COMMONWEALTH OF PENNSYLVANIA
Department of Environmental Protection
Southwest Regional Office
September 3, 2009

SUBJECT: Review of Title V Permit Renewal Application
Natural Gas Compressor Station
Dominion Transmission, Inc.
J.B. Tonkin Station
Murrysville Borough, Westmoreland County

TO: Air Quality Permit File TV-65-00634

THROUGH: Mark A. Wayner, P.E.
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BACKGROUND

Dominion Transmission, Inc. (Dominion) has submitted a Title V permit application to renew their Title V Operating Permit (TVOP) for their J.B. Tonkin Station located in Murrysville Borough, Westmoreland County. This facility is a natural gas transmission station operating as a hub to move natural gas between other stations located on the Dominion pipeline.

The facility currently includes the following sources:

- One (1) Cleaver Brooks Model No. CB-700-800 natural gas-fired boiler rated at 3.35 MMBtu/hr.
- One (1) Waukesha Model No. F-2895GU natural gas-fired auxiliary engine rated at 4.4 MCF/hr.
- One (1) Cooper Model No. 12W-330-C2 natural gas-fired engine rated at 6000 BHP.
- Facility pumps, valves, flanges, etc.
- Parts Washers.

The Cooper engine is the primary engine for driving the compressor at the facility. Emergency backup power to the station control and power systems is provided by the Waukesha engine. The boiler heats glycol which is circulated both for heating of the station and maintaining heat in the blocks of both engines so they don't start cold. Parts washers are used sparingly to clean the engines during the year.

Consolidated Natural Gas Transmission Corp. (CNGT) installed the Cooper engine under the original plan approval 65-399-006 issued on April 2, 1985. After initial permitting, a Reasonably Available Control Technology (RACT) determination was made and imposed on the natural gas-fired engines at the facility under RACT permit 65-000-634. Conditions from the RACT permit were incorporated into the initial TVOP, TV-65-00634, issued on July 29, 1997. During the year of 2000, Consolidated Natural Gas Company (the parent

company of CNGT) was merged with Dominion Resources Inc. and Dominion became the owner of the facility. The Department issued the most recent permit renewal to Dominion on July 1, 2004 with an expiration date of June 30, 2009. The permit has been amended three times during the latest permit term. No major changes have been made to the sources or controls at the facility in the past 5 years.

This is a Title V facility because potential emissions exceed major thresholds for both NO_x and CO.

The Department received this renewal application on November 17, 2008. A letter of administrative completeness was sent to the applicant on December 17, 2008. The applicant was contacted by phone on January 23, 2009 to discuss the difficulties of undergoing a State Implementation Plan (SIP) revision to remove the seasonal limitation on stack testing. At this time, the Environmental Protection Agency (EPA) is not processing SIP changes. Dominion agreed to wait until SIP revision requests are being acted upon by the EPA and to continue work practices as usual. Upon review, the application was determined to be technically incomplete and a technical deficiency letter was sent to the applicant on March 19, 2009. On March 27, 2009 the applicant corrected all technical deficiencies by email and phone contact.

A draft permit was provided to the applicant on April 13, 2009. Comments received from Mr. Kingston on May 13, 2009 have been addressed in a separate comment and response review memo. The comment and response review memo and a second draft permit were provided to the applicant on July 10, 2009. A second set of comments received from Mr. Kingston on August 6, 2009 have been addressed in a second comment and response review memo. A final draft of the permit has been accepted by the applicant on August 27, 2009.

REQUESTS AND RESPONSE

Two requests were made with this renewal application to incorporate changes to the permit that were requested in a Minor Operating Permit Modification Application received on February 06, 2008. Each request is listed below followed directly by the response:

Request #1: Dominion requests that a permit condition (C.VII. #17) be added to Section C of the permit to define VOCs as "non-methane, non-ethane hydrocarbons as determined by EPA Method 18/25A (or equivalent), not including formaldehyde." This definition is in keeping with the development of the VOC limits (limits developed using EPA Method 18/25A) as included in the permit, and with the current stack-testing procedures and requirements for this facility.

