E-03 | 4.96E-03 |
| 2,2,4-Trimethylpentane | 2.50E-04 | 8.90E-03 | 3.90E-02 |
| Vinyl Chloride | 1.49E-05 | 5.31E-04 | 2.32E-03 |
| Xylene | 1.84E-04 | 6.55E-03 | 2.87E-02 |
| POLYCYCLIC ORGANIC MATTER | | | |
| Naphthalene | 7.44E-05 | 2.65E-03 | 1.16E-02 |
| 2-Methylnaphthalene | 3.32E-05 | 1.18E-03 | 5.18E-03 |
| PAH | 2.69E-05 | 9.58E-04 | 4.20E-03 |
| TOTAL HAP | | 1.15 | 5.05 |

^a 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. NO_x, VOC, CO, CO₂, CH₄, and Formaldehyde emission factors are based on manufacturer's guarantees for the oxidation catalyst. N₂O emission factors are based on 40 CFR Part 98, Subpart C, Table C-2 for natural gas combustion.

^b Emission Rate (lb/hr) = Rated Capacity (MMBtu/hr or bhp) × Emission Factor (lb/MMBtu or lb/bhp-hr).
 Emission Rate (lb/hr) = Rated Capacity (bhp) × Emission Factor (g/bhp-hr) ÷ 453.6 (g/lb)

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

Company Name:
 Facility Name:
 Project Description:

EQM Gathering Opco
 SATURN COMPRESSOR STATION
 R-13 PERMIT CLASS II ADMINISTRATIVE UPDATE

65 MMscfd Glycol Dehy
 RSV-1
 GLY-CALC Output

GRI-GLYCalc Version 4.0 - EMISSIONS SUMMARY

REGENERATOR EMISSIONS

| Pollutant | (lbs/hr) | (lbs/day) | (tons/yr) |
|------------------------------------|-------------|--------------|-------------|
| Carbon dioxide | 0.29 | 7.03 | 1.28 |
| Methane | 0.03 | 0.66 | 0.12 |
| Ethane | 0.08 | 1.94 | 0.35 |
| Propane | 0.10 | 2.33 | 0.42 |
| Isobutane | 0.03 | 0.65 | 0.12 |
| n-Butane | 0.07 | 1.78 | 0.32 |
| Isopentane | 0.02 | 0.53 | 0.10 |
| n-Pentane | 0.03 | 0.65 | 0.12 |
| Cyclopentane | 0.00 | 0.01 | 0.00 |
| n-Hexane | 0.02 | 0.36 | 0.07 |
| Cyclohexane | 0.01 | 0.30 | 0.05 |
| Other Hexanes | 0.02 | 0.42 | 0.08 |
| Heptanes | 0.04 | 0.96 | 0.17 |
| Methylcyclohexane | 0.00 | 0.03 | 0.00 |
| Benzene | 0.03 | 0.75 | 0.14 |
| Toluene | 0.10 | 2.45 | 0.45 |
| Ethylbenzene | 0.02 | 0.46 | 0.08 |
| Xylenes | 0.16 | 3.82 | 0.70 |
| C8 + Heavier Hydrocarbons | 0.16 | 3.92 | 0.72 |
| Total Emissions | 0.92 | 22.02 | 4.02 |
| Total Hydrocarbon Emissions | 0.92 | 22.02 | 4.02 |
| Total VOC Emissions | 0.81 | 19.42 | 3.54 |
| Total HAP Emissions | 0.33 | 7.85 | 1.43 |

* Based on GRI GlyCalc 4.0 runs at worst case emission scenario of dry gas flowrate of 49 MMscf/day and T and P of 100°F and 800 psig, respectively.

GRI-GLYCalc Version 4.0 - EMISSIONS SUMMARY

FLASH GAS EMISSIONS

| Pollutant | (lbs/hr) | (lbs/day) | (tons/yr) |
|------------------------------------|-------------|--------------|-------------|
| Carbon Dioxide | 59.90 | 1437.60 | 262.36 |
| Methane | 0.36 | 8.74 | 1.59 |
| Ethane | 0.33 | 8.01 | 1.46 |
| Propane | 0.19 | 4.48 | 0.82 |
| Isobutane | 0.04 | 0.88 | 0.16 |
| n-Butane | 0.08 | 1.89 | 0.34 |
| Isopentane | 0.02 | 0.51 | 0.09 |
| n-Pentane | 0.02 | 0.51 | 0.09 |
| Cyclopentane | 0.00 | 0.00 | 0.00 |
| n-Hexane | 0.01 | 0.17 | 0.03 |
| Cyclohexane | 0.00 | 0.04 | 0.01 |
| Other Hexanes | 0.01 | 0.26 | 0.05 |
| Heptanes | 0.01 | 0.24 | 0.04 |
| Methylcyclohexane | 0.00 | 0.00 | 0.00 |
| Benzene | 0.00 | 0.01 | 0.00 |
| Toluene | 0.00 | 0.03 | 0.01 |
| Ethylbenzene | 0.00 | 0.00 | 0.00 |
| Xylenes | 0.00 | 0.02 | 0.00 |
| C8 + Heavier Hydrocarbons | 0.01 | 0.15 | 0.03 |
| Total Emissions | 1.08 | 25.95 | 4.74 |
| Total Hydrocarbon Emissions | 1.08 | 25.95 | 4.74 |
| Total VOC Emissions | 0.38 | 9.20 | 1.68 |
| Total HAP Emissions | 0.01 | 0.24 | 0.04 |

* Based on GRI GlyCalc 4.0 runs at worst case emission scenario of T and P of 150°F and 65 psig, respectively.

Company Name:
 Facility Name:
 Project Description:

EQM Gathering Opco
 SATURN COMPRESSOR STATION
 R-13 PERMIT CLASS II ADMINISTRATIVE UPDATE

130 MMscfd Glycol Dehy
 RSV-2 & RSV-3 (each)
 GLY-CALC Output

GRI-GLYCalc Version 4.0 - EMISSIONS SUMMARY
CONTROLLED REGENERATOR EMISSIONS

| Pollutant | (lbs/hr) | (lbs/day) | (tons/yr) |
|------------------------------------|--------------|---------------|--------------|
| Carbon dioxide | 0.509 | 12.216 | 2.2294 |
| Methane | 0.0435 | 1.0450 | 0.1907 |
| Ethane | 0.1230 | 2.9520 | 0.5387 |
| Propane | 0.1471 | 3.5310 | 0.6445 |
| Isobutane | 0.0430 | 1.0320 | 0.1883 |
| n-Butane | 0.1181 | 2.8350 | 0.5174 |
| Isopentane | 0.0391 | 0.9390 | 0.1714 |
| n-Pentane | 0.0499 | 1.1980 | 0.2187 |
| n-Hexane | 0.0356 | 0.8550 | 0.1560 |
| Cyclohexane | 0.0293 | 0.7030 | 0.1283 |
| Other Hexanes | 0.0417 | 1.0010 | 0.1827 |
| Heptanes | 0.0964 | 2.3130 | 0.4223 |
| 2,2,4 - Trimethylpentane | 0.0181 | 0.4330 | 0.0791 |
| Benzene | 0.0686 | 1.6470 | 0.3007 |
| Toluene | 0.1623 | 3.8960 | 0.7111 |
| Xylenes | 0.2087 | 5.0080 | 0.9140 |
| C8 + Heavier Hydrocarbons | 0.0909 | 2.1820 | 0.3983 |
| Total Emissions | 1.315 | 31.574 | 5.762 |
| Total Hydrocarbon Emissions | 1.315 | 31.574 | 5.762 |
| Total VOC Emissions | 1.149 | 27.577 | 5.033 |
| Total HAP Emissions | 0.493 | 11.841 | 2.161 |

GRI-GLYCalc Version 4.0 - EMISSIONS SUMMARY
FLASH GAS EMISSIONS

| Pollutant | (lbs/hr) | (lbs/day) | (tons/yr) |
|------------------------------------|--------------|---------------|---------------|
| Carbon Dioxide | 1.06 | 25.44 | 4.6428 |
| Methane | 1.1098 | 26.6350 | 4.8610 |
| Ethane | 0.9020 | 21.6480 | 3.9508 |
| Propane | 0.4750 | 11.3990 | 2.0803 |
| Isobutane | 0.0916 | 2.1980 | 0.4012 |
| n-Butane | 0.1913 | 4.5910 | 0.8378 |
| Isopentane | 0.0553 | 1.3270 | 0.2422 |
| n-Pentane | 0.0562 | 1.3490 | 0.2461 |
| n-Hexane | 0.0221 | 0.5320 | 0.0970 |
| Cyclohexane | 0.0047 | 0.1130 | 0.0206 |
| Other Hexanes | 0.0344 | 0.8250 | 0.1506 |
| Heptanes | 0.0293 | 0.7020 | 0.1281 |
| 2,2,4 - Trimethylpentane | 0.0110 | 0.2640 | 0.0482 |
| Benzene | 0.0014 | 0.0350 | 0.0063 |
| Toluene | 0.0022 | 0.0530 | 0.0096 |
| Xylenes | 0.0011 | 0.0270 | 0.0048 |
| C8 + Heavier Hydrocarbons | 0.0025 | 0.0600 | 0.0110 |
| Total Emissions | 2.990 | 71.758 | 13.096 |
| Total Hydrocarbon Emissions | 2.990 | 71.758 | 13.096 |
| Total VOC Emissions | 0.978 | 23.475 | 4.284 |
| Total HAP Emissions | 0.038 | 0.910 | 0.166 |

* Based on GRI GlyCalc 4.0 runs at worst case emission scenario of dry gas flowrate of 130 MMscf/day and T and P of 100°F and 1000 psig, respectively.

* Based on GRI GlyCalc 4.0 runs at worst case emission scenario of T and P of 125°F and 35 psig, respectively. Emissions from the Still Vent and Flash Tank will be controlled by a thermal oxidizer which is expected to achieve a destruction efficiency of 95 %

**Glycol Dehydrator Thermal Oxidizer
Emission Calculations - Criteria**

EQM Gathering Opco
SATURN COMPRESSOR STATION
R-13 PERMIT CLASS II ADMINISTRATIVE UPDATE

Company Name:
Facility Name:
Project Description:

Unit ID TO-1, TO-2, TO-3
Thermal Oxidizer Rating (MMBtu/hr) 3.00
Pilot Rating (MMBtu/hr) 0.62
Potential Operating Hours (hrs) 8760

| Pollutant ² | Emission Factors ¹ (lb/MMBtu) | Potential Emissions (lb/hr) | Pilot Combustor Emissions (tpy) |
|------------------------|---|--------------------------------|------------------------------------|
| NO _x | 0.082 | 0.051 | 0.222 |
| CO | 0.069 | 0.043 | 0.187 |
| PM/PM ₁₀ | 0.006 | 0.004 | 0.017 |
| SO ₂ | 0.000 | 0.0003 | 0.001 |
| CO ₂ | 117 | 72 | 317 |
| CH ₄ | 0.002 | 0.0014 | 0.006 |
| N ₂ O | 0.000 | 0.0001 | 0.001 |

| Pollutant ² | Emission Factors ¹ (lb/MMBtu) | Potential Emissions (lb/hr) | Thermal Oxidizer Emissions (tpy) |
|------------------------|---|--------------------------------|-------------------------------------|
| NO _x | 0.082 | 0.246 | 1.076 |
| CO | 0.069 | 0.206 | 0.904 |
| PM/PM ₁₀ | 0.006 | 0.019 | 0.082 |
| SO ₂ | 0.000 | 0.0015 | 0.006 |
| CO ₂ | 117 | 351 | 1536 |
| CH ₄ | 0.002 | 0.0066 | 0.029 |
| N ₂ O | 0.000 | 0.0007 | 0.003 |
| VOC | **GLYCalc** | | |

1. Emission factors from AP-42 Ch. 1.4 for natural gas combustion were used as they were determined to be most representative of the process. Ch. 5.3 (Natural Gas Processing) was consulted, however, factors contained there are appropriate for amine gas sweetening processes, which is not the case at the Saturn Station. Also, Ch. 13.5 (Industrial Flares) was consulted, but since the control device in this case is a thermal oxidizer vs. an elevated flare, these factors were also determined to be
2. Greenhouse gas emission factors from 40 CFR Part 98 Tables C-1 and C-2.

Company Name:
 Facility Name:
 Project Description:

EQM Gathering Opco
 SATURN COMPRESSOR STATION
 R-13 PERMIT CLASS II ADMINISTRATIVE UPDATE

Pipeline Flare Emission Calculations -
 Criteria Pollutants

Unit ID
 Thermal Oxidizer Rating (MMBtu/hr)
 Pilot Rating (MMBtu/hr)
 Potential Operating Hours (hrs)

TO-4
 41.00
 0.11
 8760

| Pollutant ² | Emission Factors ¹ | | Potential Emissions (lb/hr) | Pilot Combustor Emissions (tpy) |
|------------------------|-------------------------------|---------|--------------------------------|------------------------------------|
| | (lb/MMBtu) | (lb/hr) | | |
| NO _x | 0.082 | 0.009 | 0.039 | 0.039 |
| CO | 0.069 | 0.008 | 0.033 | 0.033 |
| PM/PM ₁₀ | 0.006 | 0.001 | 0.003 | 0.003 |
| SO ₂ | 0.000 | 0.0001 | 0.000 | 0.000 |
| CO ₂ | 117 | 13 | 56 | 56 |
| CH ₄ | 0.002 | 0.0002 | 0.001 | 0.001 |
| N ₂ O | 0.000 | 0.0000 | 0.000 | 0.000 |

| Pollutant ² | Emission Factors ¹ | | Potential Emissions (lb/hr) | Thermal Oxidizer Emissions (tpy) |
|------------------------|-------------------------------------|---------|--------------------------------|--|
| | (lb/MMBtu) | (lb/hr) | | |
| NO _x | 0.082 | 3.358 | 14.708 | 14.708 |
| CO | 0.069 | 2.821 | 12.354 | 12.354 |
| PM/PM ₁₀ | 0.006 | 0.255 | 1.118 | 1.118 |
| SO ₂ | 0.000 | 0.0201 | 0.088 | 0.088 |
| CO ₂ | 117 | 4792 | 20991 | 20991 |
| CH ₄ | 0.002 | 0.0904 | 0.396 | 0.396 |
| N ₂ O | 0.000 | 0.0090 | 0.040 | 0.040 |
| VOC | E&P TANK (Produced Fluids Tanks) | 3.710 | 16.249 | 16.249 |

1. Emission factors from AP-42 Ch. 1.4 for natural gas combustion were used as they were determined to be most representative of the process. Ch. 5.3 (Natural Gas Processing) was consulted, however, factors contained there are appropriate for amine gas sweetening processes, which is not the case at the Saturn Station. Also, Ch. 13.5 (Industrial Flares) was consulted, but since the control device in this case is a thermal oxidizer vs. an elevated flare, these factors were also determined to be inappropriate.

