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February 9, 2016

Mr. Frederick Tipane  
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  
Application No.: R30-01700027-2016  
Revisions to December 9, 2015 Title V Permit Application**

Dear Mr. Tipane:

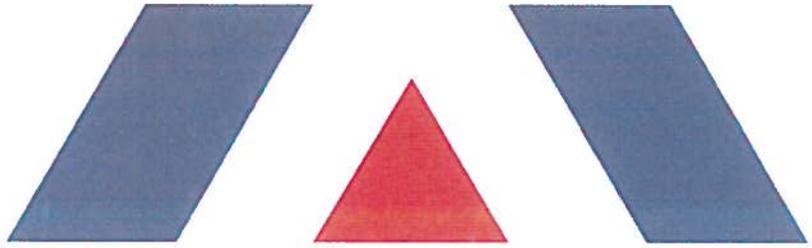
EQM Gathering Opco, LLC (EQM) is submitting the attached revisions to the initial Title V Operating Permit (TVOP) application that was originally submitted on December 9, 2015 for an existing compressor station located in Doddridge County, West Virginia (Saturn Compressor Station). These revisions are in response to your letter of January 21, 2016, RE: Completeness Determination-Saturn Compressor Station-Application No.: R30-01700027-2016

Please contact me at 412-395-3654 or via email at [msowa@eqt.com](mailto:msowa@eqt.com) 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**

**Initial Title V Operating Permit Application**

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December 2015

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# 1. INTRODUCTION

EQM Gathering Opco, LLC (EQM) is submitting this initial Title V Operating Permit (TVOP) application to the West Virginia Department of Environmental Protection (WVDEP) for the continued operation of its existing compressor station located in Doddridge County, West Virginia (Saturn Compressor Station). The Station currently operates under R13 Permit No. R13-3150.

## 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 130 MMSCFD with associated reboilers, each controlled by a thermal oxidizer;
- > Four (4) 8,820 gallon produced fluid storage tanks controlled by a thermal oxidizer; and
- > Thirty eight (38) miscellaneous storage tanks (rated 30,000 gallons or less).

A process flow diagram is included as Attachment C.

## 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 Section 3 for detailed discussion regarding applicable requirements and compliance demonstration methodology.

## 1.3. TITLE V APPLICATION ORGANIZATION

This West Virginia Initial Title V permit application is organized as follows:

- > Section 2: Sample Emission Source Calculations;

- > Section 3: Regulatory Discussion;
- > Section 4: Title V Application Form;
- > Attachment A: Area Map;
- > Attachment B: Plot Plan;
- > Attachment C: Process Flow Diagram;
- > Attachment D: Equipment Table;
- > Attachment E: Emission Unit Forms;
- > Attachment F: Schedule of Compliance Forms (*Not applicable*);
- > Attachment G: Air Pollution Control Device Forms;
- > Attachment H: Compliance Assurance Monitoring Forms (*Not applicable*);
- > Attachment I: Emission Calculations; and
- > Application Fee.

## 2. SAMPLE EMISSION SOURCE CALCULATIONS

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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 Attachment I of this application.

Emissions from the facility will result from combustion of natural gas in the compressor engines, microturbines, heaters, combustion of gases in the thermal oxidizers, and reboilers. Emissions will also result from the storage of methanol and produced fluid, operation of the dehydrator units, and fugitive emissions from component leaks. 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.

- > **Compressor Engines:** Potential emissions of nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), volatile organic compounds (VOC), formaldehyde, and greenhouse gases (GHGs) are calculated using factors provided by the engine manufacturer and the oxidation catalyst manufacturer where available. Potential emissions of other criteria pollutants and all other hazardous air pollutants (HAPs) are calculated using U.S. EPA's AP-42 factors for natural gas-fired engines.<sup>1</sup> When needed to estimate emissions, calculations assume a site-specific heat content of natural gas.
- > **Fuel Gas Heaters and Reboilers:** Potential emissions of criteria pollutants and HAPs are calculated using U.S. EPA's AP-42 factors for natural gas external combustion.<sup>2</sup> These calculations assume a site-specific heat content of natural gas. Greenhouse gas emissions are calculated according to 40 CFR 98 Subpart C.<sup>3</sup>
- > **Microturbine Generators:** Potential emissions of NO<sub>x</sub>, CO, VOC, methane, and CO<sub>2</sub> are calculated using manufacturer's emission data. Emissions of all other criteria pollutants and HAPs are calculated using U.S. EPA's AP-42 factors for stationary gas turbines.<sup>4</sup> These calculations use a site specific heat content. Although one unit will provide backup power, potential emissions of all units are calculated assuming continuous operation (i.e., 8,760 hours per year). Emissions of CH<sub>4</sub> and N<sub>2</sub>O are calculated according to 40 CFR 98 Subpart C.
- > **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.<sup>5</sup>
- > **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.<sup>6</sup> These calculations assume a site-specific heat content of natural gas. Greenhouse gas emissions are calculated according to 40 CFR 98 Subpart C.<sup>7</sup>
- > **Methanol Storage Tanks:** Working and breathing losses from the methanol storage tanks were calculated using EPA Tanks. 4.09d.

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<sup>1</sup> U.S. EPA, AP 42, Fifth Edition, Volume I, Chapter 3.2, *Natural Gas-Fired Reciprocating Engine*, July 2000.

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

<sup>3</sup> 40 CFR 98 Subpart C, *General Stationary Fuel combustion Sources*, Tables C-1 and C-2.

<sup>4</sup> U.S. EPA, AP-42, Fifth Edition, Volume 1, Chapter 3.1, *Stationary Gas Turbines*, April 2000.

<sup>5</sup> U.S. EPA, AP-42, Fifth Edition, Volume I, Chapter 1.4, *Natural Gas Combustion*, Supplement D, July 1998.

<sup>6</sup> U.S. EPA, AP 42, Fifth Edition, Volume I, Chapter 1.4, *Natural Gas Combustion*, Supplement D, July 1998.

<sup>7</sup> 40 CFR 98 Subpart C, *General Stationary Fuel combustion Sources*, Tables C-1 and C-2.

- > **Produced Fluid Tanks:** Working, breathing, and flashing losses from the produced fluid storage tanks were calculating using API's E&P Tank.
- > **Fugitive Emissions:** Emissions from fugitive equipment leaks are calculated using published EPA emission factors and 40 CFR Part 98, Subpart W emission factors. Emissions from blowdown events are calculated using engineering estimates of the amount of gas vented during each event. Site specific gas analyses were used to speciate VOC, HAP, and GHG emissions.

## 3. REGULATORY DISCUSSION

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

- > Prevention of Significant Deterioration (PSD) permitting;
- > Non-attainment New Source Review (NNSR) permitting;
- > Title V of the 1990 Clean Air Act Amendments;
- > Compliance Assurance Monitoring (CAM);
- > 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 Title V operating 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 station. Regulations that are categorically non-applicable are not discussed (e.g., NSPS Subpart J, Standards of Performance for Petroleum Refineries).

### 3.1. PSD AND NNSR SOURCE CLASSIFICATION

Federal construction permitting programs regulate new and modified sources of attainment pollutants under Prevention of Significant Deterioration and new and modified sources of non-attainment pollutants under Non-Attainment New Source Review. PSD regulations apply when a new source is constructed in which emissions exceed major source thresholds, an existing minor source undergoes a modification in which emission increases exceed PSD major source thresholds, or an existing major source undergoes a modification in which emission increases exceed PSD significant emission rates. The Saturn Station is considered an existing minor source with respect to PSD and will remain a minor source. No new sources are being installed as part of this application and as such, PSD is not triggered.

NNSR regulations only apply in areas designated as non-attainment. The Saturn Station is located in Doddridge County, which is designated as attainment/unclassifiable for all criteria pollutants.<sup>8</sup> Therefore, NNSR regulations do not apply to the Saturn Station.

### 3.2. TITLE V OPERATING PERMIT PROGRAM

Title 40 of the Code of Federal Regulations Part 70 (40 CFR 70) establishes the federal Title V operating permit program. West Virginia has incorporated the provisions of this federal program in its Title V operating permit program in West Virginia Code of State Regulations (CSR) 45-30. The major source thresholds with respect to the West Virginia Title V operating permit program regulations are 10 tons per year (tpy) of a single HAP, 25 tpy of any

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<sup>8</sup> U.S. EPA Greenbook, [http://www.epa.gov/airquality/greenbook/anayo\\_wv.html](http://www.epa.gov/airquality/greenbook/anayo_wv.html), as of January 30, 2015.

combination of HAP, and 100 tpy of all other regulated pollutants.<sup>9</sup> As a result of the projects associated with the facility's existing construction permit, potential emissions of NO<sub>x</sub>, 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. EQM is submitting this Title V operating permit application in accordance with 40 CFR 70.5(a)(1) and 45 CSR 30 4.1.a.2 within 12 months of start-up of the authorized equipment under the previous construction permit request.

### **3.3. COMPLIANCE ASSURANCE MONITORING**

Under 40 CFR 64, the Compliance Assurance Monitoring (CAM) regulations, facilities are required to prepare and submit monitoring plans for certain emissions units with the initial or renewal Title V operating permit application. CAM Plans are intended to provide an on-going and reasonable assurance of compliance with emission limits for sources that utilize active control devices. As there are no units with potential emissions post-control greater than the major source thresholds, the regulatory requirement for addressing CAM is to do so at the time of the first Title V Operating Permit Renewal, per 64.5(b). Since this application is an initial application for a Title V Operating Permit, CAM is not required to be addressed. CAM for the Saturn station will be addressed accordingly during the facility's first Title V Operating Permit Renewal.

### **3.4. NEW SOURCE PERFORMANCE STANDARDS**

New Source Performance Standards, 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 facility.

#### **3.4.1. NSPS Subparts D, Da, Db, and Dc - Steam Generating Units**

These subparts apply to steam generating units of various sizes, all greater than 10 MMBtu/hr. The station does not include any steam generating units with a heat input greater than 10 MMBtu/hr, therefore the requirements of these subparts do not apply.

#### **3.4.2. NSPS Subparts GG - Stationary Gas Turbines**

This subpart applies to stationary gas turbines with a heat input at peak load equal to or greater than 10 MMBtu/hr, based on the lower heating value of the fuel, commencing construction after October 3, 1977. The microturbines at the station have a heat input rating less than 10 MMBtu/hr, therefore the requirements of this subpart do not apply.

#### **3.4.3. NSPS Subparts IIII - Stationary Compression Ignition Internal Combustion Engines**

This subpart applies to manufacturers, owners, and operators of stationary compression ignition internal combustion engines (CI ICE) that have been constructed, reconstructed, or modified after various dates, the earliest of which is July 11, 2005. The compressor engines at the Saturn Compressor Station are spark-ignition internal combustion engines. Therefore the requirements of this subpart do not apply.

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<sup>9</sup> 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.

### 3.4.4. NSPS Subpart JJJJ - Stationary Spark Ignition Internal Combustion Engines

New Source Performance Standards 40 CFR Part 60 Subpart JJJJ affects owners and operators of stationary spark ignition internal combustion engines (SI ICE) that commence construction, reconstruction or modification after June 12, 2006. Applicability dates are based on the date the engine was ordered by the operator. The existing engines at the Saturn Compressor Station are 4-stroke, lean burn spark ignition RICE (each rated at >500 hp) manufactured after July 1, 2007. The engines are equipped with oxidation catalysts which are guaranteed by the manufacturer to achieve a 93% reduction in CO, 83% reduction in formaldehyde emissions, and a 50% reduction in VOC emissions. The engines are subject to the emission standards per Table 1 of NSPS JJJJ non-emergency use engines and will be in compliance with the NSPS JJJJ limits.

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

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

### 3.4.5. NSPS Subparts K, Ka, and Kb - Storage Vessels

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 m<sup>3</sup> (~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.

### 3.4.6. NSPS Subpart OOOO – Crude Oil and Natural Gas Production, Transmission, and Distribution

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

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

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 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.

The reciprocating compressors at the facility are subject to the requirements of NSPS 0000, 40 CFR §60.5385, which requires owners and operators of affected reciprocating compressors to change the rod packing prior to each operating 26,000 hours or prior to 36 months of since start up or the last packing replacement. EQM will continue to comply with the requirements of this rule.

Pneumatic controllers located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment and not including natural gas processing plants, are required to have a natural gas bleed rate less than 6 standard cubic feet per hour. EQM will continue to comply with the requirements for pneumatic controller affected facilities as outlined in the current permit.

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

### **3.4.7. 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.

## **3.5. NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS**

Regulatory requirements for facilities subject to NESHAP standards, otherwise known as 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 Saturn facility was previously a minor HAP source prior to the installation and startup of two (2) 4,735 HP lean burn engines and other ancillary equipment in December 2014. The new sources are required to be in compliance with major source requirements upon startup. Existing engines at the site are required to be in compliance with requirements for HAP major source no later than three (3) years after the facility becomes a major source. The potential applicability of specific MACT standards to the Saturn Compressor Station is discussed below.

### **3.5.1. NESHAP Subpart HH - Oil and Natural Gas Production Facilities**

This MACT standard contains requirements for both major and area sources of HAP. The benzene emissions from the existing glycol dehydrator vents are less than 0.90 megagrams per year (1 tpy) each, therefore, the Saturn Compressor Station is exempt from the requirements of NESHAP Subpart HH pursuant to 40 CFR §63.764(e)(1)(ii), except for the requirement to keep records of the actual average natural gas flow rate or actual average benzene

emissions from the dehydrator, per 40 CFR §63.774(d)(1). EQM will continue to comply with the requirements of Subpart HH as outlined in the current permit.

### **3.5.2. NESHAP Subpart HHH - Natural Gas Transmission and Storage Facilities**

Glycol dehydration units are potentially subject to Subpart HHH, NESHAP from Natural Gas Transmission and Storage Facilities. This standard applies to such units at natural gas transmission and storage facilities that are major sources of HAP emissions located downstream of the point of custody transfer (after processing and/or treatment in the production sector), but upstream of the distribution sector. The Saturn Station is a gathering station that is not a transmission or storage facility. As such, the requirements of this subpart do not apply to the station.

