west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-3243
Plant ID No.:	041-00067
Applicant:	CNX Gas Company LLC (CNX)
Facility Name:	Camden 17
Location:	Lewis County
NAICS Code:	211111
Application Type:	Construction
Received Date:	March 19, 2015
Engineer Assigned:	David Keatley
Fee Amount:	$2,000
Date Received:	March 27, 2015 and April 17, 2015
Complete Date:	May 7, 2015
Due Date:	August 5, 2015
Applicant Ad Date:	March 25, 2015
Newspaper:	*The Weston Democrat*
UTM's:	Easting: 535.738 km Northing: 4,325.666 km Zone: 17
Description:	After-the-fact installation and operation of: two (2) 1.0 mmBtu/hr gas processing units (GPU), one (1) 9.1 mmBtu/hr vapor destruction unit (VDU), four (4) 210-bbl produced water tanks, and two (2) 210-bbl condensate tanks.

DESCRIPTION OF PROCESS

Raw natural gas (natural gas, condensate, and produced water) come from two (2) natural gas wells. The natural gas will flow will be sent in parallel to two (2) 1.0 mmBtu/hr GPUs. The natural gas from the GPU will exit the facility via natural gas sales pipeline. The produced water will flow from the GPUs to four (4) 210-bbl produced water tanks. The condensate will flow to two (2) 210-bbl condensate tanks. The vapors from the six (6) tanks will be sent to a 9.1 mmBtu/hr LEED VDU to be controlled. The contents of the produced water tanks and condensate tanks will be trucked off the facility as needed, but not to exceed 10,731,000 gallons/year.

SITE INSPECTION

John Moneypenny from DEP DAQ's Compliance and Enforcement section performed a site visit on March 9, 2015. The emission units were installed and operating at that time.

Directions to the facility from I79. Take exit 99 and turn onto US 119/US 33 and travel west until you reach Camden. Once reaching Camden travel north on CR 9 (Churchville Rd.) for approximately 2.4 miles. Turn left onto CR 9/3 (Kemper Run Road) for approximately 0.2 miles. Turn left onto the access road, stay left and the facility is at the top of hill.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions for 1e and 2e were estimated with AP-42 emission factors. Emissions from the tanks were estimated using a gas analysis and liquid sample from this facility in ProMax with a 98% control efficiency for the vapor destruction unit. Truck loading emissions were estimated with AP-42. Fugitive emissions were estimated using a component count approach from 40 CFR 98.

Table 1: Estimated Maximum Controlled Regulated Air Emissions

Emission Point ID	Emission Source(s)	Emission Source	Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (tpy)
1e	GPU-1	Gas Processing Unit 1.0 mmBtu/hr	Nitrogen Oxides	0.10	0.43
			Carbon Monoxide	0.09	0.37
			Volatile Organic Compounds	0.01	0.03
			PM_{10}	0.01	0.04
			CO_2e	117	513
2e	GPU-2	Gas Processing Unit 1.0 MMBtu/hr	Nitrogen Oxides	0.10	0.43
			Carbon Monoxide	0.09	0.37
			Volatile Organic Compounds	0.01	0.03
			PM_{10}	0.01	0.04
			CO_2e	117	513
3e	VDU-1 pilot-1 T01-T04 T05-T06	Vapor Destruction Unit with Pilot (Controlling Produced Water and Condensate Tanks)	Nitrogen Oxides	0.63	2.72
			Carbon Monoxide	3.38	14.79
			Volatile Organic Compounds	1.95	8.51
			SO_2	0.18	0.75
			CO_2e	1,031	4,647
TL Fugitives	Truck	Truck Loading Fugitives	Volatile Organic Compounds	1.55	6.77
Fugitives	Fugitives	Piping Fugitives	Volatile Organic Compounds	<0.01	0.01
			CO_2e	6	23

Table 2: Proposed Estimated Maximum Controlled Facility Wide Emissions

Pollutant	Maximum Annual Facility Wide Emissions (tons/year)
Nitrogen Oxides	3.58
Carbon Monoxide	15.51
Volatile Organic Compounds	15.33
Total Particulate Matter	0.07
PM_{10}	0.07
Sulfur Dioxide	0.76
n-Hexane	0.02
Total HAPs	0.02
CO_2e	5,693

REGULATORY APPLICABILITY

The following rules and regulations apply to the facility:

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

The purpose of 45CSR2 (Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers) 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 all of the proposed fuel burning units (GPU-1 and GPU-) are below 10 MMBTU/hr. Therefore, these units are exempt from the aforementioned sections of 45CSR2. However, these units are subject to the opacity requirements in 45CSR2, which is 10% opacity based on a six minute block average.

45CSR4 (To Prevent and Control the Discharge of Air Pollutants into the Open Air which Causes or Contributes to an Objectionable Odor or Odors)

This facility shall not cause the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public. 45CSR4 states that an objectionable odor is an odor that is deemed objectionable when in the

opinion of a duly authorized representative of the Air Pollution Control Commission (Division of Air Quality), based upon their investigations and complaints, such odor is objectionable.