2. Greenhouse gas emission factors from 40 CFR Part 98 Tables C-1 and C-2.

Company Name: EQM Gathering Opco
Facility Name: SATURN COMPRESSOR STATION
Project Description: R-13 PERMIT CLASS II ADMINISTRATIVE UPDATE

| |
|-----------------------------------|
| Reboiler 1 RBV-1 |
|-----------------------------------|

| | |
|---|-------------|
| Source Designation | Reboiler |
| Year Installed | 2010 |
| Fuel Used | Natural Gas |
| Higher Heating Value (HHV) (Btu/scf) | 1,223 |
| Heat Input (MMBtu/hr) | 1.54 |
| Fuel Consumption (mmscf/hr) | 1.26E-03 |
| Potential Annual Hours of Operation (hr/yr) | 8,760 |

CRITERIA AND MANUFACTURER SPECIFIC POLLUTANT EMISSION FACTORS

| Pollutant | Emission Factor (lb/MMscf) ^a | Potential Emissions | |
|-------------------|---|----------------------|------------------------|
| | | (lb/hr) ^b | (tons/yr) ^c |
| NO _x | 100 | 0.126 | 0.551 |
| CO | 84 | 0.106 | 0.463 |
| SO ₂ | 0.6 | 0.0008 | 0.003 |
| PM | 7.6 | 0.010 | 0.042 |
| PM ₁₀ | 7.6 | 0.010 | 0.042 |
| PM _{2.5} | 7.6 | 0.010 | 0.042 |
| VOC | 5.5 | 0.007 | 0.030 |
| CO ₂ | 142,907 | 179.828 | 787.645 |
| CH ₄ | 2.70 | 0.003 | 0.015 |
| N ₂ O | 0.27 | 0.000 | 0.001 |

Company Name: EQM Gathering Opco
 Facility Name: SATURN COMPRESSOR STATION
 Project Description: R-13 PERMIT CLASS II ADMINISTRATIVE UPDATE

| |
|---------------------|
| Reboiler 1 RBV-1 |
|---------------------|

HAZARDOUS AIR POLLUTANT (HAP) POTENTIAL EMISSIONS

| Pollutant | Emission Factor (lb/MMscf) ^a | Potential Emissions | |
|----------------------------------|--|----------------------|------------------------|
| | | (lb/hr) ^b | (tons/yr) ^c |
| HAPs | | | |
| 3-Methylchloranthrene | 1.80E-06 | 2.27E-09 | 9.92E-09 |
| 7,12-Dimethylbenz(a)anthracene | 1.60E-05 | 2.01E-08 | 8.82E-08 |
| Acenaphthene | 1.80E-06 | 2.27E-09 | 9.92E-09 |
| Acenaphthylene | 1.80E-06 | 2.27E-09 | 9.92E-09 |
| Anthracene | 2.40E-06 | 3.02E-09 | 1.32E-08 |
| Benz(a)anthracene | 1.80E-06 | 2.27E-09 | 9.92E-09 |
| Benzene | 2.10E-03 | 2.64E-06 | 1.16E-05 |
| Benzo(a)pyrene | 1.20E-06 | 1.51E-09 | 6.61E-09 |
| Benzo(b)fluoranthene | 1.80E-06 | 2.27E-09 | 9.92E-09 |
| Benzo(g,h,i)perylene | 1.20E-06 | 1.51E-09 | 6.61E-09 |
| Benzo(k)fluoranthene | 1.80E-06 | 2.27E-09 | 9.92E-09 |
| Chrysene | 1.80E-06 | 2.27E-09 | 9.92E-09 |
| Dibenzo(a,h) anthracene | 1.20E-06 | 1.51E-09 | 6.61E-09 |
| Dichlorobenzene | 1.20E-03 | 1.51E-06 | 6.61E-06 |
| Fluoranthene | 3.00E-06 | 3.78E-09 | 1.65E-08 |
| Fluorene | 2.80E-06 | 3.52E-09 | 1.54E-08 |
| Formaldehyde | 7.50E-02 | 9.44E-05 | 4.13E-04 |
| Hexane | 1.80E+00 | 2.27E-03 | 9.92E-03 |
| Indo(1,2,3-cd)pyrene | 1.80E-06 | 2.27E-09 | 9.92E-09 |
| Phenanthrene | 1.70E-05 | 2.14E-08 | 9.37E-08 |
| Pyrene | 5.00E-06 | 6.29E-09 | 2.76E-08 |
| Toluene | 3.40E-03 | 4.28E-06 | 1.87E-05 |
| Arsenic | 2.00E-04 | 2.52E-07 | 1.10E-06 |
| Beryllium | 1.20E-05 | 1.51E-08 | 6.61E-08 |
| Cadmium | 1.10E-03 | 1.38E-06 | 6.06E-06 |
| Chromium | 1.40E-03 | 1.76E-06 | 7.72E-06 |
| Cobalt | 8.40E-05 | 1.06E-07 | 4.63E-07 |
| Lead | 5.00E-04 | 6.29E-07 | 2.76E-06 |
| Manganese | 3.80E-04 | 4.78E-07 | 2.09E-06 |
| Mercury | 2.60E-04 | 3.27E-07 | 1.43E-06 |
| Nickel | 2.10E-03 | 2.64E-06 | 1.16E-05 |
| Selenium | 2.40E-05 | 3.02E-08 | 1.32E-07 |
| POLYCYCLIC ORGANIC MATTER | | | |
| Methylnaphthalene (2-) | 2.40E-05 | 3.02E-08 | 1.32E-07 |
| Naphthalene | 6.10E-04 | 7.68E-07 | 3.36E-06 |
| TOTAL HAP | | 2.38E-03 | 1.04E-02 |

^a Emission factors from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1, 1.4-2, & 1.4-3.

Greenhouse gas emission factors from 40 CFR Part 98 Tables C-1 and C-2.

^b Emission Rate (lb/hr) = Rated Capacity (MMscf/hr) × Emission Factor (lb/MMscf).

^c Annual Emissions (tons/yr)_{Potential} = (lb/hr)_{Emissions} × (Maximum Allowable Operating Hours, 8760 hr/yr) × (1 ton/2000 lb).

Company Name: EQM Gathering Opco
Facility Name: SATURN COMPRESSOR STATION
Project Description: R-13 PERMIT CLASS II ADMINISTRATIVE UPDATE

| |
|-----------------------------------|
| Reboiler 2 RBV-2 |
|-----------------------------------|

| | |
|---|-------------|
| Source Designation | Reboiler |
| Year Installed | 2012 |
| Fuel Used | Natural Gas |
| Higher Heating Value (HHV) (Btu/scf) | 1,223 |
| Heat Input (MMBtu/hr) | 1.54 |
| Fuel Consumption (mmscf/hr) | 1.26E-03 |
| Potential Annual Hours of Operation (hr/yr) | 8,760 |
| Potential Fuel Consumption (MMscf/yr) | 11.02 |

CRITERIA AND MANUFACTURER SPECIFIC POLLUTANT EMISSION FACTORS

| Pollutant | Emission Factor (lb/MMscf) ^a | Potential Emissions | |
|-------------------|---|----------------------|------------------------|
| | | (lb/hr) ^b | (tons/yr) ^c |
| NO _x | 100 | 0.126 | 0.551 |
| CO | 84 | 0.106 | 0.463 |
| SO ₂ | 0.6 | 0.0008 | 0.003 |
| PM | 7.6 | 0.010 | 0.042 |
| PM ₁₀ | 7.6 | 0.010 | 0.042 |
| PM _{2.5} | 7.6 | 0.010 | 0.042 |
| VOC | 5.5 | 0.007 | 0.030 |
| CO ₂ | 142,907 | 179.828 | 787.645 |
| CH ₄ | 2.70 | 0.003 | 0.015 |
| N ₂ O | 0.27 | 0.000 | 0.001 |

Company Name: EOM Gathering Opco
 Facility Name: SATURN COMPRESSOR STATION
 Project Description: R-13 PERMIT CLASS II ADMINISTRATIVE UPDATE

| |
|---------------------|
| Reboiler 2 RBV-2 |
|---------------------|

HAZARDOUS AIR POLLUTANT (HAP) POTENTIAL EMISSIONS

| Pollutant | Emission Factor (lb/MMscf) ^a | Potential Emissions | |
|----------------------------------|--|----------------------|------------------------|
| | | (lb/hr) ^b | (tons/yr) ^c |
| HAPs | | | |
| 3-Methylchloranthrene | 1.80E-06 | 2.27E-09 | 9.92E-09 |
| 7,12-Dimethylbenz(a)anthracene | 1.60E-05 | 2.01E-08 | 8.82E-08 |
| Acenaphthene | 1.80E-06 | 2.27E-09 | 9.92E-09 |
| Acenaphthylene | 1.80E-06 | 2.27E-09 | 9.92E-09 |
| Anthracene | 2.40E-06 | 3.02E-09 | 1.32E-08 |
| Benz(a)anthracene | 1.80E-06 | 2.27E-09 | 9.92E-09 |
| Benzene | 2.10E-03 | 2.64E-06 | 1.16E-05 |
| Benzo(a)pyrene | 1.20E-06 | 1.51E-09 | 6.61E-09 |
| Benzo(b)fluoranthene | 1.80E-06 | 2.27E-09 | 9.92E-09 |
| Benzo(g,h,i)perylene | 1.20E-06 | 1.51E-09 | 6.61E-09 |
| Benzo(k)fluoranthene | 1.80E-06 | 2.27E-09 | 9.92E-09 |
| Chrysene | 1.80E-06 | 2.27E-09 | 9.92E-09 |
| Dibenzo(a,h) anthracene | 1.20E-06 | 1.51E-09 | 6.61E-09 |
| Dichlorobenzene | 1.20E-03 | 1.51E-06 | 6.61E-06 |
| Fluoranthene | 3.00E-06 | 3.78E-09 | 1.65E-08 |
| Fluorene | 2.80E-06 | 3.52E-09 | 1.54E-08 |
| Formaldehyde | 7.50E-02 | 9.44E-05 | 4.13E-04 |
| Hexane | 1.80E+00 | 2.27E-03 | 9.92E-03 |
| Indo(1,2,3-cd)pyrene | 1.80E-06 | 2.27E-09 | 9.92E-09 |
| Phenanthrene | 1.70E-05 | 2.14E-08 | 9.37E-08 |
| Pyrene | 5.00E-06 | 6.29E-09 | 2.76E-08 |
| Toluene | 3.40E-03 | 4.28E-06 | 1.87E-05 |
| Arsenic | 2.00E-04 | 2.52E-07 | 1.10E-06 |
| Beryllium | 1.20E-05 | 1.51E-08 | 6.61E-08 |
| Cadmium | 1.10E-03 | 1.38E-06 | 6.06E-06 |
| Chromium | 1.40E-03 | 1.76E-06 | 7.72E-06 |
| Cobalt | 8.40E-05 | 1.06E-07 | 4.63E-07 |
| Lead | 5.00E-04 | 6.29E-07 | 2.76E-06 |
| Manganese | 3.80E-04 | 4.78E-07 | 2.09E-06 |
| Mercury | 2.60E-04 | 3.27E-07 | 1.43E-06 |
| Nickel | 2.10E-03 | 2.64E-06 | 1.16E-05 |
| Selenium | 2.40E-05 | 3.02E-08 | 1.32E-07 |
| POLYCYCLIC ORGANIC MATTER | | | |
| Methylnaphthalene (2-) | 2.40E-05 | 3.02E-08 | 1.32E-07 |
| Naphthalene | 6.10E-04 | 7.68E-07 | 3.36E-06 |
| TOTAL HAP | | 0.002 | 0.01 |

^a Emission factors from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1, 1.4-2, & 1.4-3. Greenhouse gas emission factors from 40 CFR Part 98 Tables C-1 and C-2.

^b Emission Rate (lb/hr) = Rated Capacity (MMscf/hr) × Emission Factor (lb/MMscf).

^c Annual Emissions (tons/yr)_{Potential} = (lb/hr)_{Emissions} × (Maximum Allowable Operating Hours, 8760 hr/yr) × (1 ton/2000 lb).

Company Name: EQM Gathering Opco
Facility Name: SATURN COMPRESSOR STATION
Project Description: R-13 PERMIT CLASS II ADMINISTRATIVE UPDATE

| |
|-----------------------------------|
| Reboiler 3 RBV-3 |
|-----------------------------------|

| | |
|---|-------------|
| Source Designation: | Reboiler |
| Year Installed | TBD |
| Fuel Used | Natural Gas |
| Higher Heating Value (HHV) (Btu/scf) | 1,223 |
| Heat Input (MMBtu/hr) | 2.31 |
| Fuel Consumption (mmscf/hr) | 1.89E-03 |
| Potential Annual Hours of Operation (hr/yr) | 8,760 |
| Potential Fuel Consumption (MMscf/yr) | 16.55 |

CRITERIA AND MANUFACTURER SPECIFIC POLLUTANT EMISSION FACTORS

| Pollutant | Emission Factor (lb/MMscf) ^a | Potential Emissions | |
|-------------------|---|----------------------|------------------------|
| | | (lb/hr) ^b | (tons/yr) ^c |
| NO _x | 100 | 0.19 | 0.83 |
| CO | 84 | 0.16 | 0.70 |
| SO ₂ | 0.6 | 0.001 | 0.005 |
| PM | 7.6 | 0.01 | 0.06 |
| PM ₁₀ | 7.6 | 0.01 | 0.06 |
| PM _{2.5} | 7.6 | 0.01 | 0.06 |
| VOC | 5.5 | 0.01 | 0.05 |
| CO ₂ | 142,907 | 270 | 1183 |
| CH ₄ | 2.70 | 0.005 | 0.022 |
| N ₂ O | 0.27 | 0.001 | 0.002 |

Company Name: EOM Gathering Opco
 Facility Name: SATURN COMPRESSOR STATION
 Project Description: R-13 PERMIT CLASS II ADMINISTRATIVE UPDATE

| |
|---------------------|
| Reboiler 3 RBV-3 |
|---------------------|

HAZARDOUS AIR POLLUTANT (HAP) POTENTIAL EMISSIONS

| Pollutant | Emission Factor (lb/MMscf) ^a | Potential Emissions | |
|----------------------------------|--|----------------------|------------------------|
| | | (lb/hr) ^b | (tons/yr) ^c |
| HAPs | | | |
| 3-Methylchloranthrene | 1.80E-06 | 3.40E-09 | 1.49E-08 |
| 7,12-Dimethylbenz(a)anthracene | 1.60E-05 | 3.02E-08 | 1.32E-07 |
| Acenaphthene | 1.80E-06 | 3.40E-09 | 1.49E-08 |
| Acenaphthylene | 1.80E-06 | 3.40E-09 | 1.49E-08 |
| Anthracene | 2.40E-06 | 4.53E-09 | 1.99E-08 |
| Benz(a)anthracene | 1.80E-06 | 3.40E-09 | 1.49E-08 |
| Benzene | 2.10E-03 | 3.97E-06 | 1.74E-05 |
| Benzo(a)pyrene | 1.20E-06 | 2.27E-09 | 9.93E-09 |
| Benzo(b)fluoranthene | 1.80E-06 | 3.40E-09 | 1.49E-08 |
| Benzo(g,h,i)perylene | 1.20E-06 | 2.27E-09 | 9.93E-09 |
| Benzo(k)fluoranthene | 1.80E-06 | 3.40E-09 | 1.49E-08 |
| Chrysene | 1.80E-06 | 3.40E-09 | 1.49E-08 |
| Dibenzo(a,h) anthracene | 1.20E-06 | 2.27E-09 | 9.93E-09 |
| Dichlorobenzene | 1.20E-03 | 2.27E-06 | 9.93E-06 |
| Fluoranthene | 3.00E-06 | 5.67E-09 | 2.48E-08 |
| Fluorene | 2.80E-06 | 5.29E-09 | 2.32E-08 |
| Formaldehyde | 7.50E-02 | 1.42E-04 | 6.21E-04 |
| Hexane | 1.80E+00 | 3.40E-03 | 1.49E-02 |
| Indo(1,2,3-cd)pyrene | 1.80E-06 | 3.40E-09 | 1.49E-08 |
| Phenanthrene | 1.70E-05 | 3.21E-08 | 1.41E-07 |
| Pyrene | 5.00E-06 | 9.45E-09 | 4.14E-08 |
| Toluene | 3.40E-03 | 6.42E-06 | 2.81E-05 |
| Arsenic | 2.00E-04 | 3.78E-07 | 1.66E-06 |
| Beryllium | 1.20E-05 | 2.27E-08 | 9.93E-08 |
| Cadmium | 1.10E-03 | 2.08E-06 | 9.10E-06 |
| Chromium | 1.40E-03 | 2.65E-06 | 1.16E-05 |
| Cobalt | 8.40E-05 | 1.59E-07 | 6.95E-07 |
| Lead | 5.00E-04 | 9.45E-07 | 4.14E-06 |
| Manganese | 3.80E-04 | 7.18E-07 | 3.14E-06 |
| Mercury | 2.60E-04 | 4.91E-07 | 2.15E-06 |
| Nickel | 2.10E-03 | 3.97E-06 | 1.74E-05 |
| Selenium | 2.40E-05 | 4.53E-08 | 1.99E-07 |
| POLYCYCLIC ORGANIC MATTER | | | |
| Methylnaphthalene (2-) | 2.40E-05 | 4.53E-08 | 1.99E-07 |
| Naphthalene | 6.10E-04 | 1.15E-06 | 5.05E-06 |
| TOTAL HAP | | 3.57E-03 | 0.02 |

- ^a Emission factors from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1, 1.4-2, & 1.4-3.
Greenhouse gas emission factors from 40 CFR Part 98 Tables C-1 and C-2.
- ^b Emission Rate (lb/hr) = Rated Capacity (MMscf/hr) × Emission Factor (lb/MMscf).
- ^c Annual Emissions (tons/yr)_{Potential} = (lb/hr)_{Emissions} × (Maximum Allowable Operating Hours, 8760 hr/yr) × (1 ton/2000 lb).

