



west virginia department of environmental protection

Division of Air Quality
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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.: G35-A031B
Plant ID No.: 017-00005
Applicant: Dominion Transmission Inc.
Facility Name: Maxwell Station
Location: Doddridge County
NAICS Code: 486210
Application Type: Class II Administrative Update
Received Date: April 23, 2015
Engineer Assigned: David Keatley
Fee Amount: \$2,800 (\$2,500 NESHP and \$300 Class II Administrative)
Date Fee Received: April 22, 2015
Complete Date: July 15, 2015
Due Date: August 29, 2015
Applicant Ad Date: April 21, 2015
Newspaper: The Herald Record
UTM's: Easting: 520.530 km Northing: 4,336.751 km Zone: 17
Description: Installation and operation of one (1) 515-bhp compressor engine, modification of one (1) 4.25 mmscf/day TEG dehydration unit, and removal of one (1) 440-bhp compressor engine.

DESCRIPTION OF PROCESS

Maxwell Station is a transmission compressor station that services a natural gas pipeline system. The purpose of the facility is to compress natural gas to a higher pressure than what is entering the facility and lower the moisture content (water) of the natural gas stream. The compressor at the facility receives natural gas from a valve on the pipeline and compresses the natural gas to a higher pressure for transportation purposes. The compressor is powered by one (1) four-stroke lean-burn 515-bhp Caterpillar G3508 LE natural gas fired compressor engine. After being compressed additional water is removed by the dehydration unit. The rich TEG first flows to a flash tank. During this process a small amount of hydrocarbons are extracted from the natural gas stream. A maximum of 4.3 mmscf/day of natural gas enters the contactor where moisture and some hydrocarbons

are absorbed into the lean triethylene glycol (TEG) which flows countercurrent. The vapors from the flash tank are piped back to the main natural gas stream before the compressor. The TEG then flows to the regenerator where it is heated by a natural gas fired reboiler (RBV-1) to liberate the water and some hydrocarbon vapors. The vapor from the regenerator exit the still vent RSV-1. The vapors from the still vent are sent to a 4.2 mmBtu/hr flare (F1) to combust the hydrocarbons, thereby, reducing overall emissions and odor. The compressed, dehydrated gas then reenters the pipeline. The facility also has two (2) 192.5-bhp emergency generator engines EG01 and EG02 used to provide the station with necessary electricity when purchase power is unavailable.

SITE INSPECTION

A site inspection was conducted by Douglas Hammell of DAQ's Compliance and Enforcement on December 2, 2013. The facility was deemed in compliance.

From US Route 50 at West Union, take route 18 south for 9.9 miles. Turn right onto CR 54 (Porto Rico Road). Travel 4.6 miles, station will be on the left.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions for engine CE-1 are estimated using Caterpillar emission factors for NOx, CO, VOCs, and formaldehyde; SO2 was estimated using an AP-42 emission factor. Emissions from the TEG dehydration unit were estimated using GRI-GLYCalc 4.0 using a 20% buffer to account for gas analysis variation and 95% control efficiency for the flare.

Table 1: Maximum New/Modified Controlled Air Emissions

Source ID	Emission Source	Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (tpy)
CE-1	Caterpillar G3508 LE Compressor Engine 515 bhp	Nitrogen Oxides	2.27	9.95
		Carbon Monoxide	1.7	7.46
		Volatile Organic Compounds	0.42	1.84
		Sulfur Dioxide	<0.01	0.01
		Formaldehyde	0.23	1
RSV-1	Glycol Dehydrator Regenerator Still Vent	Volatile Organic Compounds	4.52	19.79
		Benzene	0.02	0.09
		Ethylbenzene	0.03	0.14
		Toluene	0.05	0.23
		Xylenes	0.09	0.41
		n-Hexane	0.05	0.24

Table 2: Maximum Estimated Controlled Facility Wide Air Emissions

Pollutant	Maximum Annual Facility Wide Emissions (tons/year)
Nitrogen Oxides	10.10
Carbon Monoxide	7.77
Volatile Organic Compounds	21.74
Particulate Matter	0.01
Sulfur Dioxide	0.01
Benzene	0.09
Ethylbenzene	0.14
Toluene	0.23
Xylenes	0.41
n-Hexane	0.26
Formaldehyde	1.02
Total HAPs	2.15

REGULATORY APPLICABILITY

The following rules and regulations apply to the new/modified equipment at this facility:

45CSR4 To Prevent and Control the Discharge of Air Pollutants Into the Open Air Which Causes or Contributes to an Objectionable Odor or Odors

The facility is subject to the requirements of 45CSR4 and shall not allow the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public.

45CSR13 Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits, and Procedures for Evaluation

This facility is eligible for a Class II Administrative Update because the increase in emissions for regulated air pollutants is less than statutory thresholds as can be determined from Table 2.

45CSR22 Air Quality Management Fee Program

Since this source is subject to 45CSR13 and not currently subject to 45CSR30 this source is subject to 45CSR22. Since this facility has a total reciprocating capacity (900 hp) less than 1,000 hp, this is a 9M source and has an annual fee of \$200.

40 CFR 63 Subpart HH - National Emission Standards for Hazardous Air Pollutants From Oil and Natural Gas Production Facilities

On June 1, 2013 the DAQ took delegation of the area source provisions of 40 CFR 63, Subpart HH. This facility is a natural gas production facility that processes, upgrades, or stores natural gas prior to transmission. This facility is an area source of HAPs refer to the previous facility wide emissions table.

Pursuant to §63.760(b)(2), each glycol dehydration unit (GDU) located at an area source that meets the requirements under §63.760(a)(3) is defined as an affected facility under Subpart HH. The requirements for affected sources at area sources are given under §63.764(d). However, for a GDU, exemptions to these requirements are given under §63.764(e)(2) "actual average emissions of benzene from the glycol dehydration unit process vent to the atmosphere are less than 0.90 megagram [1 TPY] per year."

As can be seen above in Table 1, the maximum PTE of benzene emissions from the GDU process vent is 0.09 TPY. Therefore, the GDU is exempt from the Subpart HH requirements given under §63.764(d).

40CFR63 Subpart ZZZZ National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines

Subpart ZZZZ establishes national emission limitations and operating limitations for HAPs emitted from stationary 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. This facility is subject to the area source requirements for non-emergency spark ignition engines.

Engines CE-2 is an "Existing Stationary RICE" sources at an area source of HAPs and is an affected source because construction commenced before June 12, 2006 [63.6590(a)(1)(iii)] due to the installation date of the engine (2001).

Engine CE-2 due to the installation date of the engines must comply with the applicable emission limitations, operating limitations, and other requirements no later than October 19, 2013. Engines CE-1 is a non-emergency, non-black start four-stroke lean-burn stationary RICE >500 HP that are remote (Table 2d.8). Engines CE-2 have oil, oil filter, spark plug, hose, and belt maintenance requirements.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

There will be small amounts of various regulated hazardous air pollutants emitted from the operation of this facility as seen in Table 1. The facility is a minor source of HAPs as can be seen in Table 2. If you want to obtain additional information about certain hazardous air pollutants feel free to visit [<http://www.epa.gov/ttn/atw/hlthef/hapindex.html>].

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates that compliance with all state and federal air pollution control requirements will be satisfied and Maxwell Station is expected to meet the requirements of the G35-A permit. Therefore, I recommend to the Director of Air Quality the issuance of Permit Number G35-A031B to Dominion Transmission Inc. for Maxwell Station



David Keatley
Permit Writer - NSR Permitting

July 15, 2015

Date

Fact Sheet G35-A031B
Dominion Transmission Inc.
Maxwell Station