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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.: R13-3042
Plant ID No.: 097-00055
Applicant: Equitable Production Company
Facility Name: Moss Station
Location: Upshur County
NAICS Code: 211111
Application Type: Modification - Replace and supersede G30-A070
Received Date: February 4, 2013
Engineer Assigned: Steven R. Pursley, PE
Fee Amount: \$2,000.00
Date Received: February 15, 2013
Complete Date: March 6, 2013
Due Date: June 4, 2013
Applicant Ad Date: February 4, 2013
Newspaper: *The Record Delta*
UTM's: Easting: 576.692 km Northing: 4,305.193 km Zone: 17
Description: Construction and operation of support facilities associated with a natural gas production wellpad.

DESCRIPTION OF PROCESS

The Moss wellpad consists of a single conventional well with multiple wells feeding it, a compressor and miscellaneous storage tanks. The incoming gas stream from nearby wells is gathered into pipelines that extend out into the production field. The gas enters the site on the suction lines where particulates and free fluids are removed by a suction scrubber. The gas from the wells will then enter the natural gas compressor to increase pipeline pressure to the required level. The gas may then enter a filter and solid desiccant bed to strip oil and free fluids and moisture from the gas. The gas stream is regulated and measured via an orifice meter prior to entry to the gathering pipeline.

SITE INSPECTION

A site inspection of the facility was performed by the writer on March 20, 2013. To get to the well pad from Charleston take I-79 to exit 99 and proceed east on US 33 for approximately 15.miles. Turn right on Kesling Mill Road/Co. Rt. 3 and go approximately 0.1 miles until it dead ends at Co. Rt. 151. Next, turn left and proceed approximately 8.4 miles. Then veer right onto Co. Rt. 28. Go approximately 2.4 miles and turn left (and cross a bridge) on Co. Rt. 28/1. Go approximately 0.2 miles and the access road is on the right. Follow the access road approximately 100 yards to the gated facility. GPS coordinates take at the site were 38° 53.665' N, 80° 6.939' W.

The following are pictures of the Moss Station taken on the day of the inspection:



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ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

EQT included in Attachment N of the permit application air emissions calculations for the equipment and processes at the Moss Station. The following will summarize the calculation methodologies used by EQT to calculate the potential-to-emit (PTE) of the proposed facility.

Compressor Engine

NO_x, CO and VOC emissions were based on manufacturer provided emission factors. SO₂, PM and all HAP emissions were based on AP-42 emission factors. All annual

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emissions were based on 8,760 hours per year of operation.

Storage Tanks

Working and breathing emissions from the single 4,200 gallon produced fluid storage tanks were based on the TANKS 4.09d program as provided under AP-42, Section 7. Input and summary sheets for the program was included in the permit application. An aggregate annual throughput of 8,400 gallons of liquid was used in the calculations for the storage tanks. These numbers are based on maximum historic data. Because these wells are lower pressure, conventional wells, flash emissions were considered “negligible” by the applicant and calculations were not submitted. However, calculations performed by the writer using a spreadsheet based on the Vasquez Beggs equation showed potential VOC emissions from flashing of 0.08 tons per year. Therefore, the tables below reflect those emissions.

Fugitives

Equitable based their fugitive equipment leak calculations on emission factors taken from the document EPA-453/R-95-017 - “Protocol for Equipment Leak Emission Estimates.” Emission factors were taken from Table 2-4 and no control efficiency, as based on a Leak Detection and Repair (LDAR) protocol, was applied.

Truck Loading

Given the low throughput, truck loading emissions are considered negligible. The applicant estimated 1 pound of VOCs per year. The writer, using equation (1) of AP-42 Section 5.2, estimated 0.6 pounds of VOCs per year.

Emissions Summary

Based on the above estimation methodology, which is determined to be appropriate, the PTE of the Moss Station is given in the following table:

Hourly Emissions (lb/hr)

	Compressor Engine	Fugitives	Tanks	Total
PM/PM ₁₀ /PM _{2.5}	0.02	--	--	0.02
SO ₂	0.01	--	--	0.01
CO	0.64	--	--	0.64
NO _x	0.32	--	--	0.32
VOC	0.06	0.66	0.02	0.72
Formaldehyde	0.03	--	--	0.03
Benzene	0.01	--	--	0.01

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Acetaldehyde	0.01	--	--	0.01
Acrolein	0.01	--	--	0.01
Methanol	0.01	--	--	0.01
Total HAPs	0.05	--	--	0.05

Annual Emissions (tons per year)