Company Name: EOM Gathering Opco
 Facility Name: SATURN COMPRESSOR STATION
 Project Description: R-13 PERMIT CLASS II ADMINISTRATIVE UPDATE

| |
|--|
| Fuel Gas Heater HTR-3 |
|--|

| | |
|---|-----------------|
| Source Designation | Fuel Gas Heater |
| Year Installed | 2010 |
| Fuel Used | Natural Gas |
| Higher Heating Value (HHV) (Btu/scf) | 1,223 |
| Heat Input (MMBtu/hr) | 0.38 |
| Fuel Consumption (mmscf/hr) | 3.15E-04 |
| Potential Annual Hours of Operation (hr/yr) | 8,760 |

CRITERIA AND MANUFACTURER SPECIFIC POLLUTANT EMISSION FACTORS

| Pollutant | Emission Factor (lb/MMscf) ^a | Potential Emissions | |
|-------------------|--|----------------------|------------------------|
| | | (lb/hr) ^b | (tons/yr) ^c |
| NO _x | 100 | 0.03 | 0.14 |
| CO | 84 | 0.03 | 0.12 |
| SO ₂ | 0.6 | 0.00 | 0.00 |
| PM | 7.6 | 0.00 | 0.01 |
| PM ₁₀ | 7.6 | 0.00 | 0.01 |
| PM _{2.5} | 7.6 | 0.00 | 0.01 |
| VOC | 5.5 | 0.00 | 0.01 |
| CO ₂ | 142,907 | 44.957 | 196.911 |
| CH ₄ | 2.70 | 0.001 | 0.004 |
| N ₂ O | 0.27 | 0.000 | 0.000 |

Company Name: **EOM Gathering Opco**
 Facility Name: **SATURN COMPRESSOR STATION**
 Project Description: **R-13 PERMIT CLASS II ADMINISTRATIVE UPDATE**

**Fuel Gas Heater
HTR-3**

HAZARDOUS AIR POLLUTANT (HAP) POTENTIAL EMISSIONS

| Pollutant | Emission Factor (lb/MMscf) ^a | Potential Emissions | |
|----------------------------------|--|----------------------|------------------------|
| | | (lb/hr) ^b | (tons/yr) ^c |
| HAPs: | | | |
| 3-Methylchloranthrene | 1.80E-06 | 5.66E-10 | 2.48E-09 |
| 7,12-Dimethylbenz(a)anthracene | 1.60E-05 | 5.03E-09 | 2.20E-08 |
| Acenaphthene | 1.80E-06 | 5.66E-10 | 2.48E-09 |
| Acenaphthylene | 1.80E-06 | 5.66E-10 | 2.48E-09 |
| Anthracene | 2.40E-06 | 7.55E-10 | 3.31E-09 |
| Benz(a)anthracene | 1.80E-06 | 5.66E-10 | 2.48E-09 |
| Benzene | 2.10E-03 | 6.61E-07 | 2.89E-06 |
| Benzo(a)pyrene | 1.20E-06 | 3.78E-10 | 1.65E-09 |
| Benzo(b)fluoranthene | 1.80E-06 | 5.66E-10 | 2.48E-09 |
| Benzo(g,h,i)perylene | 1.20E-06 | 3.78E-10 | 1.65E-09 |
| Benzo(k)fluoranthene | 1.80E-06 | 5.66E-10 | 2.48E-09 |
| Chrysene | 1.80E-06 | 5.66E-10 | 2.48E-09 |
| Dibenzo(a,h) anthracene | 1.20E-06 | 3.78E-10 | 1.65E-09 |
| Dichlorobenzene | 1.20E-03 | 3.78E-07 | 1.65E-06 |
| Fluoranthene | 3.00E-06 | 9.44E-10 | 4.13E-09 |
| Fluorene | 2.80E-06 | 8.81E-10 | 3.86E-09 |
| Formaldehyde | 7.50E-02 | 2.36E-05 | 1.03E-04 |
| Hexane | 1.80E+00 | 5.66E-04 | 2.48E-03 |
| Indo(1,2,3-cd)pyrene | 1.80E-06 | 5.66E-10 | 2.48E-09 |
| Phenanthrene | 1.70E-05 | 5.35E-09 | 2.34E-08 |
| Pyrene | 5.00E-06 | 1.57E-09 | 6.89E-09 |
| Toluene | 3.40E-03 | 1.07E-06 | 4.68E-06 |
| Arsenic | 2.00E-04 | 6.29E-08 | 2.76E-07 |
| Beryllium | 1.20E-05 | 3.78E-09 | 1.65E-08 |
| Cadmium | 1.10E-03 | 3.46E-07 | 1.52E-06 |
| Chromium | 1.40E-03 | 4.40E-07 | 1.93E-06 |
| Cobalt | 8.40E-05 | 2.64E-08 | 1.16E-07 |
| Lead | 5.00E-04 | 1.57E-07 | 6.89E-07 |
| Manganese | 3.80E-04 | 1.20E-07 | 5.24E-07 |
| Mercury | 2.60E-04 | 8.18E-08 | 3.58E-07 |
| Nickel | 2.10E-03 | 6.61E-07 | 2.89E-06 |
| Selenium | 2.40E-05 | 7.55E-09 | 3.31E-08 |
| POLYCYCLIC ORGANIC MATTER | | | |
| Methylnaphthalene (2-) | 2.40E-05 | 7.55E-09 | 3.31E-08 |
| Naphthalene | 6.10E-04 | 1.92E-07 | 8.41E-07 |
| TOTAL HAP | | 5.94E-04 | 2.60E-03 |

^a Emission factors from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1, 1.4-2, & 1.4-3. Greenhouse gas emission factors from 40 CFR Part 98 Tables C-1 and C-2.

^b Emission Rate (lb/hr) = Rated Capacity (MMscf/hr) × Emission Factor (lb/MMscf).

^c Annual Emissions (tons/yr)_{Potential} = (lb/hr)_{Emissions} × (Maximum Allowable Operating Hours, 8760 hr/yr) × (1 ton/2000 lb).

Company Name: EOM Gathering Opco
Facility Name: SATURN COMPRESSOR STATION
Project Description: R-13 PERMIT CLASS II ADMINISTRATIVE UPDATE

| |
|--|
| Fuel Gas Heater HTR-4 |
|--|

| | |
|---|-----------------|
| Source Designation | Fuel Gas Heater |
| Year Installed | 2014 |
| Fuel Used | Natural Gas |
| Higher Heating Value (HHV) (Btu/scf) | 1,223 |
| Heat Input (MMBtu/hr) | 0.38 |
| Fuel Consumption (mmscf/hr) | 3.15E-04 |
| Potential Annual Hours of Operation (hr/yr) | 8,760 |

CRITERIA AND MANUFACTURER SPECIFIC POLLUTANT EMISSION FACTORS

| Pollutant | Emission Factor (lb/MMscf) ^a | Potential Emissions | |
|-------------------|--|----------------------|------------------------|
| | | (lb/hr) ^b | (tons/yr) ^c |
| NO _x | 100 | 0.03 | 0.14 |
| CO | 84 | 0.03 | 0.12 |
| SO ₂ | 0.6 | 0.00 | 0.00 |
| PM | 7.6 | 0.00 | 0.01 |
| PM ₁₀ | 7.6 | 0.00 | 0.01 |
| PM _{2.5} | 7.6 | 0.00 | 0.01 |
| VOC | 5.5 | 0.00 | 0.01 |
| CO ₂ | 142,907 | 44.957 | 196.911 |
| CH ₄ | 2.70 | 0.001 | 0.004 |
| N ₂ O | 0.27 | 0.000 | 0.000 |

Company Name: EOM Gathering Opco
 Facility Name: SATURN COMPRESSOR STATION
 Project Description: R-13 PERMIT CLASS II ADMINISTRATIVE UPDATE

| |
|--------------------------|
| Fuel Gas Heater HTR-4 |
|--------------------------|

HAZARDOUS AIR POLLUTANT (HAP) POTENTIAL EMISSIONS

| Pollutant | Emission Factor (lb/MMscf) ^a | Potential Emissions | |
|----------------------------------|--|----------------------|------------------------|
| | | (lb/hr) ^b | (tons/yr) ^c |
| HAPs | | | |
| 3-Methylchloranthrene | 1.80E-06 | 5.66E-10 | 2.48E-09 |
| 7,12-Dimethylbenz(a)anthracene | 1.60E-05 | 5.03E-09 | 2.20E-08 |
| Acenaphthene | 1.80E-06 | 5.66E-10 | 2.48E-09 |
| Acenaphthylene | 1.80E-06 | 5.66E-10 | 2.48E-09 |
| Anthracene | 2.40E-06 | 7.55E-10 | 3.31E-09 |
| Benz(a)anthracene | 1.80E-06 | 5.66E-10 | 2.48E-09 |
| Benzene | 2.10E-03 | 6.61E-07 | 2.89E-06 |
| Benzo(a)pyrene | 1.20E-06 | 3.78E-10 | 1.65E-09 |
| Benzo(b)fluoranthene | 1.80E-06 | 5.66E-10 | 2.48E-09 |
| Benzo(g,h,i)perylene | 1.20E-06 | 3.78E-10 | 1.65E-09 |
| Benzo(k)fluoranthene | 1.80E-06 | 5.66E-10 | 2.48E-09 |
| Chrysene | 1.80E-06 | 5.66E-10 | 2.48E-09 |
| Dibenzo(a,h) anthracene | 1.20E-06 | 3.78E-10 | 1.65E-09 |
| Dichlorobenzene | 1.20E-03 | 3.78E-07 | 1.65E-06 |
| Fluoranthene | 3.00E-06 | 9.44E-10 | 4.13E-09 |
| Fluorene | 2.80E-06 | 8.81E-10 | 3.86E-09 |
| Formaldehyde | 7.50E-02 | 2.36E-05 | 1.03E-04 |
| Hexane | 1.80E+00 | 5.66E-04 | 2.48E-03 |
| Indo(1,2,3-cd)pyrene | 1.80E-06 | 5.66E-10 | 2.48E-09 |
| Phenanthrene | 1.70E-05 | 5.35E-09 | 2.34E-08 |
| Pyrene | 5.00E-06 | 1.57E-09 | 6.89E-09 |
| Toluene | 3.40E-03 | 1.07E-06 | 4.68E-06 |
| Arsenic | 2.00E-04 | 6.29E-08 | 2.76E-07 |
| Beryllium | 1.20E-05 | 3.78E-09 | 1.65E-08 |
| Cadmium | 1.10E-03 | 3.46E-07 | 1.52E-06 |
| Chromium | 1.40E-03 | 4.40E-07 | 1.93E-06 |
| Cobalt | 8.40E-05 | 2.64E-08 | 1.16E-07 |
| Lead | 5.00E-04 | 1.57E-07 | 6.89E-07 |
| Manganese | 3.80E-04 | 1.20E-07 | 5.24E-07 |
| Mercury | 2.60E-04 | 8.18E-08 | 3.58E-07 |
| Nickel | 2.10E-03 | 6.61E-07 | 2.89E-06 |
| Selenium | 2.40E-05 | 7.55E-09 | 3.31E-08 |
| POLYCYCLIC ORGANIC MATTER | | | |
| Methylnaphthalene (2-) | 2.40E-05 | 7.55E-09 | 3.31E-08 |
| Naphthalene | 6.10E-04 | 1.92E-07 | 8.41E-07 |
| TOTAL HAP | | 5.94E-04 | 2.60E-03 |

- ^a Emission factors from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1, 1.4-2, & 1.4-3. Greenhouse gas emission factors from 40 CFR Part 98 Tables C-1 and C-2.
- ^b Emission Rate (lb/hr) = Rated Capacity (MMscf/hr) × Emission Factor (lb/MMscf).
- ^c Annual Emissions (tons/yr)_{Potential} = (lb/hr)_{Emissions} × (Maximum Allowable Operating Hours, 8760 hr/yr) × (1 ton/2000 lb).

Company Name: EQM Gathering Opco
Facility Name: SATURN COMPRESSOR STATION
Project Description: R-13 PERMIT CLASS II ADMINISTRATIVE UPDATE

| |
|----------------------------------|
| Fuel Gas Heater HTR-5 |
|----------------------------------|

| | |
|---|-----------------|
| Source Designation | Fuel Gas Heater |
| Year Installed | 2014 |
| Fuel Used | Natural Gas |
| Higher Heating Value (HHV) (Btu/scf) | 1,223 |
| Heat Input (MMBtu/hr) | 0.38 |
| Fuel Consumption (mmscf/hr) | 3.15E-04 |
| Potential Annual Hours of Operation (hr/yr) | 8,760 |

CRITERIA AND MANUFACTURER SPECIFIC POLLUTANT EMISSION FACTORS

| Pollutant | Emission Factor (lb/MMscf) ^a | Potential Emissions | |
|-------------------|--|----------------------|------------------------|
| | | (lb/hr) ^b | (tons/yr) ^c |
| NO _x | 100 | 0.03 | 0.14 |
| CO | 84 | 0.03 | 0.12 |
| SO ₂ | 0.6 | 0.0002 | 0.001 |
| PM | 7.6 | 0.002 | 0.01 |
| PM ₁₀ | 7.6 | 0.002 | 0.01 |
| PM _{2.5} | 7.6 | 0.002 | 0.01 |
| VOC | 5.5 | 0.002 | 0.01 |
| CO ₂ | 142,907 | 45 | 197 |
| CH ₄ | 2.70 | 0.001 | 0.004 |
| N ₂ O | 0.27 | 0.000 | 0.000 |

Company Name: EOM Gathering Opco
 Facility Name: SATURN COMPRESSOR STATION
 Project Description: R-13 PERMIT CLASS II ADMINISTRATIVE UPDATE

| |
|--------------------------|
| Fuel Gas Heater HTR-5 |
|--------------------------|

