west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-2915
Plant ID No.:	033-00013
Applicant:	Dominion Transmission, Inc. (Dominion)
Facility Name:	Sardis Station
Location:	Sardis, Harrison County
SIC Code:	4922
NAICS Code:	486210
Application Type:	Construction
Received Date:	February 2, 2012
Engineer Assigned:	Jerry Williams, P.E.
Fee Amount:	$2,000.00
Date Received:	February 2, 2012
Complete Date:	March 2, 2012
Due Date:	May 31, 2012
Applicant Ad Date	February 4, 2012
Newspaper:	*The Exponent Telegram*
UTM's:	Easting: 552.89 km Northing: 4355.61 km Zone: 17
Description:	Addition of a new natural gas compressor engine and replacement of existing glycol dehydration unit, reboiler, and flare.

DESCRIPTION OF PROCESS

The following process description was taken from Permit Application R13-2915:

Dominion plans to modify an existing natural gas compressor station. The Sardis Station currently operates under Title V Permit Number R30-033000013-2011.

The proposed equipment changes with this permit application include the following:

1. Addition of one (1) Ajax reciprocating internal combustion engine for compression. The natural gas fired engine will be a 750 hp Ajax Model DPC-2804 LE with an oxidation catalyst. The engine is two (2) stroke lean burn and is not certified.

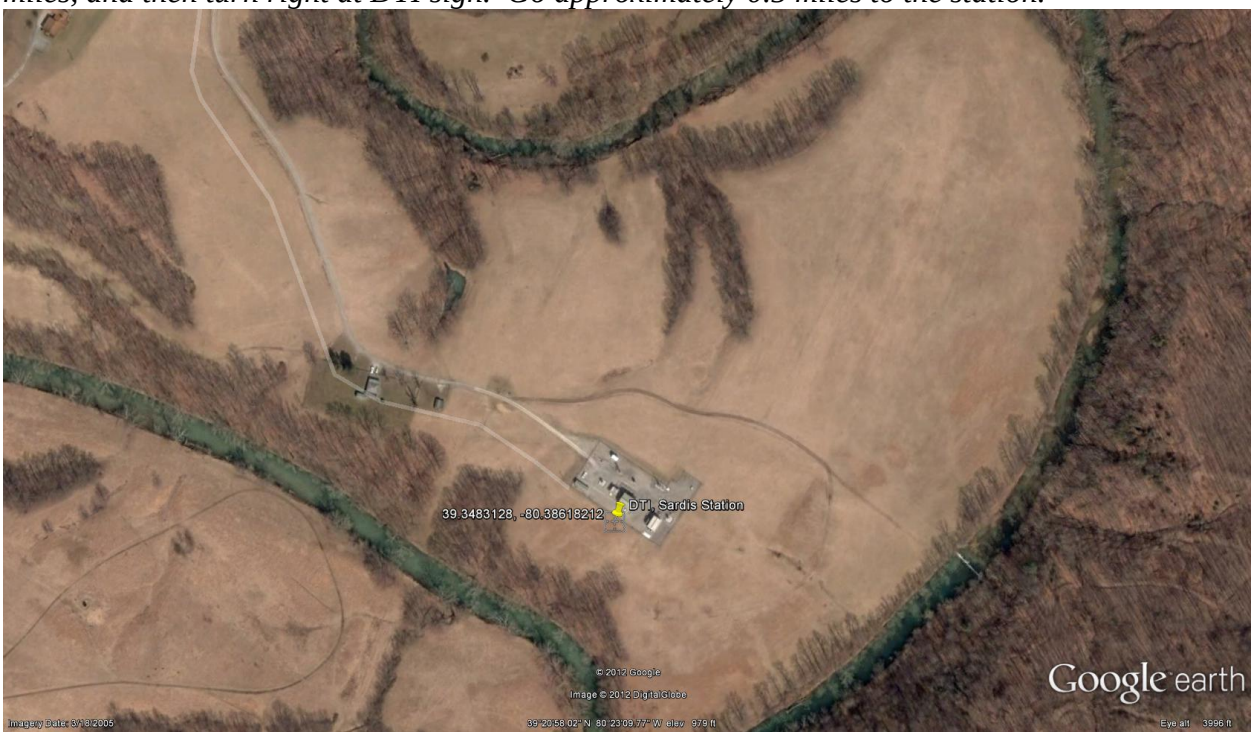
2. Replacement of the current NATCO glycol dehydration unit with a new Cameron glycol dehydration unit. The new unit will be rated at 22 million standard cubic feet per day (mmscfd). Emissions from the new regenerator still vent will be routed to flare rated at 4 MMBTU/hr, for volatile organic compound, hazardous air pollutant and odor control. The new natural gas fired reboiler associated with the unit will be rated at 1.437 MMBTU/hr. The existing dehydration unit, reboiler, and flare will be taken out of service.

