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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-3220
Plant ID No.:	019-00113
Applicant:	EQT Gathering, LLC
Facility Name:	Armstrong Creek Station
Location:	Powellton, Fayette County
NAICS Code:	211111
SIC Code:	1311
Application Type:	Construction
Received Date:	August 25, 2014
Engineer Assigned:	Laura Jennings
Fee Amount:	$3,000
Date Received:	September 5, 2014
Complete Date:	December 2, 2014
Applicant Ad Date:	November 12, 2014
Newspaper:	*Beckley Newspapers*
UTM's:	Easting: 472.84 km Northing: 4,214.26 km Zone: 17
Lat/Long:	Latitude: 38.07576 Longitude: -81.30961
Description:	After the fact application for a natural gas compressor station that started-up in its current location in 2009. This application was originally submitted as a G70-A registration application; however, was converted to an R13 permit application because the facility is not a production facility located at the well pad.

DESCRIPTION OF PROCESS

Introduction:
EQT submitted an after-the-fact permit application for the Armstrong Creek Compressor Station located in Powelton, Fayette County. Operations at the Armstrong Creek Compressor Station originally began in 2009.

Facility Description:
Natural gas produced from surrounding gas wells is routed to the Armstrong Creek Compressor

Station. The pipeline gas suction line feeds into a separator that separates natural gas from produced liquids. Natural gas is then compressed to a higher pressure and discharged downstream into the sales line. Produced liquids are temporarily stored in produced fluids tanks located on-site.

The following equipment is located at Armstrong Creek Compressor Station:

- One (1) two-phase separator;
- One (1) natural gas fueled internal combustion engine (CAT 3306A) with a design capacity of 203 brake horsepower. 1993 (Original Build); 2008 (Overhaul, < 50% of cost)
- One (1) 1,000 gallon lube oil tank;
- One (1) 500 gallon methanol tank;
- One (1) 500 gallon used oil tank;
- One (1) 500 gallon produced fluids tank; and
- Two (2) 1,000 gallon produced fluids tanks

Process Description:
Natural gas is produced from surrounding gas wells and routed to this central compressor station. The pipeline gas suction line feeds into a separator [SEP-100] that removes the produced liquids from the natural gas. Natural gas is then compressed to a higher pressure and discharged downstream into the sales line. The natural gas fueled internal combustion engine [CAT-001] that is present at the compressor station is a CAT 3306TA natural gas fueled internal combustion engine with a design capacity of 203 brake horsepower. Produced liquids are temporarily stored in one of the three produced fluids tanks [PFT 002-004] until they can be removed off-site by tank truck.

Emission Units Table:

Emission Unit ID	Emission point ID	Emission Unit Description	Year Installed / Modified	Design Capacity	Type and Date of Change	Control Device
CAT-001	CAT-001	Caterpillar 3306TA	2009	203 hp@ 1800 rpm	1993 / 2008 (Overhaul)	None
PFT-002	PFT-002	Produced Fluids Tank 002	2009	520 gallon	n/a	n/a
PFT-003	PFT-003	Produced Fluids Tank 003	2009	1,000 gallon	n/a	n/a
PFT-004	PFT-004	Produced Fluids Tank 004	2009	1,000 gallon	n/a	n/a
MT-005	MT-005	Methanol Tank 005	2009	500 gallon	n/a	n/a
LOT-006	LOT-006	Lube Oil Tank 006	2009	1,000 gallon	n/a	n/a
UOT-007	UOT-007	Used Oil Tank 007	2009	500 gallon	n/a	n/a
LR-1	LR-1	Tank Truck Loading Area	2009	30,000 gal/yr	n/a	n/a

SITE INSPECTION

A site inspection was conducted by James Jarrett of DAQ's Compliance and Enforcement Section on March 18, 2014. At the time of the inspection, it was found that a Caterpillar G3306TA compressor engine was operating without a permit. NO_X emissions were above the

threshold for which an air permit is required under 45CSR13.

Directions to the facility: From the town of Powelton, WV travel south on Co. Route 6/61 for 1.83 miles. The Armstrong Creek Compressor Station is located on the left.

SOURCE AGGREGATION

According to DAQ's AIRTRAX data base, this is the only facility owned and operated by EQT Gathering that is located in Fayette County, WV. This source does not meet the criteria required to aggregate sources for the purposes of determining major source status.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

The following table indicates which methodology was used in the emissions determination. All emission calculations were reviewed and verified by the writer.