	Compressor Engine	Fugitives	Tanks	Total
PM/PM ₁₀ /PM _{2.5}	0.10	--	--	0.10
SO ₂	0.01	--	--	0.01
CO	2.80	--	--	2.80
NO _x	1.40	--	--	1.40
VOC	0.28	2.87	0.09	3.24
Formaldehyde	0.11	--	--	0.11
Benzene	0.01	--	--	0.01
Acetaldehyde	0.02	--	--	0.02
Acrolein	0.02	--	--	0.02
Methanol	0.02	--	--	0.02
Total HAPs	0.17	--	--	0.16

REGULATORY APPLICABILITY

The Moss Station is subject to the following substantive state and federal air quality rules and regulations: 45CSR13, and 40 CFR 60 Subpart OOOO, 40 CFR 60 Subpart JJJJ. Each applicable rule (and those that have questionable non-applicability) and Equitable compliance therewith will be discussed in detail below.

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*

Since the Moss Station is subject to substantive requirements of a federal rule (see below) it is subject to 45CSR13.

As required under §45-13-8.3 (“Notice Level A”), Equitable placed a Class I legal advertisement in a “newspaper of general circulation in the area where the source is . . . located.” The ad ran on February 4, 2013 in *The Record Delta* and the affidavit of publication for this legal advertisement was submitted on February 14, 2013.

45CSR22 *Air Quality Management Fee Program*

As shown below (45CSR30 non-applicability), the facility is not subject to 45CSR 30 and, therefore, will pay its annual fees through the Rule 22 program.

40 CFR 60 Subpart JJJJ: *Standards of Performance for Stationary Spark Ignition Internal Combustion Engines*

The compressor engine is a natural gas fired, spark ignition, rich burn, non emergency engine manufactured after January 1, 2011. Therefore, per §60.4233(e), the engine must meet the emission requirements in Table 1 of the rule. Said limits are listed in the table below:

NO _x		CO		VOC	
g/HP-hr	ppm _{vd} @15% O ₂	g/HP-hr	ppm _{vd} @15% O ₂	g/HP-hr	ppm _{vd} @15% O ₂
2.0	160	4.0	540	1.0	86

Compliance with the above limits can be demonstrated by purchasing a “certified” engine in accordance with §60.4243(b)(1) or by emissions testing and following maintenance requirements per §60.4243(b)(2). The applicant has indicated that they intend to comply with the performance testing and maintenance requirements of the rule.

40 CFR 60, Subpart OOOO *Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution*

Subpart OOOO applies to facilities that commence construction, reconstruction, or modification after August 23, 2011 (October 15, 2012 for well completions performed after hydraulic refracturing).

The following affected sources which commence construction, modification or reconstruction after the effective date are subject to the applicable provisions of this subpart:

Gas Wells

Each gas well affected facility, which is a single natural gas well.

The gas wells serviced by the Moss site were drilled before August 23, 2011. Therefore, no requirements of 40 CFR 60 Subpart OOOO would apply.

Centrifugal Compressors

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 Moss Facility. Therefore, all requirements regarding centrifugal compressors under 40 CFR 60 Subpart OOOO would not apply.

Reciprocating Compressors

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 is one (1) reciprocating internal combustion engine located at the facility. However it was constructed before the applicability date.

Pneumatic Controllers

Pursuant to §60.5365(d)(2), “[f]or the natural gas production segment (between the wellhead and the point of custody transfer to the natural gas transmission and storage segment and not including natural gas processing plants), 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” that is constructed after August 23, 2011 is subject to the applicable provisions of Subpart OOOO. The substantive requirements for pneumatic controllers are given under §60.5390.

The applicant has indicated that they will comply with the bleed rate for controllers subject to the rule.

Storage Vessels

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 nonearthen 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 vessel located at the Moss Station was constructed before August 23, 2011. Specifically, it was installed in November of 2004. Therefore it is not subject to the rule.

Group of all Equipment, except Compressors.

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 Moss Station is not a natural gas processing plant. Therefore, Leak Detection and Repair (LDAR) requirements for onshore natural gas processing plants would not apply.

Sweetening Units

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 (H₂S) 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 Moss Station. Therefore, all requirements regarding sweetening units under 40 CFR 60 Subpart OOOO would not apply.

Non Applicability and Non Delegation

45CSR2: To Prevent and Control Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers (non applicability)

Pursuant to the definition of “fuel burning unit” under 45CSR2 (“producing heat or power by indirect heat transfer”), 45CSR2 does not apply to the compressor engines.

45CSR10: To Prevent and Control Air Pollution from the Emission of Sulfur Oxides (non applicability)

Pursuant to the definition of “fuel burning unit” under 45CSR10 (“producing heat or power by indirect heat transfer”), the limitations on fuel burning units under 45CSR10 do not apply to the compressor engine.