### **3.5.3. NESHAP Subpart ZZZZ - Stationary Reciprocating Internal Combustion Engines**

The original rule, published on February 26, 2004, initially affected new (constructed or reconstructed after December 19, 2002) reciprocating internal combustion engines (RICE) with a site-rating greater than 500 brake horsepower (HP) located at a major source of hazardous air pollutant (HAP) emissions. On January 18, 2008, EPA published an amendment that promulgated standards for RICE constructed or reconstructed after June 12, 2006 with a site rating less than or equal to 500 HP located at major sources, and for engines constructed and reconstructed after June 12, 2006 located at area sources. On August 10, 2010, EPA published another amendment that promulgated standards for existing (constructed or reconstructed before June 12, 2006) RICE at area sources and existing RICE (constructed or reconstructed before June 12, 2006) with a site rating of less than or equal to 500 HP at major sources.

The Caterpillar G3616 compressor engines at the Saturn Compressor Station (CE007 and CE008) are classified as new spark ignition engines at a major source of HAP. The emission limitations for the engines are included in 40 CFR §63.6600 and Table 2a. The operating limitations are included in Table 2b and the continuous parametric monitoring system requirements included in 40 CFR §63.6625(b). The initial compliance demonstration is to be conducted with 180 days of startup as per 40 CFR §63.6610(a). The notification on compliance status requirements are included in 40 CFR §63.6645(h). Semiannual reporting requirements are included in 40 CFR §63.6645. The recordkeeping requirements are included in 40 CFR §63.6655(a), (b), and (d).

The Caterpillar G3608 engines at the facility (CE001 through CE006) are also classified as new spark ignition engines at a major source of HAP and are subject to the same requirements described above. The engines were constructed prior to the station becoming a major source of HAP. Per 40 CFR §63.6595(b)(2), stationary RICE for which construction or reconstruction is commenced before an area source becomes a major source of HAP must be in compliance with the provisions that are applicable to RICE located at major sources within 3 years after the area source becomes a major source of HAP. EQM will comply with the aforementioned requirements for new spark ignition engines at a major source of HAP.

### **3.5.4. NESHAP Subpart DDDDD - Industrial, Commercial, and Institutional Boilers and Process Heaters**

This MACT standard applies to industrial, commercial, and institutional boilers of various sizes and fuel types at major sources of HAP. The major source Boiler MACT covers boilers and process heaters. As the dehy reboilers are part of an affected source under Subpart HH, they are exempt from the requirements of Subpart DDDDD, per 63.7491(h). The fuel gas heaters are considered boilers/process heaters under the rule. The units are classified as new, natural gas-fired (i.e., Gas 1) units. For natural gas-fired units, the requirements include periodic tune-ups. For units less than 5 MMBtu/hr, the frequency is every five years. EQM will comply with the requirements of this rule as outlined in the facility's permit.

## 3.6. 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).

### 3.6.1. 45 CSR 2: To Prevent and Control Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers

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

### 3.6.2. 45 CSR 4: To Prevent and Control the Discharge of Air Pollutants into the Air Which Causes or Contributes to an Objectionable Odor

According to 45 CSR 4-3:

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

The 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.

### 3.6.3. 45 CSR 6: Control of Air Pollution from the Combustion of Refuse

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

### 3.6.4. 45 CSR 10: To Prevent and Control Air Pollution from the Emission of Sulfur Oxides

This rule potentially applies to fuel burning units, including glycol dehydration unit reboilers and fuel gas heaters. Per 45 CSR 10-10.1, units rated less than 10 MMBtu/hr are exempt from the SO<sub>2</sub> emission limitations and testing, monitoring, recordkeeping, and reporting requirements of this rule. The reboilers and fuel gas heaters at the station are each rated less than 10 MMBtu/hr and as such are exempt from this rule.

### 3.6.5. 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.

### **3.6.6. 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.

### **3.6.7. 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.

### **3.6.8. 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.

### **3.6.9. 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.

## 4. TITLE V APPLICATION FORMS

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



WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF AIR QUALITY

601 57th Street SE
Charleston, WV 25304
Phone: (304) 926-0475

www.dep.wv.gov/daq

INITIAL/RENEWAL TITLE V PERMIT APPLICATION - GENERAL FORMS

Section 1: General Information

Form with 10 sections: 1. Name of Applicant (EQM Gathering Opco, LLC), 2. Facility Name (Saturn Compressor Station), 3. DAQ Plant ID No. (0017-00027), 4. Federal Employer ID No. (32-0422322), 5. Permit Application Type (Initial Permit), 6. Type of Business Entity (LLC), 7. Is the Applicant the: (Both), 8. Number of onsite employees (0), 9. Governmental Code (Privately owned), 10. Business Confidentiality Claims (No).

<b>11. Mailing Address</b>		
Street or P.O. Box: 625 Liberty Avenue, Suite 1700		
City: Pittsburgh	State: PA	Zip: 15222
Telephone Number: (412) 553-7848	Fax Number: ( ) -	

<b>12. Facility Location</b>		
Street:	City: Central Station	County: Doddridge
UTM Easting: 515.528 km	UTM Northing: 4,349.752 km	Zone: <input checked="" type="checkbox"/> 17 or <input type="checkbox"/> 18
<b>Directions:</b> From Parkersburg, WV take US-50 East for approximately 42 miles. Turn left onto Willhelm Run Road and continue onto Stone Valley Road for approximately 1.6 miles. Take a sharp left into the entrance to the station.		
Portable Source? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
Is facility located within a nonattainment area? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes, for what air pollutants?	
Is facility located within 50 miles of another state? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes, name the affected state(s). Ohio Pennsylvania	
Is facility located within 100 km of a Class I Area <sup>1</sup> ? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes, name the area(s).	
If no, do emissions impact a Class I Area <sup>1</sup> ? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
<sup>1</sup> Class I areas include Dolly Sods and Otter Creek Wilderness Areas in West Virginia, and Shenandoah National Park and James River Face Wilderness Area in Virginia.		

<b>13. Contact Information</b>		
<b>Responsible Official:</b> Diana Charletta		<b>Title:</b> Sr. Vice President
<b>Street or P.O. Box:</b> 625 Liberty Avenue, Suite 1700		
<b>City:</b> Pittsburgh	<b>State:</b> PA	<b>Zip:</b> 15222
<b>Telephone Number:</b> ( ) -		<b>Fax Number:</b> ( ) -
<b>E-mail address:</b> dcharletta@eqt.com		
<b>Environmental Contact:</b> Mark A. Sowa		<b>Title:</b> Sr. Environmental Coordinator
<b>Street or P.O. Box:</b> 625 Liberty Avenue, Suite 1700		
<b>City:</b> Pittsburgh	<b>State:</b> PA	<b>Zip:</b> 15222
<b>Telephone Number:</b> (412) 395-3654		<b>Fax Number:</b> ( ) -
<b>E-mail address:</b> msowa@eqt.com		
<b>Application Preparer:</b> Thomas Muscenti		<b>Title:</b> Principal Consultant
<b>Company:</b> Trinity Consultants		
<b>Street or P.O. Box:</b> 4500 Brooktree Road, Suite 103		
<b>City:</b> Wexford	<b>State:</b> PA	<b>Zip:</b> 15090
<b>Telephone Number:</b> (724) 935-2611		<b>Fax Number:</b> ( ) -
<b>E-mail address:</b> tmuscenti@trinityconsultants.com		

**14. Facility Description**

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

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

**Provide a general description of operations.**

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

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

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

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



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

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

Permit Shield

**20. Facility-Wide Applicable Requirements**

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

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

Permit Shield

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

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

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

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

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

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

Permit Shield

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

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

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





**Section 3: Facility-Wide Emissions**

<b>23. Facility-Wide Emissions Summary [Tons per Year]</b>	
<b>Criteria Pollutants</b>	<b>Potential Emissions</b>
Carbon Monoxide (CO)	62.08
Nitrogen Oxides (NO <sub>x</sub> )	125.67
Lead (Pb)	1.2E-05
Particulate Matter (PM <sub>2.5</sub> ) <sup>1</sup>	8.94
Particulate Matter (PM <sub>10</sub> ) <sup>1</sup>	8.94
Total Particulate Matter (TSP)	8.94
Sulfur Dioxide (SO <sub>2</sub> )	0.71
Volatile Organic Compounds (VOC)	136.82
<b>Hazardous Air Pollutants<sup>2</sup></b>	<b>Potential Emissions</b>
Formaldehyde (HCHO)	11.86
Total HAPs	32.64
<b>Regulated Pollutants other than Criteria and HAP</b>	<b>Potential Emissions</b>

<sup>1</sup>PM<sub>2.5</sub> and PM<sub>10</sub> are components of TSP.  
<sup>2</sup>For HAPs that are also considered PM or VOCs, emissions should be included in both the HAPs section and the Criteria Pollutants section.

**Section 4: Insignificant Activities**

<b>24. Insignificant Activities (Check all that apply)</b>	
<input checked="" type="checkbox"/>	1. Air compressors and pneumatically operated equipment, including hand tools.
<input type="checkbox"/>	2. Air contaminant detectors or recorders, combustion controllers or shutoffs.
<input checked="" type="checkbox"/>	3. Any consumer product used in the same manner as in normal consumer use, provided the use results in a duration and frequency of exposure which are not greater than those experienced by consumer, and which may include, but not be limited to, personal use items; janitorial cleaning supplies, office supplies and supplies to maintain copying equipment.
<input type="checkbox"/>	4. Bathroom/toilet vent emissions.
<input type="checkbox"/>	5. Batteries and battery charging stations, except at battery manufacturing plants.
<input type="checkbox"/>	6. Bench-scale laboratory equipment used for physical or chemical analysis, but not lab fume hoods or vents. Many lab fume hoods or vents might qualify for treatment as insignificant (depending on the applicable SIP) or be grouped together for purposes of description.
<input type="checkbox"/>	7. Blacksmith forges.
<input type="checkbox"/>	8. Boiler water treatment operations, not including cooling towers.
<input type="checkbox"/>	9. Brazing, soldering or welding equipment used as an auxiliary to the principal equipment at the source.
<input type="checkbox"/>	10. CO <sub>2</sub> lasers, used only on metals and other materials which do not emit HAP in the process.
<input checked="" type="checkbox"/>	11. Combustion emissions from propulsion of mobile sources, except for vessel emissions from Outer Continental Shelf sources.
<input checked="" type="checkbox"/>	12. Combustion units designed and used exclusively for comfort heating that use liquid petroleum gas or natural gas as fuel.
<input type="checkbox"/>	13. Comfort air conditioning or ventilation systems not used to remove air contaminants generated by or released from specific units of equipment.
<input type="checkbox"/>	14. Demineralized water tanks and demineralizer vents.
<input type="checkbox"/>	15. Drop hammers or hydraulic presses for forging or metalworking.
<input type="checkbox"/>	16. Electric or steam-heated drying ovens and autoclaves, but not the emissions from the articles or substances being processed in the ovens or autoclaves or the boilers delivering the steam.
<input type="checkbox"/>	17. Emergency (backup) electrical generators at residential locations.
<input type="checkbox"/>	18. Emergency road flares.
<input type="checkbox"/>	19. Emission units which do not have any applicable requirements and which emit criteria pollutants (CO, NO <sub>x</sub> , SO <sub>2</sub> , VOC and PM) into the atmosphere at a rate of less than 1 pound per hour and less than 10,000 pounds per year aggregate total for each criteria pollutant from all emission units.  Please specify all emission units for which this exemption applies along with the quantity of criteria pollutants emitted on an hourly and annual basis:  _____ _____ _____ _____ _____ _____ _____ _____ _____

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

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

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

<b>25. Equipment Table</b>
Fill out the <b>Title V Equipment Table</b> and provide it as <b>ATTACHMENT D</b> .
<b>26. Emission Units</b>
For each emission unit listed in the <b>Title V Equipment Table</b> , fill out and provide an <b>Emission Unit Form</b> as <b>ATTACHMENT E</b> .
For each emission unit not in compliance with an applicable requirement, fill out a <b>Schedule of Compliance Form</b> as <b>ATTACHMENT F</b> .
<b>27. Control Devices</b>
For each control device listed in the <b>Title V Equipment Table</b> , fill out and provide an <b>Air Pollution Control Device Form</b> as <b>ATTACHMENT G</b> .
For any control device that is required on an emission unit in order to meet a standard or limitation for which the potential pre-control device emissions of an applicable regulated air pollutant is greater than or equal to the Title V Major Source Threshold Level, refer to the <b>Compliance Assurance Monitoring (CAM) Form(s)</b> for CAM applicability. Fill out and provide these forms, if applicable, for each Pollutant Specific Emission Unit (PSEU) as <b>ATTACHMENT H</b> .