HAZARDOUS AIR POLLUTANT (HAP) POTENTIAL EMISSIONS

| Pollutant | Emission Factor (lb/MMscf) ^a | Potential Emissions | |
|----------------------------------|--|----------------------|------------------------|
| | | (lb/hr) ^b | (tons/yr) ^c |
| HAPs | | | |
| 3-Methylchloranthrene | 1.80E-06 | 5.66E-10 | 2.48E-09 |
| 7,12-Dimethylbenz(a)anthracene | 1.60E-05 | 5.03E-09 | 2.20E-08 |
| Acenaphthene | 1.80E-06 | 5.66E-10 | 2.48E-09 |
| Acenaphthylene | 1.80E-06 | 5.66E-10 | 2.48E-09 |
| Anthracene | 2.40E-06 | 7.55E-10 | 3.31E-09 |
| Benz(a)anthracene | 1.80E-06 | 5.66E-10 | 2.48E-09 |
| Benzene | 2.10E-03 | 6.61E-07 | 2.89E-06 |
| Benzo(a)pyrene | 1.20E-06 | 3.78E-10 | 1.65E-09 |
| Benzo(b)fluoranthene | 1.80E-06 | 5.66E-10 | 2.48E-09 |
| Benzo(g,h,i)perylene | 1.20E-06 | 3.78E-10 | 1.65E-09 |
| Benzo(k)fluoranthene | 1.80E-06 | 5.66E-10 | 2.48E-09 |
| Chrysene | 1.80E-06 | 5.66E-10 | 2.48E-09 |
| Dibenzo(a,h) anthracene | 1.20E-06 | 3.78E-10 | 1.65E-09 |
| Dichlorobenzene | 1.20E-03 | 3.78E-07 | 1.65E-06 |
| Fluoranthene | 3.00E-06 | 9.44E-10 | 4.13E-09 |
| Fluorene | 2.80E-06 | 8.81E-10 | 3.86E-09 |
| Formaldehyde | 7.50E-02 | 2.36E-05 | 1.03E-04 |
| Hexane | 1.80E+00 | 5.66E-04 | 2.48E-03 |
| Indo(1,2,3-cd)pyrene | 1.80E-06 | 5.66E-10 | 2.48E-09 |
| Phenanthrene | 1.70E-05 | 5.35E-09 | 2.34E-08 |
| Pyrene | 5.00E-06 | 1.57E-09 | 6.89E-09 |
| Toluene | 3.40E-03 | 1.07E-06 | 4.68E-06 |
| Arsenic | 2.00E-04 | 6.29E-08 | 2.76E-07 |
| Beryllium | 1.20E-05 | 3.78E-09 | 1.65E-08 |
| Cadmium | 1.10E-03 | 3.46E-07 | 1.52E-06 |
| Chromium | 1.40E-03 | 4.40E-07 | 1.93E-06 |
| Cobalt | 8.40E-05 | 2.64E-08 | 1.16E-07 |
| Lead | 5.00E-04 | 1.57E-07 | 6.89E-07 |
| Manganese | 3.80E-04 | 1.20E-07 | 5.24E-07 |
| Mercury | 2.60E-04 | 8.18E-08 | 3.58E-07 |
| Nickel | 2.10E-03 | 6.61E-07 | 2.89E-06 |
| Selenium | 2.40E-05 | 7.55E-09 | 3.31E-08 |
| POLYCYCLIC ORGANIC MATTER | | | |
| Methylnaphthalene (2-) | 2.40E-05 | 7.55E-09 | 3.31E-08 |
| Naphthalene | 6.10E-04 | 1.92E-07 | 8.41E-07 |
| TOTAL HAP | | 0.001 | 0.003 |

^a Emission factors from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1, 1.4-2, & 1.4-3.

Greenhouse gas emission factors from 40 CFR Part 98 Tables C-1 and C-2.

^b Emission Rate (lb/hr) = Rated Capacity (MMscf/hr) × Emission Factor (lb/MMscf).

^c Annual Emissions (tons/yr)_{Potential} = (lb/hr)_{Emissions} × (Maximum Allowable Operating Hours, 8760 hr/yr) × (1 ton/2000 lb).

Company Name: EOM Gathering Opco
 Facility Name: SATURN COMPRESSOR STATION
 Project Description: R-13 PERMIT CLASS II ADMINISTRATIVE UPDATE

| |
|---------------------------------------|
| CAPSTONE C200 MICROTURBINE |
|---------------------------------------|

| Source Designation | Compressor |
|--|-------------|
| Manufacturer | Capstone |
| Model No. | C200 |
| Model Year | TBD |
| Fuel Used | Natural Gas |
| Higher Heating Value (HHV) (Btu/scf) | 1,223 |
| Rated Output (MW) | 0.2 |
| Maximum Fuel Consumption at 100% Load (scf/hr) | 1,865 |
| Heat Input HHV (MMBtu/hr) | 2.28 |
| Control Device | NA |
| Stack Designation | TBD |

OPERATIONAL DETAILS

| | |
|---|-------|
| Potential Annual Hours of Operation (hr/yr) | 8,760 |
| Potential Fuel Consumption (MMscf/yr) | 16.34 |

CRITERIA AND MANUFACTURER SPECIFIC POLLUTANT EMISSION FACTORS

| Pollutant | Emission Factors ^a | Units |
|--------------------------------|-------------------------------|----------|
| NO _x ² | 0.40 | lb/MWhe |
| CO ² | 1.10 | lb/MWhe |
| SO ₂ ¹ | 3.40E-03 | lb/MMBtu |
| PM ₁₀ ¹ | 6.60E-03 | lb/MMBtu |
| PM _{2.5} ¹ | 6.60E-03 | lb/MMBtu |
| VOC ² | 0.10 | lb/MWhe |
| CO ₂ ² | 1,330 | lb/MWhe |
| CH ₄ ⁴ | 1.0E-01 | lb/MWhe |
| N ₂ O ⁴ | 2.2E-04 | lb/MMBtu |

Company Name: EOM Gathering Opco
 Facility Name: SATURN COMPRESSOR STATION
 Project Description: R-13 PERMIT CLASS II ADMINISTRATIVE UPDATE

**CAPSTONE C200
MICROTURBINE**

CRITERIA POLLUTANT EMISSIONS

| Pollutant | Potential Emissions | |
|-------------------|----------------------|------------------------|
| | (lb/hr) ^b | (tons/yr) ^c |
| NO _x | 0.08 | 0.35 |
| CO | 0.22 | 0.96 |
| SO ₂ | 0.01 | 0.03 |
| PM ₁₀ | 0.02 | 0.07 |
| PM _{2.5} | 0.02 | 0.07 |
| VOC | 0.02 | 0.09 |
| CO ₂ | 266 | 1,165 |
| CH ₄ | 2.0E-02 | 0.09 |
| N ₂ O | 5.0E-04 | 0.00 |

HAZARDOUS AIR POLLUTANT (HAP) POTENTIAL EMISSIONS

| Pollutant | Emission Factor (lb/MMBtu) ^a | Potential Emissions | |
|------------------|--|----------------------|------------------------|
| | | (lb/hr) ^b | (tons/yr) ^c |
| HAPs | | | |
| 1,3-Butadiene | 4.30E-07 | 9.80E-07 | 4.29E-06 |
| Acetaldehyde | 4.00E-05 | 9.12E-05 | 3.99E-04 |
| Acrolein | 6.40E-06 | 1.46E-05 | 6.39E-05 |
| Benzene | 1.20E-05 | 2.74E-05 | 1.20E-04 |
| Ethylbenzene | 3.20E-05 | 7.30E-05 | 3.20E-04 |
| Formaldehyde | 7.10E-04 | 1.62E-03 | 7.09E-03 |
| Naphthalene | 1.30E-06 | 2.96E-06 | 1.30E-05 |
| PAH | 2.20E-06 | 5.02E-06 | 2.20E-05 |
| Propylene Oxide | 2.90E-05 | 6.61E-05 | 2.90E-04 |
| Toluene | 1.30E-04 | 2.96E-04 | 1.30E-03 |
| Xylenes | 6.40E-05 | 1.46E-04 | 6.39E-04 |
| TOTAL HAP | | 0.00 | 0.01 |

1. Emission factors from AP-42 Section 3.1, Tables 3.1-1, 3.1-2a, and 3.1-3.
2. VOC, NO_x, and CO, and CO₂ emission factors from Table 1 and Table 5 (CO₂) of Capstone MicroTurbine Systems Emissions sheet.
3. Emission Rate (lb/hr) = Rated Capacity (MMBtu/hr or bhp) × Emission Factor (lb/MMBtu or lb/bhp-hr).
4. CH₄ and N₂O emission factors from Tables C-1 and C-2, 40 CFR 98, Subpart C.

Produced Fluids Tanks

Company Name: EQM Gathering Opco
 Facility Name: SATURN COMPRESSOR STATION
 Project Description: R-13 PERMIT CLASS II ADMINISTRATIVE UPDATE

Storage Tank Information:

| | |
|--|------------------------|
| Source ID: | T10, T12, T16, and T17 |
| Tank Capacity (gallons): | 8,820 |
| Tank Contents: | Produced Fluids |
| Annual Produced Fluid Throughput (gallons/year): | 500,000 |
| Annual Condensate Throughput (gallons/year): | 50,000 |
| Max. Annual Hours of Operation (hr/yr): | 8,760 |

Tank Emissions Data:

| Pollutant | Uncontrolled Emissions | | Emissions Estimation Method |
|-------------------------|------------------------|-------|-----------------------------|
| | lbs/hr | tpy | |
| VOC | 0.93 | 4.06 | E & P TANKS |
| HAPs | 0.03 | 0.13 | E & P TANKS |
| CO ₂ | 0.00 | 0.01 | E & P TANKS |
| CH ₄ | 0.25 | 1.09 | E & P TANKS |
| GHG (CO ₂ e) | 6.22 | 27.25 | E & P TANKS |

Notes:
 1. GHG (CO₂e) is carbon dioxide equivalent, which is the summation of CO₂ (GWP = 1) + CH₄ (GWP = 25) + N₂O (GWP = 298).

E & P TANKS Emissions Data - Produced Fluids Tank:

| Pollutant | Total Emissions (Working + Breathing + Flashing) | |
|-----------------|--|---------|
| | lbs/hr | lbs/yr |
| VOC | 0.93 | 8124.02 |
| HAPs | 0.03 | 263.68 |
| CO ₂ | 0.00 | 11.39 |
| CH ₄ | 0.25 | 2179.49 |

Notes:
 1. E & P TANKS software estimates working, breathing, and flashing losses and reports as one total.
 2. These tanks contain hydrocarbons that could be flashed off at tank operating conditions.
 3. Emissions are 10% of calculated emissions as condensate is 10% of the throughput. The remainder is water.

Company Name:
 Facility Name:
 Project Description:

EQM Gathering Opco
 SATURN COMPRESSOR STATION
 R-13 PERMIT CLASS II ADMINISTRATIVE UPDATE

Methanol Tanks

Storage Tank Information:

| Source ID: | T27A - T27E | T14A - T14C | T13 |
|---|-------------|-------------|----------|
| Tank Capacity (gallons): | 300 | 500 | 2,000 |
| Tank Contents: | Methanol | Methanol | Methanol |
| Annual Throughput (gallons/year): | 3,600 | 6,000 | 24,000 |
| Max. Annual Hours of Operation (hr/yr): | 8,760 | 8,760 | 8,760 |

Tank Emissions Data (per tank):

| Pollutant | T27A - T27E Uncontrolled Emissions | | T14A - T14C Uncontrolled Emissions | | T13 Uncontrolled Emissions | |
|-----------|------------------------------------|------|------------------------------------|------|----------------------------|------|
| | lbs/hr | tpy | lbs/hr | tpy | lbs/hr | tpy |
| VOC | 0.00 | 0.01 | 0.00 | 0.01 | 0.01 | 0.03 |
| HAPs | 0.00 | 0.01 | 0.00 | 0.01 | 0.01 | 0.03 |

1. Emissions Estimation Method - EPA Tanks 4.0.9d

EPA Tanks Emissions Data - Methanol Tank:

| Pollutant | T27A - T27E Uncontrolled Emissions | | T14A - T14C Uncontrolled Emissions | | T13 Uncontrolled Emissions | |
|-----------|------------------------------------|-------------------------|------------------------------------|-------------------------|----------------------------|-------------------------|
| | Working Losses lbs/yr | Breathing Losses lbs/yr | Working Losses lbs/yr | Breathing Losses lbs/yr | Working Losses lbs/yr | Breathing Losses lbs/yr |
| VOC | 3.62 | 9.63 | 6.04 | 13.83 | 24.16 | 41.26 |
| HAPs | 3.62 | 9.63 | 6.04 | 13.83 | 24.16 | 41.26 |

Notes:

1. EPA Tanks software estimates working and breathing losses.
2. These tanks do not contain hydrocarbons that could be flashed off at tank operating conditions.

Company Name:
 Facility Name:
 Project Description:

EQM Gathering Opco
 SATURN COMPRESSOR STATION
 R-13 PERMIT CLASS II ADMINISTRATIVE UPDATE

Fugitive Emissions

VOC AND HAP FUGITIVE EMISSION

| Component | Component Count ² | TOC Emission Factor ³ (kg/hr/component) | Average NG Leak Rate (lb/hr) | Max NG Leak Rate ⁴ (tpy) | Potential VOC Emissions (tpy) | Potential HAP Emissions (tpy) |
|--------------------|------------------------------|---|---------------------------------|--|----------------------------------|----------------------------------|
| Valves | 62 | 4.50E-03 | 6.15E-01 | 3.23 | 0.48 | 0.015 |
| Connectors | 508 | 2.00E-04 | 2.24E-01 | 1.18 | 0.17 | 0.005 |
| Flanges | 258 | 3.90E-04 | 2.22E-01 | 1.17 | 0.17 | 0.005 |
| Open-Ended Lines | 0 | 2.00E-03 | 0.00E+00 | 0.00 | 0.00 | 0.000 |
| Pump Seals | 5 | 2.40E-03 | 2.65E-02 | 0.14 | 0.02 | 0.001 |
| Other ¹ | 58 | 8.80E-03 | 1.13E+00 | 5.91 | 0.87 | 0.028 |
| TOTAL | | | 2.2 | 11.6 | 1.72 | 0.054 |

- The component type "Other" includes any equipment type other than connectors, flanges, open-ended lines, pumps and valves that have fugitive emissions.
- The component count is an estimate based on the design of the Callisto Station and scaled based on compressor number.
- Table 2-4 : Oil & Gas Production Operations Average Emission Factors , Protocol for Equipment Leak Emission Estimates, EPA 453/R-95-017, November 1995. Emission factors based on average measured TOC from component types indicated in gas service at O&G Production Operations.
- Assumes maximum leak rate 20% greater than measured average leak rate.

VOC AND HAP VENTED BLOWDOWN EMISSIONS

| Blowdown Emissions Sources | Number of Units | Vented Gas Volume Per Blowdown Event (scf) | Number of Blowdown Events per year | Total Volume NG Emitted (scf/yr) | Potential VOC Emissions (tpy) | Potential HAP Emissions (tpy) |
|-------------------------------|-----------------|---|------------------------------------|----------------------------------|----------------------------------|----------------------------------|
| Station ESD Vent | 1 | 165,000 | 2 | 330,000 | 1.2 | 0.038 |
| Compressors | 7 | 25,000 | 12 | 2,100,000 | 7.7 | 0.245 |
| Compressor Starter Vent | 7 | 250 | 12 | 21,000 | 0.1 | 0.002 |
| Suction Filter Maintenance | 1 | 3,500 | 2 | 7,000 | 0.0 | 0.001 |
| Discharge Filter Maintenance | 2 | 3,000 | 4 | 24,000 | 0.1 | 0.003 |
| Contacto Maintenance | 3 | 25,000 | 1 | 75,000 | 0.3 | 0.009 |
| TEE Strainer Unit Maintenance | 3 | 50 | 12 | 1,800 | 0.0 | 0.000 |
| TOTAL | | | | | 9.43 | 0.298 |

Density of natural gas: 0.05 lb/ft³ @ STP (www.engineeringtoolbox.com)

Company Name:
 Facility Name:
 Project Description:

EQM Gathering Opco
 SATURN COMPRESSOR STATION
 R-13 PERMIT CLASS II ADMINISTRATIVE UPDATE

Fugitive Emissions

GHG FUGITIVE EMISSIONS

| Component | Component Count ¹ | GHG Emission Factor ² (scf/hr/component) | CH ₄ Emissions ³ (tpy) | CO ₂ Emissions ³ (tpy) | CO ₂ e Emissions (tpy) |
|----------------------------|------------------------------|--|---|---|--------------------------------------|
| Valves | 62 | 2.70E-02 | 0.25 | 0.00 | 6.27 |
| Connectors | 766 | 3.00E-03 | 0.34 | 0.00 | 8.60 |
| Open-Ended Lines | 0 | 6.10E-02 | 0.00 | 0.00 | 0.00 |
| PRVs | 38 | 4.00E-02 | 0.23 | 0.00 | 5.69 |
| Low-Bleed Pneumatic Device | 0 | 1.39E+00 | 0.00 | 0.00 | 0.00 |
| TOTAL | | | 0.8 | 0.00 | 21 |

1. The component count is an estimate based on the design of the Callisto Station and scaled based on compressor number.
2. Table A-1A of Subpart W - Default Whole Gas Emission Factors for Onshore Production, 40 CFR 98, Subpart W.
3. Calculated in accordance with Equations W-34 and W-35 in Subpart W of 40 CFR 98.