Response #1: The Department defines VOC in Title 25 PA Code 121.1 as an organic compound which participates in atmospheric photochemical reactions; that is, an organic compound other than those which the Administrator of the EPA designates in 40 CFR 51.100 (relating to definitions) as having negligible photochemical activity. Methane and Ethane are both designated by the EPA as having negligible photochemical activity. Formaldehyde is classified by the EPA in Section 112 of the Clean Air Act as a Hazardous Air Pollutant (HAP) but is also an organic compound with chemical composition HCHO that is not designated by the EPA as having negligible photochemical activity.

The Department recognizes that VOC limits currently included in this permit were developed using EPA Method 18/25A as a basis. EPA Method 18/25A purposely excludes ethane and methane but inadvertently excludes formaldehyde because the oxygen content in formaldehyde shields it from Method 18/25A detection devices. VOC emission limitations in this permit can not be made to be less stringent without a SIP revision. Therefore, conditions in this permit relating to VOC limitations and testing shall be clarified to indicate that VOC limitations were developed using EPA Method 18/25A as a basis, and that ethane, methane, and formaldehyde are excluded in these limitations. These clarifications will be consistent with the permit condition

changes granted in OP-30-00089 for Dominion's Crayne Station. The Department believes modification of VOC limitation and testing conditions is one of the issues that should be addressed whenever SIP revision requests are being acted upon by the EPA.

Request #2: Permittee requests change to Condition D.II.005 to remove requirements to perform testing during the period between April 1 and October 31. Subject engine does not typically operate during the period of April through October.

Response #2: The Department agrees that stack testing of an engine should not be required to occur during seasonal periods of minimal to no operation. However, the requirements and language in the condition to stack test the Cooper engine during the Ozone Season (April 1st through October 31st) cannot be modified without a SIP revision. The Department believes modification of this condition is one of the issues that should be addressed whenever SIP revision requests are being acted upon by the EPA.

REGULATORY ANALYSIS

Per Title 25 PA Code Section 127.402(a), a permit is required to operate a stationary air contamination source.

All natural gas-fired engines at the facility were manufactured before January 1, 2008; therefore they are not subject to New Source Performance Standards (NSPS) 40 CFR Part 60 Subpart JJJJ Stationary Spark Ignition (SI) Internal Combustion Engines (ICE).

All natural gas-fired engines and the primary boiler at this facility are subject to the regulatory conditions imposed by RACT permit 65-000-634. The EPA published a direct final rule to approve revisions to the Commonwealth of Pennsylvania's State Implementation Plan (SIP) on August 13, 2001. This SIP revision was made to impose RACT for this major source of NO_x as well as other major sources of VOC and NO_x. Regulatory conditions and emissions limitations from this RACT determination have already been incorporated into the existing permit.

National Emissions Standards for Hazardous Air Pollutants (NESHAPS) for Stationary Reciprocating Internal Combustion Engines (RICE) from 40 CFR Part 63 Subpart ZZZZ has been amended on January 18, 2008. Per 40 CFR 63.6585 a person is subject to this subpart if they own or operate a stationary RICE at a major or area source of HAP emissions, except if the stationary RICE is being tested at a stationary RICE test cell/stand. This facility is an area source of HAP emissions, specifically formaldehyde, and includes a stationary RICE source that is not being tested at a stationary RICE test cell/stand. However, Subpart ZZZZ continues per 40 CFR 63.6590(b)(3) to define stationary RICE subject to limited requirements. "A stationary RICE which is … ,an existing spark ignition 2 stroke lean burn (2SLB) stationary RICE, … does not have to meet the requirements of this subpart and of Subpart A of this part. No initial notification is necessary." The Cooper engine at this facility is a 2SLB stationary RICE and will not be subject to 40 CFR 63 Subpart ZZZZ.

This facility is subject to Title V Permitting because the potential emission rates for NO_x and CO are above major source thresholds.