**Section 6: Certification of Information**

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

*Note: This Certification must be signed by a responsible official. The original, signed in blue ink, must be submitted with the application. Applications without an original signed certification will be considered as incomplete.*

**a. Certification of Truth, Accuracy and Completeness**

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

**b. Compliance Certification**

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

**Responsible official (type or print)**

Name: Dina Charletta

Title: Sr. Vice President

**Responsible official's signature:**

Signature: *Dina M. Charletta* Signature Date: 2/5/16.  
(Must be signed and dated in blue ink)

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

<input checked="" type="checkbox"/>	ATTACHMENT A: Area Map
<input checked="" type="checkbox"/>	ATTACHMENT B: Plot Plan(s)
<input checked="" type="checkbox"/>	ATTACHMENT C: Process Flow Diagram(s)
<input checked="" type="checkbox"/>	ATTACHMENT D: Equipment Table
<input checked="" type="checkbox"/>	ATTACHMENT E: Emission Unit Form(s)
<input type="checkbox"/>	ATTACHMENT F: Schedule of Compliance Form(s) <i>(Not Applicable)</i>
<input checked="" type="checkbox"/>	ATTACHMENT G: Air Pollution Control Device Form(s)
<input type="checkbox"/>	ATTACHMENT H: Compliance Assurance Monitoring (CAM) Form(s) <i>(Not Applicable)</i>

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

**ATTACHMENT A**

**Area Map**

## ATTACHMENT A - AREA MAP



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

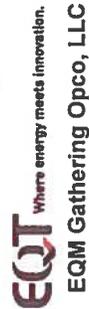
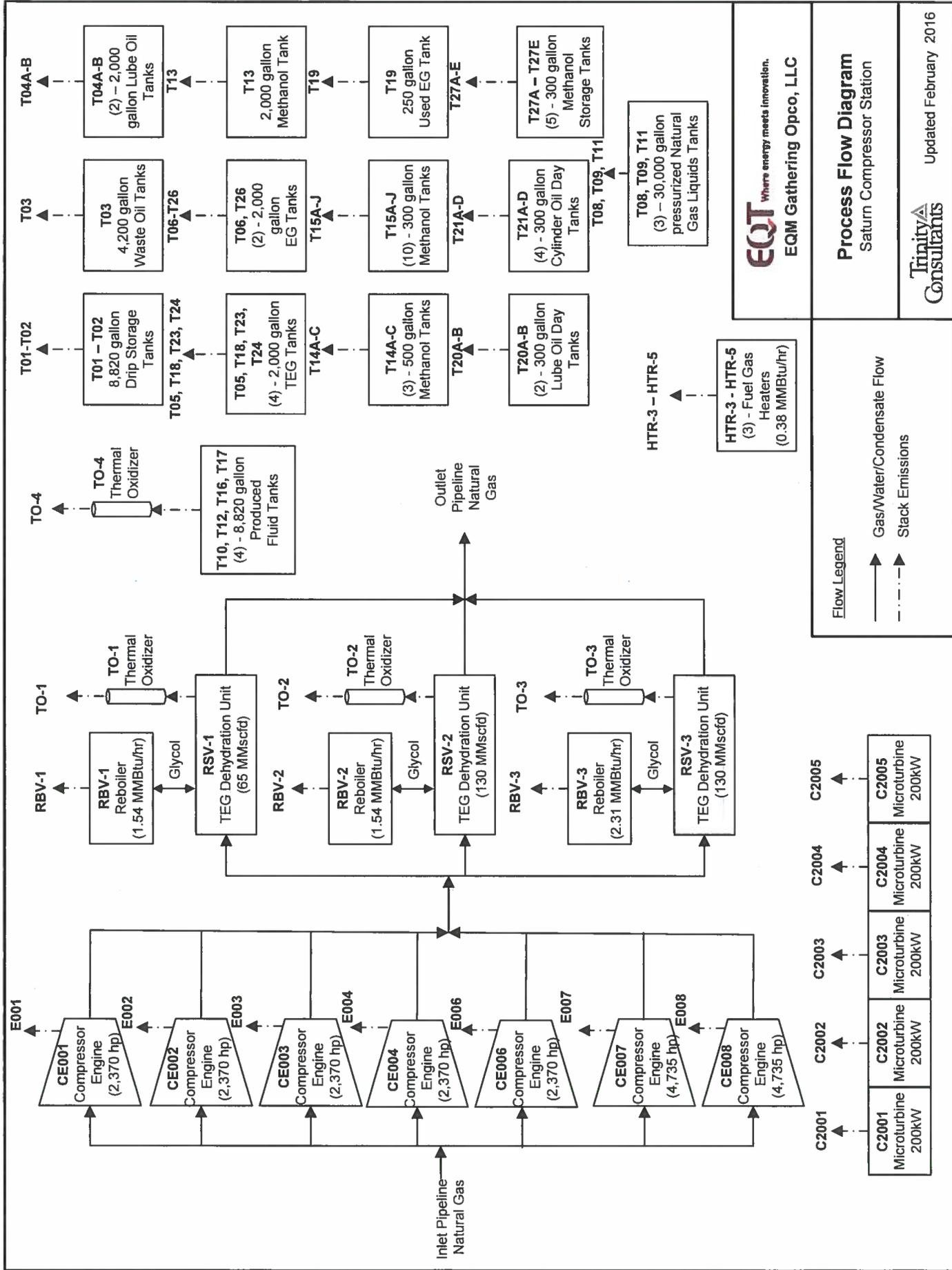
**ATTACHMENT B**

**Plot Plan**



# ATTACHMENT C

## Process Flow Diagram



**Process Flow Diagram**  
Saturn Compressor Station

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



Updated February 2016

**ATTACHMENT D**

**Equipment Table**

**ATTACHMENT D - Title V Equipment Table**  
(includes all emission units at the facility except those designated as  
insignificant activities in Section 4, Item 24 of the General Forms)

Emission Point ID <sup>1</sup>	Control Device <sup>1</sup>	Emission Unit ID <sup>1</sup>	Emission Unit Description	Design Capacity	Year Installed/ Modified
E001	C001 Oxidation Catalyst	CE001	Compressor Engine	2,370 hp	2010
E002	C001 Oxidation Catalyst	CE002	Compressor Engine	2,370 hp	2010
E003	C001 Oxidation Catalyst	CE003	Compressor Engine	2,370 hp	2010
E004	C001 Oxidation Catalyst	CE004	Compressor Engine	2,370 hp	2011
E006	C001 Oxidation Catalyst	CE006	Compressor Engine	2,370 hp	2012
E007	C002 Oxidation Catalysts	CE007	Compressor Engine	4,735 hp	2014
E008	C002 Oxidation Catalysts	CE008	Compressor Engine	4,735 hp	2014
C2001	None	C2001	Microturbine	200 KW	2014
C2002	None	C2002	Microturbine	200 KW	2014
C2003	None	C2003	Microturbine	200 KW	2014
C2004	None	C2004	Microturbine	200 KW	2014
C2005	None	C2005	Microturbine	200 KW	2014
HTR-3	None	HTR-3	Fuel Gas Heater	0.38 MMBtu/hr	2010
HTR-4	None	HTR-4	Fuel Gas Heater	0.38 MMBtu/hr	2014
HTR-5	None	HTR-5	Fuel Gas Heater	0.38 MMBtu/hr	2014
TO-1	TO-1 (Thermal Oxidizer)	RSV-1	Dehydration Unit	65 MMscfd	2010
TO-1	NA	TO-1	Thermal Oxidizer	3.62 MMBtu/hr	2010
RBV-1	None	RBV-1	Reboiler	1.54 MMBtu/hr	2010
TO-2	TO-2 (Thermal Oxidizer)	RSV-2	Dehydration Unit	130 MMscfd	2012
TO-2	NA	TO-2	Thermal Oxidizer	3.62 MMBtu/hr	2012
RBV-2	None	RBV-2	Reboiler	1.54 MMBtu/hr	2012
TO-3	TO-3 (Thermal Oxidizer)	RSV-3	Dehydration Unit	130 MMscfd	2014
TO-3	NA	TO-3	Thermal Oxidizer	3.62 MMBtu/hr	2014
RBV-3	None	RBV-3	Reboiler	2.31 MMBtu/hr	2014
TO-4	None	TO-4	Pipeline Thermal Oxidizer (Non-Emergency Use)	41.00 MMBtu/hr	2015
T01	None	T01	Condensed water, lube oil, and trace natural gas liquids Tank	8,820 gallon	2010

Title V Equipment Table (equipment table.doc)

Page 1 of 1

Revised 4/11/05

T02	None	T02	Condensed water, lube oil, and trace natural gas liquids Tank	8,820 gallon	2010
T03	None	T03	Waste Oil Tank	4,200 gal	2010
T04A/B	None	T04A/B	Two (2) Lube oil Tanks	2,000 gal each	2010
T05	None	T05	TEG Tank	2,000 gal	2010
T06	None	T06	50/50 Ethylene Glycol & Water Tank	2,000 gal	2010
T08	None	T08	Natural gas liquids Tank	30,000 gal	2010
T09	None	T09	Natural gas liquids Tank	30,000 gal	2010
TO-4	TO-4	T10	Produced fluids Tank	8,820 gallon	2012
T11	None	T11	Natural gas liquids Tank	30,000 gal	2011
TO-4	TO-4	T12	Produced fluids Tank	8,820 gallon	2012
T13	None	T13	Methanol Tank	2,000 gal	2010
T14A-C	None	T14A-C	Three (3) Methanol Tanks	500 gal each	2010
T15 A-J	None	T15 A-J	Ten (10) Cylinder Oil Tanks	300 gal each	2010
TO-4	TO-4	T16	Produced Fluids Tank	8,820 gallon	2014
TO-4	TO-4	T17	Produced Fluids Tank	8,820 gallon	2014
T18	None	T18	Triethylene Glycol Tank	2,000 gallon	2014
T19	None	T19	Used Ethylene Glycol Tank	250 gallon	2014
T20A/B	None	T20A/B	Two (2) Lube Oil Day Tanks	300 gallon each	2014
T21A/D	None	T21A/D	Four (4) Cylinder Oil Day Tanks	300 gallon each	2014
T23	None	T23	New Triethylene Glycol Storage Tank	2,000 gallon	2014
T24	None	T24	Used Triethylene Glycol Tank	2,000 gallon	2014
T26	None	T26	Used Glycol Storage Tank	2,000 gallon	2014
T27A-E	None	T27A-E	Five (5) Methanol Storage Tanks	300 gallon each	TBD

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

**ATTACHMENT E**

**Emission Unit Forms**

## ATTACHMENT E - Emission Unit Form

**Emission Unit Description**

<b>Emission unit ID number:</b> C2001 – C2005	<b>Emission unit name:</b> Microturbines	<b>List any control devices associated with this emission unit:</b> None
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**Provide a description of the emission unit (type, method of operation, design parameters, etc.):**  
Five (5) Capstone microturbines for generating electricity.

<b>Manufacturer:</b> Capstone	<b>Model number:</b> C200	<b>Serial number:</b>
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<b>Construction date:</b> 2014	<b>Installation date:</b> 2014	<b>Modification date(s):</b> N/A
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**Design Capacity (examples: furnaces - tons/hr, tanks - gallons):**  
200 kW (each)

<b>Maximum Hourly Throughput:</b> 1,865 scf/hr (each)	<b>Maximum Annual Throughput:</b> 16.34 MMscf/year	<b>Maximum Operating Schedule:</b> 8,760 hours (each)
--	---	--

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

<b>Does this emission unit combust fuel?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<b>If yes, is it?</b> <input type="checkbox"/> Indirect Fired <input checked="" type="checkbox"/> Direct Fired
--	---

<b>Maximum design heat input and/or maximum horsepower rating:</b> 2.28 MMbtu/hr (each)	<b>Type and Btu/hr rating of burners:</b> 2.28 MMbtu/hr (each)
--	---

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

Natural Gas – 1,865 scf/hr (each); 16.34 MMscf/yr (each)

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

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Natural Gas	Negl.	Negl.	1,223 BTU/scf

**Emissions Data**

Criteria Pollutants	Potential Emissions ( <i>Each Unit</i> )	
	PPH	TPY
Carbon Monoxide (CO)	0.22	0.96
Nitrogen Oxides (NO <sub>x</sub> )	0.08	0.35
Lead (Pb)	--	--
Particulate Matter (PM <sub>2.5</sub> )	0.02	0.07
Particulate Matter (PM <sub>10</sub> )	0.02	0.07
Total Particulate Matter (TSP)	0.02	0.07
Sulfur Dioxide (SO <sub>2</sub> )	0.01	0.03
Volatile Organic Compounds (VOC)	0.02	0.09
Hazardous Air Pollutants	Potential Emissions ( <i>Each Unit</i> )	
	PPH	TPY
Formaldehyde (HCHO)	0.002	0.007
Total HAP	0.002	0.01
Regulated Pollutants other than Criteria and HAP	Potential Emissions ( <i>Each Unit</i> )	
	PPH	TPY
CO <sub>2</sub> e	267	1,168
<p><b>List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).</b></p> <p>Emission factors from AP-42 Section 3.1, Tables 3.1-1, 3.1-2a, and 3.1-3.  VOC, NO<sub>x</sub>, and CO, and CO<sub>2</sub> emission factors from Table 1 and Table 5 (CO<sub>2</sub>) of Capstone MicroTurbine Systems Emissions sheet. CH<sub>4</sub> and N<sub>2</sub>O emission factors from Tables C-1 and C-2, 40 CFR 98, Subpart C.</p>		

**Applicable Requirements**

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

No change from current R13 permit conditions. . (Conditions 9.1-9.2)

Permit Shield

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

No change from current R13 permit conditions. (Conditions 9.1-9.2)

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

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

## ATTACHMENT E - Emission Unit Form

**Emission Unit Description**

<b>Emission unit ID number:</b> T10, T12, T16 & T17	<b>Emission unit name:</b> Produced Fluids Tanks	<b>List any control devices associated with this emission unit:</b> TO-4
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**Provide a description of the emission unit (type, method of operation, design parameters, etc.):**  
Four (4) 8,820 gallon storage tanks for produced fluids.

