



west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.: G35-A053A
Plant ID No.: 017-00029
Applicant: Dominion Transmission, Inc.
Facility Name: Big Isaac Station
Location: Doddridge County
NAICS Code: 486210
Application Type: Modification
Received Date: January 5, 2015
Engineer Assigned: Steven R. Pursley, PE
Fee Amount: \$3,000.00
Date Received: January 6, 2015
Complete Date: January 26, 2015
Due Date: March 12, 2015
Applicant Ad Date: January 8, 2015
Newspaper: *The Exponent Telegram*
UTM's: Easting: 538.34 km Northing: 4,344.03 km Zone: 17
Description: Replacement of an existing flare with an enclosed flare.

DESCRIPTION OF PROCESS

The Big Isaac Compressor Station (BICS) is a natural gas compressor station used to compress gas for Dominions pipeline system in West Virginia. The station pumps natural gas from production and gathering lines to a Dominion pipeline. As part of operations at the BICS, Dominion utilizes a glycol dehydration unit. The purpose of the dehydration unit is to remove moisture and impurities from the inlet natural gas stream. Water is removed from the rich natural gas stream via physical absorption while it flows countercurrent to circulating triethylene glycol (TEG) in a contactor. The rich TEG is sent to a flash tank to reduce volatile hydrocarbons. Vapors from the flash tank are primarily vented back to station suction and reclaimed. If the station suction pressure is too high, the vapors from the flash tank can be directly vented to the flare, used as fuel in the reboiler or vented to a waste tank if they are unable to be completely consumed as fuel gas. Vapors from the reboiler pass through a still column that is controlled by the flare.

Dominion proposes to replace the control device (flare) for the existing dehydration unit with a new enclosed flare. As part of the control device replacement, a blowcase will be installed between the still column and enclosed flare on the glycol dehydration unit. The blow-case serves to enhance the efficiency of the enclosed flare and will not debottleneck the glycol dehydration unit.

The new replacement flare will be a Questor Technologies Q50 enclosed flare with a 95% control efficiency.

SITE INSPECTION

An inspection of the facility was performed on March 27, 2012 by Douglas Hammell of DAQs Compliance and Enforcement Section. The facility was found to be in compliance. To get to the facility take I-77 north from Charleston to exit 176 and take US Route 50 east approximately 56 miles to the Dog Run Rd. (Co. Rt. 50/1) exit. Go 0.7 miles and turn right on East Main St. (Co. Rt. 50/73) and go approximately 0.5 miles and veer left on South St. (Co. Rt. 29). Continue driving and at the intersection of Co. Rt. 29 and Co. Rt. 15, stay left at the fork and continue until Co. Rt. 15 intersects Co. Rt. 28 (Coburn Fork Road). Turn left on Co. Rt. 28 and continue until Raccoon Run Road. The facility will be on the left at the intersection.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions of NO_x, CO and SO₂ are based on vendor specifications. Emissions of PM is based on AP-42. VOC emissions were based on GRI-GLYCalc. Emissions from the new enclosed flare will be limited to the following:

	lb/hr	tpy
NO _x	0.07	0.32
CO	0.06	0.27
VOCs	2.17	9.55
PM/PM ₁₀ /PM _{2.5}	0.01	0.05
SO ₂	--	--
HAPs	0.24	1.07

Emissions of all pollutants based upon information submitted with application G35-A053. Emissions from the old flare were as follows:

	tpy
NO _x	0.22
CO	0.70
VOCs	3.97
PM/PM ₁₀ /PM _{2.5}	--
SO ₂	--
HAPs	0.71

The emissions change due to this modification will be as follows:

	tpy
NO _x	0.10
CO	-0.43
VOCs	5.58
PM/PM ₁₀ /PM _{2.5}	0.05
SO ₂	--
HAPs	0.36

REGULATORY APPLICABILITY

The modification is subject to the following state and federal rules:

