



west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Permit No.: R13-2856
Plant ID No.: 033-00011
Applicant: Dominion Transmission, Inc. (Dominion)
Facility Name: Wilsonburg Compressor Station
Location: Wilsonburg, Harrison County
SIC Code: 4922 - Natural Gas Pipeline Station, Natural Gas Transportation
486210 - Pipeline Transportation of Natural Gas

Application Type: Construction
Received Date: September 16, 2010
Engineer Assigned: John Legg
Fee Amount: \$2,000.00
Date Paid: September 21, 2010
Complete Date: September 21, 2010
Applicant Ad Date: September 16, 2010
Newspaper: *Exponent Telegram*
Revised Application: December 1, 2010 (Stamped in at DAQ)
UTM's: Easting: 549.9 km Northing: 4,348.7 km Zone: 17
Description: Installation of two (2), 192.5 hp (1.82 MM Btu/hr) natural gas-fired engine/emergency generators (Emission Point IDs EG01 and EG02) to be used to provide electricity to Dominion's Wilsonburg Natural Gas Compressor Station when purchased power is not available. Station is located in Harrison County, WV.

SUMMARY

Dominion proposes to install two natural gas-fired emergency generator to provide electricity to the Wilsonburg Station when purchased power is not available. Based on operating each of the two (2) new generators 500 hr/yr, emissions are estimated at : Nitrogen Oxides (NO_x) 0.02 ton/yr; Carbon Monoxide (CO) 0.20 ton/yr; Volatile Organic Compounds (VOC) 0.10 ton/yr; Formaldehyde 0.02 ton/yr.

PROCESS DESCRIPTION

Existing Facility

Dominion's Wilsonburg Compressor Station is a natural gas compressor station used to compress gas for transportation through a pipeline system. The existing station is comprised of natural gas-fired reciprocating internal combustion engines used to drive compressors and a glycol dehydration unit used to remove water from the gas stream.

Proposed Changes

Dominion proposes to install two (2) natural gas-fired emergency generators (Emission Unit ID's 005-001 and 005-02) to provide the station with necessary electricity when purchased power is not available.

Table 1: Proposed Two (2) New Natural Gas-fired Emergency Generators to be Installed at Dominion's Wilsonburg Natural Gas Compressor Station, Harrison County, WV.

Emission Unit ID	Emission Point ID	Emission Unit Description	Model Year	Year Installed	Design Capacity	Control Device
005-01	EG01	Cummins GM8.1L	2010	2010	192.5 hp	None
005-02	EG02	Cummins GM8.1L	2010	2010	192.5 hp	None

SITE INSPECTION

The writer did not inspect Dominion's Wilsonburg Compressor Station because the station is routinely inspected by DAQ's North Central Regional Office located in Wheeling, WV. Enforcement Inspector Lou Ann Lee last inspected the facility on September 8, 2010. At that time the station was found to be in compliance and was given the inspection code 30.

Directions to the Wilsonburg Compressor Station as given in application:

Travel West on Route 50 past Clarksburg. Turn right onto Paleo Road. Travel 50 feet and turn Right onto gravel road. Station is at the end of the gravel road.

ESTIMATE OF EMISSIONS

Emission rates for the proposed two (2) natural gas-fired emergency generators are based on manufacturer’s data and AP-42 values. In addition to providing electricity when purchased power is unavailable, the generator will be operated for the purpose of maintenance checks and readiness testing. Emissions, based on operating each of the two generators a maximum of 500 hr/yr, are summarized in Table 2 and Table 3 below:

Table 2: Hourly and Annual Emissions from Dominion’s Proposed Two New Emergency Natural Gas-fired Generators to be Installed at the Wilsonburg Compressor Station, Harrison County, WV.					
Pollutant		Maximum Emissions (Uncontrolled)			
		One Generator		Two Generator ⁽⁴⁾	
		(lb/hr)	(ton/yr) ⁽³⁾	(lb/hr)	(ton/yr)
Criteria Pollutants	Nitrogen Oxides (_{Nox})	0.03 ⁽¹⁾	0.01	0.06	0.02
	Carbon Monoxide (CO)	0.39 ⁽¹⁾	0.10	0.78	0.20
	Volatile Organic Compounds (VOC)	0.19 ⁽¹⁾	0.05	0.38	0.10
	PM ₁₀	0.02 ⁽²⁾	<0.01	0.04	<0.02
	PM _{2.5}	0.02 ⁽²⁾	<0.01	0.04	<0.02
	Sulfur Dioxide (SO ₂)	<0.01 ⁽²⁾	<0.01	<0.01	<0.02
Speciated VOCs & HAPS	Acetaldehyde	0.01 ⁽²⁾	<0.01	0.02	<0.02
	Acrolein	0.01 ⁽²⁾	<0.01	0.01	<0.02
	Benzene	<0.01 ⁽²⁾	<0.01	<0.02	<0.02
	Ethylbenzene	<0.01 ⁽²⁾	<0.01	<0.02	<0.02
	Formaldehyde	0.04 ⁽²⁾	0.01	0.08	0.02
	Toluene	<0.01 ⁽²⁾	<0.01	<0.02	<0.02
	Xylene	<0.01 ⁽²⁾	<0.01	<0.02	<0.02
<p>(1) Estimated using Manufacturer’s Information.</p> <p>(2) Estimated using AP-42 factors.</p> <p>(3) Annual Based on 500 hr/yr of operation.</p> <p>(4) Two Generator Operation = One Generator Operation x 2</p>					

REGULATORY APPLICABILITY

Dominion's Wilsonburg Station is located near Wilsonburg, Harrison County, WV which is classified as attainment area with respect to the National Ambient Air Quality Standards (NAAQS) for all criteria pollutants.

The facility is not a major source, i.e., it does not emit 250 TPY or more of any regulated air pollutant, nor does it emit or have the potential to emit 10 tons of a single HAP or 25 tons of aggregated HAPs, and it is not one of the stationary sources named in 45CSR14, Table 1. The facility's existing potential to emit is given below:

Dominion Compressor Station	Existing Potential to Emit (ton/yr)				
	NO _x	CO	VOC	PM	SO ₂
Wilsonburg Station	240.24	46.43	154.80	0.61	0.04

The following State Rules were reviewed for applicability:

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

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

The station exceeds the regulatory emission threshold for criteria pollutants of 6 lb/hr and 10 tons/yr. The facility is also subject to the New Source Performance Standards (NSPS) of 40 CFR 60 and per 45CSR13-5, a permit is required.

45CSR14 - "Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution for the Prevention of Significant Deterioration"

The two (2) new proposed emergency generators at the Wilsonburg Station are below the thresholds of 45CSR14.2.74a and therefore their construction/installation is not classified as a major modification and PSD regulations do not apply.

Dominion's Wilsonburg Compressor Station	Potential to Emit (ton/yr)					
	NO _x	CO	VOC	PM	SO ₂	HAPs
Projected Increase (R13-2856)	0.02	0.20	0.10	0.01	0.01	0.02
Major Modification Threshold	40	100	40	25	40	

45CSR16 "Standards of Performance for New Stationary Sources"

Adopts by reference the standards of performance for new stationary sources promulgated by the United States Environmental Protection Agency pursuant to section 111(b) of the federal Clean Air Act, as amended (CAA). This rule codifies general procedures and criteria to implement the standards of performance for new stationary sources set forth in 40 CFR Part 60. The rule also adopts associated reference methods, performance specifications and other test methods which are appended to these standards.

40 CFR 60, Subpart JJJJ applies. See below.

40CSR30 - "Requirements for Operating Permits."

The facility is considered to be a major Title V source emitting greater than 100 tons per year of VOC and NO_x. A significant modification to the station's current Title V permit (R13-03300011-2006) was submitted at the same time as this application.

40 CFR 60 Subpart JJJJ, "Standards of Performance for Stationary Spark Ignition Internal Combustion Engines"

On March 18, 2008 the USEPA issued the NSPS for Stationary Spark Ignition Internal Combustion Engines (Subpart JJJJ). This rule outlines standards of performance for all new, modified, or reconstructed units meeting the applicability of the rule. The rule segments applicability by unit horsepower and manufactured date.