Calculation Methodology Table:

Emission Unit ID#	**Process Equipment**	**Calculation Methodology**
CAT-001	Caterpillar 3306 TA; 203 hp RB4S engine	Vendor Guarantee for NO_X, CO, VOC, and Formaldehyde. AP-42 emission factors (Chapter 3.2) for SO_2 and $PM_{10.}$ 40 CFR98, Subpart W for CO_2e.
PFT-002	Produced Fluids Tank 002	E&P Tanks
PFT-003	Produced Fluids Tank 003	E&P Tanks
PFT-004	Produced Fluids Tank 004	E&P Tanks
MT-005	Methanol Tank 005	Tanks 4.09d
LOT-006	Lube Oil Tank 006	Tanks 4.09d
UOT-007	Used Oil Tank 007	Tanks 4.09d
LR-1	Tank Truck Loading Area	AP-42, Equation 5.2-4
Fugitive Emissions	Equipment Leaks	40 CFR98, Subpart W for component counts and emission rates.

EQT Gathering LLC – Armstrong Creek Station
Controlled Potential Emissions

Emission Unit ID	Description	NO_X		CO		VOC		$PM_{10}/_{2.5}$		SO_2		Total HAP		CO_2e
		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	tpy
CAT-001	Caterpillar 3306TA	10.19	44.62	0.57	2.51	0.05	0.22	0.01	0.06	<0.01	<0.01	0.23	1.02	1,012
PFT-002	Produced Fluids Tank 002	n/a	n/a	n/a	n/a	0.04	0.18	n/a	n/a	n/a	n/a	<0.01	0.01	0.54
PFT-003	Produced Fluids Tank 003	n/a	n/a	n/a	n/a	0.04	0.18	n/a	n/a	n/a	n/a	<0.01	0.01	0.54
PFT-004	Produced Fluids Tank 004	n/a	n/a	n/a	n/a	0.04	0.18	n/a	n/a	n/a	n/a	<0.01	0.01	0.54
MT-005	Methanol Tank 005	n/a	n/a	n/a	n/a	<0.01	0.01	n/a	n/a	n/a	n/a	<0.01	0.01	0.01
LOT-006	Lube Oil Tank 006	n/a	n/a	n/a	n/a	<0.01	<0.01	n/a	n/a	n/a	n/a	<0.01	<0.01	<0.01
UOT-007	Used Oil Tank 007	n/a	n/a	n/a	n/a	<0.01	<0.01	n/a	n/a	n/a	n/a	<0.01	<0.01	<0.01
LR-1	Tank Truck Loading Area	n/a	n/a	n/a	n/a	8.10	0.20	n/a	n/a	n/a	n/a	2.72	0.07	0.27
Fugitive Emissions	Equipment Leaks	n/a	n/a	n/a	n/a	0.01	0.02	n/a	n/a	n/a	n/a	<0.01	<0.01	1.80

Facility PTE Emissions Table (including fugitives):

Pollutant	TPY
NO_X	44.62
CO	2.51
VOCs	0.99
$PM_{10}/_{2.5}$	0.06
SO_2	<0.01
Formaldehyde	1.01
Total HAPs	1.13
CO_2e	1,015

REGULATORY APPLICABILITY

Applicable State Regulations:

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)

Potential emissions associated with the proposed project are greater than the minor source construction permit thresholds of 6 pounds per hour (pph) AND 10 tons per year (tpy) of any regulated air pollutant; OR 144 pounds per day (ppd) of any regulated air pollutant; OR 2 pph OR 5 tpy of aggregated hazardous air pollutants OR 45 CSR27 toxic air pollutant; OR subject to applicable substantive rule. The applicant has demonstrated compliance with 45CSR13 by submitting this permit application.

EQT has published the required Class I legal advertisement notifying the public of their permit application, and submitted a complete permit application.

45CSR22 (Air Quality Management Fee Program)

This facility will be required to maintain a valid Certificate to Operate on the premises.

45CSR34 (Emission Standards for Hazardous Air Pollutants)

The applicant is subject because they are subject to 40 CFR 63, Subpart ZZZZ.

Applicable Federal Regulations*:*

40 CFR 63, Subpart ZZZZ (National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines)

Subpart ZZZZ establishes national emission limitations and operating limitations for hazardous air pollutants (HAP) emitted from stationary reciprocating internal combustion engines (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 CAT3306 RICE is subject to these requirements. The engine was originally manufactured in 1993 and although the engine was overhauled in 2008, the cost of the maintenance was less than 50% of the fixed capital costs; therefore, it does not meet the definition of reconstruction. As such, the engine is subject to the existing area source requirements.

Existing stationary SI RICE located at an area source of HAP emissions must comply with the applicable emission limitations, operating limitations, and other requirements no later than October 19, 2013. (§63.6595)

The CAT3306 RICE is subject to § 63.6603 (a) and described below.