EMISSIONS & CONTROLS

No changes have been authorized to the air contamination sources or controls at the facility since the previous permit renewal and the original TVOP application. The applicant submitted potential emission rates for the primary air contaminants for each source with the original application. These rates were calculated using a

combination of imposed RACT limitations and AP-42 factors for NO_x, CO, and VOC, FIRE database and AP-42 factors for SO_x and PM_{10}, and Gas Research Institute's (GRI's) HAPCalc v1.0 software for HAP. Method 320 stack test data indicated formaldehyde emissions slightly greater than the originally submitted potential emission rate. The higher formaldehyde emission rate has replaced the original estimation. Yearly emission rates reflect a worst case operating scenario of 8760 hours per year. Potential emission rates for each non-trivial source at the facility are listed in tables 1-5 below:

Table 1: Cooper Engine Potential Emission Rates

Air Contaminant	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
CO	26.5	116.1
NO_x	39.7	173.8
PM_{10}	0.39	1.7
SO_x	0.024	0.10
VOC	6.6	28.9
Formaldehyde (HAP)	1.47	6.44

Control of NO_x is achieved by the OEM lean burn combustion design of the Cooper engine.

Table 2: Cleaver Brooks Boiler Potential Emission Rates

Air Contaminant	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
CO	0.07	0.31
NO_x	0.33	1.5
PM_{10}	0.04	0.18
SO_x	0.002	0.0088
VOC	0.018	0.078
Formaldehyde (HAP)	0.000028	0.00012

Table 3: Waukesha Engine Potential Emission Rates

Air Contaminant	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
CO	7.60	33.2
NO_x	8.8	38.6
PM_{10}	0.044	0.19
SO_x	0.0026	0.012
VOC	0.12	0.54
Formaldehyde (HAP)	0.05	0.24

Table 4: Pumps, Valves, Flanges, Etc. Potential Emissions

Fugitive Air Contaminant	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
VOC	1.8	7.82
Glycol Ethers (HAP)	0.48	2.1

Potential fugitive emission estimations for VOC and HAP were based upon component counts and emission factors developed for the gas industry by GRI. Component counts were derived from a survey of 6 existing CNG stations and a comparison to the actual station's sources.

Table 5: Parts Washer Potential Emissions

Fugitive Air Contaminant	Potential Emission Rate (lb/gal)	Potential Emission Rate (tpy)
VOC	6.58	0.49

Potential fugitive VOC emissions from parts washer solvent use were calculated using information from a submitted Material Safety Data Sheet (MSDS). Solvent use is approximately 25 gallons per year but an estimation has been made from a worst case use of 150 gallons.

Table 6: Facility-Wide Potential Emissions

Air Contaminant	Potential Emission Rate (tpy)
CO	149.41
NO_x	213.9
PM_{10}	2.07
SO_x	0.12
VOC	37.93
Formaldehyde (HAP)	6.7
Glycol Ethers (HAP)	2.1
Total HAP	8.8

The applicant submitted an Emission Test Report on December 12, 2008 detailing the stack test for their Cooper engine. Emissions were tested for NO_x, CO, and VOCs on October 15, 2008 in accordance with Department approved testing protocol. Emissions of formaldehyde were also tested using Method 320 on the same date. Stack testing of the Cooper engine is required once every five years per Source ID 102 Condition #005 in TV-65-00634. Table 7 below summarizes the measured emission rates compared to the permit limits:

Table 7: Cooper Engine Emission Rate Comparison

Air Contaminant	Stack Test Emissions		Permit Emission Limits	
	(lb/hr)	(tpy)	(lb/hr)	(tpy)
NO_x	28.57	125.14	39.68	173.8
CO	8.79	38.50	26.5	116.1
VOC	0.76	3.34	6.6	28.9
Formaldehyde	1.47	6.44	-	-

Yearly emission rates from the stack test data are based upon an operating time of 8760 hours per year. All air contaminant emissions are demonstrated to be within permitted limits. Actual operating time of the Cooper engine varies greatly depending upon the time of the year and the demand for natural gas. The facility operates very little most years during the summer months with the majority of the natural gas transmission necessary during the winter months. From 2003 to 2007 the Cooper engine has run between a minimum of 3000 hours and a maximum of 8000 hours each year. The Waukesha engine has operated for less than 61 hours each year.