SITE INSPECTION

A site inspection was conducted by Lou Ann Lee of the NCRO on March 31, 2011. The facility was found to be operating in compliance at that time.

Directions are as follows:

From Charleston I-79N to the Clarksburg exit. Turn left off the exit ramp, then go through Clarksburg on Route 50. Off of Route 50, turn onto Route 9 (Gregory Run Road). Travel for 5 miles, and then turn right at DTI sign. Go approximately 0.5 miles to the station.



ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions associated with this permit application consist of a compressor engine, flare, glycol dehydration system, fugitive emissions from equipment leaks and a used oil storage tank. The estimated emission calculations were performed by Dominion and checked for accuracy and completeness by the writer. The following tables include the emission source, and controlled emission rate:

Emission Point ID#	Source	Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (tpy)
EN03	750 hp Ajax DPC-2804 LE Compressor Engine	Nitrogen Oxides	1.66	7.20
		Carbon Monoxide	1.24	5.40
		Particulate Matter-10	0.23	1.00
		Sulfur Dioxide	0.01	0.02
		Volatile Organic Compounds	0.50	2.20
		Total HAPs	0.47	2.06
		Formaldehyde	0.33	1.43
		Carbon Dioxide Equivalent	592	2,592
DEHY02	22 mmscfd TEG Dehydration Unit Still Vent	Volatile Organic Compounds	6.85	30.00
		Hexane	0.07	0.29
		Benzene	0.11	0.46
		Toluene	0.26	1.12
		Ethylbenzene	0.07	0.28
		Xylene	0.54	2.35
		Total HAPs	1.03	4.48
RBR02	1.437 MMBTU/hr TEG Reboiler	Nitrogen Oxides	0.13	0.57
		Carbon Monoxide	0.11	0.44
		Particulate Matter-10	0.01	0.01
		Sulfur Dioxide	0.01	0.01

		Volatile Organic Compounds	0.06	0.26
		Carbon Dioxide Equivalent	145	632
FL02	Regenerator Still Vent Flare	Nitrogen Oxides	0.13	0.57
		Carbon Monoxide	0.40	1.75
		Particulate Matter-10	ND	ND
		Sulfur Dioxide	ND	ND
		Volatile Organic Compounds	0.01	0.05
		Carbon Dioxide Equivalent	236	1,032
Fugitive	Equipment Leaks	Volatile Organic Compounds	NA	21.78
		Hazardous Air Pollutants	NA	1.36
		Carbon Dioxide Equivalent	NA	2,209

The following table indicates which methodology was used in the emissions determination:

Emission Unit ID#	Process Equipment	Calculation Methodology
EN03	750 hp Ajax DPC-2804 LE Compressor Engine with Oxidation Catalyst	Manufacturer's Data / EPA AP-42 Emission Factors
DEHY02	22.0 mmscfd TEG Dehydration Unit	GRI-GlyCalc 4.0 Emission Estimation Software
RBR02	1.437 MMBTU/hr TEG Reboiler	EPA AP-42 Emission Factors
FL02	4 MMBTU/hr Flare	EPA AP-42 Emission Factors
Fugitive	Fugitive Equipment Leaks	API Compendium of GHG Emissions Methodologies

Fugitive emissions for the facility are based on calculation methodologies presented in the 2009 American Petroleum Institute Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Gas Industry. The factors presented in the API Compendium are for methane emissions. Therefore, the fugitive VOC and HAP emissions were calculated using a representative gas analysis and the weight percent of each respective pollutant.