> *(a) If you own or operate an existing stationary RICE located at an area source of HAP emissions, you must comply with the requirements in Table 2d to this subpart and the operating limitations in Table 2b to this subpart that apply to you.*

The requirements in Table 2d for existing stationary RICE that apply to the applicant are provided in item #10 for non-emergency, non-black start 4SRB stationary RICE $\leq$ 500 HP located at area sources of HAP emissions and include:

a. Change oil and filter every 1,440 hours of operation or annually, whichever comes first;
b. Inspect spark plugs every 1,440 hours of operation or annually, whichever comes first, and replace as necessary; and
c. Inspect all hoses and belts every 1,440 hours of operation or annually, whichever comes first, and replace as necessary.

There are no requirements in Table 2b that apply to existing SI engines < 500 HP.

The applicant is also subject to continuous compliance, notification, and recordkeeping requirements.

Non-applicability determinations:

The following state and federal rules and regulations have been reviewed for applicability based on the information provided in the application and were found to be not applicable for EQT's Armstrong Creek Compressor Station.

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

According to the application, there are no indirect heat exchangers at this facility.

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

According to the application, there are no indirect heat exchangers at this facility.

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

The facility is not subject to NSPS standards; therefore, they are not subject to this rule.

45CSR30 (Requirements for Operating Permits)

The applicant is not subject because they do not meet the definition of a major source. The applicant is subject to 40 CFR 63, Subpart ZZZZ; however, they are exempt from the obligation to obtain a permit under 40 CFR Part 70 or 71 unless they are otherwise required to do so for a reason other than their status as an area source.

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

The CAT3306 RICE is not subject to these requirements. The engine was originally manufactured in 1993 and although the engine was overhauled in 2008 the cost of the maintenance was less than 50% of a new engine and does not meet the definition of a reconstructed engine (see below). The applicant stated that the overhaul does not meet the definition of a modification (see below). Based on the date of manufacture of the engine, it does not meet the applicability requirements of § 60.4230.

Date of manufacture means one of the following things:

(1) For freshly manufactured engines and modified engines, date of manufacture means the date the engine is originally produced.

(2) For reconstructed engines, date of manufacture means the date the engine was originally produced, except as specified in paragraph (3) of this definition.

(3) Reconstructed engines are assigned a new date of manufacture if the fixed capital cost of the new and refurbished components exceeds 75 percent of the fixed capital cost of a comparable entirely new facility. An engine that is produced from a previously used engine block does not retain the date of manufacture of the engine in which the engine block was previously used if the engine is produced using all new components except for the engine block. In these cases, the date of manufacture is the date of reconstruction or the date the new engine is produced.

Modification means any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted into the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) into the atmosphere not previously emitted.

40CFR60 Subpart OOOO (Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution)

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_2) emissions from affected facilities that commence construction, modification or reconstruction after August 23, 2011.

Operations at the Armstrong Creek Compressor Station originally began in 2009 and therefore, the facility is not subject to this subpart.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

Formaldehyde is emitted from the combustion of the natural gas fueled engine. A summary is provided below.

Formaldehyde is used mainly to produce resins used in particle board products and as an intermediate in the synthesis of other chemicals. Exposure to formaldehyde may occur by breathing contaminated indoor air, tobacco smoke, or ambient urban air. Acute (short-term) and chronic (long-term) inhalation exposure to formaldehyde in humans can result in respiratory symptoms, and eye, nose, and throat irritation. Limited human studies have reported an association between formaldehyde exposure and lung and nasopharyngeal cancer. Animal inhalation studies have reported an increased incidence of nasal squamous cell cancer. EPA considers formaldehyde a probable human carcinogen (Group B1).

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) as seen in the table listed in the Regulatory Discussion Section.

MONITORING OF OPERATIONS

Listed below are the monitoring, recordkeeping, and notification for the Armstrong Compressor Station:

- Records as required by § 63.6655(d) and (e)
- Operate and maintain the stationary RICE according to manufacturer's emission-related operation and maintenance instruction; or develop and follow applicant's own maintenance plan (#9 of Table 6 per § 63.6640)
- Notifications as required by §§ 63.6645(a)(2) and (f)
- Tank truck throughput records

RECOMMENDATION TO DIRECTOR

Permit R13-3220 is recommended for EQT Gathering, LLC for their Armstrong Creek Compressor Station (019-00113) located in Fayette County, WV. Based on the information provided in the application and including all supplemental information received, the applicant should meet all applicable state and federal air regulations by demonstrating compliance with the permit requirements.

_____
Laura Jennings
Permit Engineer

_____
Date