GHG VENTED BLOWDOWN EMISSIONS

| Blowdown Emissions Sources | Number of Units | Vented Gas Volume Per Blowdown Event (scf) | Number of Blowdown Events per year | Total Volume NG Emitted (scf/yr) | Potential CH ₄ Emissions ¹ (tpy) | Potential CO ₂ Emissions ¹ (tpy) | Potential CO ₂ e Emissions (tpy) |
|-------------------------------|-----------------|---|------------------------------------|----------------------------------|---|---|--|
| Station ESD Vent | 1 | 165,000 | 2 | 330,000 | 5.6 | 0.029 | 140 |
| Compressors | 7 | 25,000 | 12 | 2,100,000 | 35.7 | 0.188 | 893 |
| Turbine Gas Starter Vent | 7 | 250 | 12 | 21,000 | 0.4 | 0.002 | 9 |
| Suction Filter Maintenance | 1 | 3,500 | 2 | 7,000 | 0.1 | 0.001 | 3 |
| Discharge Filler Maintenance | 2 | 3,000 | 4 | 24,000 | 0.4 | 0.002 | 10 |
| Contacto Maintenance | 2 | 25,000 | 1 | 50,000 | 0.9 | 0.004 | 21 |
| TEE Strainer Unit Maintenance | 3 | 50 | 12 | 1,800 | 0.0 | 0.000 | 1 |
| TOTAL | | | | | 43.1 | 0.226 | 1077 |

1. Calculated in accordance with Equations W-34 and W-35 in Subpart W of 40 CFR 98.

Company Name: EOM Gathering Opco
 Facility Name: SATURN COMPRESSOR STATION
 Project Description: R-13 PERMIT CLASS II ADMINISTRATIVE UPDATE

| |
|--------------|
| Gas Analysis |
|--------------|

Heating Value 1223 btu/scf

| | Wet Gas Loading (Vol %) | Wet Gas Stream Speciation (Wt. %) |
|-------------------------|----------------------------|--------------------------------------|
| Carbon Dioxide | 0.154% | 0.338% |
| Nitrogen | 0.441% | 0.615% |
| Methane | 80.354% | 64.210% |
| Ethane | 13.237% | 19.826% |
| Propane | 3.762% | 8.263% |
| Isobutane | 0.481% | 1.393% |
| n-Butane | 0.854% | 2.472% |
| Isopentane | 0.2260% | 0.8120% |
| n-Pentane | 0.1990% | 0.7150% |
| Cyclopentane | 0.0000% | 0.0000% |
| n-Hexane* | 0.0610% | 0.2610% |
| Cyclohexane | 0.0080% | 0.0340% |
| Other Hexanes | 0.1030% | 0.4390% |
| Heptanes | 0.0680% | 0.0680% |
| Methylcyclohexane | 0.0000% | 0.0000% |
| 2,2,4-Trimethylpentane* | 0.0330% | 0.1730% |
| Benzene* | 0.0020% | 0.0070% |
| Toluene* | 0.0030% | 0.0150% |
| Ethylbenzene* | 0.0000% | 0.0010% |
| Xylenes* | 0.0020% | 0.0090% |
| C8 + Heavies | 0.0120% | 0.0860% |
| TOTAL TOC | | 98.78% |
| TOTAL VOC | | 14.75% |
| TOTAL HAP | | 0.466% |

* HAPs

Components listed as NIL are assumed to be 1/2 detection limit (0.0005%)

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

Identification

User Identification: Methanol Tanks (300 gallon)
City:
State:
Company:
Type of Tank: Horizontal Tank
Description: EQT Saturn Station - PTE for 300 gallon Methanol Tanks

Tank Dimensions

Shell Length (ft): 6.00
Diameter (ft): 3.00
Volume (gallons): 300.00
Turnovers: 12.00
Net Throughput(gal/yr): 3,600.00
Is Tank Heated (y/n): N
Is Tank Underground (y/n): N

Paint Characteristics

Shell Color/Shade: Gray/Medium
Shell Condition: Good

Breather Vent Settings

Vacuum Settings (psig): -0.03
Pressure Settings (psig): 0.03

Meteorological Data used in Emissions Calculations: Elkins, West Virginia (Avg Atmospheric Pressure = 13.73 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Methanol Tanks (300 gallon) - Horizontal Tank

| Mixture/Component | Month | Daily Liquid Surf. Temperature (deg F) | | | Liquid Bulk Temp (deg F) | Vapor Pressure (psia) | | | Vapor Mol. Weight | Liquid Mass Fract. | Vapor Mass Fract. | Mol. Weight | Basis for Vapor Pressure Calculations |
|-------------------|-------|--|-------|-------|--------------------------|-----------------------|--------|--------|-------------------|--------------------|-------------------|-------------|---------------------------------------|
| | | Avg. | Min | Max | | Avg. | Min | Max | | | | | |
| Methyl alcohol | All | 57.20 | 47.18 | 67.23 | 52.14 | 1.3195 | 0.9508 | 1.8044 | 32.0400 | | | 32.04 | Option 2 A=7.897, B=1474.08, C=229.13 |

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Methanol Tanks (300 gallon) - Horizontal Tank

| Annual Emission Calculations | |
|--|------------|
| Standing Losses (lb): | 9 8318 |
| Vapor Space Volume (cu ft): | 27 0137 |
| Vapor Density (lb/cu ft): | 0 0076 |
| Vapor Space Expansion Factor: | 0 1416 |
| Vented Vapor Saturation Factor: | 0 9051 |
| Tank Vapor Space Volume | |
| Vapor Space Volume (cu ft): | 27 0137 |
| Tank Diameter (ft): | 3 0000 |
| Effective Diameter (ft): | 4 7885 |
| Vapor Space Outage (ft): | 1 5000 |
| Tank Shell Length (ft): | 6 0000 |
| Vapor Density | |
| Vapor Density (lb/cu ft): | 0 0076 |
| Vapor Molecular Weight (lb/lb-mole): | 32 0400 |
| Vapor Pressure at Daily Average Liquid | |
| Surface Temperature (psia): | 1 3195 |
| Daily Avg. Liquid Surface Temp. (deg. R): | 518 8667 |
| Daily Average Ambient Temp. (deg. F): | 49 0583 |
| Ideal Gas Constant R: | 10 731 |
| (psia cu ft / (lb-mol-deg R)): | |
| Liquid Bulk Temperature (deg. R): | 511 8083 |
| Tank Paint Solar Absorptance (Shell): | 0 6800 |
| Daily Total Solar Insulation | |
| Factor (Btu/sqft day): | 1,193 8870 |
| Vapor Space Expansion Factor | |
| Vapor Space Expansion Factor: | 0 1416 |
| Daily Vapor Temperature Range (deg. R): | 40 1436 |
| Daily Vapor Pressure Range (psia): | 0 8536 |
| Breather Vent Press. Setting Range (psia): | 0 0600 |
| Vapor Pressure at Daily Average Liquid | |
| Surface Temperature (psia): | 1 3195 |
| Vapor Pressure at Daily Minimum Liquid | |
| Surface Temperature (psia): | 0 9508 |
| Vapor Pressure at Daily Maximum Liquid | |
| Surface Temperature (psia): | 1 8044 |
| Daily Avg. Liquid Surface Temp. (deg. R): | 518 8667 |
| Daily Min. Liquid Surface Temp. (deg. R): | 506 8308 |
| Daily Max. Liquid Surface Temp. (deg. R): | 526 9026 |
| Daily Ambient Temp. Range (deg. R): | 24 1833 |
| Vented Vapor Saturation Factor | |
| Vented Vapor Saturation Factor: | 0 9051 |
| Vapor Pressure at Daily Average Liquid | |
| Surface Temperature (psia): | 1 3195 |
| Vapor Space Outage (ft): | 1 5000 |
| Working Losses (lb) | |
| Working Losses (lb): | 3 6237 |
| Vapor Molecular Weight (lb/lb-mole): | 32 0400 |
| Vapor Pressure at Daily Average Liquid | |
| Surface Temperature (psia): | 1 3195 |
| Annual Net Throughput (gall/yr.): | 3,600 0000 |
| Annual Turnovers: | 12 0000 |
| Turnover Factor: | 1 0000 |
| Tank Diameter (ft): | 3 0000 |
| Working Loss Product Factor: | 1 0000 |
| Total Losses (lb): | 13 2555 |

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

Emissions Report for: Annual

Methanol Tanks (300 gallon) - Horizontal Tank

| Components | Losses(lbs) | | |
|----------------|--------------|----------------|-----------------|
| | Working Loss | Breathing Loss | Total Emissions |
| Methyl alcohol | 3.62 | 9.63 | 13.26 |

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

Identification

User Identification: Methanol Tank (2,000 gallon)
City:
State:
Company:
Type of Tank: Vertical Fixed Roof Tank
Description: EQT Saturn Station - PTE for 2,000 gallon Methanol Tank

Tank Dimensions

Shell Height (ft): 10.00
Diameter (ft): 6.00
Liquid Height (ft): 10.00
Avg. Liquid Height (ft): 5.00
Volume (gallons): 2,000.00
Turnovers: 12.00
Net Throughput(gal/yr): 24,000.00
Is Tank Heated (y/n): N

Paint Characteristics

Shell Color/Shade: Gray/Medium
Shell Condition: Good
Roof Color/Shade: Gray/Medium
Roof Condition: Good

Roof Characteristics

Type: Cone
Height (ft): 0.00
Slope (ft/ft) (Cone Roof): 0.00

Breather Vent Settings

Vacuum Settings (psig): -0.03
Pressure Settings (psig): 0.03

Meteorological Data used in Emissions Calculations: Elkins, West Virginia (Avg Atmospheric Pressure = 13.73 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Methanol Tank (2,000 gallon) - Vertical Fixed Roof Tank

| Mixture/Component | Month | Daily Liquid Surf. Temperature (deg F) | | | Liquid Bulk Temp (deg F) | Vapor Pressure (psia) | | | Vapor Mol. Weight | Liquid Mass Fract. | Vapor Mass Fract. | Mol. Weight | Basis for Vapor Pressure Calculations |
|-------------------|-------|--|-------|-------|--------------------------|-----------------------|--------|--------|-------------------|--------------------|-------------------|-------------|---------------------------------------|
| | | Avg | Min | Max | | Avg | Min | Max | | | | | |
| Methyl alcohol | All | 57.20 | 47.16 | 67.23 | 52.14 | 1.3195 | 0.9508 | 1.8044 | 32.0400 | | | 32.04 | Option 2 A=7.897, B=1474.08, C=228.13 |

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Methanol Tank (2,000 gallon) - Vertical Fixed Roof Tank

| Annual Emission Calculations | |
|---|-------------|
| Standing Losses (lb) | 41.2649 |
| Vapor Space Volume (cu ft) | 141.3717 |
| Vapor Density (lb/cu ft) | 0.0078 |
| Vapor Space Expansion Factor | 0.1416 |
| Vented Vapor Saturation Factor | 0.7409 |
| Tank Vapor Space Volume | |
| Vapor Space Volume (cu ft) | 141.3717 |
| Tank Diameter (ft) | 6.0000 |
| Vapor Space Outage (ft) | 5.0000 |
| Tank Shell Height (ft) | 10.0000 |
| Average Liquid Height (ft) | 5.0000 |
| Roof Outage (ft) | 0.0000 |
| Roof Outage (Cone Roof) | |
| Roof Outage (ft) | 0.0000 |
| Roof Height (ft) | 0.0000 |
| Roof Slope (ft/ft) | 0.0000 |
| Shell Radius (ft) | 3.0000 |
| Vapor Density | |
| Vapor Density (lb/cu ft) | 0.0078 |
| Vapor Molecular Weight (lb/lb-mole) | 32.0400 |
| Vapor Pressure at Daily Average Liquid Surface Temperature (psia) | 1.3195 |
| Daily Avg. Liquid Surface Temp (deg. R) | 516.8667 |
| Daily Average Ambient Temp (deg. F) | 48.0583 |
| Ideal Gas Constant R (psia cu ft / (lb-mol-deg R)) | 10.731 |
| Liquid Bulk Temperature (deg. R) | 511.8083 |
| Tank Paint Solar Absorptance (Shell) | 0.6800 |
| Tank Paint Solar Absorptance (Roof) | 0.6800 |
| Daily Total Solar Insulation Factor (Btu/sqft day) | 1,193.8870 |
| Vapor Space Expansion Factor | |
| Vapor Space Expansion Factor | 0.1416 |
| Daily Vapor Temperature Range (deg. R) | 40.1436 |
| Daily Vapor Pressure Range (psia) | 0.8536 |
| Breather Vent Press. Setting Range (psia) | 0.0600 |
| Vapor Pressure at Daily Average Liquid Surface Temperature (psia) | 1.3195 |
| Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia) | 0.9508 |
| Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia) | 1.8044 |
| Daily Avg. Liquid Surface Temp (deg. R) | 516.8667 |
| Daily Min. Liquid Surface Temp (deg. R) | 506.8308 |
| Daily Max. Liquid Surface Temp (deg. R) | 526.9026 |
| Daily Ambient Temp. Range (deg. R) | 24.1833 |
| Vented Vapor Saturation Factor | |
| Vented Vapor Saturation Factor | 0.7409 |
| Vapor Pressure at Daily Average Liquid Surface Temperature (psia) | 1.3195 |
| Vapor Space Outage (ft) | 5.0000 |
| Working Losses (lb) | |
| Working Losses (lb) | 24.1582 |
| Vapor Molecular Weight (lb/lb-mole) | 32.0400 |
| Vapor Pressure at Daily Average Liquid Surface Temperature (psia) | 1.3195 |
| Annual Net Throughput (gal/yr) | 24,000.0000 |
| Annual Turnovers | 12.0000 |
| Turnover Factor | 1.0000 |
| Maximum Liquid Volume (gall) | 2,000.0000 |
| Maximum Liquid Height (ft) | 10.0000 |
| Tank Diameter (ft) | 6.0000 |
| Working Loss Product Factor | 1.0000 |
| Total Losses (lb) | |
| Total Losses (lb) | 65.4231 |

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

Emissions Report for: Annual**Methanol Tank (2,000 gallon) - Vertical Fixed Roof Tank**

| Components | Losses(lbs) | | |
|----------------|--------------|----------------|-----------------|
| | Working Loss | Breathing Loss | Total Emissions |
| Methyl alcohol | 24.16 | 41.26 | 65.42 |

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

Identification

User Identification: Methanol Tanks (500 gal)
City:
State:
Company:
Type of Tank: Horizontal Tank
Description: EQT Saturn Station - PTE for 500 gallon Methanol Tanks

Tank Dimensions

Shell Length (ft): 5.00
Diameter (ft): 4.00
Volume (gallons): 500.00
Turnovers: 12.00
Net Throughput(gal/yr): 6,000.00
Is Tank Heated (y/n): N
Is Tank Underground (y/n): N

Paint Characteristics

Shell Color/Shade: Gray/Medium
Shell Condition: Good

Breather Vent Settings

Vacuum Settings (psig): -0.03
Pressure Settings (psig): 0.03

Meteorological Data used in Emissions Calculations: Elkins, West Virginia (Avg Atmospheric Pressure = 13.73 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Methanol Tanks (500 gal) - Horizontal Tank

| Mixture/Component | Month | Daily Liquid Surf Temperature (deg F) | | | Liquid Bulk Temp (deg F) | Vapor Pressure (psia) | | | Vapor Mol Weight | Liquid Mass Fract. | Vapor Mass Fract. | Mol Weight | Basis for Vapor Pressure Calculations |
|-------------------|-------|---------------------------------------|-------|-------|--------------------------|-----------------------|--------|--------|------------------|--------------------|-------------------|------------|---------------------------------------|
| | | Avg | Min | Max | | Avg | Min | Max | | | | | |
| Methyl alcohol | All | 57.20 | 47.16 | 67.23 | 52.14 | 1.3195 | 0.9508 | 1.8044 | 32.0400 | | | 32.04 | Option 2 A=7.697, B=1474.08, C=229.13 |

