



**west virginia** department of environmental protection

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**ENGINEERING EVALUATION / FACT SHEET**

BACKGROUND INFORMATION

Application No.: R13-3339  
Plant ID No.: 085-00022  
Applicant: EQT Production Company (EQT)  
Facility Name: PEN-15 Well Pad  
Location: Pennsboro, Ritchie County  
NAICS Code: 211111 (Natural Gas Production)  
Application Type: Modification  
Received Date: September 21, 2016  
Engineer Assigned: Jerry Williams, P.E.  
Fee Amount: \$2,000.00  
Date Received: October 19, 2016  
Complete Date: November 7, 2016  
Due Date: February 5, 2017  
Applicant Ad Date: October 28, 2016  
Newspaper: *Pennsboro News*  
UTM's: Easting: 504.4 km      Northing: 4,345.8 km      Zone: 17  
Description: Addition of vapor recovery unit (VRU) and modify combustor maximum design heat input (MDHI). This permitting action will supersede and replace G70-A044B.

DESCRIPTION OF PROCESS

The following process description was taken from the permit application:

The PEN-15 well pad is an existing natural gas production facility that consists of ten (10) wells, and has two (2) modes of operation. The first operation has wells dedicated to a high pressure separator, while the second operation has wells dedicated to a high pressure separator and low pressure separators.

The incoming gas stream from underground wells passes through a sand separator, where sand, water, and residual solids are displaced and transferred to the sand separator tanks. The gas stream will then pass through a line heater to raise/maintain temperature of the stream and prevent hydrate formation. The gas then flows into a high pressure separator which separates produced fluids (water and condensate) from the gas stream. The outlet gas stream from the high pressure separator flows into the sales pipeline to be transported downstream.

For one set of wells, the liquid stream from the high pressure separator flows into one of two low pressure separators where it is heated via low pressure separator heaters rated at 1 MMBTU/hr to volatilize (flash off) lighter hydrocarbons and separate condensate from water in the combined liquid stream. The flash gas from the condensate stream is recovered by the VRU, utilizing a natural gas-fired engine to raise the pressure of the flash gas and route it back into the natural gas pipeline. The condensate is then transferred to the condensate storage tanks and produced water is transferred to the produced water tanks.

There are two (2) tank batteries at the PEN-15 well pad. The first tank battery (six (6) produced fluids tanks) supports gas wells that are dedicated to high pressure separators, and stores condensate and produced water combined. The second tank battery (three (3) condensate tanks and three (3) produced water tanks) supports gas wells that are dedicated to high and low pressure separators, and stores the condensate and produced water separately.

Once the tanks are filled, the contents are loaded into trucks for transport using vapor balanced loading. Vapors from the produced water tanks, the condensate tanks and liquid loading operations are controlled by vapor combustors.

Facility electricity is provided by thermoelectric generators.

## SITE INSPECTION

A site inspection was conducted on February 16, 2016 by Doug Hammell of the DAQ Enforcement Section. According to Mr. Hammell, the facility was operating in compliance.

Latitude: 39.26222  
Longitude: -80.95146

Directions to the facility are as follows:

*From Pennsboro, go east on Old US 50 for approximately 1 mile and turn right onto Pullman Road (Route 74). Go approximately 1.5 miles, turn left onto access road to the site.*



**ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER**

Emissions associated with this application consist of the combustion emissions from four (4) vapor combustors which control the VOC and HAP emissions from storage tanks and liquids loading operations, ten (10) line heaters, three (3) thermoelectric generators, two (2) sand separator tanks, two (2) low pressure separator heaters, one (1) VRU engine and fugitive emissions. Fugitive emissions for the facility are based on calculation methodologies presented in EPA Protocol for Equipment Leak Emission Estimates. The following table indicates which methodology was used in the emissions determination:

| <b>Emission Point ID#</b> | <b>Process Equipment</b>                   | <b>Calculation Methodology</b>                  |
|---------------------------|--|---|
| C001<br>C002              | 11.66 MMBTU/hr Vapor Combustors            | ProMax 3.2, EPA AP-42 Emission Factors          |
| C003<br>C004              | 19.22 MMBTU/hr Vapor Combustors            | ProMax 3.2, EPA AP-42 Emission Factors          |
| E007-E012<br>E019-E023    | 1.54 MMBTU/hr Line Heaters                 | EPA AP-42 Emission Factors                      |
| E012, E024-<br>E025       | 0.013 MMBTU/hr Thermoelectric Generators   | EPA AP-42 Emission Factors                      |
| E026                      | 140 bbl Sand Separator Tank                | E&P Tanks                                       |
| E029<br>E032              | 1.0 MMBTU/hr Low Pressure Separator Heater | EPA AP-42 Emission Factors                      |
| E031                      | 440 hp VRU Engine                          | Manufacturer's Data, EPA AP-42 Emission Factors |