<b>Manufacturer:</b>	<b>Model number:</b>	<b>Serial number:</b>
<b>Construction date:</b> T10, T12 – 2010 T16, T17 – 2014	<b>Installation date:</b> T10, T12 – 2010 T16, T17 – 2014	<b>Modification date(s):</b> N/A

**Design Capacity (examples: furnaces - tons/hr, tanks - gallons):**  
8,820 gallons (each)

<b>Maximum Hourly Throughput:</b>	<b>Maximum Annual Throughput:</b> 500,000 gal/yr (produced fluid) 50,000 gal/yr (condensate)	<b>Maximum Operating Schedule:</b> 8,760 hours (each)
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**Fuel Usage Data (fill out all applicable fields)**

<b>Does this emission unit combust fuel?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<b>If yes, is it?</b> <input type="checkbox"/> Indirect Fired <input type="checkbox"/> Direct Fired
<b>Maximum design heat input and/or maximum horsepower rating:</b> NA	<b>Type and Btu/hr rating of burners:</b> NA

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

NA

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

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
NA			

**Emissions Data**

Criteria Pollutants	Potential Emissions ( <i>Each Unit</i> )	
	PPH	TPY
Carbon Monoxide (CO)	--	--
Nitrogen Oxides (NO <sub>x</sub> )	--	--
Lead (Pb)	--	--
Particulate Matter (PM <sub>2.5</sub> )	--	--
Particulate Matter (PM <sub>10</sub> )	--	--
Total Particulate Matter (TSP)	--	--
Sulfur Dioxide (SO <sub>2</sub> )	--	--
Volatile Organic Compounds (VOC)	0.93	4.06
Hazardous Air Pollutants	Potential Emissions ( <i>Each Unit</i> )	
	PPH	TPY
Formaldehyde (HCHO)	--	--
Total HAP	0.03	0.13
Regulated Pollutants other than Criteria and HAP	Potential Emissions ( <i>Each Unit</i> )	
	PPH	TPY
CO <sub>2</sub> e	6.22	27.25
<p><b>List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).</b></p> <p>E&amp;P TANKS</p>		

**Applicable Requirements**

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

No change from existing R13 requirements. (Condition 13.1-13.5)

Permit Shield

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

No change from existing R13 requirements. (Condition 13.1-13.5)

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

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

## ATTACHMENT E - Emission Unit Form

**Emission Unit Description**

<b>Emission unit ID number:</b> T13	<b>Emission unit name:</b> Methanol Tank	<b>List any control devices associated with this emission unit:</b> None
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**Provide a description of the emission unit (type, method of operation, design parameters, etc.):**  
One (1) 2,000 gallon methanol storage tank

<b>Manufacturer:</b>	<b>Model number:</b>	<b>Serial number:</b>
<b>Construction date:</b> 2010	<b>Installation date:</b> 2010	<b>Modification date(s):</b> N/A

**Design Capacity (examples: furnaces - tons/hr, tanks - gallons):**

2,000 gallons

<b>Maximum Hourly Throughput:</b>	<b>Maximum Annual Throughput:</b> 24,00 gallons/year	<b>Maximum Operating Schedule:</b> 8,760 hours
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**Fuel Usage Data (fill out all applicable fields)**

<b>Does this emission unit combust fuel?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<b>If yes, is it?</b>  <input type="checkbox"/> Indirect Fired <input type="checkbox"/> Direct Fired
<b>Maximum design heat input and/or maximum horsepower rating:</b> NA	<b>Type and Btu/hr rating of burners:</b> NA

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

NA

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

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
NA			

<b>Emissions Data</b>		
Criteria Pollutants	Potential Emissions ( <i>Each Unit</i> )	
	PPH	TPY
Carbon Monoxide (CO)	--	--
Nitrogen Oxides (NO <sub>x</sub> )	--	--
Lead (Pb)	--	--
Particulate Matter (PM <sub>2.5</sub> )	--	--
Particulate Matter (PM <sub>10</sub> )	--	--
Total Particulate Matter (TSP)	--	--
Sulfur Dioxide (SO <sub>2</sub> )	--	--
Volatile Organic Compounds (VOC)	0.01	0.03
Hazardous Air Pollutants	Potential Emissions ( <i>Each Unit</i> )	
	PPH	TPY
Formaldehyde (HCHO)	--	--
Total HAP	0.01	0.03
Regulated Pollutants other than Criteria and HAP	Potential Emissions ( <i>Each Unit</i> )	
	PPH	TPY
<p><b>List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).</b></p> <p>EPA TANKS 4.0.9d</p>		

**Applicable Requirements**

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

No change from existing R13 requirements.

Permit Shield

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

No change from existing R13 requirements.

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

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

## ATTACHMENT E - Emission Unit Form

***Emission Unit Description***

<b>Emission unit ID number:</b> T14A – T14C	<b>Emission unit name:</b> Methanol Tanks	<b>List any control devices associated with this emission unit:</b> None
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**Provide a description of the emission unit (type, method of operation, design parameters, etc.):**  
Three (3) 500 gallon methanol storage tanks

<b>Manufacturer:</b>	<b>Model number:</b>	<b>Serial number:</b>
<b>Construction date:</b> 2010	<b>Installation date:</b> 2010	<b>Modification date(s):</b> N/A

**Design Capacity (examples: furnaces - tons/hr, tanks - gallons):**  
500 gallons (each)

<b>Maximum Hourly Throughput:</b>	<b>Maximum Annual Throughput:</b> 6,000 gallons/year (each)	<b>Maximum Operating Schedule:</b> 8,760 hours
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***Fuel Usage Data (fill out all applicable fields)***

<b>Does this emission unit combust fuel?</b> ___Yes ___X___ No	<b>If yes, is it?</b> ___ Indirect Fired ___ Direct Fired
--	--

<b>Maximum design heat input and/or maximum horsepower rating:</b> NA	<b>Type and Btu/hr rating of burners:</b> NA
--	---

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

NA

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

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
NA			

<i>Emissions Data</i>		
Criteria Pollutants	Potential Emissions ( <i>Each Unit</i> )	
	PPH	TPY
Carbon Monoxide (CO)	--	--
Nitrogen Oxides (NO <sub>x</sub> )	--	--
Lead (Pb)	--	--
Particulate Matter (PM <sub>2.5</sub> )	--	--
Particulate Matter (PM <sub>10</sub> )	--	--
Total Particulate Matter (TSP)	--	--
Sulfur Dioxide (SO <sub>2</sub> )	--	--
Volatile Organic Compounds (VOC)	0.002	0.01
Hazardous Air Pollutants	Potential Emissions ( <i>Each Unit</i> )	
	PPH	TPY
Formaldehyde (HCHO)	--	--
Total HAP	0.002	0.01
Regulated Pollutants other than Criteria and HAP	Potential Emissions ( <i>Each Unit</i> )	
	PPH	TPY
<p><b>List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).</b></p> <p>EPA TANKS 4.0.9d</p>		

**Applicable Requirements**

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

No change from existing R13 requirements.

Permit Shield

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

No change from existing R13 requirements.

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

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

## ATTACHMENT E - Emission Unit Form

***Emission Unit Description***

<b>Emission unit ID number:</b> T27A – T27E	<b>Emission unit name:</b> Methanol Tanks	<b>List any control devices associated with this emission unit:</b> None	
<b>Provide a description of the emission unit (type, method of operation, design parameters, etc.):</b> Five (5) 300 gallon methanol storage tanks			
<b>Manufacturer:</b>	<b>Model number:</b>	<b>Serial number:</b>	
<b>Construction date:</b> 2015	<b>Installation date:</b> 2015	<b>Modification date(s):</b> N/A	
<b>Design Capacity (examples: furnaces - tons/hr, tanks - gallons):</b> 300 gallons (each)			
<b>Maximum Hourly Throughput:</b>	<b>Maximum Annual Throughput:</b> 3,600 gallons/year (each)	<b>Maximum Operating Schedule:</b> 8,760 hours	
<b>Fuel Usage Data (fill out all applicable fields)</b>			
<b>Does this emission unit combust fuel?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<b>If yes, is it?</b> <input type="checkbox"/> Indirect Fired <input type="checkbox"/> Direct Fired	
<b>Maximum design heat input and/or maximum horsepower rating:</b> NA		<b>Type and Btu/hr rating of burners:</b> NA	
<b>List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.</b>  NA			
<b>Describe each fuel expected to be used during the term of the permit.</b>			
Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
NA			

<b><i>Emissions Data</i></b>		
Criteria Pollutants	Potential Emissions ( <i>Each Unit</i> )	
	PPH	TPY
Carbon Monoxide (CO)	--	--
Nitrogen Oxides (NO <sub>x</sub> )	--	--
Lead (Pb)	--	--
Particulate Matter (PM <sub>2.5</sub> )	--	--
Particulate Matter (PM <sub>10</sub> )	--	--
Total Particulate Matter (TSP)	--	--
Sulfur Dioxide (SO <sub>2</sub> )	--	--
Volatile Organic Compounds (VOC)	0.002	0.01
Hazardous Air Pollutants	Potential Emissions ( <i>Each Unit</i> )	
	PPH	TPY
Formaldehyde (HCHO)	--	--
Total HAP	0.002	0.01
Regulated Pollutants other than Criteria and HAP	Potential Emissions ( <i>Each Unit</i> )	
	PPH	TPY
<p><b>List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).</b></p> <p>EPA TANKS 4.0.9d</p>		

**Applicable Requirements**

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

No change from existing R13 requirements.

Permit Shield

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

No change from existing R13 requirements.

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

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

## ATTACHMENT E - Emission Unit Form

***Emission Unit Description***

<b>Emission unit ID number:</b> HTR-3 – HTR-5	<b>Emission unit name:</b> Fuel Gas Heater	<b>List any control devices associated with this emission unit:</b>  None
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**Provide a description of the emission unit (type, method of operation, design parameters, etc.):**  
Three (3) 0.38 MMBtu/hr natural gas-fired fuel gas heaters.

<b>Manufacturer:</b>	<b>Model number:</b>	<b>Serial number:</b>
<b>Construction date:</b> HTR-3 – 2010 HTR-4, 5 – 2014	<b>Installation date:</b> HTR-3 – 2010 HTR-4, 5 – 2014	<b>Modification date(s):</b> N/A

**Design Capacity (examples: furnaces - tons/hr, tanks - gallons):**  
0.38 MMBtu/hr (each)

<b>Maximum Hourly Throughput:</b> 3.15E-04 MMscf/hr (each)	<b>Maximum Annual Throughput:</b> 2.76 MMscf/hr (each)	<b>Maximum Operating Schedule:</b> 8,760 hours (each)
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***Fuel Usage Data (fill out all applicable fields)***

**Does this emission unit combust fuel?**  Yes  No

**If yes, is it?**  
 Indirect Fired  Direct Fired

**Maximum design heat input and/or maximum horsepower rating:**  
0.38 MMbtu/hr (each)

**Type and Btu/hr rating of burners:**  
0.38 MMbtu/hr (each)

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

Natural Gas – 3.15E-04 MMscf/hr (each)

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

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Natural Gas	Negl.	Negl.	1.223 BTU/scf

***Emissions Data***

<b>Criteria Pollutants</b>	<b>Potential Emissions (Each Unit)</b>
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	PPH	TPY
Carbon Monoxide (CO)	0.03	0.12
Nitrogen Oxides (NO <sub>x</sub> )	0.03	0.14
Lead (Pb)	1.57E-07	6.89E-07
Particulate Matter (PM <sub>2.5</sub> )	2.39E-03	0.01
Particulate Matter (PM <sub>10</sub> )	2.39E-03	0.01
Total Particulate Matter (TSP)	2.39E-03	0.01
Sulfur Dioxide (SO <sub>2</sub> )	1.89E-04	8.27E-04
Volatile Organic Compounds (VOC)	1.73E-03	0.01
Hazardous Air Pollutants	Potential Emissions ( <i>Each Unit</i> )	
	PPH	TPY
Formaldehyde (HCHO)	2.55E-05	1.12E-04
Total HAP	6.42E-04	2.81E-03
Regulated Pollutants other than Criteria and HAP	Potential Emissions ( <i>Each Unit</i> )	
	PPH	TPY
CO <sub>2</sub> e	45	197
<p><b>List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).</b></p> <p>Criteria pollutant and HAP emission factors from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1, 1.4-2, &amp; 1.4-3. Greenhouse gas emission factors from 40 CFR Part 98 Tables C-1 and C-2.</p>		

**Applicable Requirements**

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

No change from existing R13 requirements. (Conditions 11.1-11.5, 12.1-12.8)

Permit Shield

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

No change from existing R13 requirements. (Conditions 11.1-11.5, 12.1-12.8)

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

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

## ATTACHMENT E - Emission Unit Form

**Emission Unit Description**

<b>Emission unit ID number:</b> CE001 - CE006	<b>Emission unit name:</b> Compressor Engines	<b>List any control devices associated with this emission unit:</b> C001
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**Provide a description of the emission unit (type, method of operation, design parameters, etc.):**  
Five (5) natural gas-fired 2,370 horsepower (hp) reciprocating internal combustion engines that drive compressors for the compression of natural gas.

<b>Manufacturer:</b> Caterpillar	<b>Model number:</b> G3608	<b>Serial number:</b>
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<b>Construction date:</b> CE001, CE002, CE003 – 2010 CE004 – 2011 CE006 – 2012	<b>Installation date:</b> CE001, CE002, CE003 – 2010 CE004 – 2011 CE006 – 2012	<b>Modification date(s):</b> N/A
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**Design Capacity (examples: furnaces - tons/hr, tanks - gallons):**  
2,370 HP (each)

<b>Maximum Hourly Throughput:</b> ~14,570 scf/hr (each)	<b>Maximum Annual Throughput:</b> ~127.63 MMscf/year (each)	<b>Maximum Operating Schedule:</b> 8,760 hours (each)
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**Fuel Usage Data (fill out all applicable fields)**

<b>Does this emission unit combust fuel?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<b>If yes, is it?</b>  <input type="checkbox"/> Indirect Fired <input checked="" type="checkbox"/> Direct Fired
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<b>Maximum design heat input and/or maximum horsepower rating:</b> 2,370 HP (each) 17.81 MMBtu/hr (each)	<b>Type and Btu/hr rating of burners:</b> 17.81 MMBtu/hr (each)
--	--

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

Natural Gas – 14,570 scf/hr (each); 127.63 MMscf/yr (each)

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

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Natural Gas	Negl.	Negl.	~1,223 BTU/scf

<b>Emissions Data</b>		
Criteria Pollutants	Potential Emissions ( <i>Each Unit</i> )	
	PPH	TPY
Carbon Monoxide (CO)	1.01	4.41
Nitrogen Oxides (NO <sub>x</sub> )	2.61	11.44
Lead (Pb)	--	--
Particulate Matter (PM <sub>2.5</sub> )	0.00	0.01
Particulate Matter (PM <sub>10</sub> )	0.00	0.01
Total Particulate Matter (TSP)	0.18	0.78
Sulfur Dioxide (SO <sub>2</sub> )	0.01	0.05
Volatile Organic Compounds (VOC) <sup>1</sup>	2.00	8.76
Hazardous Air Pollutants	Potential Emissions ( <i>Each Unit</i> )	
	PPH	TPY
Formaldehyde (HCHO)	0.36	1.56
Total HAP	0.70	3.07
Regulated Pollutants other than Criteria and HAP	Potential Emissions ( <i>Each Unit</i> )	
	PPH	TPY
CO <sub>2</sub> e	2,953	12,935
<p><b>List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).</b></p> <p>SO<sub>2</sub>, 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<sub>x</sub>, 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.</p>		

<sup>1</sup> VOC is non-methane, non-ethane hydrocarbons plus formaldehyde.  
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**Applicable Requirements**

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

No change from existing R13 requirements (Conditions 5.1-5.5, 6.1-6.6, 7.1-7.12, 8.1-8.4)

Permit Shield

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

No change from existing R13 requirements. (Conditions 5.1-5.5, 6.1-6.6, 7.1-7.12, 8.1-8.4)

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

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

## ATTACHMENT E - Emission Unit Form

**Emission Unit Description**

<b>Emission unit ID number:</b> CE007 - CE008	<b>Emission unit name:</b> Compressor Engines	<b>List any control devices associated with this emission unit:</b> C002
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**Provide a description of the emission unit (type, method of operation, design parameters, etc.):**  
Two (2) natural gas-fired 4,735 horsepower (hp) reciprocating internal combustion engines that drive compressors for the compression of natural gas.