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Methanol Tanks (500 gal) - Horizontal Tank

| Annual Emission Calculations | |
|---|------------|
| Standing Losses (lb) | 13 8318 |
| Vapor Space Volume (cu ft) | 40 0203 |
| Vapor Density (lb/cu ft) | 0 0076 |
| Vapor Space Expansion Factor | 0 1416 |
| Vented Vapor Saturation Factor | 0 8773 |
| Tank Vapor Space Volume | |
| Vapor Space Volume (cu ft) | 40 0203 |
| Tank Diameter (ft) | 4 0000 |
| Effective Diameter (ft) | 5 0475 |
| Vapor Space Outage (ft) | 2 0000 |
| Tank Shell Length (ft) | 5 0000 |
| Vapor Density | |
| Vapor Density (lb/cu ft) | 0 0076 |
| Vapor Molecular Weight (lb/lb-mole) | 32 0400 |
| Vapor Pressure at Daily Average Liquid Surface Temperature (psia) | 1 3195 |
| Daily Avg. Liquid Surface Temp. (deg R) | 518 8667 |
| Daily Average Ambient Temp. (deg F) | 49 0583 |
| Ideal Gas Constant R (psia cuft / (lb-mol-deg R)) | 10 731 |
| Liquid Bulk Temperature (deg R) | 511 8083 |
| Tank Paint Solar Absorptance (Shell) | 0 6800 |
| Daily Total Solar Insolation Factor (Btu/sqft day) | 1,183 8870 |
| Vapor Space Expansion Factor | |
| Vapor Space Expansion Factor | 0 1416 |
| Daily Vapor Temperature Range (deg R) | 40 1438 |
| Daily Vapor Pressure Range (psia) | 0 8536 |
| Breather Vent Press. Setting Range (psia) | 0 0600 |
| Vapor Pressure at Daily Average Liquid Surface Temperature (psia) | 1 3195 |
| Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia) | 0 9508 |
| Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia) | 1 8044 |
| Daily Avg. Liquid Surface Temp. (deg R) | 518 8667 |
| Daily Min. Liquid Surface Temp. (deg R) | 506 8308 |
| Daily Max. Liquid Surface Temp. (deg R) | 526 9026 |
| Daily Ambient Temp. Range (deg R) | 24 1633 |
| Vented Vapor Saturation Factor | |
| Vented Vapor Saturation Factor | 0 8773 |
| Vapor Pressure at Daily Average Liquid Surface Temperature (psia) | 1 3195 |
| Vapor Space Outage (ft) | 2 0000 |
| Working Losses (lb) | |
| Working Losses (lb) | 6 0396 |
| Vapor Molecular Weight (lb/lb-mole) | 32 0400 |
| Vapor Pressure at Daily Average Liquid Surface Temperature (psia) | 1 3195 |
| Annual Net Throughput (gal/yr) | 6 000 0000 |
| Annual Turnovers | 12 0000 |
| Turnover Factor | 1 0000 |
| Tank Diameter (ft) | 4 0000 |
| Working Loss Product Factor | 1 0000 |
| Total Losses (lb) | 19 8711 |

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

Emissions Report for: Annual**Methanol Tanks (500 gal) - Horizontal Tank**

| Components | Losses(lbs) | | |
|----------------|--------------|----------------|-----------------|
| | Working Loss | Breathing Loss | Total Emissions |
| Methyl alcohol | 6.04 | 13.83 | 19.87 |

GRI-GLYCalc VERSION 4.0 - SUMMARY OF INPUT VALUES

Case Name: Saturn Dehy #2 and #3 - 130 MMscfd
 File Name: Z:\Client\EQT Corporation\West Virginia\Saturn\Projects\153901.0117 Saturn
 Title V Permit\03 Deliverables\2015-1006 R13 Class II Update\Att N - Emission
 Calculations\20150929 Saturn Dehy -130 MMscfd.ddf
 Date: October 06, 2015

DESCRIPTION:

 Description: Saturn Dehy -130 MMSCFD
 Max Pump rate - 15 gpm

Annual Hours of Operation: 8760.0 hours/yr

WET GAS:

 Temperature: 100.00 deg. F
 Pressure: 1000.00 psig
 Wet Gas Water Content: Saturated

| Component | Conc. (vol %) |
|------------------------|------------------|
| Carbon Dioxide | 0.1540 |
| Nitrogen | 0.4410 |
| Methane | 80.3540 |
| Ethane | 13.2370 |
| Propane | 3.7620 |
| Isobutane | 0.4810 |
| n-Butane | 0.8540 |
| Isopentane | 0.2260 |
| n-Pentane | 0.1990 |
| n-Hexane | 0.0610 |
| Cyclohexane | 0.0080 |
| Other Hexanes | 0.1030 |
| Heptanes | 0.0680 |
| 2,2,4-Trimethylpentane | 0.0330 |
| Benzene | 0.0020 |
| Toluene | 0.0030 |
| Xylenes | 0.0020 |
| C8+ Heavies | 0.0120 |

DRY GAS:

 Flow Rate: 130.0 MMSCF/day
 Water Content: 7.0 lbs. H2O/MMSCF

LEAN GLYCOL:

 Glycol Type: TEG
 Water Content: 1.0 wt% H2O
 Flow Rate: 15.0 gpm

PUMP:

Glycol Pump Type: Electric/Pneumatic

FLASH TANK:

Flash Control: Combustion device
Flash Control Efficiency: 95.00 %
Temperature: 125.0 deg. F
Pressure: 35.0 psig

REGENERATOR OVERHEADS CONTROL DEVICE:

Control Device: Combustion Device
Destruction Efficiency: 95.0 %
Excess Oxygen: 5.0 %
Ambient Air Temperature: 70.0 deg. F

GRI-GLYCalc VERSION 4.0 - AGGREGATE CALCULATIONS REPORT

Case Name: Saturn Dehy #2 and #3 - 130 MMscfd
 File Name: Z:\Client\EQT Corporation\West Virginia\Saturn\Projects\153901.0117 Saturn
 Title V Permit\04 Draft Application\2015-0826 R13 Class II Update\Att N - Emission
 Calculations\20150929 Saturn Dehy -130 MMscfd.ddf
 Date: September 29, 2015

DESCRIPTION:

Description: Saturn Dehy -130 MMSCFD
 Max Pump rate - 15 gpm

Annual Hours of Operation: 8760.0 hours/yr

EMISSIONS REPORTS:

CONTROLLED REGENERATOR EMISSIONS

| Component | lbs/hr | lbs/day | tons/yr |
|-----------------------------|---------------|---------------|---------------|
| Methane | 0.0435 | 1.045 | 0.1907 |
| Ethane | 0.1230 | 2.952 | 0.5387 |
| Propane | 0.1471 | 3.531 | 0.6445 |
| Isobutane | 0.0430 | 1.032 | 0.1883 |
| n-Butane | 0.1181 | 2.835 | 0.5174 |
| Isopentane | 0.0391 | 0.939 | 0.1714 |
| n-Pentane | 0.0499 | 1.199 | 0.2187 |
| n-Hexane | 0.0356 | 0.855 | 0.1560 |
| Cyclohexane | 0.0293 | 0.703 | 0.1283 |
| Other Hexanes | 0.0417 | 1.001 | 0.1827 |
| Heptanes | 0.0964 | 2.314 | 0.4223 |
| 2,2,4-Trimethylpentane | 0.0181 | 0.434 | 0.0791 |
| Benzene | 0.0687 | 1.648 | 0.3007 |
| Toluene | 0.1624 | 3.897 | 0.7111 |
| Xylenes | 0.2087 | 5.008 | 0.9140 |
| C8+ Heavies | 0.0909 | 2.182 | 0.3983 |
| Total Emissions | 1.3156 | 31.574 | 5.7622 |
| Total Hydrocarbon Emissions | 1.3156 | 31.574 | 5.7622 |
| Total VOC Emissions | 1.1490 | 27.577 | 5.0328 |
| Total HAP Emissions | 0.4934 | 11.841 | 2.1610 |
| Total BTEX Emissions | 0.4397 | 10.553 | 1.9259 |

UNCONTROLLED REGENERATOR EMISSIONS

| Component | lbs/hr | lbs/day | tons/yr |
|------------|--------|---------|---------|
| Methane | 0.8706 | 20.893 | 3.8130 |
| Ethane | 2.4600 | 59.040 | 10.7747 |
| Propane | 2.9427 | 70.625 | 12.8891 |
| Isobutane | 0.8600 | 20.639 | 3.7666 |
| n-Butane | 2.3624 | 56.698 | 10.3474 |
| Isopentane | 0.7827 | 18.785 | 3.4283 |
| n-Pentane | 0.9988 | 23.971 | 4.3746 |
| n-Hexane | 0.7123 | 17.094 | 3.1197 |

| | | | |
|-----------------------------|---------|---------|----------|
| Cyclohexane | 0.5860 | 14.064 | 2.5668 |
| Other Hexanes | 0.8341 | 20.020 | 3.6536 |
| Heptanes | 1.9281 | 46.274 | 8.4450 |
| 2,2,4-Trimethylpentane | 0.3613 | 8.670 | 1.5823 |
| Benzene | 1.3731 | 32.953 | 6.0140 |
| Toluene | 3.2471 | 77.931 | 14.2223 |
| Xylenes | 4.1737 | 100.168 | 18.2807 |
| C8+ Heavies | 1.8185 | 43.644 | 7.9651 |
| ----- | | | |
| Total Emissions | 26.3113 | 631.471 | 115.2434 |
| Total Hydrocarbon Emissions | 26.3113 | 631.471 | 115.2434 |
| Total VOC Emissions | 22.9807 | 551.538 | 100.6556 |
| Total HAP Emissions | 9.8674 | 236.817 | 43.2190 |
| Total BTEX Emissions | 8.7938 | 211.052 | 38.5170 |

FLASH GAS EMISSIONS

| Component | lbs/hr | lbs/day | tons/yr |
|-----------------------------|--------|---------|---------|
| Methane | 1.1098 | 26.635 | 4.8610 |
| Ethane | 0.9020 | 21.648 | 3.9508 |
| Propane | 0.4750 | 11.399 | 2.0803 |
| Isobutane | 0.0916 | 2.198 | 0.4012 |
| n-Butane | 0.1913 | 4.591 | 0.8378 |
| Isopentane | 0.0553 | 1.327 | 0.2422 |
| n-Pentane | 0.0562 | 1.349 | 0.2461 |
| n-Hexane | 0.0221 | 0.532 | 0.0970 |
| Cyclohexane | 0.0047 | 0.113 | 0.0206 |
| Other Hexanes | 0.0344 | 0.825 | 0.1506 |
| Heptanes | 0.0293 | 0.702 | 0.1281 |
| 2,2,4-Trimethylpentane | 0.0110 | 0.264 | 0.0482 |
| Benzene | 0.0014 | 0.035 | 0.0063 |
| Toluene | 0.0022 | 0.053 | 0.0096 |
| Xylenes | 0.0011 | 0.027 | 0.0048 |
| C8+ Heavies | 0.0025 | 0.060 | 0.0110 |
| ----- | | | |
| Total Emissions | 2.9899 | 71.758 | 13.0958 |
| Total Hydrocarbon Emissions | 2.9899 | 71.758 | 13.0958 |
| Total VOC Emissions | 0.9781 | 23.475 | 4.2841 |
| Total HAP Emissions | 0.0379 | 0.910 | 0.1660 |
| Total BTEX Emissions | 0.0048 | 0.114 | 0.0208 |

FLASH TANK OFF GAS

| Component | lbs/hr | lbs/day | tons/yr |
|---------------|---------|---------|---------|
| Methane | 22.1962 | 532.708 | 97.2192 |
| Ethane | 18.0400 | 432.961 | 79.0154 |
| Propane | 9.4993 | 227.983 | 41.6069 |
| Isobutane | 1.8320 | 43.968 | 8.0241 |
| n-Butane | 3.8257 | 91.816 | 16.7564 |
| Isopentane | 1.1058 | 26.539 | 4.8433 |
| n-Pentane | 1.1239 | 26.974 | 4.9227 |
| n-Hexane | 0.4429 | 10.630 | 1.9401 |
| Cyclohexane | 0.0940 | 2.257 | 0.4119 |
| Other Hexanes | 0.6878 | 16.508 | 3.0127 |
| Heptanes | 0.5851 | 14.043 | 2.5628 |

| | | | |
|-----------------------------|---------|----------|----------|
| 2,2,4-Trimethylpentane | 0.2202 | 5.284 | 0.9643 |
| Benzene | 0.0290 | 0.696 | 0.1269 |
| Toluene | 0.0440 | 1.055 | 0.1926 |
| Xylenes | 0.0221 | 0.530 | 0.0967 |
| C8+ Heavies | 0.0504 | 1.209 | 0.2207 |
| ----- | | | |
| Total Emissions | 59.7983 | 1435.159 | 261.9165 |
| ----- | | | |
| Total Hydrocarbon Emissions | 59.7983 | 1435.159 | 261.9165 |
| Total VOC Emissions | 19.5621 | 469.490 | 85.6819 |
| Total HAP Emissions | 0.7581 | 18.195 | 3.3206 |
| Total BTEX Emissions | 0.0950 | 2.281 | 0.4163 |

COMBINED REGENERATOR VENT/FLASH GAS EMISSIONS

| Component | lbs/hr | lbs/day | tons/yr |
|-----------------------------|--------|---------|---------|
| ----- | | | |
| Methane | 1.1533 | 27.680 | 5.0516 |
| Ethane | 1.0250 | 24.600 | 4.4895 |
| Propane | 0.6221 | 14.930 | 2.7248 |
| Isobutane | 0.1346 | 3.230 | 0.5895 |
| n-Butane | 0.3094 | 7.426 | 1.3552 |
| Isopentane | 0.0944 | 2.266 | 0.4136 |
| n-Pentane | 0.1061 | 2.547 | 0.4649 |
| n-Hexane | 0.0578 | 1.386 | 0.2530 |
| Cyclohexane | 0.0340 | 0.816 | 0.1489 |
| Other Hexanes | 0.0761 | 1.826 | 0.3333 |
| Heptanes | 0.1257 | 3.016 | 0.5504 |
| 2,2,4-Trimethylpentane | 0.0291 | 0.698 | 0.1273 |
| Benzene | 0.0701 | 1.682 | 0.3070 |
| Toluene | 0.1646 | 3.949 | 0.7207 |
| Xylenes | 0.2098 | 5.035 | 0.9189 |
| C8+ Heavies | 0.0934 | 2.243 | 0.4093 |
| ----- | | | |
| Total Emissions | 4.3055 | 103.331 | 18.8580 |
| ----- | | | |
| Total Hydrocarbon Emissions | 4.3055 | 103.331 | 18.8580 |
| Total VOC Emissions | 2.1271 | 51.051 | 9.3169 |
| Total HAP Emissions | 0.5313 | 12.751 | 2.3270 |
| Total BTEX Emissions | 0.4444 | 10.667 | 1.9467 |