45CSR6: To Prevent and Control Particulate Air Pollution from Combustion of Refuse

EQT has proposed an enclosed combustor for controlling the working/breathing/flashing emissions produced from the condensate/produced-water storage tanks. The vapor combustor meets the definition of an "incinerator" under 45CSR6 and is, therefore, subject to the requirements therein. The substantive requirements applicable to the vapor combustor are discussed below.

45CSR6 Emission Standards for Incinerators - Section 4.1

Section 4.1 limits PM emissions from incinerators to a value determined by the following formula:

Emissions (lb/hr) = F x Incinerator Capacity (tons/hr)

Where, the factor, F, is as indicated in Table I below:

Table I: Factor, F, for Determining Maximum Allowable Particulate Emissions

Incinerator Capacity	Factor F
A. Less than 15,000 lbs/hr	5.43
B. 15,000 lbs/hr or greater	2.72

While particulate matter emissions from the combustor are expected to be nominal, for a conservative estimate, EQT calculated potential particulate matter emissions from the unit based on an emission factor taken from AP-42, Section 1.4. Since the VDU will be smokeless the particulate matter emissions will be considered negligible. Based on information included in the application, the maximum vapor mass sent to the combustor will be 24.27 lb/hr (0.0121 tons/hour), which gives a factor of 5.43. Based on the above, the aggregate particulate matter limit of the combustor is 0.07 lbs/hr. Therefore, the combustor should demonstrate compliance with this standard.

45CSR6 Opacity Limits for - Section 4.3, 4.4

Pursuant to Section 4.3, and subject to the exemptions under 4.4, the combustor has a 20% limit on opacity during operation. As the primary constituent in the vapors combusted in the unit shall be clean burning methane/ethane, particulate matter emissions from the combustor are expected to be nominal. Therefore, the vapor combustor should easily meet this requirement.

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

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 all of the proposed fuel burning units (GPU-1 and GPU-2) 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)

This facilities volatile organic compounds exceed the thresholds of 6 lbs/hr and 10 tons/year and is therefore required to get a permit.

45CSR16 (*Standards of Performance for New Stationary Sources Pursuant to 40CFR60)*

45CSR16 incorporates by reference the standards of performance for new stationary sources (40CFR60). This facility is subject to 40CFR60 Subpart OOOO and therefore this facility is subject to 45CSR16.

45CSR22 (Air Quality Management Fee Program)

This facility is a minor source as can be seen in Table 2 and not subject to 45CSR30 since this facility is exempt from the obligation to obtain a permit under 40 CFR part 70 or 40 CFR part 71. This facility has maximum horsepower capacity less than 1,000 hp and is a 9M source and is required to pay the $200 annual fee. CNX is required to keep their Certificate to Operate current.

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. The following affected sources which commence construction, modification or reconstruction after August 23, 2011 are subject to the applicable provisions of this subpart:

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

The two (2) natural gas wells that currently exist at this facility were drilled principally for the production of natural gas and were done so after August 23, 2011. Therefore, these wells would be considered affected facilities under this subpart. The compliance date for these hydraulically fractured wells is October 15, 2012. Stone is required under §60.5410 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 Stone demonstrate continuous compliance by submitting reports and maintaining records for each completion operation.

b. 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.

As can be seen in Table 1 all tanks located at this facility emit less than 6 tpy of VOC. Therefore T01 through T06 are not subject to this section of this regulation.

The following regulations do not apply to the facility:

40CFR60 Subpart 60.18 (General Control Device and Work Practice Requirements)

40CFR60 Subpart 60.18 contains requirements for control devices when they are used to comply with applicable subparts of 40CFR60 and 40CFR61. The vapor combustors that Stone has proposed is not used to comply with one of these rules. The purpose of the vapor combustors is to control emissions from the tanks that are routed to it. However, these tanks are not subject to 40CFR60 Subpart Kb due to their size. In addition 40CFR60.18 refers to flares but makes no mention of vapor combustors, which are essentially enclosed combustion devices. Therefore this facility is not subject to this regulation.

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 tanks that CHK has proposed to install are 33.4 cubic meters each. Therefore this facility is not subject to this regulation.

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. Antero included the following HAPs as emitted in substantive amounts (0.01 tons/year) in their emissions estimate: Benzene, n-Hexane, Toluene, and Xylenes. The following table lists each HAP's carcinogenic risk (as based on analysis provided in the Integrated Risk Information System (IRIS)):

Table 3: Potential HAPs - Carcinogenic Risk

HAPs	Type	Known/Suspected Carcinogen	Classification
n-Hexane	VOC	No	Inadequate Data

All HAPs have other non-carcinogenic chronic and acute effects. These adverse health affects 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*. This facility is a minor source of HAPs as can be seen in Table 2. 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

Modeling was not performed 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 can be seen in Table 2.

RECOMMENDATION TO DIRECTOR

The information provided in this facility's permit application indicates that compliance with all state and federal air quality requirements should be achieved . It is recommended that CNX should be granted a 45CSR13 Construction permit for Camden 17 natural gas production facility.

David Keatley
Permit Writer - NSR Permitting

May 8, 2015
Date