<b>Manufacturer:</b> Caterpillar	<b>Model number:</b> G3616	<b>Serial number:</b>
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<b>Construction date:</b> 2014	<b>Installation date:</b> 2014	<b>Modification date(s):</b> N/A
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**Design Capacity (examples: furnaces - tons/hr, tanks - gallons):**  
4,735 HP (each)

<b>Maximum Hourly Throughput:</b> 29,124 scf/hr (each)	<b>Maximum Annual Throughput:</b> 255.13 MMscf/year (each)	<b>Maximum Operating Schedule:</b> 8,760 hours (each)
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**Fuel Usage Data (fill out all applicable fields)**

<b>Does this emission unit combust fuel?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<b>If yes, is it?</b> <input type="checkbox"/> Indirect Fired <input checked="" type="checkbox"/> Direct Fired
--	---

<b>Maximum design heat input and/or maximum horsepower rating:</b> 4,735 HP (each) 35.61 MMBtu/hr (each)	<b>Type and Btu/hr rating of burners:</b> 35.61 MMBtu/hr (each)
--	--

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

Natural Gas – 31,455 scf/hr; 275.55 MMscf/yr (each)

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

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Natural Gas	Negl.	Negl.	~1,223 BTU/scf

**Emissions Data**

Criteria Pollutants	Potential Emissions ( <i>Each Unit</i> )	
	PPH	TPY
Carbon Monoxide (CO)	2.01	8.80
Nitrogen Oxides (NO <sub>x</sub> )	5.22	22.86
Lead (Pb)	--	--
Particulate Matter (PM <sub>2.5</sub> )	0.36	1.56
Particulate Matter (PM <sub>10</sub> )	0.36	1.56
Total Particulate Matter (TSP)	0.36	1.56
Sulfur Dioxide (SO <sub>2</sub> )	0.02	0.09
Volatile Organic Compounds (VOC) <sup>1</sup>	4.69	20.54
Hazardous Air Pollutants	Potential Emissions ( <i>Each Unit</i> )	
	PPH	TPY
Formaldehyde (HCHO)	0.46	2.02
Total HAP	1.15	5.05
Regulated Pollutants other than Criteria and HAP	Potential Emissions ( <i>Each Unit</i> )	
	PPH	TPY
CO <sub>2</sub> e	5,950	26,060
<p><b>List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).</b></p> <p>SO<sub>2</sub>, 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<sub>x</sub>, 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.</p>		

<sup>1</sup> VOC is non-methane, non-ethane hydrocarbons plus formaldehyde.  
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**Applicable Requirements**

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

No change from existing R13 requirements. (Conditions 5.1-5.5, 6.1-6.6, 7.1-7.12, 8.1-8.4)

Permit Shield

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

No change from existing R13 requirements. (Conditions 5.1-5.5, 6.1-6.6, 7.1-7.12, 8.1-8.4)

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

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

## ATTACHMENT E - Emission Unit Form

**Emission Unit Description**

<b>Emission unit ID number:</b> RSV-1	<b>Emission unit name:</b> Dehydration Unit	<b>List any control devices associated with this emission unit:</b> TO-1 (Thermal Oxidizer)
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**Provide a description of the emission unit (type, method of operation, design parameters, etc.):**  
Triethylene glycol dehydration unit for removing water and impurities from natural gas.

<b>Manufacturer:</b>	<b>Model number:</b>	<b>Serial number:</b>
<b>Construction date:</b>	<b>Installation date:</b> 2010	<b>Modification date(s):</b> N/A

**Design Capacity (examples: furnaces - tons/hr, tanks - gallons):**

65 MMscfd

<b>Maximum Hourly Throughput:</b> 2.71 MMscf/hour	<b>Maximum Annual Throughput:</b> 569,400 MMscf/year	<b>Maximum Operating Schedule:</b> 8,760 hours
--	---	---

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

<b>Does this emission unit combust fuel?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<b>If yes, is it?</b> NA <input type="checkbox"/> Indirect Fired <input type="checkbox"/> Direct Fired
--	---

<b>Maximum design heat input and/or maximum horsepower rating:</b> NA	<b>Type and Btu/hr rating of burners:</b> NA
--	---

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

NA

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

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
NA			

**Emissions Data**

Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	--	--
Nitrogen Oxides (NO <sub>x</sub> )	--	--
Lead (Pb)	--	--
Particulate Matter (PM <sub>2.5</sub> )	--	--
Particulate Matter (PM <sub>10</sub> )	--	--
Total Particulate Matter (TSP)	--	--
Sulfur Dioxide (SO <sub>2</sub> )	--	--
Volatile Organic Compounds (VOC)	1.19	5.22
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Formaldehyde (HCHO)	--	--
Total HAP	0.34	1.48
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
CO <sub>2</sub> e	69.99	307
<p><b>List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).</b></p> <p>GRI GlyCalc 4.0</p>		

**Applicable Requirements**

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

No change from current R13 permit conditions (Conditions 10.1-10.4)

Permit Shield

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

No change from current R13 permit conditions (Conditions 10.1-10.4)

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

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

## ATTACHMENT E - Emission Unit Form

<b>Emission Unit Description</b>			
<b>Emission unit ID number:</b> RSV-2 & RSV-3	<b>Emission unit name:</b> Dehydration Unit	<b>List any control devices associated with this emission unit:</b> TO-2 & TO-3 (Thermal Oxidizers)	
<b>Provide a description of the emission unit (type, method of operation, design parameters, etc.):</b> Triethylene Glycol dehydration unit for removing water and impurities from natural gas.			
<b>Manufacturer:</b>	<b>Model number:</b>	<b>Serial number:</b>	
<b>Construction date:</b>	<b>Installation date:</b> RSV-2 – 2012 RSV-3 – 2014	<b>Modification date(s):</b> N/A	
<b>Design Capacity (examples: furnaces - tons/hr, tanks - gallons):</b>  130 MMscfd (each)			
<b>Maximum Hourly Throughput:</b> 5.42 MMScf/hour	<b>Maximum Annual Throughput:</b> 1,138,800 MMscf/year	<b>Maximum Operating Schedule:</b> 8,760 hours (each)	
<b>Fuel Usage Data (fill out all applicable fields)</b>			
<b>Does this emission unit combust fuel?</b> ___ Yes ___ <input checked="" type="checkbox"/> No		<b>If yes, is it?</b> ___ Indirect Fired ___ Direct Fired	
<b>Maximum design heat input and/or maximum horsepower rating:</b> NA		<b>Type and Btu/hr rating of burners:</b> NA	
<b>List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.</b>  NA			
<b>Describe each fuel expected to be used during the term of the permit.</b>			
Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
NA			

<b>Emissions Data</b>		
Criteria Pollutants	Potential Emissions ( <i>Each Unit</i> )	
	PPH	TPY
Carbon Monoxide (CO)	--	--
Nitrogen Oxides (NO <sub>x</sub> )	--	--
Lead (Pb)	--	--
Particulate Matter (PM <sub>2.5</sub> )	--	--
Particulate Matter (PM <sub>10</sub> )	--	--
Total Particulate Matter (TSP)	--	--
Sulfur Dioxide (SO <sub>2</sub> )	--	--
Volatile Organic Compounds (VOC)	2.13	9.32
Hazardous Air Pollutants	Potential Emissions ( <i>Each Unit</i> )	
	PPH	TPY
Formaldehyde (HCHO)	--	--
Total HAP	0.53	2.33
Regulated Pollutants other than Criteria and HAP	Potential Emissions ( <i>Each Unit</i> )	
	PPH	TPY
CO <sub>2</sub> e	30.40	133.16
<p><b>List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).</b></p> <p>GRI GlyCalc 4.0</p>		

**Applicable Requirements**

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

No change from current R13 permit conditions (Conditions 10.1-10.4)

Permit Shield

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

No change from current R13 permit conditions (Conditions 10.1-10.4)

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

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

## ATTACHMENT E - Emission Unit Form

**Emission Unit Description**

<b>Emission unit ID number:</b> RBV-1 & RBV-2	<b>Emission unit name:</b> Reboilers	<b>List any control devices associated with this emission unit:</b> None
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**Provide a description of the emission unit (type, method of operation, design parameters, etc.):**  
Two (2) 1.54 MMBtu/hr reboiler heaters associated with dehydration units RSV-1 and RSV-2.

<b>Manufacturer:</b>	<b>Model number:</b>	<b>Serial number:</b>
<b>Construction date:</b> RBV-1 – 2010 RBV-2 – 2012	<b>Installation date:</b> RBV-1 – 2010 RBV-2 – 2012	<b>Modification date(s):</b> N/A

**Design Capacity (examples: furnaces - tons/hr, tanks - gallons):**  
1.54 MMBtu/hr (each)

<b>Maximum Hourly Throughput:</b> 1.26E-03 MMscf/hr (each)	<b>Maximum Annual Throughput:</b> 11.0 MMscf/year (each)	<b>Maximum Operating Schedule:</b> 8,760 hours (each)
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**Fuel Usage Data (fill out all applicable fields)**

<b>Does this emission unit combust fuel?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<b>If yes, is it?</b> <input type="checkbox"/> Indirect Fired <input checked="" type="checkbox"/> Direct Fired
--	---

<b>Maximum design heat input and/or maximum horsepower rating:</b> 1.54 MMBtu/hr (each)	<b>Type and Btu/hr rating of burners:</b> 1.54 MMBtu/hr (each)
--	---

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

Natural Gas – 1.26E-03 MMscf/hr (each)

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

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Natural Gas	Negl.	Negl.	1,223 BTU/scf

<b><i>Emissions Data</i></b>		
Criteria Pollutants	Potential Emissions ( <i>Each Unit</i> )	
	PPH	TPY
Carbon Monoxide (CO)	0.11	0.46
Nitrogen Oxides (NO <sub>x</sub> )	0.13	0.55
Lead (Pb)	--	--
Particulate Matter (PM <sub>2.5</sub> )	0.01	0.04
Particulate Matter (PM <sub>10</sub> )	0.01	0.04
Total Particulate Matter (TSP)	0.01	0.04
Sulfur Dioxide (SO <sub>2</sub> )	0.0008	0.003
Volatile Organic Compounds (VOC)	0.01	0.03
Hazardous Air Pollutants	Potential Emissions ( <i>Each Unit</i> )	
	PPH	TPY
Formaldehyde (HCHO)	9.44E-04	4.13E-04
Total HAP	2.38E-03	1.04E-02
Regulated Pollutants other than Criteria and HAP	Potential Emissions ( <i>Each Unit</i> )	
	PPH	TPY
CO <sub>2</sub> e	180	788
<p><b>List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).</b></p> <p>Criteria pollutant and HAP emission factors from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1, 1.4-2, &amp; 1.4-3. Greenhouse gas emission factors from 40 CFR Part 98 Tables C-1 and C-2.</p>		

**Applicable Requirements**

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

No change from current R13 permit conditions (Condition 11.1-11.5)

Permit Shield

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

No change from current R13 permit conditions (Condition 11.1-11.5)

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

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

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## ATTACHMENT E - Emission Unit Form

***Emission Unit Description***

<b>Emission unit ID number:</b> RBV-3	<b>Emission unit name:</b> Reboiler	<b>List any control devices associated with this emission unit:</b> None
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**Provide a description of the emission unit (type, method of operation, design parameters, etc.):**  
One (1) 2.31 MMBtu/hr reboiler heater associated with dehydration unit RSV-3.