The following table indicates the control device efficiencies that are required for this facility:

| <b>Emission Unit</b>                             | <b>Pollutant</b>           | <b>Control Device</b>                                   | <b>Control Efficiency</b> |
|--|----------------------------|---|---------------------------|
| S001-S006 (PW, Cond Tanks), S013-S018 (PF Tanks) | Volatile Organic Compounds | Vapor Combustors (C001-C004)                            | 98 %                      |
|  | Hazardous Air Pollutants   |   | 98 %                      |
| S028 (Liquid Loading)                            | Volatile Organic Compounds | Vapor Combustors (C001-C004) w/ 70% Capture (C001-C004) | 69 %                      |
|  | Hazardous Air Pollutants   |   | 69 %                      |

The total facility PTE (including fugitives) for the PEN-15 Well Pad is shown in the following table:

| <b>Pollutant</b>           | <b>G70-A044B PTE (tons/year)</b> | <b>R13-3339 PTE (tons/year)</b> | <b>PTE Change (tons/year)</b> |
|----------------------------|----------------------------------|---------------------------------|-------------------------------|
| Nitrogen Oxides            | 34.12                            | 42.38                           | 8.26                          |
| Carbon Monoxide            | 29.89                            | 33.98                           | 4.09                          |
| Volatile Organic Compounds | 41.20                            | 67.80                           | 26.60                         |
| Particulate Matter-10/2.5  | 2.58                             | 5.40                            | 2.82                          |
| Sulfur Dioxide             | 0.20                             | 0.21                            | 0.01                          |
| Total HAPs                 | 3.22                             | 4.66                            | 1.44                          |
| Carbon Dioxide Equivalent  | 40,259                           | 43,500                          | 3,241                         |

Maximum detailed controlled point source emissions were calculated by EQT and checked for accuracy by the writer and are summarized in the table on the next page.