COMBINED REGENERATOR VENT/FLASH GAS EMISSION CONTROL REPORT:

| Component | Uncontrolled tons/yr | Controlled tons/yr | % Reduction |
|------------------------|-------------------------|-----------------------|-------------|
| ----- | | | |
| Methane | 101.0322 | 5.0516 | 95.00 |
| Ethane | 89.7901 | 4.4895 | 95.00 |
| Propane | 54.4960 | 2.7248 | 95.00 |
| Isobutane | 11.7907 | 0.5895 | 95.00 |
| n-Butane | 27.1038 | 1.3552 | 95.00 |
| Isopentane | 8.2716 | 0.4136 | 95.00 |
| n-Pentane | 9.2974 | 0.4649 | 95.00 |
| n-Hexane | 5.0598 | 0.2530 | 95.00 |
| Cyclohexane | 2.9786 | 0.1489 | 95.00 |
| Other Hexanes | 6.6662 | 0.3333 | 95.00 |
| Heptanes | 11.0078 | 0.5504 | 95.00 |
| 2,2,4-Trimethylpentane | 2.5465 | 0.1273 | 95.00 |

| | | | |
|-----------------------------|----------|---------|-------|
| Benzene | 6.1409 | 0.3070 | 95.00 |
| Toluene | 14.4149 | 0.7207 | 95.00 |
| Xylenes | 18.3775 | 0.9189 | 95.00 |
| C8+ Heavies | 8.1858 | 0.4093 | 95.00 |
| ----- | | | |
| Total Emissions | 377.1599 | 18.8580 | 95.00 |
| ----- | | | |
| Total Hydrocarbon Emissions | 377.1599 | 18.8580 | 95.00 |
| Total VOC Emissions | 186.3375 | 9.3169 | 95.00 |
| Total HAP Emissions | 46.5396 | 2.3270 | 95.00 |
| Total BTEX Emissions | 38.9333 | 1.9467 | 95.00 |

EQUIPMENT REPORTS:

COMBUSTION DEVICE

Ambient Temperature: 70.00 deg. F
 Excess Oxygen: 5.00 %
 Combustion Efficiency: 95.00 %
 Supplemental Fuel Requirement: 2.17e-001 MM BTU/hr

| Component | Emitted | Destroyed |
|------------------------|---------|-----------|
| ----- | | |
| Methane | 5.00% | 95.00% |
| Ethane | 5.00% | 95.00% |
| Propane | 5.00% | 95.00% |
| Isobutane | 5.00% | 95.00% |
| n-Butane | 5.00% | 95.00% |
| Isopentane | 5.00% | 95.00% |
| n-Pentane | 5.00% | 95.00% |
| n-Hexane | 5.00% | 95.00% |
| Cyclohexane | 5.00% | 95.00% |
| Other Hexanes | 5.00% | 95.00% |
| Heptanes | 5.00% | 95.00% |
| 2,2,4-Trimethylpentane | 5.00% | 95.00% |
| Benzene | 5.00% | 95.00% |
| Toluene | 5.00% | 95.00% |
| Xylenes | 5.00% | 95.00% |
| C8+ Heavies | 5.00% | 95.00% |

ABSORBER

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

Calculated Absorber Stages: 1.25
 Calculated Dry Gas Dew Point: 3.62 lbs. H2O/MMSCF
 Temperature: 100.0 deg. F
 Pressure: 1000.0 psig
 Dry Gas Flow Rate: 130.0000 MMSCF/day
 Glycol Losses with Dry Gas: 3.0663 lb/hr
 Wet Gas Water Content: Saturated
 Calculated Wet Gas Water Content: 58.66 lbs. H2O/MMSCF

Calculated Lean Glycol Recirc. Ratio: 3.02 gal/lb H2O

| Component | Remaining in Dry Gas | Absorbed in Glycol |
|------------------------|-------------------------|-----------------------|
| Water | 6.16% | 93.84% |
| Carbon Dioxide | 99.84% | 0.16% |
| Nitrogen | 99.99% | 0.01% |
| Methane | 99.99% | 0.01% |
| Ethane | 99.96% | 0.04% |
| Propane | 99.95% | 0.05% |
| Isobutane | 99.93% | 0.07% |
| n-Butane | 99.91% | 0.09% |
| Isopentane | 99.92% | 0.08% |
| n-Pentane | 99.90% | 0.10% |
| n-Hexane | 99.85% | 0.15% |
| Cyclohexane | 99.29% | 0.71% |
| Other Hexanes | 99.88% | 0.12% |
| Heptanes | 99.74% | 0.26% |
| 2,2,4-Trimethylpentane | 99.89% | 0.11% |
| Benzene | 93.71% | 6.29% |
| Toluene | 91.66% | 8.34% |
| Xylenes | 86.15% | 13.85% |
| C8+ Heavies | 99.36% | 0.64% |

FLASH TANK

Flash Control: Combustion device
Flash Control Efficiency: 95.00 %
Flash Temperature: 125.0 deg. F
Flash Pressure: 35.0 psig

| Component | Left in Glycol | Removed in Flash Gas |
|------------------------|-------------------|-------------------------|
| Water | 99.95% | 0.05% |
| Carbon Dioxide | 32.48% | 67.52% |
| Nitrogen | 3.60% | 96.40% |
| Methane | 3.77% | 96.23% |
| Ethane | 12.00% | 88.00% |
| Propane | 23.65% | 76.35% |
| Isobutane | 31.95% | 68.05% |
| n-Butane | 38.18% | 61.82% |
| Isopentane | 41.74% | 58.26% |
| n-Pentane | 47.32% | 52.68% |
| n-Hexane | 61.85% | 38.15% |
| Cyclohexane | 86.62% | 13.38% |
| Other Hexanes | 55.26% | 44.74% |
| Heptanes | 76.83% | 23.17% |
| 2,2,4-Trimethylpentane | 62.70% | 37.30% |
| Benzene | 98.04% | 1.96% |
| Toluene | 98.77% | 1.23% |
| Xylenes | 99.54% | 0.46% |
| C8+ Heavies | 97.63% | 2.37% |

REGENERATOR

No Stripping Gas used in regenerator.

| Component | Remaining in Glycol | Distilled Overhead |
|------------------------|------------------------|-----------------------|
| Water | 22.06% | 77.94% |
| 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 | 1.20% | 98.80% |
| n-Pentane | 1.06% | 98.94% |
| n-Hexane | 0.81% | 99.19% |
| Cyclohexane | 3.69% | 96.31% |
| Other Hexanes | 1.81% | 98.19% |
| Heptanes | 0.65% | 99.35% |
| 2,2,4-Trimethylpentane | 2.39% | 97.61% |
| Benzene | 5.10% | 94.90% |
| Toluene | 8.00% | 92.00% |
| Xylenes | 13.00% | 87.00% |
| C8+ Heavies | 12.33% | 87.67% |

STREAM REPORTS:

WET GAS STREAM

Temperature: 100.00 deg. F
 Pressure: 1014.70 psia
 Flow Rate: 5.42e+006 scfh

| Component | Conc. (vol%) | Loading (lb/hr) |
|------------------------|-----------------|--------------------|
| Water | 1.24e-001 | 3.18e+002 |
| Carbon Dioxide | 1.54e-001 | 9.68e+002 |
| Nitrogen | 4.40e-001 | 1.76e+003 |
| Methane | 8.03e+001 | 1.84e+005 |
| Ethane | 1.32e+001 | 5.68e+004 |
| Propane | 3.76e+000 | 2.37e+004 |
| Isobutane | 4.80e-001 | 3.99e+003 |
| n-Butane | 8.53e-001 | 7.09e+003 |
| Isopentane | 2.26e-001 | 2.33e+003 |
| n-Pentane | 1.99e-001 | 2.05e+003 |
| n-Hexane | 6.09e-002 | 7.51e+002 |
| Cyclohexane | 7.99e-003 | 9.61e+001 |
| Other Hexanes | 1.03e-001 | 1.27e+003 |
| Heptanes | 6.79e-002 | 9.73e+002 |
| 2,2,4-Trimethylpentane | 3.30e-002 | 5.38e+002 |
| Benzene | 2.00e-003 | 2.23e+001 |
| Toluene | 3.00e-003 | 3.95e+001 |
| Xylenes | 2.00e-003 | 3.03e+001 |
| C8+ Heavies | 1.20e-002 | 2.92e+002 |
| Total Components | 100.00 | 2.87e+005 |

DRY GAS STREAM

 Temperature: 100.00 deg. F
 Pressure: 1014.70 psia
 Flow Rate: 5.42e+006 scfh

| Component | Conc. (vol%) | Loading (lb/hr) |
|------------------------|-----------------|--------------------|
| Water | 7.62e-003 | 1.96e+001 |
| Carbon Dioxide | 1.54e-001 | 9.66e+002 |
| Nitrogen | 4.41e-001 | 1.76e+003 |
| Methane | 8.04e+001 | 1.84e+005 |
| Ethane | 1.32e+001 | 5.68e+004 |
| Propane | 3.76e+000 | 2.37e+004 |
| Isobutane | 4.81e-001 | 3.99e+003 |
| n-Butane | 8.53e-001 | 7.08e+003 |
| Isopentane | 2.26e-001 | 2.33e+003 |
| n-Pentane | 1.99e-001 | 2.05e+003 |
| n-Hexane | 6.09e-002 | 7.49e+002 |
| Cyclohexane | 7.94e-003 | 9.55e+001 |
| Other Hexanes | 1.03e-001 | 1.27e+003 |
| Heptanes | 6.78e-002 | 9.70e+002 |
| 2,2,4-Trimethylpentane | 3.30e-002 | 5.38e+002 |
| Benzene | 1.87e-003 | 2.09e+001 |
| Toluene | 2.75e-003 | 3.62e+001 |
| Xylenes | 1.72e-003 | 2.61e+001 |
| C8+ Heavies | 1.19e-002 | 2.90e+002 |
| Total Components | 100.00 | 2.87e+005 |

LEAN GLYCOL STREAM

 Temperature: 100.00 deg. F
 Flow Rate: 1.50e+001 gpm

| Component | Conc. (wt%) | Loading (lb/hr) |
|------------------------|----------------|--------------------|
| TEG | 9.90e+001 | 8.36e+003 |
| Water | 1.00e+000 | 8.45e+001 |
| Carbon Dioxide | 1.86e-012 | 1.57e-010 |
| Nitrogen | 3.06e-013 | 2.59e-011 |
| Methane | 9.17e-018 | 7.75e-016 |
| Ethane | 1.15e-007 | 9.68e-006 |
| Propane | 5.99e-009 | 5.06e-007 |
| Isobutane | 9.56e-010 | 8.08e-008 |
| n-Butane | 1.82e-009 | 1.53e-007 |
| Isopentane | 1.12e-004 | 9.49e-003 |
| n-Pentane | 1.26e-004 | 1.07e-002 |
| n-Hexane | 6.87e-005 | 5.81e-003 |
| Cyclohexane | 2.66e-004 | 2.25e-002 |
| Other Hexanes | 1.82e-004 | 1.54e-002 |
| Heptanes | 1.49e-004 | 1.26e-002 |
| 2,2,4-Trimethylpentane | 1.05e-004 | 8.85e-003 |
| Benzene | 8.74e-004 | 7.38e-002 |
| Toluene | 3.34e-003 | 2.83e-001 |
| Xylenes | 7.38e-003 | 6.24e-001 |
| C8+ Heavies | 3.03e-003 | 2.56e-001 |
| Total Components | 100.00 | 8.45e+003 |

RICH GLYCOL STREAM

 Temperature: 100.00 deg. F
 Pressure: 1014.70 psia
 Flow Rate: 1.58e+001 gpm
 NOTE: Stream has more than one phase.

| Component | Conc. (wt%) | Loading (lb/hr) |
|------------------------|----------------|--------------------|
| ----- | ----- | ----- |
| TEG | 9.47e+001 | 8.36e+003 |
| Water | 4.34e+000 | 3.83e+002 |
| Carbon Dioxide | 1.77e-002 | 1.57e+000 |
| Nitrogen | 2.93e-003 | 2.59e-001 |
| Methane | 2.61e-001 | 2.31e+001 |
| Ethane | 2.32e-001 | 2.05e+001 |
| Propane | 1.41e-001 | 1.24e+001 |
| Isobutane | 3.05e-002 | 2.69e+000 |
| n-Butane | 7.01e-002 | 6.19e+000 |
| Isopentane | 2.15e-002 | 1.90e+000 |
| n-Pentane | 2.42e-002 | 2.13e+000 |
| n-Hexane | 1.31e-002 | 1.16e+000 |
| Cyclohexane | 7.95e-003 | 7.03e-001 |
| Other Hexanes | 1.74e-002 | 1.54e+000 |
| Heptanes | 2.86e-002 | 2.53e+000 |
| 2,2,4-Trimethylpentane | 6.68e-003 | 5.90e-001 |
| Benzene | 1.67e-002 | 1.48e+000 |
| Toluene | 4.05e-002 | 3.57e+000 |
| Xylenes | 5.46e-002 | 4.82e+000 |
| C8+ Heavies | 2.41e-002 | 2.12e+000 |
| ----- | ----- | ----- |
| Total Components | 100.00 | 8.83e+003 |

FLASH TANK OFF GAS STREAM

 Temperature: 125.00 deg. F
 Pressure: 49.70 psia
 Flow Rate: 9.08e+002 scfh

| Component | Conc. (vol%) | Loading (lb/hr) |
|------------------------|-----------------|--------------------|
| ----- | ----- | ----- |
| Water | 4.12e-001 | 1.78e-001 |
| Carbon Dioxide | 1.00e+000 | 1.06e+000 |
| Nitrogen | 3.72e-001 | 2.49e-001 |
| Methane | 5.78e+001 | 2.22e+001 |
| Ethane | 2.51e+001 | 1.80e+001 |
| Propane | 9.00e+000 | 9.50e+000 |
| Isobutane | 1.32e+000 | 1.83e+000 |
| n-Butane | 2.75e+000 | 3.83e+000 |
| Isopentane | 6.40e-001 | 1.11e+000 |
| n-Pentane | 6.51e-001 | 1.12e+000 |
| n-Hexane | 2.15e-001 | 4.43e-001 |
| Cyclohexane | 4.67e-002 | 9.40e-002 |
| Other Hexanes | 3.33e-001 | 6.88e-001 |
| Heptanes | 2.44e-001 | 5.85e-001 |
| 2,2,4-Trimethylpentane | 8.05e-002 | 2.20e-001 |
| Benzene | 1.55e-002 | 2.90e-002 |
| Toluene | 1.99e-002 | 4.40e-002 |

| | | |
|------------------|-----------|-----------|
| Xylenes | 8.69e-003 | 2.21e-002 |
| C8+ Heavies | 1.24e-002 | 5.04e-002 |
| ----- | | |
| Total Components | 100.00 | 6.13e+001 |

FLASH TANK GLYCOL STREAM

Temperature: 125.00 deg. F
Flow Rate: 1.56e+001 gpm

| Component | Conc. (wt%) | Loading (lb/hr) |
|------------------------|----------------|--------------------|
| ----- | | |
| TEG | 9.53e+001 | 8.36e+003 |
| Water | 4.37e+000 | 3.83e+002 |
| Carbon Dioxide | 5.81e-003 | 5.09e-001 |
| Nitrogen | 1.06e-004 | 9.31e-003 |
| Methane | 9.93e-003 | 8.71e-001 |
| Ethane | 2.80e-002 | 2.46e+000 |
| Propane | 3.36e-002 | 2.94e+000 |
| Isobutane | 9.81e-003 | 8.60e-001 |
| n-Butane | 2.69e-002 | 2.36e+000 |
| Isopentane | 9.03e-003 | 7.92e-001 |
| n-Pentane | 1.15e-002 | 1.01e+000 |
| n-Hexane | 8.19e-003 | 7.18e-001 |
| Cyclohexane | 6.94e-003 | 6.08e-001 |
| Other Hexanes | 9.69e-003 | 8.50e-001 |
| Heptanes | 2.21e-002 | 1.94e+000 |
| 2,2,4-Trimethylpentane | 4.22e-003 | 3.70e-001 |
| Benzene | 1.65e-002 | 1.45e+000 |
| Toluene | 4.02e-002 | 3.53e+000 |
| Xylenes | 5.47e-002 | 4.80e+000 |
| C8+ Heavies | 2.37e-002 | 2.07e+000 |
| ----- | | |
| Total Components | 100.00 | 8.77e+003 |