<b>Manufacturer:</b>	<b>Model number:</b>	<b>Serial number:</b>
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<b>Construction date:</b> 2014	<b>Installation date:</b> 2014	<b>Modification date(s):</b> N/A
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**Design Capacity (examples: furnaces - tons/hr, tanks - gallons):**

2.31 MMBtu/hr

<b>Maximum Hourly Throughput:</b> 1.89E-03 MMscf/hr	<b>Maximum Annual Throughput:</b> 16.6 MMscf/year	<b>Maximum Operating Schedule:</b> 8,760 hours
--	--	---

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

<b>Does this emission unit combust fuel?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<b>If yes, is it?</b> <input type="checkbox"/> Indirect Fired <input checked="" type="checkbox"/> Direct Fired
--	---

<b>Maximum design heat input and/or maximum horsepower rating:</b> 2.31 MMBtu/hr	<b>Type and Btu/hr rating of burners:</b> 2.31 MMBtu/hr
---	--

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

Natural Gas – 1.89E-03 MMscf/hr

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

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Natural Gas	Negl.	Negl.	1,223 BTU/scf

<b>Emissions Data</b>		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	0.16	0.70
Nitrogen Oxides (NO <sub>x</sub> )	0.19	0.83
Lead (Pb)	--	--
Particulate Matter (PM <sub>2.5</sub> )	0.01	0.06
Particulate Matter (PM <sub>10</sub> )	0.01	0.06
Total Particulate Matter (TSP)	0.01	0.06
Sulfur Dioxide (SO <sub>2</sub> )	0.001	0.005
Volatile Organic Compounds (VOC)	0.01	0.05
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Formaldehyde (HCHO)	1.42E-04	6.21E-04
Total HAP	3.57E-03	0.02
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
CO <sub>2</sub> e	270	1183
<p><b>List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).</b></p> <p>Criteria pollutants and HAP emission factors from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1, 1.4-2, &amp; 1.4-3. Greenhouse gas emission factors from 40 CFR Part 98 Tables C-1 and C-2.</p>		

**Applicable Requirements**

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

No change from current R13 permit conditions (Condition 11.1-11.5)

Permit Shield

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

No change from current R13 permit conditions (Condition 11.1-11.5)

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

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

**ATTACHMENT G**

**Air Pollution Control Device Forms**

## ATTACHMENT G - Air Pollution Control Device Form

<b>Control device ID number:</b> C001	<b>List all emission units associated with this control device.</b> CE001 – CE006	
<b>Manufacturer:</b> GT	<b>Model number:</b> 201VO-6-300-6124	<b>Installation date:</b> CE001 – CE003: 2010 CE004: 2011 CE006: 2012

**Type of Air Pollution Control Device:**

<input type="checkbox"/> Baghouse/Fabric Filter	<input type="checkbox"/> Venturi Scrubber	<input type="checkbox"/> Multiclone
<input type="checkbox"/> Carbon Bed Adsorber	<input type="checkbox"/> Packed Tower Scrubber	<input type="checkbox"/> Single Cyclone
<input type="checkbox"/> Carbon Drum(s)	<input type="checkbox"/> Other Wet Scrubber	<input type="checkbox"/> Cyclone Bank
<input type="checkbox"/> Catalytic Incinerator	<input type="checkbox"/> Condenser	<input type="checkbox"/> Settling Chamber
<input type="checkbox"/> Thermal Incinerator	<input type="checkbox"/> Flare	<input checked="" type="checkbox"/> Other (describe) <u>Oxidation Catalyst</u>
<input type="checkbox"/> Wet Plate Electrostatic Precipitator	<input type="checkbox"/> Dry Plate Electrostatic Precipitator	

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

Pollutant	Capture Efficiency	Control Efficiency
NMNEHC	100%	50%
CO	100%	93%
Formaldehyde	100%	83%

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

Flow Rate: 15,734.68 ACFM  
Pressure Drop: 5.97 in. H<sub>2</sub>O

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

If Yes, Complete ATTACHMENT H

If No, Provide justification.  
Initial Title V application

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

The Pressure drop and temperature -across the catalyst will be continuously monitored

## ATTACHMENT G - Air Pollution Control Device Form

<b>Control device ID number:</b> C002	<b>List all emission units associated with this control device.</b> CE007 – CE008	
<b>Manufacturer:</b>	<b>Model number:</b>	<b>Installation date:</b> 2014

**Type of Air Pollution Control Device:**

<input type="checkbox"/> Baghouse/Fabric Filter	<input type="checkbox"/> Venturi Scrubber	<input type="checkbox"/> Multiclone
<input type="checkbox"/> Carbon Bed Adsorber	<input type="checkbox"/> Packed Tower Scrubber	<input type="checkbox"/> Single Cyclone
<input type="checkbox"/> Carbon Drum(s)	<input type="checkbox"/> Other Wet Scrubber	<input type="checkbox"/> Cyclone Bank
<input type="checkbox"/> Catalytic Incinerator	<input type="checkbox"/> Condenser	<input type="checkbox"/> Settling Chamber
<input type="checkbox"/> Thermal Incinerator	<input type="checkbox"/> Flare	<input checked="" type="checkbox"/> Other (describe) <u>Oxidation Catalyst</u>
<input type="checkbox"/> Wet Plate Electrostatic Precipitator	<input type="checkbox"/> Dry Plate Electrostatic Precipitator	

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

Pollutant	Capture Efficiency	Control Efficiency
NMNEHC	100%	50%
CO	100%	93%
Formaldehyde	100%	83%

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

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

If Yes, **Complete ATTACHMENT H**

If No, **Provide justification.**  
 Initial Title V application

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

The Pressure drop and temperature across the catalyst will be continuously monitored

## ATTACHMENT G - Air Pollution Control Device Form

<b>Control device ID number:</b> TO-1	<b>List all emission units associated with this control device.</b> RSV-1	
<b>Manufacturer:</b>	<b>Model number:</b>	<b>Installation date:</b> 2010

**Type of Air Pollution Control Device:**

<input type="checkbox"/> Baghouse/Fabric Filter	<input type="checkbox"/> Venturi Scrubber	<input type="checkbox"/> Multiclone
<input type="checkbox"/> Carbon Bed Adsorber	<input type="checkbox"/> Packed Tower Scrubber	<input type="checkbox"/> Single Cyclone
<input type="checkbox"/> Carbon Drum(s)	<input type="checkbox"/> Other Wet Scrubber	<input type="checkbox"/> Cyclone Bank
<input type="checkbox"/> Catalytic Incinerator	<input type="checkbox"/> Condenser	<input type="checkbox"/> Settling Chamber
<input type="checkbox"/> Thermal Incinerator	<input type="checkbox"/> Flare	<input checked="" type="checkbox"/> Other (describe) <u>Thermal Oxidizer</u>
<input type="checkbox"/> Wet Plate Electrostatic Precipitator	<input type="checkbox"/> Dry Plate Electrostatic Precipitator	

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

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

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

4,022 scf/hour, 3 MMBtu/hr  
Pilot rating 620,000 Btu/hr

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

If Yes, **Complete ATTACHMENT H**

If No, **Provide justification.**  
Initial Title V application

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

Pilot flame is equipped with a thermocouple.

## ATTACHMENT G - Air Pollution Control Device Form

<b>Control device ID number:</b> TO-2	<b>List all emission units associated with this control device.</b> RSV-2																			
<b>Manufacturer:</b>	<b>Model number:</b>	<b>Installation date:</b> 2010																		
<b>Type of Air Pollution Control Device:</b>																				
<table style="width: 100%; border: none;"> <tr> <td style="width: 33%;"><input type="checkbox"/> Baghouse/Fabric Filter</td> <td style="width: 33%;"><input type="checkbox"/> Venturi Scrubber</td> <td style="width: 33%;"><input type="checkbox"/> Multiclone</td> </tr> <tr> <td><input type="checkbox"/> Carbon Bed Adsorber</td> <td><input type="checkbox"/> Packed Tower Scrubber</td> <td><input type="checkbox"/> Single Cyclone</td> </tr> <tr> <td><input type="checkbox"/> Carbon Drum(s)</td> <td><input type="checkbox"/> Other Wet Scrubber</td> <td><input type="checkbox"/> Cyclone Bank</td> </tr> <tr> <td><input type="checkbox"/> Catalytic Incinerator</td> <td><input type="checkbox"/> Condenser</td> <td><input type="checkbox"/> Settling Chamber</td> </tr> <tr> <td><input type="checkbox"/> Thermal Incinerator</td> <td><input type="checkbox"/> Flare</td> <td><input checked="" type="checkbox"/> Other (describe) <u>Thermal Oxidizer</u></td> </tr> <tr> <td><input type="checkbox"/> Wet Plate Electrostatic Precipitator</td> <td></td> <td><input type="checkbox"/> Dry Plate Electrostatic Precipitator</td> </tr> </table>			<input type="checkbox"/> Baghouse/Fabric Filter	<input type="checkbox"/> Venturi Scrubber	<input type="checkbox"/> Multiclone	<input type="checkbox"/> Carbon Bed Adsorber	<input type="checkbox"/> Packed Tower Scrubber	<input type="checkbox"/> Single Cyclone	<input type="checkbox"/> Carbon Drum(s)	<input type="checkbox"/> Other Wet Scrubber	<input type="checkbox"/> Cyclone Bank	<input type="checkbox"/> Catalytic Incinerator	<input type="checkbox"/> Condenser	<input type="checkbox"/> Settling Chamber	<input type="checkbox"/> Thermal Incinerator	<input type="checkbox"/> Flare	<input checked="" type="checkbox"/> Other (describe) <u>Thermal Oxidizer</u>	<input type="checkbox"/> Wet Plate Electrostatic Precipitator		<input type="checkbox"/> Dry Plate Electrostatic Precipitator
<input type="checkbox"/> Baghouse/Fabric Filter	<input type="checkbox"/> Venturi Scrubber	<input type="checkbox"/> Multiclone																		
<input type="checkbox"/> Carbon Bed Adsorber	<input type="checkbox"/> Packed Tower Scrubber	<input type="checkbox"/> Single Cyclone																		
<input type="checkbox"/> Carbon Drum(s)	<input type="checkbox"/> Other Wet Scrubber	<input type="checkbox"/> Cyclone Bank																		
<input type="checkbox"/> Catalytic Incinerator	<input type="checkbox"/> Condenser	<input type="checkbox"/> Settling Chamber																		
<input type="checkbox"/> Thermal Incinerator	<input type="checkbox"/> Flare	<input checked="" type="checkbox"/> Other (describe) <u>Thermal Oxidizer</u>																		
<input type="checkbox"/> Wet Plate Electrostatic Precipitator		<input type="checkbox"/> Dry Plate Electrostatic Precipitator																		
<b>List the pollutants for which this device is intended to control and the capture and control efficiencies.</b>																				
Pollutant	Capture Efficiency	Control Efficiency																		
HC	100%	95%																		
VOC	100%	95%																		
HAP	100%	95%																		
<b>Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.).</b>  9,210 scf/hour, 3 MMBtu/hr  Pilot rating 620,000 Btu/hr																				
<b>Is this device subject to the CAM requirements of 40 C.F.R. 64?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Complete ATTACHMENT H If No, Provide justification. Initial Title V application																				
<b>Describe the parameters monitored and/or methods used to indicate performance of this control device.</b>  Pilot flame is equipped with a thermocouple.																				

## ATTACHMENT G - Air Pollution Control Device Form

<b>Control device ID number:</b> TO-3	<b>List all emission units associated with this control device.</b> RSV-3	
<b>Manufacturer:</b>	<b>Model number:</b>	<b>Installation date:</b> 2010

**Type of Air Pollution Control Device:**

<input type="checkbox"/> Baghouse/Fabric Filter	<input type="checkbox"/> Venturi Scrubber	<input type="checkbox"/> Multiclone
<input type="checkbox"/> Carbon Bed Adsorber	<input type="checkbox"/> Packed Tower Scrubber	<input type="checkbox"/> Single Cyclone
<input type="checkbox"/> Carbon Drum(s)	<input type="checkbox"/> Other Wet Scrubber	<input type="checkbox"/> Cyclone Bank
<input type="checkbox"/> Catalytic Incinerator	<input type="checkbox"/> Condenser	<input type="checkbox"/> Settling Chamber
<input type="checkbox"/> Thermal Incinerator	<input type="checkbox"/> Flare	<input checked="" type="checkbox"/> Other (describe) <u>Thermal Oxidizer</u>
<input type="checkbox"/> Wet Plate Electrostatic Precipitator	<input type="checkbox"/> Dry Plate Electrostatic Precipitator	

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

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

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

9,210 scf/hour, 3 MMBtu/hr  
 Pilot rating 620,000 Btu/hr

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

If Yes, Complete ATTACHMENT H  
 If No, Provide justification.  
 Initial Title V application

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

Pilot flame is equipped with a thermocouple.

## ATTACHMENT G - Air Pollution Control Device Form

<b>Control device ID number:</b> TO-4	<b>List all emission units associated with this control device.</b> T10, T12, T16, T17	
<b>Manufacturer:</b>	<b>Model number:</b>	<b>Installation date:</b> 2015

**Type of Air Pollution Control Device:**

<input type="checkbox"/> Baghouse/Fabric Filter	<input type="checkbox"/> Venturi Scrubber	<input type="checkbox"/> Multiclone
<input type="checkbox"/> Carbon Bed Adsorber	<input type="checkbox"/> Packed Tower Scrubber	<input type="checkbox"/> Single Cyclone
<input type="checkbox"/> Carbon Drum(s)	<input type="checkbox"/> Other Wet Scrubber	<input type="checkbox"/> Cyclone Bank
<input type="checkbox"/> Catalytic Incinerator	<input type="checkbox"/> Condenser	<input type="checkbox"/> Settling Chamber
<input type="checkbox"/> Thermal Incinerator	<input type="checkbox"/> Flare	<input checked="" type="checkbox"/> Other (describe) <u>Thermal Oxidizer</u>
<input type="checkbox"/> Wet Plate Electrostatic Precipitator	<input type="checkbox"/> Dry Plate Electrostatic Precipitator	

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

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

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

17,500 scf/hour, 41 MMBtu/hr  
 Pilot rating 109,890 Btu/hr

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

If Yes, Complete ATTACHMENT H

If No, Provide justification.

Initial Title V application

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

Pilot flame is equipped with a thermocouple.