The Sardis Station currently operates under Title V Permit Number R30-03300013-2011. According to their Title V Permit, the Sardis Station consists of the following grandfathered equipment: one (1) 1000 HP natural gas fired reciprocating engine (EN01), (1) 800 HP natural gas fired reciprocating engine (EN02), two (2) 192.5 HP emergency generators (EG01 and EG02), one (1) glycol dehydrator system (DEHY01), one (1) dehydration unit reboiler (RBR01),

one (1) 0.3 MMBtu/hr dehydration unit still flare (DEHY), two (2) 2,730-gallon aboveground storage tanks (TK01 and TK02), one (1) 2,500-gallon aboveground storage tank (TK03), one (1) 230-gallon aboveground storage tank (TK04), one (1) 5,000-gallon aboveground storage tank (TK05), one (1) 500-gallon aboveground storage tanks (TK06), and one (1) 520-gallon aboveground storage tanks (TK07).

The Sardis Station is a production facility that compresses production gas to Hastings Extraction Plant.

According to their Title V Permit the facility has the potential to emit 422.32 tons of NO_X and 159.68 tons of VOC. Due to this facility's potential to emit over 100 tons per year of criteria pollutant, Dominion is required to have an operating permit pursuant to Title V of the Federal Clean Air Act as amended and 45CSR30.

The following increase in potential emissions will be authorized by this permit action: Particulate Matter less than 10 microns, 1.00 tons per year (TPY); Particulate Matter, 1.00 TPY; Oxides of Nitrogen, 8.30 TPY; Carbon Monoxide, 7.50 TPY.

The following decrease in potential emissions will be authorized by this permit action: Volatile Organic Compounds, 16.30 TPY; Total Hazardous Air Pollutants, 6.40 TPY.

REGULATORY APPLICABILITY

Unless otherwise stated WVDEP DAQ did not determine whether the permittee is subject to an area source air toxics standard requiring Generally Achievable Control Technology (GACT) promulgated after January 1, 2007 pursuant to 40 CFR 63, including the area source air toxics provisions of 40 CFR 63, Subpart HH and 40 CFR 63, Subpart ZZZZ.

The following rules apply to the changes requested in this modification application:

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

> 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. No odors have been deemed objectionable.

45CSR6 (To Prevent and Control Air Pollution from the Combustion of Refuse)

Dominion has a flare at the facility. The flare is subject to section 4, emission standards for incinerators. The flare has an allowable emission rate of 470.9 pounds of particulate matter per hour (assuming a natural gas density of 0.044 lb/ft^3). The flare has negligible amounts of particulate matter emissions per hour. Therefore, the facility's flare should demonstrate compliance with this section. The facility will demonstrate compliance by maintaining records of the amount of natural gas consumed by the flare and the hours of operation. The facility will also monitor the flame of the flare and record any malfunctions that may cause no flame to be present during operation.

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)

45CSR13 applies to this source due to the fact that the changes proposed under this permitting action results in the facility exceeding the modification emission thresholds and being subject to a substantive requirement of an emission control rule (40CFR60 Subpart JJJJ). Therefore, Dominion is required to submit a modification application. Dominion has published the required Class I legal advertisement notifying the public of their permit application, and paid the appropriate application fee (modification).

45CSR16 (Standards of Performance for New Stationary Sources Pursuant to 40 CFR Part 60)

45CSR16 applies to this source by reference of 40CFR60 Subpart JJJJ. Dominion is subject to the recordkeeping, monitoring, and testing required by 40CFR60 Subpart JJJJ.