## EQT Production Company – PEN-15 Well Pad (R13-3339)

| Emission Point ID#        | Source                      | NO <sub>x</sub> |              | CO          |              | VOC          |              | PM-10       |             | SO <sub>2</sub> |             | Total HAPs  |             | CO <sub>2e</sub> |
|---------------------------|-----------------------------|-----------------|--------------|-------------|--------------|--------------|--------------|-------------|-------------|-----------------|-------------|-------------|-------------|------------------|
|                           |                             | lb/hr           | ton/year     | lb/hr       | ton/year     | lb/hr        | ton/year     | lb/hr       | ton/year    | lb/hr           | ton/year    | lb/hr       | ton/year    | ton/year         |
| C001                      | Combustor (Tanks/Loading)   | 1.15            | 5.03         | 0.96        | 4.22         | 0.79         | 0.58         | 0.09        | 0.38        | 0.01            | 0.03        | 0.05        | 0.04        | 6009             |
| C002                      | Combustor (Tanks/Loading)   | 1.15            | 5.03         | 0.96        | 4.22         | 0.79         | 0.58         | 0.09        | 0.38        | 0.01            | 0.03        | 0.05        | 0.04        | 6009             |
| C003                      | Combustor (Tanks/Loading)   | 1.89            | 8.28         | 1.59        | 6.95         | 3.29         | 11.50        | 0.14        | 0.63        | 0.01            | 0.05        | 0.25        | 0.92        | 9951             |
| C004                      | Combustor (Tanks/Loading)   | 1.89            | 8.28         | 1.59        | 6.95         | 3.29         | 11.50        | 0.14        | 0.63        | 0.01            | 0.05        | 0.25        | 0.92        | 9951             |
| E07-E011, E019-E023       | 10 Line Heaters             | 1.50            | 6.40         | 1.20        | 5.40         | 0.10         | 0.40         | 0.12        | 0.50        | <0.01           | 0.04        | 0.03        | 0.11        | 7892             |
| E012, E024, E025          | 3 Thermoelectric Generators | <0.01           | 0.03         | <0.01       | 0.01         | <0.01        | <0.01        | <0.01       | <0.01       | <0.01           | <0.01       | <0.01       | <0.01       | 20               |
| E029, E032                | 2 LPS Heaters               | 0.20            | 0.84         | 0.16        | 0.70         | 0.01         | 0.04         | 0.01        | 0.06        | <0.01           | <0.01       | <0.01       | 0.01        | 1026             |
| E026                      | Sand Separator Storage Tank | 0               | 0            | 0           | 0            | 0.05         | 0.20         | 0           | 0           | 0               | 0           | <0.01       | 0.01        | 1                |
| E028                      | Uncaptured Liquid Loading   | 0               | 0            | 0           | 0            | 60.21        | 15.65        | 0           | 0           | 0               | 0           | 4.07        | 1.06        | 0                |
| E031                      | VRU Engine                  | 1.94            | 8.50         | 1.26        | 5.52         | 0.33         | 1.42         | 0.06        | 0.26        | <0.01           | 0.01        | 0.10        | 0.44        | 1731             |
| <b>Total Point Source</b> |                             | <b>9.67</b>     | <b>42.38</b> | <b>7.76</b> | <b>33.98</b> | <b>68.83</b> | <b>41.83</b> | <b>0.65</b> | <b>2.84</b> | <b>0.05</b>     | <b>0.21</b> | <b>4.82</b> | <b>3.56</b> | <b>42590</b>     |
| Fugitive                  | Fugitive Venting            | 0               | 0            | 0           | 0            | NA           | 25.97        | 0           | 0           | 0               | 0           | NA          | 1.10        | 910              |
| HR                        | Haulroad Emissions          | 0               | 0            | 0           | 0            | 0            | 0            | NA          | 2.56        | 0               | 0           | 0           | 0           | 0                |
| <b>Total Fugitive</b>     |                             | <b>0.00</b>     | <b>0.00</b>  | <b>0.00</b> | <b>0.00</b>  | <b>0.00</b>  | <b>25.97</b> | <b>0.00</b> | <b>2.56</b> | <b>0.00</b>     | <b>0.00</b> | <b>0.00</b> | <b>1.10</b> | <b>910</b>       |
| <b>Total Sitewide</b>     |                             | <b>9.67</b>     | <b>42.38</b> | <b>7.76</b> | <b>33.98</b> | <b>68.83</b> | <b>67.80</b> | <b>0.65</b> | <b>5.40</b> | <b>0.05</b>     | <b>0.21</b> | <b>4.82</b> | <b>4.66</b> | <b>43500</b>     |

## REGULATORY APPLICABILITY

The following rules apply to this modification:

### **45CSR2** (Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers)

The purpose of 45CSR2 is to establish emission limitations for smoke and particulate matter which are discharged from fuel burning units. 45CSR2 states that any fuel burning unit that has a heat input under ten (10) million B.T.U.'s per hour is exempt from sections 4 (weight emission standard), 5 (control of fugitive particulate matter), 6 (registration), 8 (testing, monitoring, recordkeeping, reporting) and 9 (startups, shutdowns, malfunctions). However, failure to attain acceptable air quality in parts of some urban areas may require the mandatory control of these sources at a later date.

The individual heat input of the line heaters (E007-E011), thermoelectric generators (E012, E024, E025) and low pressure separator heater (E029) are below 10 MMBTU/hr. Therefore, these units are exempt from the aforementioned sections of 45CSR2.

EQT would also be subject to the opacity requirements in 45CSR2, which is 10% opacity based on a six minute block average.

### **45CSR6** (To Prevent and Control Air Pollution from the Combustion of Refuse)

The purpose of this rule is to prevent and control air pollution from combustion of refuse.

EQT has four (4) vapor combustors at the facility. The vapor combustors are subject to section 4, emission standards for incinerators. The vapor combustors have negligible hourly particulate matter emissions. Therefore, the facility's vapor combustors should demonstrate compliance with this section. The facility will demonstrate compliance by maintaining records of the amount of natural gas consumed by the vapor combustors and the hours of operation. The facility will also monitor the flame of the vapor combustors and record any malfunctions that may cause no flame to be present during operation.

