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west virginia department of environmental protection

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Division of Air Quality  
601 57<sup>th</sup> Street, SE  
Charleston, WV 25304-2345  
Phone: 304 926 0475 • Fax: 304 926 0479

Earl Ray Tomblin, Governor  
Randy C. Huffman, Cabinet Secretary  
[www.dep.wv.gov](http://www.dep.wv.gov)

## ENGINEERING EVALUATION/FACT SHEET

### B BACKGROUND INFORMATION

Application No.:	R13-3030
Plant ID No.:	081-00191
Applicant:	CNX Gas Company, LLC
Facility Name:	Rowland 303B Compressor Station
Location:	Dameron
NAICS Code:	211111
Application Type:	Modification
Received Date:	November 19, 2012
Engineer Assigned:	Edward S. Andrews, P.E.
Fee Amount:	\$2000.00
Fee Deposit Date:	December 18, 2012
Complete Date:	February 28, 2013
Due Date:	April 17, 2013
Applicant Ad Date:	December 21, 2012
Newspaper:	<i>The Register-Herald</i>
UTM's:	Easting: 468.5 km      Northing: 4,191.9 km      Zone: 17
Description:	The application is for a replacement compressor engine.

### FINDING OF FACT

The Rowland Station is a compressor station that supports a coal-bed methane production pipeline system. Currently, the station has one compressor engine Caterpillar G342NA that compresses wet coal-bed methane to a higher pressure, which allows the gas to be transported further down the pipeline system.

This station uses two gas separators (one just upstream and one downstream of the compressor) to allow liquids to condense out of the gas stream. No other gas processing is conducted at this station.

A gas fired (coal bed methane) generator set (Generac QT060) is used to provide electric power to the site on a continuous basis. The General Permit Registration G30-D115A covers the

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Caterpillar G342NA compressor set, Waulesha F1197G (never installed) and an Olympia generator set equipped with a Ford 96 bhp engine. The proposed Olympia generator set under G30-D115A was never installed either. A Generac QT 060 generator set was installed in 2007, which has a 94 bhp engine.

General Permit G30-D does not cover the operation of non-emergency generators at a compressor station. The difference between specific engines for the generator sets caused exceedances with the CO limits in the General Permit Registration G30-D115A, which was noticed during a compliance inspection conducted on May 24, 2012. CNX Gas proactively filed this permit modification and proposed some changes to be made at the Rowland Station.

CNX proposes to replace the existing engine with a Caterpillar G3304NA rated at 95 brake horsepower (bhp) as the driver for the gas compressor. No other emissions sources were proposed in the application.

### SITE INSPECTION

A full on-site inspection was last performed by the WVDAQ on May 24, 2012. On that date, Mr. James Jarrett, P.E., an engineer for the Compliance and Enforcement Section, found the station to be “Out of Compliance” with the General Permit G30-D. The generator sets exceeded the annual limit for CO for the generator set and the Air/Fuel Ratio controller on the compressor engine was not working.

### ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

The scope of this particular request is to replace the existing compressor engine and change the generator set from emergency to non-emergency, while transferring the facility to be covered under a Rule 13 Modification Permit rather than under the G30-D General Permit. Both of these engines will be operated continuously. Thus, no limitation in hours of operation was proposed, which means annual emissions will be based on an operating schedule of 8,760 hours per year.

These engines will be fueled with coal-bed methane. Coal-bed methane is mainly composed of about 90% of methane, which is nearly the same as natural gas. Thus, treating this coal-bed methane as natural gas is acceptable.

Typically the pollutants of concern from internal combustion engines are oxides of nitrogen (NO<sub>x</sub>), carbon monoxide (CO), and formaldehyde (HCHO). Particulate matter and sulfur dioxide are usually not emitted in significant amounts from emission sources burning/fueled with natural gas. However, this facility is a coal bed methane station that used coal bed methane. As part of the May 24, 2012 inspection, the hydrogen sulfide concentration was noted as being 0.64 ppm from a spot sample from the incoming gas pipeline. Typically natural gas could have up to 4 ppm of mercaptan (sulfur based compounds). Volatile organic

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compounds (VOCs) are a potential pollutant from these combustion sources, which will be noted in the following.

The applicant used several sources of data, which included manufacturer's data (engine and catalytic converter), to estimate emissions from the proposed engine and existing generator engine. Presented in the following table is the writer's estimate of emissions from the replacement emissions.