45CSR30 (Requirements for Operating Permits)

This rule provides for the establishment of a comprehensive air quality permitting system consistent with the requirements of Title V of the Clean Air Act, and provides for a transition period prior to the implementation of the permitting system.

The source is subject to 45CSR30. Changes authorized by this permit must also be incorporated into the facility's Title V operating permit. Commencement of the operations authorized by this permit shall be determined by the appropriate timing limitations associated with Title V permit revisions per 45CSR30.

The following regulations do not apply to the facility:

45CSR14 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollutants)

Determination of Existing Major Source Status

The proposed modification to the Sardis Station is located in an area – Harrison County - classified as "in attainment" with all National Ambient Air Quality Standards (NAAQS) and, therefore, the major source status of the source is determined under 45CSR14.

The existing natural gas compressor station is not a source listed under §45-14-2.43(a). Therefore it falls under the definition of a "major stationary source," pursuant to §45-14-2.43(b), which is any stationary source which emits or has the potential to emit, two hundred fifty (250) tons per year or more of any regulated NSR pollutant. The existing unmodified source has a PTE - including fugitive emissions and based on calculations provided by the applicant - of 422.32 TPY of NO_x. This PTE defines the source as an existing major stationary source under 45CSR14.

Determination of Major Modification

As Dominion is proposing a "physical change in or change in the method of operation of a major stationary source," included in the permit application is an applicability analysis to determine if the proposed changes to the plant are defined as a "major modification" and subject to Prevention of Significant Deterioration (PSD) review under 45CSR14. A "major modification" is defined under section 2.40 of 45CSR14 as a:

> . . . physical change in or change in the method of operation of a major stationary source which results in: a significant emissions increase (as defined in subsection 2.75) of any regulated NSR pollutant (as defined in subsection 2.66); and a significant net emissions increase of that pollutant from the major stationary source. [. . .]

Section 3.4 of 45CSR14 provides guidance on the process of determining if proposed changes are a major modification. §45-14-3.4(a) states that:

> . . . consistent with the definition of major modification contained in subsection 2.40, a project is a major modification for a regulated NSR pollutant if it causes two types of emissions increases -- a significant emissions increase (as defined in subsection 2.75), and a significant net emissions increase (as defined in subsections 2.46 and 2.74). The proposed project is not a major modification if it does not cause a significant emissions increase. [. . .]

Therefore, for the proposed changes to meet the definition of a major modification, the changes themselves must result in a significant emissions increase. The methodology for calculating the emissions increase under the first step is given under Sections 3.4(b), 3.4(c), 3.4(d) and 3.4(f). The substantive language of each is given below:

[§45-14-3.4(b)]
The procedure for calculating (before beginning actual construction) whether a significant emissions increase (i.e., the first step of the process) will occur depends upon the type of emissions units being modified, according to subdivisions 3.4.c through 3.4.f.

[§45-14-3.4(c)]
Actual-to-projected-actual applicability test for projects that only involve existing emissions units. -- A significant emissions increase of a regulated NSR pollutant is projected to occur if the sum of the difference between the projected actual emissions (as defined in subsection 2.63) and the baseline actual emissions (as defined in subdivisions 2.8.a and 2.8.b), for each existing emissions unit, equals or exceeds the significant amount for that pollutant (as defined in subsection 2.74).

[§45-14-3.4(d)]
Actual-to-potential test for projects that only involve construction of a new emissions unit(s). – A significant emissions increase of a regulated NSR pollutant is projected to occur if the sum of the difference between the potential to emit (as defined in subsection 2.58) from each new emissions unit following completion of the project and the baseline actual emissions (as defined in subdivision 2.8.c) of these units before the project equals or exceeds the significant amount for that pollutant (as defined in subsection 2.74).