While actual emissions based upon the stack test are lower than major source levels for CO, these hours of operation lead to emissions that are still potentially above major source levels for NO_x.

RECOMMENDATIONS

Dominion Transmission, Inc. has submitted a complete application and I recommend renewing their TVOP for an additional 5 years. Special conditions in the permit will be modified as indicated in the following sections per Dominion's request and the Department's approval. Testing for formaldehyde by Method 320 will be included in conditions where stack testing is required. VOC emission limits for the Cooper engine in the permit's emission restriction summary shall also be noted as being based on US EPA Method 18/25A. Source level testing requirements based upon operational hours will be corrected to indicate annual or semi-annual testing frequencies as published in the SIP.

SPECIAL CONDITIONS

Source Level Condition to Be Modified

1. Source 102 Existing Condition #001 – Other than the startup and shutdown periods addressed in Section D, Condition #13, the following emission limits shall not be exceeded for this source:

   39.68 Lbs/Hr Nitrogen Oxides
   173.8 Tons/Yr Nitrogen Oxides
   26.5 Lbs/Hr Carbon Monoxide
   116.1 Tons/Yr Carbon Monoxide
   6.6 Lbs/Hr Volatile Organic Compounds
   28.9 Tons/Yr Volatile Organic Compounds

2. Source 102 Existing Condition #005 – A minimum of one (1) stack test in accordance with 25 Pa. Code Chapter 139 and the Department Source Testing Manual shall be performed on this source at least once every five (5) years to verify the emission rates for NOx (as NO2), CO, and VOC. Testing shall be conducted while this source is operating at full load, full speed between April 1 and October 31.

3. Source 102 Existing Condition #009 – If operated less than 750 hours per calendar year, this source shall be tested once during the term of the permit through either and EPA Method stack test or through the use of portable analyzers in order to verify the rates of NOx (as NO2), CO, and VOC.

4. Source 102 Existing Condition #010 – If operated 750 hours or more per calendar year, this source shall be tested annually through either an EPA Method stack test or through the use of portable analyzers in order to verify the rates of NOx (as NO2), CO and VOC.

Modified Source Level Condition

1. Source 102 Existing Condition #001 - Other than the startup and shutdown periods addressed in Section D, Condition #13, the following emission limits shall not be exceeded for this source:

   39.68 Lbs/Hr Nitrogen Oxides
   173.8 Tons/Yr Nitrogen Oxides
   26.5 Lbs/Hr Carbon Monoxide

116.1 Tons/Yr Carbon Monoxide
6.6 Lbs/Hr Volatile Organic Compounds*
28.9 Tons/Yr Volatile Organic Compounds*

* Based on US EPA Method 18/25A (or Agency approved equivalent, does not include formaldehyde)

2. Source 102 Existing Condition #005 - A minimum of one (1) stack test in accordance with 25 Pa. Code Chapter 139 and the Department Source Testing Manual shall be performed on this source at least once every five (5) years to verify the emission rates for NOx, CO, VOC, and formaldehyde (using US EPA Method 320). VOC testing by US EPA Method 18/25A (or Agency approved equivalent, does not include formaldehyde) shall be required to determine compliance with the emission limits above. Testing shall be conducted while this source is operating at full load, full speed between April 1 and October 31.

3. Source 102 Existing Condition #009 - If operated less than 750 hours per calendar year, this source shall be tested annually through either an EPA Method stack test or through the use of portable analyzers in order to verify the rates of NOx, CO, and VOC. If testing through an EPA Method stack test, VOC testing by US EPA Method 18/25A (or Agency approved equivalent, does not include formaldehyde) shall be accepted to determine compliance with the emission limits above.

4. Source 102 Existing Condition #010 - If operated 750 hours or more per calendar year, this source shall be tested semi-annually through either an EPA Method stack test or through the use of portable analyzers in order to verify the rates of NOx, CO, and VOC. If testing through an EPA Method stack test, VOC testing by US EPA Method 18/25A (or Agency approved equivalent, does not include formaldehyde) shall be accepted to determine compliance with the emission limits above.