45CSR30: Requirements for Operating Permits (non applicability)

45CSR30 provides for the establishment of a comprehensive air quality permitting system consistent with the requirements of Title V of the Clean Air Act. The proposed facility does not meet the definition of a "major source under § 112 of the Clean Air Act" as outlined under §45-30-2.26 and clarified (fugitive policy) under 45CSR30b. However, as the facility is subject to New Source Performance Standards (NSPS) - 40 CFR 60, Subpart OOOO and 40 CFR 60 Subpart JJJJ- the facility would, in most cases, be subject to Title V as a “deferred source.” However, pursuant to §60.5370(c) and §60.4230(c), as a non-major source, Equitable is not required to obtain a Title V permit for the proposed facility. Therefore, the Moss station is not subject to 45CSR30.

40 CFR 63 Subpart HH: National Emission Standards for Hazardous Air Pollutants from Oil and Natural Gas Production Facilities- (non-delegation)

The Alton facility is a minor (or area) source of HAPs. Subpart HH contains requirements for both area and major sources, however, WVDAQ has not been delegated authority from USEPA to enforce the area source requirements of this rule. Therefore, unless otherwise stated, DAQ did not formally determine whether the permittee is subject to an area source air toxics standard requiring Generally Achievable Control Technology (GACT) promulgated after January 1, 2007 pursuant to 40 CFR 63, including the area source air toxics provisions of 40 CFR 63, Subpart HH.

40 CFR 63 Subpart ZZZZ: Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (non-delegation)

The compressor engine appears to be subject to the area source requirements of 40 CFR 63, Subpart ZZZZ. However, the DAQ has not been delegated authority from USEPA to enforce the area source requirements of this rule. Therefore, unless otherwise stated, DAQ did not formally determine whether the permittee is subject to an area source air toxics standard requiring Generally Achievable Control Technology (GACT) promulgated after January 1, 2007 pursuant to 40 CFR 63, including the area source air toxics provisions of 40 CFR 63, Subpart ZZZZ.

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. Equitable included the following HAPs as emitted in substantive amounts (at least 0.01 lb/hr or 0.01 tpy (rounded up)) in their emissions estimate: Acetaldehyde, Acrolein, Benzene, Methanol, and Formaldehyde. 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
Acetaldehyde	VOC	Yes	Category B2 - Probable Human Carcinogen
Acrolein	VOC	No	Inadequate Data
Methanol	VOC	No	No Information

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.

AIR QUALITY IMPACT ANALYSIS

Since the facility will be a minor source as defined in 45CSR14, no modeling was performed.

MONITORING OF OPERATIONS

The following substantive monitoring, compliance demonstration, and record-keeping requirements (MRR) shall be required:

- * For the purposes of demonstrating compliance with maximum limit for the aggregate production of condensate/liquids from the wells set forth in 4.1.2 of the draft permit, Equitable shall be required to monitor and record the monthly and rolling twelve month total of condensate/liquids (in gallons) produced in the wells. Monitoring and recording the monthly and rolling twelve month total of condensate/liquids (in gallons) unloaded from the storage tanks can be used to show compliance with this requirement.
- * Per §60.4243(b)(2)(i) for the compressor engine, the permittee will have to “keep a maintenance plan and records of conducted maintenance and must...”

The permittee shall perform the following tests:

- * Testing to determine the emission rates of NO_x, CO and VOCs from the compressor engine per §60.4244.
- * Within sixty (60) days of the issuance date of this permit, Equitable shall be required to perform, or have performed, a site-specific analysis to determine the constituent properties of the condensate/produced-water. The analysis shall, at a minimum, include the same components as the analysis used to calculate storage tank emissions in Permit Application R13-3042. The sample shall be taken from the pressurized liquid stream, aqueous and organic, coming from the last separator that feeds the storage tank. Where applicable, if the analysis shows average constituent properties that, when used to calculate emissions in the same manner as submitted in Permit Application R13-3042, result in emissions greater than the limits in 4.1.4. of the draft permit, Equitable shall be required to, within thirty (30) days of receiving the results of the analysis, submit to the Director an appropriate permit application.

RECOMMENDATION TO DIRECTOR

Information supplied in the application indicates that compliance with all applicable regulations will be achieved. Therefore it is the recommendation of the writer that permit R13-3042 for the modification of the Moss Station near, Ellamore, Upshur County, be granted to Equitable Production Company.

Steven R. Pursley, PE
Engineer

May 21, 2013

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