[§45-14-3.4(f)]
Hybrid test for projects that involve multiple types of emissions units. -- A significant emissions increase of a regulated NSR pollutant is projected to occur if the sum of the emissions increases for each emissions unit, using the method specified in subdivisions 3.4.c through 3.4.d as applicable with respect to each emissions unit, for each type of emissions unit equals or exceeds the significant amount for that pollutant (as defined in subsection 2.74).

Further, under the definition of "projected actual emissions" - Section 2.63(a)(4), the applicant may use an emission unit's PTE in lieu of projecting actual emissions.

It is important to note that when any emissions decrease is claimed (including those associated with the proposed modification), the second step of the test is triggered - a determination if the project results in a "significant net emissions increase." This determination is defined under the definition of "net emissions increase" [§45-14-2.46] and must include "any other increases and decreases in actual emissions at the major source that are contemporaneous with the particular change and are otherwise creditable." A change is contemporaneous if it "occurs not more than five (5) years prior to the date on which construction on the particular change commences nor later than the date on which the increase from the particular change occurs."

Dominion PSD Applicability Analysis

Step 1 - Determination of Emission Increase under 45CSR14

Based on the above, Dominion included a PSD applicability analysis for the proposed new and modified sources. The emission points associated with the modification is the addition of one (1) Ajax reciprocating internal combustion engine for compression and the replacement of the current NATCO glycol dehydration unit with a new Cameron glycol dehydration unit. The existing dehydration unit, reboiler, and flare will be taken out of service. In lieu of projecting actual emissions, emission unit's PTE were used. The results of the determination of the emissions increase (the first step) is given in the following table:

Source	VOC (TPY)		
	PAE	F-PTE	Δ
Proposed Dehy	0.00	30.00	30.00
Proposed Compressor Engine	0.00	23.98	23.98
Proposed Reboiler	0.00	0.26	0.26
Proposed Flare	0.00	0.05	0.05
Totals			*54.29*
Significant Level			40.00
Significant?			Yes

(1) Emissions calculated by applicant using same methodology as described above.
(2) PAE = Past Actual Emissions; F-PTE = Future Potential-to-Emit

"Significant" is defined for VOC under §45-14-2.74(a) as 40 TPY. As shown in the table above, the change in emissions resulting from the proposed modifications/construction does exceed the definition of "significant" for VOC. While Dominion has claimed decreases as part of the project, they may only be included in the analysis as part of step 2 - the determination of a "significant net emissions increase."

Step 2 - Determination of Net Emission Increase under 45CSR14

The results of the significant net emissions increase analysis is given in the tables below. The decreases are a result of the removal of the glycol dehydration unit, and the increases are associated with the addition of two (2) emergency generators. No other contemporaneous increases or decreases occurred at the facility.

	2011 TPY	2010 TPY	2009 TPY	2008 TPY	2007 TPY
Existing Dehy - VOC	55.55	8.53	33.72	17.22	14.68
Existing Dehy - NO_x	0.06	0.14	0.05	0.28	0.18
Existing Dehy - CO	0.04	0.07	0.01	0.06	0.04
Existing Dehy - PM_{10}	<0.01	0.01	0.01	0.03	0.02
Existing Dehy - SO_2	<0.01	0.01	<0.01	<0.01	<0.01

Actual emissions are from the submitted Annual Emissions Inventories

Pollutant	**24-month Period TPY**	Timeframe
VOC	32.04	1/1/2010 - 12/31/2011
NO_x	0.23	1/1/2007 - 12/31/2008
CO	0.06	1/1/2010 - 12/31/2011
PM_{10}	0.01	1/1/2010 - 12/31/2011
SO_2	0.01	1/1/2010 - 12/31/2011

Net Emissions

	Removal Existing Dehy (Actual)	2 Emergency Generators (PTE)	Project (PTE)	**Net Impact**
VOC TPY	-32.04	0.10	54.29	**22.35**
NO_x TPY	-0.23	0.02	8.34	**8.13**
CO TPY	-0.06	0.20	7.59	**7.53**
PM_{10} TPY	-0.01	<0.01	1.00	**0.99**
SO_2 TPY	-0.01	0.10	0.02	**0.11**

Potential emissions from Emergency Generators for PM_{10} & SO_2 taken from the permit application.
Potential emissions from Emergency Generators for NO_x, CO, & VOC taken from Title V emissions limitation (6.1.1).
Potential emissions from the Project are from Attachment N of the permit application.