FLASH GAS EMISSIONS

Flow Rate: 3.74e+003 scfh
Control Method: Combustion Device
Control Efficiency: 95.00

| Component | Conc. (vol%) | Loading (lb/hr) |
|------------------------|-----------------|--------------------|
| ----- | | |
| Water | 6.06e+001 | 1.07e+002 |
| Carbon Dioxide | 3.81e+001 | 1.65e+002 |
| Nitrogen | 9.04e-002 | 2.49e-001 |
| Methane | 7.03e-001 | 1.11e+000 |
| Ethane | 3.05e-001 | 9.02e-001 |
| Propane | 1.09e-001 | 4.75e-001 |
| Isobutane | 1.60e-002 | 9.16e-002 |
| n-Butane | 3.34e-002 | 1.91e-001 |
| Isopentane | 7.78e-003 | 5.53e-002 |
| n-Pentane | 7.91e-003 | 5.62e-002 |
| n-Hexane | 2.61e-003 | 2.21e-002 |
| Cyclohexane | 5.67e-004 | 4.70e-003 |
| Other Hexanes | 4.05e-003 | 3.44e-002 |
| Heptanes | 2.96e-003 | 2.93e-002 |
| 2,2,4-Trimethylpentane | 9.78e-004 | 1.10e-002 |

| | | |
|-------------|-----------|-----------|
| Benzene | 1.88e-004 | 1.45e-003 |
| Toluene | 2.42e-004 | 2.20e-003 |
| Xylenes | 1.06e-004 | 1.10e-003 |
| C8+ Heavies | 1.50e-004 | 2.52e-003 |

| | | |
|------------------|--------|-----------|
| Total Components | 100.00 | 2.76e+002 |
|------------------|--------|-----------|

 REGENERATOR OVERHEADS STREAM

Temperature: 212.00 deg. F
 Pressure: 14.70 psia
 Flow Rate: 6.46e+003 scfh

| Component | Conc. (vol%) | Loading (lb/hr) |
|------------------------|-----------------|--------------------|
| Water | 9.74e+001 | 2.98e+002 |
| Carbon Dioxide | 6.80e-002 | 5.09e-001 |
| Nitrogen | 1.95e-003 | 9.31e-003 |
| Methane | 3.19e-001 | 8.71e-001 |
| Ethane | 4.81e-001 | 2.46e+000 |
| Propane | 3.92e-001 | 2.94e+000 |
| Isobutane | 8.70e-002 | 8.60e-001 |
| n-Butane | 2.39e-001 | 2.36e+000 |
| Isopentane | 6.38e-002 | 7.83e-001 |
| n-Pentane | 8.14e-002 | 9.99e-001 |
| n-Hexane | 4.86e-002 | 7.12e-001 |
| Cyclohexane | 4.09e-002 | 5.86e-001 |
| Other Hexanes | 5.69e-002 | 8.34e-001 |
| Heptanes | 1.13e-001 | 1.93e+000 |
| 2,2,4-Trimethylpentane | 1.86e-002 | 3.61e-001 |
| Benzene | 1.03e-001 | 1.37e+000 |
| Toluene | 2.07e-001 | 3.25e+000 |
| Xylenes | 2.31e-001 | 4.17e+000 |
| C8+ Heavies | 6.27e-002 | 1.82e+000 |
| Total Components | 100.00 | 3.25e+002 |

 COMBUSTION DEVICE OFF GAS STREAM

Temperature: 1000.00 deg. F
 Pressure: 14.70 psia
 Flow Rate: 8.22e+000 scfh

| Component | Conc. (vol%) | Loading (lb/hr) |
|------------------------|-----------------|--------------------|
| Methane | 1.25e+001 | 4.35e-002 |
| Ethane | 1.89e+001 | 1.23e-001 |
| Propane | 1.54e+001 | 1.47e-001 |
| Isobutane | 3.42e+000 | 4.30e-002 |
| n-Butane | 9.39e+000 | 1.18e-001 |
| Isopentane | 2.51e+000 | 3.91e-002 |
| n-Pentane | 3.20e+000 | 4.99e-002 |
| n-Hexane | 1.91e+000 | 3.56e-002 |
| Cyclohexane | 1.61e+000 | 2.93e-002 |
| Other Hexanes | 2.24e+000 | 4.17e-002 |
| Heptanes | 4.44e+000 | 9.64e-002 |
| 2,2,4-Trimethylpentane | 7.30e-001 | 1.81e-002 |
| Benzene | 4.06e+000 | 6.87e-002 |
| Toluene | 8.14e+000 | 1.62e-001 |

Xylenes 9.08e+000 2.09e-001

C8+ Heavies 2.47e+000 9.09e-002

Total Components 100.00 1.32e+000



Certificate of Analysis

Number: 2030-14120108-005A

Carencro Laboratory
4790 NE Evangeline Thruway
Carencro, LA 70520

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

Dec. 15, 2014

Field: EQT
Station Name: Saturn Plant
Sample Point: Master Meter
Cylinder No: 10011
Analyzed: 12/11/2014 08:51:27 by CC49

Sampled By: PK-GAS
Sample Of: Gas Spot
Sample Date: 12/04/2014 16:30
Sample Conditions:
Method: GPA 2286

Analytical Data

| Components | Mol. % | Wt. % | GPM at 14.73 psia | | |
|----------------|---------|---------|----------------------|----------------|-------|
| Nitrogen | 0.441 | 0.615 | | GPM TOTAL C2+ | 5.298 |
| Carbon Dioxide | 0.154 | 0.338 | | GPM TOTAL C3+ | 1.747 |
| Methane | 80.354 | 64.210 | | GPM TOTAL iC5+ | 0.280 |
| Ethane | 13.237 | 19.826 | 3.551 | | |
| Propane | 3.762 | 8.263 | 1.039 | | |
| Iso-Butane | 0.481 | 1.393 | 0.158 | | |
| n-Butane | 0.854 | 2.472 | 0.270 | | |
| Iso-Pentane | 0.226 | 0.812 | 0.083 | | |
| n-Pentane | 0.199 | 0.715 | 0.072 | | |
| Hexanes | 0.164 | 0.700 | 0.067 | | |
| Heptanes Plus | 0.128 | 0.656 | 0.058 | | |
| | 100.000 | 100.000 | 5.298 | | |

| Physical Properties | Total | C7+ |
|-----------------------------|--------|--------|
| Relative Density Real Gas | 0.6952 | 3.5361 |
| Calculated Molecular Weight | 20.08 | 102.42 |
| Compressibility Factor | 0.9967 | |

GPA 2172-09 Calculation:

Calculated Gross BTU per ft³ @ 14.73 psia & 60°F

| | | |
|-------------------------|------|------|
| Real Gas Dry BTU | 1223 | 5533 |
| Water Sat. Gas Base BTU | 1201 | 5436 |

Comments: H2O Mol% : 1.740 ; Wt% : 1.565

Hydrocarbon Laboratory Manager

Quality Assurance:

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



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Carencro Laboratory
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Gary Vermillion
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 PO Box 1028
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Dec. 15, 2014

Field: EQT
 Station Name: Saturn Plant
 Sample Point: Master Meter
 Cylinder No: 10011
 Analyzed: 12/11/2014 08:51:27 by CC49

Sampled By: PK-GAS
 Sample Of: Gas Spot
 Sample Date: 12/04/2014 16:30
 Sample Conditions:
 Method: GPA 2286

Analytical Data

| Components | Mol. % | Wt. % | GPM at 14.73 psia | | |
|----------------|---------|---------|----------------------|----------------|-------|
| Nitrogen | 0.441 | 0.615 | | GPM TOTAL C2+ | 5.298 |
| Carbon Dioxide | 0.154 | 0.338 | | GPM TOTAL C3+ | 1.747 |
| Methane | 80.354 | 64.210 | | GPM TOTAL iC5+ | 0.280 |
| Ethane | 13.237 | 19.826 | 3.551 | | |
| Propane | 3.762 | 8.263 | 1.039 | | |
| Iso-butane | 0.481 | 1.393 | 0.158 | | |
| n-Butane | 0.854 | 2.472 | 0.270 | | |
| Iso-pentane | 0.226 | 0.812 | 0.083 | | |
| n-Pentane | 0.199 | 0.715 | 0.072 | | |
| Hexanes Plus | 0.292 | 1.356 | 0.125 | | |
| | 100.000 | 100.000 | 5.298 | | |

| Physical Properties | Total | C6+ |
|--|--------|--------|
| Relative Density Real Gas | 0.6952 | 3.2102 |
| Calculated Molecular Weight | 20.08 | 92.98 |
| Compressibility Factor | 0.9967 | |
| GPA 2172-09 Calculation: | | |
| Calculated Gross BTU per ft³ @ 14.73 psia & 60°F | | |
| Real Gas Dry BTU | 1223 | 5079 |
| Water Sat. Gas Base BTU | 1201 | 4991 |

Comments: H2O Mol% : 1.740 ; Wt% : 1.564

Hydrocarbon Laboratory Manager

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Dec. 15, 2014

Field: EQT
 Station Name: Saturn Plant
 Sample Point: Master Meter
 Cylinder No: 10011
 Analyzed: 12/11/2014 08:51:27 by CC49

Sampled By: PK-GAS
 Sample Of: Gas Spot
 Sample Date: 12/04/2014 16:30
 Sample Conditions:
 Method: GPA 2286

Analytical Data

| Components | Mol. % | Wt. % | GPM at 14.73 psia | |
|-------------------|---------|---------|----------------------|---------------------|
| Nitrogen | 0.441 | 0.615 | | |
| Methane | 80.354 | 64.210 | | GPM TOTAL C2+ 5.298 |
| Carbon Dioxide | 0.154 | 0.338 | | |
| Ethane | 13.237 | 19.826 | 3.551 | |
| Propane | 3.762 | 8.263 | 1.039 | |
| Iso-Butane | 0.481 | 1.393 | 0.158 | |
| n-Butane | 0.854 | 2.472 | 0.270 | |
| Iso-Pentane | 0.226 | 0.812 | 0.083 | |
| n-Pentane | 0.199 | 0.715 | 0.072 | |
| i-Hexanes | 0.103 | 0.439 | 0.042 | |
| n-Hexane | 0.061 | 0.261 | 0.025 | |
| Benzene | 0.002 | 0.007 | 0.001 | |
| Cyclohexane | 0.008 | 0.034 | 0.003 | |
| i-Heptanes | 0.051 | 0.244 | 0.022 | |
| n-Heptane | 0.017 | 0.087 | 0.008 | |
| Toluene | 0.003 | 0.015 | 0.001 | |
| i-Octanes | 0.033 | 0.173 | 0.015 | |
| n-Octane | 0.005 | 0.027 | 0.002 | |
| Ethylbenzene | NIL | 0.001 | NIL | |
| Xylenes | 0.002 | 0.009 | 0.001 | |
| i-Nonanes | 0.004 | 0.033 | 0.003 | |
| n-Nonane | 0.001 | 0.007 | 0.001 | |
| i-Decanes | 0.002 | 0.018 | 0.001 | |
| n-Decane | NIL | 0.001 | NIL | |
| Undecanes | NIL | NIL | NIL | |
| Dodecanes | NIL | NIL | NIL | |
| Tridecanes | NIL | NIL | NIL | |
| Tetradecanes Plus | NIL | NIL | NIL | |
| | 100.000 | 100.000 | 5.298 | |

| Physical Properties | Total |
|--|--------|
| Calculated Molecular Weight | 20.076 |
| GPA 2172-09 Calculation: | |
| Calculated Gross BTU per ft³ @ 14.73 psia & 60°F | |
| Real Gas Dry BTU | 1222.6 |
| Water Sat. Gas Base BTU | 1201.4 |
| Relative Density Real Gas | 0.6952 |
| Compressibility Factor | 0.9967 |

Hydrocarbon Laboratory Manager

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



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Dec. 15, 2014

Field: EQT
 Station Name: Saturn Plant
 Sample Point: Master Meter
 Cylinder No: 10011
 Analyzed: 12/11/2014 08:51:27 by CC49

Sampled By: PK-GAS
 Sample Of: Gas Spot
 Sample Date: 12/04/2014 16:30
 Sample Conditions:
 Method: GPA 2286

Analytical Data

| Components | Mol. % | Wt. % |
|------------------------|---------|---------|
| Carbon Dioxide | 0.154 | 0.338 |
| Hydrogen Sulfide | N/R | N/R |
| Nitrogen | 0.441 | 0.615 |
| Methane | 80.354 | 64.213 |
| Ethane | 13.237 | 19.826 |
| Propane | 3.762 | 8.263 |
| Iso-Butane | 0.481 | 1.393 |
| n-Butane | 0.854 | 2.472 |
| Iso-Pentane | 0.226 | 0.812 |
| n-Pentane | 0.199 | 0.715 |
| Cyclopentane | 0.007 | 0.024 |
| n-Hexane | 0.061 | 0.260 |
| Cyclohexane | 0.008 | 0.035 |
| Other Hexanes | 0.097 | 0.413 |
| n-Heptane | 0.017 | 0.087 |
| Other Heptanes | 0.050 | 0.243 |
| Methylcyclohexane | 0.013 | 0.062 |
| 2,2,4-Trimethylpentane | NIL | 0.001 |
| Benzene | 0.002 | 0.007 |
| Toluene | 0.003 | 0.015 |
| Ethylbenzene | NIL | 0.001 |
| Xylenes | 0.002 | 0.009 |
| C8 + Heavies | 0.032 | 0.196 |
| | 100.000 | 100.000 |

Hydrocarbon Laboratory Manager

Quality Assurance:

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

ATTACHMENT O

Monitoring/Recordkeeping/Reporting/Testing Plans

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

| Plan Type | Emission unit | Pollutant | Requirements | Frequency | Method of Measurement | Regulatory Reference |
|---------------------------|------------------------|------------------|---|---------------------------|--|--|
| Monitoring, Recordkeeping | TO-1, TO-2, TO-3, TO-4 | PM, Opacity | Monthly inspection of the unit to ensure no visible emissions | Monthly | Method 22 | Condition 10.2.6 |
| Monitoring, Recordkeeping | TO-1, TO-2, TO-3, TO-4 | VOC/HAP | Continuously measure temperature | At least 4 times per hour | Thermocouple (or equivalent) | Condition 10.2.5 |
| Monitoring, Recordkeeping | TO-1, TO-2, TO-3, TO-4 | NA | Monitor throughput to enclosed combustors and maintain records of gas combusted | Monthly | Calculate throughput monthly using GRI GLYCalc | Revision to Conditions 10.2.2. and 10.2.4. |

ATTACHMENT P

Public Notice

AIR QUALITY PERMIT NOTICE Notice of Application

Notice is given that EQM Gathering Opco LLC has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a Class II Administrative Update to R13 Permit No. R13-3150 for an existing natural gas compressor station (Saturn Compressor Station). The facility is located along Right Fork Run Road in Doddridge County approximately 0.4 miles Northeast of Central Station, WV at 39.29701° N, -80.81991° W.

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

| Pollutant | Emissions (tons per year) |
|---|------------------------------|
| NO _x | 13.33 |
| CO | 11.20 |
| VOC | <0.01 |
| SO ₂ | 0.08 |
| PM | 1.01 |
| Total HAPs | <0.01 |
| Carbon Dioxide Equivalent (CO ₂ e) | 17,908 |

Specifically, this application seeks to increase the permit limit of gas throughput to the enclosed combustors (TO-1, TO-2, and TO-3), permit the existing combustor (TO-4) for full time operation i.e. 8,760 hours per year, increase the existing dehydration throughput limits (RSV-2 and RSV-3), and install five (5) 300 gallon methanol tanks, update the storage tank inventory to reflect actual equipment installed at the facility, and remove two (2) stabilizer heaters (HTR-1 and HTR-2).

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

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1250, during normal business hours.

Dated this ~~XX~~ day of December, 2015.

By: EQM Gathering Opco, LLC
Diana Charletta, Sr. Vice President
625 Liberty Ave Suite 1700
Pittsburgh, PA 15222