### **45CSR10** (To Prevent and Control Air Pollution from the Emissions of Sulfur Oxides)

The purpose of 45CSR10 is to establish emission limitations for sulfur dioxide which are discharged from fuel burning units. 45CSR10 states that any fuel burning unit that has a heat input under ten (10) million B.T.U.'s per hour is exempt from sections 3 (weight emission standard), 6 (registration), 7 (permits), and 8 (testing, monitoring, recordkeeping, reporting). However, failure to attain acceptable air quality in parts of some urban areas may require the mandatory control of these sources at a later date.

The individual heat input of the line heaters (E007-E011), thermoelectric generators (E012, E024, E025) and low pressure separator heater (E029) are below 10 MMBTU/hr. Therefore, these units are exempt from the aforementioned sections of 45CSR10.

**45CSR13** (Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation)

A 45CSR13 modification permit applies to this source due to the fact that EQT's modification results in an emissions increase of volatile organic compounds greater than 6 lb/hr and 10 tpy and is subject to a substantive requirement of an emission control rule (40CFR60 Subpart JJJJ).

EQT paid the appropriate application fee and published the required legal advertisement for a modification permit application.

**45CSR16** (Standards of Performance for New Stationary Sources Pursuant to 40 CFR Part 60)

45CSR16 applies to this source by reference of 40CFR60, Subparts JJJJ and OOOO. These requirements are discussed under those rules below.

**45CSR22** (Air Quality Management Fee Program)

EQT is not subject to 45CSR30. The PEN-15 Well Pad is subject to 40CFR60 Subparts JJJJ and OOOO, however they are exempt from the obligation to obtain a permit under 40 CFR part 70 or 40 CFR part 71, provided they are not required to obtain a permit for a reason other than their status as an area source.

EQT is required to pay the appropriate annual fees and keep their Certificate to Operate current.

**40CFR60 Subpart JJJJ** (Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (SI ICE))

40CFR60 Subpart JJJJ establishes emission standards for applicable SI ICE. The 440 hp Waukesha VGF-F18GL VRU engine was manufactured on December 12, 2008 and is subject to the emission standards in Table 1 for non-emergency SI natural gas-fired engines between 100 and 500 hp. The emission standards are NO<sub>x</sub> – 2.0 g/hp-hr (1.94 lb/hr); CO – 4.0 g/hp-hr (3.88 lb/hr); and VOC – 1.0 g/hp-hr (0.97 lb/hr). Based on the manufacturer's specifications for these engines, the emission standards will be met.

The 440 hp Waukesha VGF-F18GL VRU engine is not certified by the manufacturer to meet the emission standards listed in 40CFR60 Subpart JJJJ. Therefore, EQT will be required to conduct an initial performance test.

**40CFR60 Subpart OOOO** (Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution for which Construction, Modification or Reconstruction Commenced after August 23, 2011, and on or before September 18, 2015)

EPA published in the Federal Register new source performance standards (NSPS) and air toxics rules for the oil and gas sector on August 16, 2012. 40CFR60 Subpart OOOO establishes emission standards and compliance schedules for the control of volatile organic compounds (VOC) and sulfur dioxide (SO<sub>2</sub>) emissions from affected facilities that commence construction, modification or reconstruction after August 23, 2011. The following affected sources which commence construction, modification or reconstruction after August 23, 2011 are subject to the applicable provisions of this subpart: Each gas well affected facility, which is a single natural gas well.

*The PEN-15 well pad consist of ten (10) natural gas wells. The wells were constructed after the August 23, 2011 applicability date. The construction of the facility began in November 2013. Therefore, the gas wells located at the facility are subject to the requirements of this subpart.*

- a. Each centrifugal compressor affected facility, which is a single centrifugal compressor using wet seals that is located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment. For the purposes of this subpart, your centrifugal compressor is considered to have commenced construction on the date the compressor is installed (excluding relocation) at the facility. A centrifugal compressor located at a well site, or an adjacent well site and servicing more than one well site, is not an affected facility under this subpart.

*There are no centrifugal compressors at the PEN-15 Well Pad. Therefore, all requirements regarding centrifugal compressors under 40 CFR 60 Subpart OOOO would not apply.*

- b. Each reciprocating compressor affected facility, which is a single reciprocating compressor located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment. For the purposes of this subpart, your reciprocating compressor is considered to have commenced construction on the date the compressor is installed (excluding relocation) at the facility. A reciprocating compressor located at a well site, or an adjacent well site and servicing more than one well site, is not an affected facility under this subpart.