	Caterpillar G3304NA Engine		Generac Generator	
Engine Maximum Power Output (bhp)	95		94	
	Emissions		Emissions	
Pollutant	(lb/hr)	(TPY)	(lb/hr)	(TPY)
Oxides of Nitrogen (NO <sub>x</sub> )	0.1689	0.74	0.57	2.48
Carbon Monoxide (CO)	0.10	0.44	3.86	17.14
Volatile Organic Compounds (VOCs)	0.06	0.26	0.14	0.61
Formaldehyde (HCOH)	0.013	0.06	0.014	0.06
Carbon Dioxide (CO <sub>2</sub> )	104.21	453.31	103.11	448.53

The Rowland Compressor Station is currently covered by General Permit Registration G30-D115A, which allowed for the operation of two compressor engines and one emergency generator set. The Waukesha engine was never installed and the Generac was not included in the registration for the general permit. The following table is a comparison of the emissions covered by the general permit registration minus the Waukesha engine to the proposed changes.

Pollutant	Emission Before the Modification(TPY)	Emission After the Modification (TPY)	Net Difference (TPY)
Oxides of Nitrogen (NO <sub>x</sub> )	10.74	3.26	-7.48
Carbon Monoxide (CO)	15.11	17.58	2.47
Volatile Organic Compounds (VOCs)	2.26	0.91	-1.35

The decreases mainly stem from the use of smaller engine and the installation of an oxidation catalyst on the new compressor engine. Manufacturer's data was used to estimate the potential from the Generac engine.

## REGULATORY APPLICABILITY

CNX Gas has submitted this proposed modification to correct the operation of the generator set for continuous duty and size the compressor engine output to the needs of the facility. With the existing changes made as proposed in this application, the Rowland Station will remain a minor source, which means the station does not have the potential to emit more than 100 tpy of a single criteria pollutant or 25 tpy of total hazardous air pollutants with less than 10 of a single HAP. Thus, CNX Gas does not need to obtain a Title V Operating Permit.

The station is classified as an area source of HAPs and operates reciprocating internal combustion engines (RICE) on a continuous basis at the facility. Both engines are subject to limitation under the RICE MACT (Subpart ZZZZ).

Both engines are four stroke; rich burn (4SRB) RICE. These engines will be or were installed after June 12, 2006. Thus, both engines are classified as “new stationary non-emergency RICE located at a areas source of HAP emissions” (See 40 CFR §63.6590(a)(2)(iii). According to 40 CFR §63.6595(a), the applicant has until October 19, 2013 to implement the following non-emission limitation:

The applicable work or management practices for engines are as follows:

- Change oil and oil filter;
- Inspect spark plugs and replace if necessary; and
- Inspect all hoses and belts and replace if necessary.

*Item 9 of Table 2d to Subpart ZZZZ of Part 63.*

- Operate and maintain the engines according to the manufacturer’s instructions

Or

- Develop and follow a site specific maintenance plan.

*Item 9 of Table 6 to Subpart ZZZZ of Part 63.*

These engines are less than 100 bhp and located at an area source of HAPs, which excludes these particular engines from the emission limitation of Subpart ZZZZ (RICE MACT) (40 CFR §63.6612(a)). Notification requirements prescribed by subpart are excluded for these engines according to 40 CFR 63.6645(a)(5). Again, these engines are not required to submit compliance reports for this subpart.

There are no other rules or regulations that are applicable to this change. The Rowland 303B Compressor Station remains as an “8d” source under Rule 22.

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## TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

The proposed change will not result in any new pollutants that aren't already being emitted by another emission source at the facility. Therefore, no information about the toxicity of hazardous air pollutants (HAPs) is presented in this evaluation.

## AIR QUALITY IMPACT ANALYSIS

Based on the annual emission rates this facility will not be a major source as defined by 45CSR14, so air quality modeling was not required.

## MONITORING OF OPERATIONS

The RICE MACT (40CFR63, Subpart ZZZZ) has specific monitoring requirements, which are maintenance related activities based on hours of operation. Hours of operating will be monitored monthly as required in Condition 4.2.1. for both engines with the use of non-resettable hour meters for each engine. The requirement to record the maintenance related activities, required by the RICE MACT, are covered in Condition 4.4.4.

To ensure proper operation of the catalytic convertor on the compressor engine, the permittee will be requirement to install an air/fuel ratio controller for this engine. The writer adopted the required as stated in General Permit G30-D as Condition 4.2.2. Given the potential to emit of any single pollutant is not above 4 pounds per hour and 18 tons per year, no further monitoring of the facility is warranted.

## RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates that the Rowland B303Station should meet applicable requirements of state rules and federal regulations. It is recommended that CNX Gas Company LLC be granted a 45CSR13 modification permit for the proposed changes to Rowland 303B Compressor Station.

Edward S. Andrews, P.E.  
Engineer

March 20, 2013  
Date

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