# ATTACHMENT I

## Emission Calculations

EQM Gathering Opco  
Saturn Compressor Station  
Facility-Wide Emissions Summary

Saturn Station												
Emission Unit ID	CAT 3608 Compressor Engines	CAT 3616 Compressor Engines	Fuel Gas Heater	Reboiler	Dehydrator	Flare	Reboiler	Dehydrator	Flare	Reboiler	Dehydrator	Flare
Equipment Status	Existing	Existing	Existing	Existing	Existing	Existing	Existing	Existing	Existing	Existing	Existing	Existing
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	0.38	1.54	65	3.00	1.54	130	3.00	2.31	130	3.00
Unit	HP	HP	MMBtu/hr	MMBtu/hr	MMSCFD	MMBtu/hr	MMBtu/hr	MMSCFD	MMBtu/hr	MMBtu/hr	MMSCFD	MMBtu/hr
# of Emission Units	5	2	3	1	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 <sub>10</sub>	3.90	3.12	0.03	0.04	---	0.10	0.04	---	0.10	0.06	---	---
PM <sub>2.5</sub>	3.90	3.12	0.03	0.04	---	0.10	0.04	---	0.10	0.06	---	---
SO <sub>x</sub>	0.23	0.18	0.00	0.00	---	0.01	0.00	---	0.01	0.00	---	---
CO	22.03	17.60	0.35	0.46	---	1.09	0.46	---	1.09	0.70	---	---
NO <sub>x</sub>	57.21	45.72	0.41	0.55	---	1.30	0.55	---	1.30	0.83	---	---
VOC	43.82	41.08	0.02	0.03	5.22	---	0.03	9.32	---	0.05	9.32	---
CO <sub>2</sub>	50,461.25	40,417.86	590.73	787.64	263.65	1,853.33	787.64	6.87	1,853.33	1,182.65	6.87	6.87
CH <sub>4</sub>	567.55	467.27	0.01	0.01	1.72	0.03	0.01	5.05	0.03	0.02	5.05	5.05
N <sub>2</sub> 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 <sub>2</sub> e	64,675.53	52,120.22	591.34	788.46	306.55	1,855.24	788.46	133.16	1,855.24	1,183.87	133.16	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
Lead	---	---	0.00	0.00	---	---	0.00	---	---	0.00	---	---
Total HAPs (including HCHO)	15.35	10.09	0.01	0.01	1.48	---	0.01	2.33	---	0.02	2.33	2.33

EQM Gathering Opco  
 Saturn Compressor Station  
 Facility-Wide Emissions Summary

		Saturn Station										Saturn Station TOTAL
Emission Unit ID	Equipment Status	Flare	Capstone C200 Microturbines	Pipeline Flare	Station Fugitive & Blowdown Emissions	Methanol Tank	Methanol Tanks	Methanol Tanks	Methanol Tanks	Methanol Tanks	Produced Fluids Tank	
TO-3	Existing	Natural Gas	C2001 - C2005	TO-4	---	T13	T14A-T14C	T27A - T27E	T10, T12, T16, T17	Produced Water		
		3.00	0.200	41.00	Natural Gas	Natural Gas	Natural Gas	Methanol	Methanol	Methanol	8,820	
		MMBtu/hr	MW	MMBtu/hr	Site-Wide	gallons	gallons	gallons	gallons	gallons		
		1	5	1	ALL	1	3	5	4			
		8760	8760	8760	8760	8760	8760	8760	8760			
Pollutant		tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy
PM <sub>10</sub>		0.10	0.33	1.12	---	---	---	---	---	---	---	8.94
PM <sub>2.5</sub>		0.10	0.33	1.12	---	---	---	---	---	---	---	8.94
SO <sub>x</sub>		0.01	0.17	0.09	---	---	---	---	---	---	---	0.71
CO		1.09	4.82	12.39	---	---	---	---	---	---	---	62.08
NO <sub>x</sub>		1.30	1.75	14.75	---	---	---	---	---	---	---	125.67
VOC		---	0.44	---	11.15	0.03	0.03	0.03	16.25	---	---	136.82
CO <sub>2</sub>		1,853.33	5,825.40	21,046.99	0.23	---	---	---	0.02	---	---	126,937.79
CH <sub>4</sub>		0.03	0.44	0.40	43.91	---	---	---	4.36	---	---	1,095.92
N <sub>2</sub> O		0.00	0.01	0.04	0.00	---	---	---	0.00	---	---	0.22
CO <sub>2</sub> e		1,855.24	5,839.63	21,068.86	1,098.04	---	---	---	109.00	---	---	154,402.03
Formaldehyde		0.00	0.04	0.00	---	---	---	---	0.00	---	---	11.86
Lead		---	---	---	---	---	---	---	---	---	---	1.2E-05
Total HAPs (including HCHO)		---	0.05	---	0.35	0.03	0.03	0.03	0.53	0.03	0.53	32.64

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 <sup>a</sup>	Units
NO <sub>x</sub>	0.50	g/bhp-hr
CO	0.19	g/bhp-hr
SO <sub>2</sub>	5.88E-04	lb/MMBtu
PM <sub>10</sub> (Filterable)	7.71E-05	lb/MMBtu
PM <sub>2.5</sub> (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 <sub>2</sub>	441	g/bhp-hr
CH <sub>4</sub>	4.96	kg/MMBtu
N <sub>2</sub> O	1.00E-04	kg/MMBtu

**CRITERIA POLLUTANT EMISSIONS**

Pollutant	Potential Emissions	
	(lb/hr) <sup>b</sup>	(tons/yr) <sup>c</sup>
NO <sub>x</sub>	2.61	11.44
CO	1.01	4.41
SO <sub>2</sub>	0.01	0.05
PM <sub>10</sub> (Filterable)	0.00	0.01
PM <sub>2.5</sub> (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 <sub>2</sub>	2,304	10,092
CH <sub>4</sub>	25.92	113.51
N <sub>2</sub> O	0.00	0.02

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)**

**HAZARDOUS AIR POLLUTANT (HAP) POTENTIAL EMISSIONS**

Pollutant	Emission Factor (lb/MMBtu) <sup>a</sup>	Potential Emissions	
		(lb/hr) <sup>b</sup>	(tons/yr) <sup>c</sup>
<b>HAPs</b>			
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
<b>POLYCYCLIC ORGANIC MATTER</b>			
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
<b>TOTAL HAP</b>		<b>0.70</b>	<b>3.07</b>

<sup>a</sup> SO<sub>2</sub>, 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<sub>x</sub>, 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.

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

<sup>c</sup> Annual Emissions (tons/yr)<sub>Potential</sub> = (lb/hr)<sub>Emissions</sub> × (Maximum Allowable Operating Hours, 8,760 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**

**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 <sup>a</sup>	Units
NO <sub>x</sub>	0.50	g/bhp-hr
CO	0.19	g/bhp-hr
SO <sub>2</sub>	5.88E-04	lb/MMBtu
PM <sub>10</sub>	9.99E-03	lb/MMBtu
PM <sub>2.5</sub>	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 <sub>2</sub>	442	g/bhp-hr
CH <sub>4</sub> (THC-NMHC)	5.11	g/bhp-hr
N <sub>2</sub> O	1.00E-04	kg/MMBtu

**CRITERIA POLLUTANT EMISSIONS**

Pollutant	Potential Emissions	
	(lb/hr) <sup>b</sup>	(tons/yr) <sup>c</sup>
NO <sub>x</sub>	5.22	22.86
CO	2.01	8.80
SO <sub>2</sub>	0.02	0.09
PM <sub>10</sub>	0.36	1.56
PM <sub>2.5</sub>	0.36	1.56
PM Total	0.36	1.56
VOC	4.69	20.54
Formaldehyde (HCHO)	0.46	2.02
CO <sub>2</sub>	4614	20,209
CH <sub>4</sub>	53.34	233.64
N <sub>2</sub> O	0.01	0.03
CO <sub>2e</sub>	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) <sup>a</sup>	Potential Emissions	
		(lb/hr) <sup>b</sup>	(tons/yr) <sup>c</sup>
<b>HAPs</b>			
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)perylene	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
<b>POLYCYCLIC ORGANIC MATTER</b>			
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
<b>TOTAL HAP</b>		<b>1.15</b>	<b>5.05</b>

<sup>a</sup> SO<sub>2</sub>, 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<sub>x</sub>, VOC, CO, CO<sub>2</sub>, CH<sub>4</sub>, and Formaldehyde emission factors are based on manufacturer's guarantees for the oxidation catalyst. N<sub>2</sub>O emission factors are based on 40 CFR Part 98, Subpart C, Table C-2 for natural gas combustion.

<sup>b</sup> 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)

<sup>c</sup> Annual Emissions (tons/yr)<sub>Potential</sub> = (lb/hr)<sub>Emissions</sub> × (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
<b>Total Emissions</b>	<b>0.92</b>	<b>22.02</b>	<b>4.02</b>
<b>Total Hydrocarbon Emissions</b>	<b>0.92</b>	<b>22.02</b>	<b>4.02</b>
<b>Total VOC Emissions</b>	<b>0.81</b>	<b>19.42</b>	<b>3.54</b>
<b>Total HAP Emissions</b>	<b>0.33</b>	<b>7.85</b>	<b>1.43</b>

\* 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
<b>Total Emissions</b>	<b>1.08</b>	<b>25.95</b>	<b>4.74</b>
<b>Total Hydrocarbon Emissions</b>	<b>1.08</b>	<b>25.95</b>	<b>4.74</b>
<b>Total VOC Emissions</b>	<b>0.38</b>	<b>9.20</b>	<b>1.68</b>
<b>Total HAP Emissions</b>	<b>0.01</b>	<b>0.24</b>	<b>0.04</b>

\* 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
<b>Total Emissions</b>	<b>1.315</b>	<b>31.574</b>	<b>5.762</b>
<b>Total Hydrocarbon Emissions</b>	<b>1.315</b>	<b>31.574</b>	<b>5.762</b>
<b>Total VOC Emissions</b>	<b>1.149</b>	<b>27.577</b>	<b>5.033</b>
<b>Total HAP Emissions</b>	<b>0.493</b>	<b>11.841</b>	<b>2.161</b>

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
<b>Total Emissions</b>	<b>2.990</b>	<b>71.758</b>	<b>13.096</b>
<b>Total Hydrocarbon Emissions</b>	<b>2.990</b>	<b>71.758</b>	<b>13.096</b>
<b>Total VOC Emissions</b>	<b>0.978</b>	<b>23.475</b>	<b>4.284</b>
<b>Total HAP Emissions</b>	<b>0.038</b>	<b>0.910</b>	<b>0.166</b>

\* 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 %

Company Name:  
 Facility Name:  
 Project Description:

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

Glycol Dehydrator Thermal Oxidizer  
 Emission Calculations - Criteria

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

Pollutant <sup>2</sup>	Emission Factors <sup>1</sup> (lb/MMBtu)	Potential Emissions (lb/hr)	Thermal Oxidizer Emissions (tpy)
NO <sub>x</sub>	0.082	0.246	1.076
CO	0.069	0.206	0.904
PM/PM <sub>10</sub>	0.006	0.019	0.082
SO <sub>2</sub>	0.000	0.0015	0.006
CO <sub>2</sub>	117	351	1536
CH <sub>4</sub>	0.002	0.0066	0.029
N <sub>2</sub> 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 TO-4  
 Thermal Oxidizer Rating (MMBtu/hr) 41.00  
 Pilot Rating (MMBtu/hr) 0.11  
 Potential Operating Hours (hrs) 8760

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

Pollutant <sup>2</sup>	Emission Factors <sup>1</sup> (lb/MMBtu)	Potential Emissions (lb/hr)	Thermal Oxidizer Emissions (tpy)
NO <sub>x</sub>	0.082	3.358	14.708
CO	0.069	2.821	12.354
PM/PM <sub>10</sub>	0.006	0.255	1.118
SO <sub>2</sub>	0.000	0.0201	0.088
CO <sub>2</sub>	117	4792	20991
CH <sub>4</sub>	0.002	0.0904	0.396
N <sub>2</sub> O	0.000	0.0090	0.040
VOC	E&P TANK (Produced Fluids Tanks)	3.710	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:** EOM Gathering Opco  
**Facility Name:** SATURN COMPRESSOR STATION  
**Project Description:** R-13 PERMIT CLASS II ADMINISTRATIVE UPDATE

<b>Reboiler 1</b> <b>RBV-1</b>
-----------------------------------

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) <sup>a</sup>	Potential Emissions	
		(lb/hr) <sup>b</sup>	(tons/yr) <sup>c</sup>
NO <sub>x</sub>	100	0.126	0.551
CO	84	0.106	0.463
SO <sub>2</sub>	0.6	0.0008	0.003
PM	7.6	0.010	0.042
PM <sub>10</sub>	7.6	0.010	0.042
PM <sub>2.5</sub>	7.6	0.010	0.042
VOC	5.5	0.007	0.030
CO <sub>2</sub>	142,907	179.828	787.645
CH <sub>4</sub>	2.70	0.003	0.015
N <sub>2</sub> 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 1 RBV-1
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**HAZARDOUS AIR POLLUTANT (HAP) POTENTIAL EMISSIONS**

Pollutant	Emission Factor (lb/MMscf) <sup>a</sup>	Potential Emissions	
		(lb/hr) <sup>b</sup>	(tons/yr) <sup>c</sup>
<b>HAPs</b>			
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
<b>POLYCYCLIC ORGANIC MATTER</b>			
Methylnaphthalene (2-)	2.40E-05	3.02E-08	1.32E-07
Naphthalene	6.10E-04	7.68E-07	3.36E-06
<b>TOTAL HAP</b>		<b>2.38E-03</b>	<b>1.04E-02</b>

<sup>a</sup> 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.

<sup>b</sup> Emission Rate (lb/hr) = Rated Capacity (MMscf/hr) × Emission Factor (lb/MMscf).

<sup>c</sup> Annual Emissions (tons/yr)<sub>Potential</sub> = (lb/hr)<sub>Emissions</sub> × (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

<b>Reboiler 2</b> <b>RBV-2</b>
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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) <sup>a</sup>	Potential Emissions	
		(lb/hr) <sup>b</sup>	(tons/yr) <sup>c</sup>
NO <sub>x</sub>	100	0.126	0.551
CO	84	0.106	0.463
SO <sub>2</sub>	0.6	0.0008	0.003
PM	7.6	0.010	0.042
PM <sub>10</sub>	7.6	0.010	0.042
PM <sub>2.5</sub>	7.6	0.010	0.042
VOC	5.5	0.007	0.030
CO <sub>2</sub>	142,907	179.828	787.645
CH <sub>4</sub>	2.70	0.003	0.015
N <sub>2</sub> 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 2 RBV-2
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**HAZARDOUS AIR POLLUTANT (HAP) POTENTIAL EMISSIONS**

Pollutant	Emission Factor (lb/MMscf) <sup>a</sup>	Potential Emissions	
		(lb/hr) <sup>b</sup>	(tons/yr) <sup>c</sup>
<b>HAPs</b>			
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
<b>POLYCYCLIC ORGANIC MATTER</b>			
Methylnaphthalene (2-)	2.40E-05	3.02E-08	1.32E-07
Naphthalene	6.10E-04	7.68E-07	3.36E-06
<b>TOTAL HAP</b>		<b>0.002</b>	<b>0.01</b>

<sup>a</sup> 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.