Source	VOC (TPY)		
	PAE	F-PTE	Δ
Proposed Dehy	0.00	30.00	30.00
Proposed Compressor Engine	0.00	23.98	23.98
Proposed Reboiler	0.00	0.26	0.26
Proposed Flare	0.00	0.05	0.05
Removal Existing Dehy	32.04	0.00	-32.04
2 Emergency Generators	0.00	0.10	0.10
Totals			*22.35*
Significant Level			40.00
Significant?			No

(1) Emissions calculated by applicant using same methodology as described above.
(2) PAE = Past Actual Emissions; F-PTE = Future Potential-to-Emit

With the decrease in VOC emissions from the removal of the existing glycol dehydration unit, the net emissions increase of VOC falls below the significance level of 40 TPY. Therefore, the proposed modifications are not defined as a "major modification" and are not subject to PSD review.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

There will be small amounts of various non-criteria regulated pollutants emitted from the combustion of natural gas. However, due to the concentrations emitted, detailed toxicological information is not included in this evaluation.

AIR QUALITY IMPACT ANALYSIS

The facility will not be a major source of HAP's as defined by 45CSR14. Based on the nature of the emissions and the annual emission rate, no air quality impact analysis was performed.

SOURCE AGGREGATION

"Building, structure, facility, or installation" is defined as all the pollutant emitting activities which belong to the same industrial grouping, are located on one or more contiguous and adjacent properties, and are under the control of the same person.

The Sardis Station is located approximately 5 miles from an existing station called Wilsonburg. They are not considered to be on contiguous or adjacent property as Dominion does not own the land in between the facilities. Dominion does operate and have a right-of-way lease on pipeline that will connect the two facilities. As both these facilities are existing stations holding current federal permits to operate (Title V), it has been previously determined that they are separate facilities for the purposes of aggregation. Dominion does not own or operate any production wells within 10 miles of Sardis Station.

Both the Sardis and Wilsonburg Station will operate under SIC Code 4922 – Natural Gas Transmission. Therefore, the Sardis Station does share the same SIC code as surrounding compressor stations.

Both the Sardis Station and Wilsonburg are both owned and operated by the same parent company, Dominion Resources, Inc.

Because the facilities are not considered to be on contiguous or adjacent properties, the emissions from the Sardis Station should not be aggregated with each other in determining major source or PSD status.

MONITORING OF OPERATIONS

Dominion will be required to perform the following monitoring:

1. Monitor and record quantity of natural gas consumed for all combustion sources.
2. Monitor the presence of the flare pilot flame with a thermocouple or equivalent.
3. Maintain records of all applicable monitoring for 40CFR60 Subpart JJJJ.

Dominion will be required to perform the following recordkeeping:

1. Maintain records of the amount of natural gas consumed in each combustion source.
2. Maintain records of testing conducted in accordance with the permit. Said records shall be maintained on-site or in a readily accessible off-site location
3. Maintain the corresponding records specified by the on-going monitoring requirements of and testing requirements of the permit.
4. Maintain records of the visible emission opacity tests conducted per the permit.
5. Maintain records of the flare design evaluation.
6. The records shall be maintained on site or in a readily available off-site location maintained by Dominion for a period of five (5) years.
7. Maintain records of all applicable requirements of 40CFR60 Subparts Dc, KKK, and JJJJ.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates that Dominion meets all the requirements of applicable regulations. Therefore, impact on the surrounding area should be minimized and it is recommended that the Doddridge County location should be granted a 45CSR13 construction permit for their facility.

Jerry Williams, P.E.
Engineer

Date