*There are reciprocating internal combustion engines located at the PEN-15 Well Pad that were constructed after August 23, 2011. However, a reciprocating compressor located at a well site, or an adjacent well site and servicing more than one well site, is not an affected facility under this subpart.*

- c. Pneumatic Controllers
  - Each pneumatic controller affected facility, which is a single continuous bleed natural gas-driven pneumatic controller operating at a natural gas

bleed rate greater than 6 scfh which commenced construction after August 23, 2011, and is located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment and not located at a natural gas processing plant.

- Each pneumatic controller affected facility, which is a single continuous bleed natural gas-driven pneumatic controller which commenced construction after August 23, 2011, and is located at a natural gas processing plant.

*All pneumatic controllers at the facility will be less than 6 scfh.*

- d. Each storage vessel affected facility, which is a single storage vessel, located in the oil and natural gas production segment, natural gas processing segment or natural gas transmission and storage segment.

40CFR60 Subpart OOOO defines a storage vessel as a unit that is constructed primarily of non-earthen materials (such as wood, concrete, steel, fiberglass, or plastic) which provides structural support and is designed to contain an accumulation of liquids or other materials. The following are not considered storage vessels:

- Vessels that are skid-mounted or permanently attached to something that is mobile (such as trucks, railcars, barges or ships), and are intended to be located at a site for less than 180 consecutive days. If the source does not keep or are not able to produce records, as required by §60.5420(c)(5)(iv), showing that the vessel has been located at a site for less than 180 consecutive days, the vessel described herein is considered to be a storage vessel since the original vessel was first located at the site.
- Process vessels such as surge control vessels, bottoms receivers or knockout vessels.
- Pressure vessels designed to operate in excess of 204.9 kilopascals and without emissions to the atmosphere.

This rule requires that the permittee determine the VOC emission rate for each storage vessel affected facility utilizing a generally accepted model or calculation methodology within 30 days of startup, and minimize emissions to the extent practicable during the 30 day period using good engineering practices. For each storage vessel affected facility that emits more than 6 tpy of VOC, the permittee must reduce VOC emissions by 95% or greater within 60 days of startup. The compliance date for applicable storage vessels is October 15, 2013.

*The storage vessels located at the PEN-15 Well Pad are controlled by vapor combustors which will reduce the potential to emit to less than 6 tpy of VOC. Therefore, EQT is not required by this section to further reduce VOC emissions by 95%.*

- e. The group of all equipment, except compressors, within a process unit is an affected facility.
- Addition or replacement of equipment for the purpose of process improvement that is accomplished without a capital expenditure shall not by itself be considered a modification under this subpart.
  - Equipment associated with a compressor station, dehydration unit, sweetening unit, underground storage vessel, field gas gathering system, or liquefied natural gas unit is covered by §§60.5400, 60.5401, 60.5402, 60.5421 and 60.5422 of this subpart if it is located at an onshore natural gas processing plant. Equipment not located at the onshore natural gas processing plant site is exempt from the provisions of §§60.5400, 60.5401, 60.5402, 60.5421 and 60.5422 of this subpart.
  - The equipment within a process unit of an affected facility located at onshore natural gas processing plants and described in paragraph (f) of this section are exempt from this subpart if they are subject to and controlled according to subparts VVa, GGG or GGGa of this part.

*The PEN-15 Well Pad is not a natural gas processing plant. Therefore, Leak Detection and Repair (LDAR) requirements for onshore natural gas processing plants would not apply.*

- f. Sweetening units located at onshore natural gas processing plants that process natural gas produced from either onshore or offshore wells.
- Each sweetening unit that processes natural gas is an affected facility; and
  - Each sweetening unit that processes natural gas followed by a sulfur recovery unit is an affected facility.
  - Facilities that have a design capacity less than 2 long tons per day (LT/D) of hydrogen sulfide (H<sub>2</sub>S) in the acid gas (expressed as sulfur) are required to comply with recordkeeping and reporting requirements specified in §60.5423(c) but are not required to comply with §§60.5405 through 60.5407 and paragraphs 60.5410(g) and 60.5415(g) of this subpart.
  - Sweetening facilities producing acid gas that is completely reinjected into oil-or-gas-bearing geologic strata or that is otherwise not released to the atmosphere are not subject to §§60.5405 through 60.5407, 60.5410(g), 60.5415(g), and 60.5423 of this subpart.

