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**west virginia department of environmental protection**

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Division of Air Quality  
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**M E M O R A N D U M**

To: Bev McKeone, NSR Program Manager

From: Caraline Griffith, Engineer Trainee

Date: August 5, 2015

Subject: PD15-056, Radius Energy Service, LLC

On July 23, 2015, DAQ received a permit determination request from Radius Energy Service, LLC to request the installation of two (2) 35 hp wellhead compressors at the Penn 2G well where gas production is anticipated to be about 280 mcf/d.

Process Description

A pumping unit on a coalbed methane well is used to remove water from the well. The water is piped to a produced water storage tank. Once water is pumped from the well, coalbed methane gas is produced from the formation. The coalbed methane gas flows from the well to the adjacent compressor facility via a short pipeline. The gas goes through an inlet separator of the compressor where free liquids (water) are dropped out of suspension. When liquid accumulates in the inlet separator, it is sent to the compressor condensate storage tank. After the inlet separator, the gas stream is compressed to a higher pressure in a single stage screw compressor. Upon leaving the compressor, the gas stream passes through a desiccant dryer where both free liquid water and water vapor are removed. When discharge liquids accumulate, they too are sent to the condensate tank. The compressed gas stream exits the compressor facility via pipeline.

There are two compressors operating in parallel, each powered by a 35 hp Dorman (British) NA 4SRB natural gas fired engine (CE-1 and CE-2). The pumping unit is powered by a 9.5 hp Kohler NA 4SRB natural gas fired engine (PE-1). A 210 bbl tank (T2) is used to store the coalbed produced water. A 50 bbl tank (T1) is used to store the compressor condensate. Liquid from

45CSR13 defines the term “stationary source” as any building, structure, facility, installation, or emission unit or combination thereof that discharges or has the potential to discharge more than six (6) pounds per hour and ten (10) tons per year, or has the potential to

discharge more than 144 pounds per calendar day, of any regulated air pollutant and more than two (2) pounds per hour or five (5) tons per year of hazardous air pollutants considered on an aggregated basis. The two (2) proposed 35 hp compressors (CE-1 and CE-2) with the one (1) aggregated 9.5 hp de-watering rod pump (PE-1) do not exceed these emission limits.

According to NSPS Subpart OOOO: 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, the 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. The reciprocating compressor engines located at this natural gas well are not subject to NSPS Subpart OOOO because they are located on site.

Also, according to NSPS Subpart OOOO: Each gas well affected facility, which is a single natural gas well. The gas well proposed at the Fanrock Facility was drilled principally for the production of natural gas and was done so after August 23, 2011. Therefore, this well would be considered an affected facility under this subpart. Radius Energy Service, LLC is required under §60.5410(a) to submit an initial notification, initial annual report, maintain a log of records for each well completion, and maintain records of location and method of compliance. §60.5420 requires Radius Energy Service, LLC demonstrate continuous compliance by submitting reports and maintaining records for each completion operation.

According to 40CFR60 Subpart JJJJ, CE-1 and CE-2 are not subject because they were manufactured before July 1, 2008 and are less than 500 hp. The PE-1 Kohler compressor engine, however, was manufactured on July 18, 2013 and is a non-certified engine. Owners and operators of stationary SI ICE with a maximum engine power less than or equal to 19 KW (25 HP) manufactured on or after July 1, 2008, must comply with the emission standards in §60.4231(a) for their stationary SI ICE. However, since this engine is below 25 hp it is not subject to Subpart JJJJ.

The potential emissions, attached, are below threshold limits and no substantial requirements were triggered. Therefore, in this case, this facility does not require an air permit.



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**Table 1: Estimated PTE from Calculations for CE-1**

Regulated Pollutants	Total Emissions	
	lb/hr	TPY
PM10	0.01	0.05
VOC	0.01	0.05
CO	1.10	4.82
SO2	0	0
NOx	0.67	2.94
Formaldehyde	0.01	0.05

**Table 2: Estimated PTE from Calculations for CE-2**

Regulated Pollutants	Total Emissions	
	lb/hr	TPY
PM10	0.01	0.05
VOC	0.01	0.05
CO	1.10	4.82
SO2	0	0
NOx	0.67	2.94
Formaldehyde	0.01	0.05

**Table 3: Estimated PTE from Calculations for PE-1**

Regulated Pollutants	Total Emissions	
	lb/hr	TPY
PM10	<0.01	0.01



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VOC	<0.01	0.01
CO	0.30	1.32
SO2	0	0
NOx	0.18	0.80
Formaldehyde	<0.01	0.01

**Table 4: Facility Wide Estimated PTE from Calculations**

Regulated Pollutants	Total Emissions	
	lb/hr	TPY
PM10	0.02	0.07
VOC	0.02	0.09
CO	2.50	10.93
SO2	0	0
NOx	1.52	6.66
Formaldehyde	0.02	0.07