Based on the proposed unit horsepower of 192.5 and manufactured date of 2010, Subpart JJJJ will be applicable to both of the emergency generators. As such, the units will be subject to the following emissions limitations.

Pollutant	Limitation (g/hp-hr)
NO _x	2
CO	4
VOC	1

Both units are USEPA Certified by the manufacturer and as such are not required to perform an initial performance test. The units will be operated as emergency units and will be limited to 100 hours per year each of operation during non-emergency times. Additionally, the units will be required to maintain a maintenance plan and associated records.

GENERAL PERMIT ELIGIBILITY

The proposed installation of the two (2) emergency generators is not eligible for a G60-C General Permit registration because the Wilsonburg Station is considered to be a major source under 45CSR30 (Title V).

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

The combustion of natural gas generates very small amounts of Hazardous Air Pollutants (HAP). Commonly emitted HAP generated by the combustion of natural gas are described below:

Benzene - Found in the air from emissions from burning coal and oil, gasoline service stations, and motor vehicle exhaust. Acute (short-term) inhalation exposure of humans to benzene may cause drowsiness, dizziness, headaches, as well as eye, skin, and respiratory tract irritation, and, at high levels, unconsciousness. Chronic (long-term) inhalation exposure has caused various disorders in the blood, including reduced numbers of red blood cells and aplastic anemia, in occupational settings. Reproductive effects have been reported for women exposed by inhalation to high levels, and adverse effects on the developing fetus have been observed in animal tests. Increased incidence of leukemia (cancer of the tissues that form white blood cells) have been observed in humans occupationally exposed to benzene. EPA has classified benzene as a Group A, human carcinogen.

Ethyl-benzene - Mainly used in the manufacturing of styrene. Acute (short-term) exposure to ethyl benzene in humans results in respiratory effects, such as throat irritation and chest constriction, irritation of the eyes, and neurological effects, such as

dizziness. Chronic (long-term) exposure to ethyl benzene by inhalation in humans has shown conflicting results regarding its effects on the blood. Animal studies have reported effects on the blood, liver, and kidneys from chronic inhalation exposure to ethyl benzene. Limited information is available on the carcinogenic effects of ethyl benzene in humans. In a study by the National Toxicology Program (NTP), exposure to ethyl benzene by inhalation resulted in an increased incidence of kidney and testicular tumors in rats, and lung and liver tumors in mice. EPA has classified ethyl benzene as a Group D, not classifiable as to human carcinogenicity.

Formaldehyde - Used mainly to produce resins used in particle board products and as an intermediate in the synthesis of other chemicals. Exposure to formaldehyde may occur by breathing contaminated indoor air, tobacco smoke, or ambient urban air. Acute (short-term) and chronic (long-term) inhalation exposure to formaldehyde in humans can result in respiratory symptoms, and eye, nose, and throat irritation. Limited human studies have reported an association between formaldehyde exposure and lung and nasopharyngeal cancer. Animal inhalation studies have reported an increased incidence of nasal squamous cell cancer. EPA considers formaldehyde a probable human carcinogen (Group B1).

n-Hexane - A solvent that has many uses in the chemical and food industries, either in pure form or as a component of commercial hexane. The latter is a mixture that contains approximately 52% n-hexane; the balance is made up of structural analogs and related chemicals such as methylpentane and methylcyclopentane. Highly purified n-hexane is used as a reagent for chemical or chromatographic separations. Other grades of n-hexane are used as solvents for extracting edible fats and oils in the food industry and as a cleaning agent in the textile, furniture, and printing manufacturing industries. Hexane is the solvent base for many commercial products, such as glues, cements, paint thinners, and degreasers. n-Hexane is a minor constituent of crude oil and natural gas and occurs in different petroleum distillates. No data are available regarding the potential toxicity of n-hexane in humans orally exposed to n-hexane. However, as might be expected for a chemical with such wide application, the potential exists for persons to be environmentally and/or occupationally exposed to n-hexane via other routes of exposure.