*There are no sweetening units at the PEN-15 Well Pad. Therefore, all requirements regarding sweetening units under 40 CFR 60 Subpart OOOO would not apply.*

**40CFR63 Subpart ZZZZ** (National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines)

Subpart ZZZZ establishes national emission limitations and operating limitations for HAPs emitted from stationary RICE located at major and area sources of HAP emissions. This subpart also establishes requirements to demonstrate initial and continuous compliance with the emission limitations and operating limitations. The engine (E031) at the PEN-15 Well Pad is subject to the area source requirements for non-emergency spark ignition engines.

The applicability requirements for new stationary RICEs located at an area source of HAPs, is the requirement to meet the standards of 40CFR60 Subpart JJJJ. These requirements were outlined above. The proposed engine meets these standards.

The following rules do not apply to the facility:

**45CSR14** (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollutants)

**45CSR19** (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution which Cause or Contribute to Nonattainment)

The PEN-15 Well Pad is located in Ritchie County, which is an unclassified county for all criteria pollutants, therefore the PEN-15 Well Pad is not applicable to 45CSR19.

As shown in the following table, EQT is not a major source subject to 45CSR14 or 45CSR19 review. According to 45CSR14 Section 2.43.e, fugitive emissions are not included in the major source determination because it is not listed as one of the source categories in Table 1. Therefore, the fugitive emissions are not included in the PTE below.

| <b>Pollutant</b>       | <b>PSD (45CSR14) Threshold (tpy)</b> | <b>NANSR (45CSR19) Threshold (tpy)</b> | <b>PEN-15 PTE (tpy)</b> | <b>45CSR14 or 45CSR19 Review Required?</b> |
|------------------------|--------------------------------------|--|-------------------------|--|
| Carbon Monoxide        | 250                                  | NA                                     | 33.98                   | No   |
| Nitrogen Oxides        | 250                                  | NA                                     | 42.38                   | No   |
| Sulfur Dioxide         | 250                                  | NA                                     | 0.21                    | No   |
| Particulate Matter 2.5 | 250                                  | NA                                     | 2.84                    | No   |
| Ozone (VOC)            | 250                                  | NA                                     | 41.83                   | No   |

**45CSR30** (Requirements for Operating Permits)

EQT is not subject to 45CSR30. The PEN-15 Well Pad is subject to 40CFR60 Subparts JJJJ and OOOO, however they are exempt from the obligation to obtain a permit under 40 CFR part 70 or 40 CFR part 71, provided they are not required to obtain a permit for a reason other than their status as an area source.

**40CFR60 Subpart Kb** (Standards of Performance for VOC Liquid Storage Vessels)

40CFR60 Subpart Kb does not apply to storage vessels with a capacity less than 75 cubic meters. The largest tanks that EQT has installed are 63.60 cubic meters each. Therefore, EQT would not be subject to this rule.

**40CFR60 Subpart KKK** (Standards of Performance for Equipment Leaks of VOC from Onshore Natural Gas Processing Plants)

40CFR60 Subpart KKK applies to onshore natural gas processing plants that commenced construction after January 20, 1984, and on or Before August 23, 2011. The PEN-15 Well Pad is not a natural gas processing facility, therefore, EQT is not subject to this rule.

**40CFR60 Subpart OOOOa** (Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution for which Construction, Modification or Reconstruction Commenced after September 18, 2015)

EPA published its New Source Performance Standards (NSPS) and air toxics rules for the oil and gas sector on August 16, 2012. EPA published amendments to the Subpart on September 23, 2013 and June 3, 2016. 40CFR60 Subpart OOOOa establishes emission standards and compliance schedules for the control of the pollutant greenhouse gases (GHG). The greenhouse gas standard in this subpart is in the form of a limitation on emissions of methane from affected facilities in the crude oil and natural gas source category that commence construction, modification or reconstruction after September 18, 2015. This subpart also establishes emission standards and compliance schedules for the control of volatile organic compounds (VOC) and sulfur dioxide (SO<sub>2</sub>) emissions from affected facilities that commence construction, modification or reconstruction after September 18, 2015. The effective date of this rule is August 2, 2016.

For the purposes of 60.5397a (LDAR), a “modification” to a well site occurs when a new well is drilled at an existing well site, a well at an existing well site is hydraulically fractured or refractured. This has not occurred, therefore, for the purposes of LDAR, a “modification” has not occurred.

No modifications occurred in regards to this rule.

## TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

The majority of non-criteria regulated pollutants fall under the definition of HAPs which, with some revision since, were 188 compounds identified under Section 112(b) of the Clean Air Act (CAA) as pollutants or groups of pollutants that EPA knows or suspects may cause cancer or other serious human health effects. The following HAPs are common to this industry. The following table lists each HAP's carcinogenic risk (as based on analysis provided in the Integrated Risk Information System (IRIS)):

| HAPs         | Type | Known/Suspected Carcinogen | Classification                          |
|--------------|------|----------------------------|---|
| Formaldehyde | VOC  | Yes                        | Category B1 - Probable Human Carcinogen |
| Benzene      | VOC  | Yes                        | Category A - Known Human Carcinogen     |
| Ethylbenzene | VOC  | No                         | Inadequate Data                         |
| Toluene      | VOC  | No                         | Inadequate Data                         |
| Xylenes      | VOC  | No                         | Inadequate Data                         |

All HAPs have other non-carcinogenic chronic and acute effects. These adverse health effects may be associated with a wide range of ambient concentrations and exposure times and are influenced by source-specific characteristics such as emission rates and local meteorological conditions. Health impacts are also dependent on multiple factors that affect variability in humans such as genetics, age, health status (e.g., the presence of pre-existing disease) and lifestyle. As stated previously, *there are no federal or state ambient air quality standards for these specific chemicals*. For a complete discussion of the known health effects of each compound refer to the IRIS database located at [www.epa.gov/iris](http://www.epa.gov/iris).

## AIR QUALITY IMPACT ANALYSIS

Modeling was not required of this source due to the fact that the facility is not subject to 45CSR14 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollutants) or 45CSR19 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution which Cause or Contribute to Nonattainment) as shown in the table listed in the Regulatory Discussion section under 45CSR14/45CSR19.

## SOURCE AGGREGATION

“Building, structure, facility, or installation” is defined as all the pollutant emitting activities which belong to the same industrial grouping, are located on one or more contiguous and adjacent properties, and are under the control of the same person.

The Source Determination Rule for the oil and gas industry was published in the Federal Register on June 3, 2016 and will become effective on August 2, 2016. EPA defined the term “adjacent” and stated that equipment and activities in the oil and gas sector that are under common control will be considered part of the same source if they are located on the same site or on sites that share equipment and are within ¼ mile of each other.

The PEN-15 Well Pad will operate under SIC code 1311 (Natural Gas Production). There are other well pads operated by EQT that share the same two-digit major SIC code of 13 for natural gas production.

“Contiguous or Adjacent” determinations are made on a case by case basis. There are no other equipment and activities in the oil and gas sector that are under common control of EQT that are located on the same site or on sites that share equipment and are within ¼ mile of each other.

The PEN-15 Well Pad is not located on contiguous or adjacent properties with other facilities under common control, therefore, the emissions from this facility shall not be aggregated with other facilities for the purposes of making Title V and PSD determinations.

## MONITORING OF OPERATIONS

EQT will be required to perform the following monitoring:

- Monitor and record quantity of natural gas consumed for the engine and combustion sources.
- Monitor all applicable requirements of 40CFR60 Subparts JJJJ, OOOO, and 40CFR63 Subpart ZZZZ.
- Monitor the presence of the vapor combustor pilot flames with a thermocouple or equivalent.

EQT will be required to perform the following recordkeeping:

- Maintain records of the hours of operation for the engine.
- Maintain records of the amount of natural gas consumed and hours of operation for the vapor combustors.
- Maintain records of testing conducted in accordance with the permit. Said records shall be maintained on-site or in a readily accessible off-site location
- Maintain the corresponding records specified by the on-going monitoring requirements of and testing requirements of the permit.
- Maintain records of the visible emission opacity tests conducted per the permit.
- Maintain a record of all potential to emit (PTE) HAP calculations for the entire facility. These records shall include the natural gas compressor engines and ancillary equipment.

- Maintain records of all applicable requirements of 40CFR60 Subparts JJJJ and OOOO and 40CFR63 Subpart ZZZZ.
- Maintain records of the vapor combustors design evaluation.
- The records shall be maintained on site or in a readily available off-site location maintained by EQT for a period of five (5) years.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates that EQT meets all the requirements of applicable regulations. Therefore, impact on the surrounding area should be minimized and it is recommended that the PEN-15 Well Pad should be granted a 45CSR13 modification permit for their facility.

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Jerry Williams, P.E.  
Engineer

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Date