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

Dominion has proposed an enclosed combustor for controlling emissions from the Dehy still vent and flash tank. 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:

$$\text{Emissions (lb/hr)} = F \times \text{Incinerator Capacity (tons/hr)}$$

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

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

<u>Incinerator Capacity</u>	<u>Factor F</u>
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, Dominion calculated potential particulate matter emissions from the unit based on an emission factor taken from AP-42, Section 1.4. Using this emission factor, the hourly particulate matter emission rate from the combustor is 0.01 lbs/hr. No information was included in the application regarding the maximum vapor mass sent to the combustor. However, based upon the uncontrolled emissions of the regenerator and flash tank are 56.43 lb/hr (0.028 tons/hour). Based on the above, the aggregate particulate matter limit of the combustor is 0.15 lbs/hr. As the hourly particulate matter emission rate from the combustor is 0.01 lbs/hr, the unit is in compliance with this emission limit.

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.

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

The modification of the Big Isaac Station is subject to substantive requirements of state rules and, therefore, pursuant to §45-13-2.24a, the enclosed flare is defined as a "stationary source" under 45CSR13. Pursuant to §45-13-5.1, "[n]o person shall cause, suffer, allow or permit the construction . . . and operation of any stationary source to be commenced without . . . obtaining a permit to construct." Therefore, Dominion is required to obtain a permit registration under 45CSR13 for the modification and operation of the flare.

As required under §45-13-8.3 ("Notice Level A"), Dominion placed a Class I legal advertisement in a "newspaper of general circulation in the area where the source is . . . located." The ad ran on January 8, 2015 in the *Exponent Telegram* and the affidavit of publication was received by the DAQ on January 28, 2015.

45CSR22 (Air Quality Management Fee Program)

This rule establishes a program to collect fees for certificates to operate and for permits to construct, modify or relocate sources of air pollution. Funds collected from these fees will be used to supplement the Director's budget for the purpose of maintaining an effective air quality management program. The facility will demonstrate compliance with this rule by obtaining a Certificate to Operate (CTO) and paying annual fees in order to maintain a current CTO. It should be noted that the facility was originally (erroneously) permitted as a minor (deferred) Title V source. Most likely this was due to the original permit writer, at that time, being unfamiliar with the exemptions contained in several NSPS's/NESHAP's.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

This section provides an analysis for those regulated pollutants that may be emitted from the Big Isaac Compressor Station that are not classified as "criteria pollutants." Criteria pollutants are defined as Carbon Monoxide (CO), Lead (Pb), Oxides of Nitrogen (NO_x), Ozone, Particulate Matter (PM), Particulate Matter less than 10 microns (PM₁₀), Particulate Matter less than 2.5 microns (PM_{2.5}), and Sulfur Dioxide (SO₂). These pollutants have National Ambient Air Quality Standards (NAAQS) set for each that are designed to protect the public health and welfare. Other pollutants of concern, although designated as non-criteria and without national concentration standards, are regulated through various federal programs designed to limit their emissions and public exposure. These programs include federal source-specific Hazardous Air Pollutants (HAPs) standards promulgated under 40 CFR 61 (NESHAPS) and 40 CFR 63 (MACT). Any potential applicability to these programs were discussed above under REGULATORY APPLICABILITY.

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

HAPs	Type	Known/Suspected Carcinogen	Classification
n-Hexane	VOC	No	Inadequate Data
Benzene	VOC	Yes	Category A - Known Human Carcinogen
Toluene	VOC	No	Inadequate Data
Ethylbenzene	VOC	No	Category D - Not Classifiable
Xylene	VOC	No	Inadequate Data

All HAPs have other non-carcinogenic chronic and acute effects. These adverse health effects 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*. 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

Since this is not a major modification, as defined in 45CSR14, no modeling was performed.

GENERAL PERMIT ELIGIBILITY

The proposed modification and operation of this facility meets the eligibility, siting, limitations, and emissions controls as specified in General Permit G35-A.

RECOMMENDATION TO DIRECTOR

Information supplied in the application indicates that compliance with all applicable regulations will be achieved. Therefore it is the recommendation of the writer that permit registration G35-A053A for the modification of a natural gas compressor station near Salem, but in Doddridge County, be granted to Dominion Transmission, Inc.



Steven R. Pursley, PE
Engineer

3-10-15

March 10, 2015