Toluene - The acute toxicity of toluene is low. Toluene may cause eye, skin, and respiratory tract irritation. Short-term exposure to high concentrations of toluene (e.g., 600 ppm) may produce fatigue, dizziness, headaches, loss of coordination, nausea, and stupor; 10,000 ppm may cause death from respiratory failure. Ingestion of toluene may cause nausea and vomiting and central nervous system depression. Contact of liquid toluene with the eyes causes temporary irritation. Toluene is a skin irritant and may cause redness and pain when trapped beneath clothing or shoes; prolonged or repeated contact with toluene may result in dry and cracked skin. Because of its odor

and irritant effects, toluene is regarded as having good warning properties. The chronic effects of exposure to toluene are much less severe than those of benzene. No carcinogenic effects were reported in animal studies. Equivocal results were obtained in studies to determine developmental effects in animals. Toluene was not observed to be mutagenic in standard studies.

Xylenes - Commercial or mixed xylene usually contains about 40-65% m-xylene and up to 20% each of o-xylene and p-xylene and ethyl benzene. Xylenes are released into the atmosphere as fugitive emissions from industrial sources, from auto exhaust, and through volatilization from their use as solvents. Acute (short-term) inhalation exposure to mixed xylenes in humans results in irritation of the eyes, nose, and throat, gastrointestinal effects, eye irritation, and neurological effects. Chronic (long-term) inhalation exposure of humans to mixed xylenes results primarily in central nervous system (CNS) effects, such as headache, dizziness, fatigue, tremors, and incoordination; respiratory, cardiovascular, and kidney effects have also been reported. EPA has classified mixed xylenes as a Group D, not classifiable as to human carcinogenicity.

PERMIT LIMITATIONS AND STANDARDS

- 4.1.1. The facility is to remain a minor source of HAP.
- 4.1.2. The generators are subject to 40 CFR 60, Subpart JJJJ.
- 4.1.3. The generators must comply with the emission standards in 40 CFR 60, Subpart JJJJ, Table 1 per 4.1.3.
- 4.1.4. If the permittee purchases an engine certified by the manufacturer, and keeps records that it was operated and maintained according to manufacturer's emission-related written instructions, then no performance testing is required, otherwise a certified engine not operated per the manufacturer's instruction or a non-certified engine will need to be performance tested.
- 4.1.5. The engines must be correctly operated and maintained over their entire lives.
- 4.1.6. After January 1, 2011, the permitted can't install engines that don't meet the applicable requirements given in §60.4233.
- 4.1.7. The engines must meet the hourly and annual emissions rates given in Table 2 of the permit.
- 4.1.8. Engines shall not be operated more than 500 hr/yr.

Permit Testing Requirements

- 4.3.1. If the permittee conducts performance tests, then the procedures given in paragraphs (a) through (g) of Section 4.3.1. are to be followed.

PERMIT RECORD KEEPING REQUIREMENTS

- 4.4.4. Permittee must keep a record of HAP emissions to demonstrate that the facility is a minor source of HAP as specified in 4.1.1.

- 4.4.5. Permittee to keep records of:
 - a) All notifications submitted to comply with 40 CFR 60, Subpart JJJJ and documentation supporting notifications.
 - b) Maintenance conducted on the engine.
 - c) Documentation that the engines are certified.
 - d) For non-certified engines or certified engines operating in a non-certified manner, documentation that the engine meets emission standards.

- 4.4.6. Permittee shall keep an operating log detailing the date, time, number of hours operated and a twelve-month rolling total (of hours of operation) for each engine.

- 4.4.7. An performance test results are to be submitted within 60 days of testing.

RECOMMENDATION TO DIRECTOR

Dominion’s request to construct/install and operate two (2) natural gas-fired emergency generators at their Wilsonburg, Harrison County, WV compressor station meets the requirements of 45CSR13 (Rule 13) and all other applicable rules, and therefore should be granted a Rule 13 construction permit (R13-2856).

John Legg
Permit Writer

December 21, 2010
Date