<sup>b</sup> Emission Rate (lb/hr) = Rated Capacity (MMscf/hr) × Emission Factor (lb/MMscf).

<sup>c</sup> Annual Emissions (tons/yr)<sub>Potential</sub> = (lb/hr)<sub>Emissions</sub> × (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

<b>Reboiler 3</b> <b>RBV-3</b>
-----------------------------------

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

**CRITERIA AND MANUFACTURER SPECIFIC POLLUTANT EMISSION FACTORS**

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

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

<b>Reboiler 3</b> <b>RBV-3</b>
-----------------------------------

**HAZARDOUS AIR POLLUTANT (HAP) POTENTIAL EMISSIONS**

Pollutant	Emission Factor (lb/MMscf) <sup>a</sup>	Potential Emissions	
		(lb/hr) <sup>b</sup>	(tons/yr) <sup>c</sup>
<b>HAPs</b>			
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
<b>POLYCYCLIC ORGANIC MATTER</b>			
Methylnaphthalene (2-)	2.40E-05	4.53E-08	1.99E-07
Naphthalene	6.10E-04	1.15E-06	5.05E-06
<b>TOTAL HAP</b>		<b>3.57E-03</b>	<b>0.02</b>

- <sup>a</sup> 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.
- <sup>b</sup> Emission Rate (lb/hr) = Rated Capacity (MMscf/hr) × Emission Factor (lb/MMscf).
- <sup>c</sup> Annual Emissions (tons/yr)<sub>POTENTIAL</sub> = (lb/hr)<sub>EMISSIONS</sub> × (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

<b>Fuel Gas Heater HTR-3</b>
----------------------------------

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) <sup>a</sup>	Potential Emissions	
		(lb/hr) <sup>b</sup>	(tons/yr) <sup>c</sup>
NO <sub>x</sub>	100	0.03	0.14
CO	84	0.03	0.12
SO <sub>2</sub>	0.6	0.00	0.00
PM	7.6	0.00	0.01
PM <sub>10</sub>	7.6	0.00	0.01
PM <sub>2.5</sub>	7.6	0.00	0.01
VOC	5.5	0.00	0.01
CO <sub>2</sub>	142,907	44.957	196.911
CH <sub>4</sub>	2.70	0.001	0.004
N <sub>2</sub> 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
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**HAZARDOUS AIR POLLUTANT (HAP) POTENTIAL EMISSIONS**

Pollutant	Emission Factor (lb/MMscf) <sup>a</sup>	Potential Emissions	
		(lb/hr) <sup>b</sup>	(tons/yr) <sup>c</sup>
<b>HAPs:</b>			
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
<b>POLYCYCLIC ORGANIC MATTER</b>			
Methylnaphthalene (2-)	2.40E-05	7.55E-09	3.31E-08
Naphthalene	6.10E-04	1.92E-07	8.41E-07
<b>TOTAL HAP</b>		<b>5.94E-04</b>	<b>2.60E-03</b>

<sup>a</sup> 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.

<sup>b</sup> Emission Rate (lb/hr) = Rated Capacity (MMscf/hr) × Emission Factor (lb/MMscf).

<sup>c</sup> Annual Emissions (tons/yr)<sub>Potential</sub> = (lb/hr)<sub>Emissions</sub> × (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

<b>Fuel Gas Heater HTR-4</b>
----------------------------------

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) <sup>a</sup>	Potential Emissions	
		(lb/hr) <sup>b</sup>	(tons/yr) <sup>c</sup>
NO <sub>x</sub>	100	0.03	0.14
CO	84	0.03	0.12
SO <sub>2</sub>	0.6	0.00	0.00
PM	7.6	0.00	0.01
PM <sub>10</sub>	7.6	0.00	0.01
PM <sub>2.5</sub>	7.6	0.00	0.01
VOC	5.5	0.00	0.01
CO <sub>2</sub>	142,907	44.957	196.911
CH <sub>4</sub>	2.70	0.001	0.004
N <sub>2</sub> O	0.27	0.000	0.000

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

<b>Fuel Gas Heater</b> <b>HTR-4</b>
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**HAZARDOUS AIR POLLUTANT (HAP) POTENTIAL EMISSIONS**

Pollutant	Emission Factor (lb/MMscf) <sup>a</sup>	Potential Emissions	
		(lb/hr) <sup>b</sup>	(tons/yr) <sup>c</sup>
<b>HAPs</b>			
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
<b>POLYCYCLIC ORGANIC MATTER</b>			
Methylnaphthalene (2-)	2.40E-05	7.55E-09	3.31E-08
Naphthalene	6.10E-04	1.92E-07	8.41E-07
<b>TOTAL HAP</b>		<b>5.94E-04</b>	<b>2.60E-03</b>

<sup>a</sup> 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.

<sup>b</sup> Emission Rate (lb/hr) = Rated Capacity (MMscf/hr) × Emission Factor (lb/MMscf).

<sup>c</sup> Annual Emissions (tons/yr)<sub>Potential</sub> = (lb/hr)<sub>Emissions</sub> × (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

<b>Fuel Gas Heater</b> <b>HTR-5</b>
--

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) <sup>a</sup>	Potential Emissions	
		(lb/hr) <sup>b</sup>	(tons/yr) <sup>c</sup>
NO <sub>x</sub>	100	0.03	0.14
CO	84	0.03	0.12
SO <sub>2</sub>	0.6	0.0002	0.001
PM	7.6	0.002	0.01
PM <sub>10</sub>	7.6	0.002	0.01
PM <sub>2.5</sub>	7.6	0.002	0.01
VOC	5.5	0.002	0.01
CO <sub>2</sub>	142,907	45	197
CH <sub>4</sub>	2.70	0.001	0.004
N <sub>2</sub> 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
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**HAZARDOUS AIR POLLUTANT (HAP) POTENTIAL EMISSIONS**

Pollutant	Emission Factor (lb/MMscf) <sup>a</sup>	Potential Emissions	
		(lb/hr) <sup>b</sup>	(tons/yr) <sup>c</sup>
<b>HAPs</b>			
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
<b>POLYCYCLIC ORGANIC MATTER</b>			
Methylnaphthalene (2-)	2.40E-05	7.55E-09	3.31E-08
Naphthalene	6.10E-04	1.92E-07	8.41E-07
<b>TOTAL HAP</b>		<b>0.001</b>	<b>0.003</b>

<sup>a</sup> 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.

<sup>b</sup> Emission Rate (lb/hr) = Rated Capacity (MMscf/hr) × Emission Factor (lb/MMscf).

<sup>c</sup> Annual Emissions (tons/yr)<sub>Potential</sub> = (lb/hr)<sub>Emissions</sub> × (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

<b>CAPSTONE C200 MICROTURBINE</b>
---------------------------------------

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 <sup>a</sup>	Units
NO <sub>x</sub> <sup>2</sup>	0.40	lb/MWhe
CO <sup>2</sup>	1.10	lb/MWhe
SO <sub>2</sub> <sup>1</sup>	3.40E-03	lb/MMBtu
PM <sub>10</sub> <sup>1</sup>	6.60E-03	lb/MMBtu
PM <sub>2.5</sub> <sup>1</sup>	6.60E-03	lb/MMBtu
VOC <sup>2</sup>	0.10	lb/MWhe
CO <sub>2</sub> <sup>2</sup>	1,330	lb/MWhe
CH <sub>4</sub> <sup>4</sup>	1.0E-01	lb/MWhe
N <sub>2</sub> O <sup>4</sup>	2.2E-04	lb/MMBtu

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

<b>CAPSTONE C200 MICROTURBINE</b>
---------------------------------------

**CRITERIA POLLUTANT EMISSIONS**

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

**HAZARDOUS AIR POLLUTANT (HAP) POTENTIAL EMISSIONS**

Pollutant	Emission Factor (lb/MMBtu) <sup>a</sup>	Potential Emissions	
		(lb/hr) <sup>b</sup>	(tons/yr) <sup>c</sup>
<b>HAPs</b>			
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
<b>TOTAL HAP</b>		<b>0.00</b>	<b>0.01</b>

1. Emission factors from AP-42 Section 3.1, Tables 3.1-1, 3.1-2a, and 3.1-3.
2. VOC, NO<sub>x</sub>, and CO, and CO<sub>2</sub> emission factors from Table 1 and Table 5 (CO<sub>2</sub>) 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. CH<sub>4</sub> and N<sub>2</sub>O emission factors from Tables C-1 and C-2, 40 CFR 98, Subpart C.

Company Name:  
 Facility Name:  
 Project Description:

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

Produced Fluids Tanks

**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 <sub>2</sub>	0.00	0.01	E & P TANKS
CH <sub>4</sub>	0.25	1.09	E & P TANKS
GHG (CO <sub>2</sub> e)	6.22	27.25	E & P TANKS

**Notes:**

1. GHG (CO<sub>2</sub>e) is carbon dioxide equivalent, which is the summation of CO<sub>2</sub> (GWP = 1) + CH<sub>4</sub> (GWP = 25) + N<sub>2</sub>O (GWP = 298).

**E & P TANKS Emissions Data - Produced Fluids Tank:**

Pollutant	Total Emissions (Working + Breathing + Flashing)		
	lbs/hr	lbs/yr	tpy
VOC	0.93	8124.02	4.06
HAPs	0.03	263.68	0.13
CO <sub>2</sub>	0.00	11.39	0.01
CH <sub>4</sub>	0.25	2179.49	1.09

**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:**

- EPA Tanks software estimates working and breathing losses.
- 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 <sup>2</sup>	TOC Emission Factor <sup>3</sup> (kg/hr/component)	Average NG Leak Rate (lb/hr)	Max NG Leak Rate <sup>4</sup> (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 <sup>1</sup>	58	8.80E-03	1.13E+00	5.91	0.87	0.028
<b>TOTAL</b>			<b>2.2</b>	<b>11.6</b>	<b>1.72</b>	<b>0.054</b>

- 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
<b>TOTAL</b>					<b>9.43</b>	<b>0.298</b>

Density of natural gas: 0.05 lb/ft<sup>3</sup> @ STP (www.engineeringtoolbox.com)

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

Fugitive Emissions

**GHG FUGITIVE EMISSIONS**

Component	Component Count <sup>1</sup>	GHG Emission Factor <sup>2</sup> (scf/hr/component)	CH <sub>4</sub> Emissions <sup>3</sup> (tpy)	CO <sub>2</sub> Emissions <sup>3</sup> (tpy)	CO <sub>2</sub> 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
PRV's	38	4.00E-02	0.23	0.00	5.69
Low-Bleed Pneumatic Device					
Vents	0	1.39E+00	0.00	0.00	0.00
<b>TOTAL</b>			<b>0.8</b>	<b>0.00</b>	<b>21</b>

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 <sub>4</sub> Emissions <sup>1</sup> (tpy)	Potential CO <sub>2</sub> Emissions <sup>1</sup> (tpy)	Potential CO <sub>2</sub> 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 Filter 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
<b>TOTAL</b>					<b>43.1</b>	<b>0.226</b>	<b>1077</b>

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
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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%
<b>TOTAL TOC</b>		<b>98.78%</b>
<b>TOTAL VOC</b>		<b>14.75%</b>
<b>TOTAL HAP</b>		<b>0.466%</b>

\* 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	47.16	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 6318
Vapor Space Volume (cu ft)	27 0137
Vapor Density (lb/cu ft)	0 0076
Vapor Space Expansion Factor	0 1418
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 7845
Vapor Space Outage (ft)	1 5000
Tank Shell Length (ft)	8 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)	516 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 Insulation Factor (Btu/sqft day)	1 193 8670
Vapor Space Expansion Factor	
Vapor Space Expansion Factor	0 1418
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 8028
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)	
Vapor Molecular Weight (lb/lb-mole)	32 0400
Vapor Pressure at Daily Average Liquid Surface Temperature (psia)	1 3195
Annual Net Throughput (gal/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)		Total Emissions
	Working Loss	Breathing Loss	
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=1474.06, 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)	0.0076
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)	0.0076
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)	516.8667
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
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)	40.1438
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)	516.8667
Daily Min. Liquid Surface Temp (deg R)	506.8308
Daily Max. Liquid Surface Temp (deg R)	526.9028
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 (gal)	2,000.0000
Maximum Liquid Height (ft)	10.0000
Tank Diameter (ft)	6.0000
Working Loss Product Factor	1.0000
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)		Total Emissions
	Working Loss	Breathing Loss	
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=7.897, 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 8316
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 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 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 9028
Daily Ambient Temp. Range (deg R)	24 1833
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)		Total Emissions
	Working Loss	Breathing Loss	
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
<b>Total Emissions</b>	<b>1.3156</b>	<b>31.574</b>	<b>5.7622</b>
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

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Total Components	100.00	2.76e+002
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REGENERATOR OVERHEADS STREAM

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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

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COMBUSTION DEVICE OFF GAS STREAM

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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



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**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	
<b>GPA 2172-09 Calculation:</b>		
<b>Calculated Gross BTU per ft<sup>3</sup> @ 14.73 psia &amp; 60°F</b>		
Real Gas Dry BTU	1223	5533
Water Sat. Gas Base BTU	1201	5436
<b>Comments:</b> H2O Mol% : 1.740 ; Wt% : 1.565		

*Peter L. Petro*

Hydrocarbon Laboratory Manager

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



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**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 ft<sup>3</sup> @ 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

Quality Assurance:

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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
<b>GPA 2172-09 Calculation:</b>	
<b>Calculated Gross BTU per ft<sup>3</sup> @ 14.73 psia &amp; 60°F</b>	
Real Gas Dry BTU	1222.6
Water Sat. Gas Base BTU	1201.4
Relative Density Real Gas	0.6952
Compressibility Factor	0.9967

*Peter L. Petro*

Hydrocarbon Laboratory Manager

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 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

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## Application Fee