

**COMMONWEALTH OF VIRGINIA
Department of Environmental Quality
Valley Regional Office**

STATEMENT OF LEGAL AND FACTUAL BASIS

Columbia Gas Transmission Corporation
Shenandoah Compressor Station
Page County, Virginia
Permit No. VRO81139

Title V of the 1990 Clean Air Act Amendments required each state to develop a permit program to ensure that certain facilities have federal Air Pollution Operating Permits, called Title V Operating Permits. As required by 40 CFR Part 70 and 9 VAC 5 Chapter 80, Columbia Gas Transmission Corporation has applied for a renewal of the Title V Operating Permit for its natural gas compressor station in Page County, Virginia. The Department has reviewed the application and has prepared a Title V Operating Permit.

Engineer/Permit Contact: _____ Date: _____
Cassandra J. Frysinger
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Air Permit Manager: _____ Date: _____
Janardan R. Pandey, P.E.

FACILITY INFORMATION

Permittee

Columbia Gas Transmission, LLC
1700 MacCorkle Avenue SE
Charleston, West Virginia 25314

Facility

Shenandoah Compressor Station
On the northwest side of State Route 685, approximately 1.7 miles southwest of the northernmost intersection with U.S. 340
Page County, Virginia

County-Plant Identification Number: 51-139-0027

SOURCE DESCRIPTION

NAICS Code: NAICS 486210 – Natural Gas Transmission

Shenandoah Compressor Station (SCS) is a natural gas compressor station. Natural gas is received via gas pipelines from an upstream compressor station, compressed, and pumped into outlet pipelines for transmission to a downstream station. The natural gas is compressed using two turbines, site-rated at 5,027 horsepower (hp) each. On-site auxiliary equipment includes one emergency generator rated at 135 hp. Also on-site is a 2.1 MMBtu/hr heating system boiler.

The existing Title V permit for the facility was issued on April 5, 2009, modified on June 5, 2009 and expires on April 4, 2014. The existing Title V permit allows operation of two natural gas-fired turbines (each rated at 5,027 hp), one natural gas-fired emergency generator rated at 135 hp, and one 2.1 MMBtu/hr natural gas-fired boiler.

The facility is a Title V major source of nitrogen oxides. The facility is considered an area source of hazardous air pollutants (HAPs). This source is located in an attainment area for all pollutants. The facility is currently permitted under a minor NSR permit dated August 23, 1991, as amended January 27, 1994, March 10, 1995, August 6, 1998, and September 16, 2008. The permit amendment on January 27, 1994 has been superseded by subsequent amendments.

COMPLIANCE STATUS

A full compliance evaluation of this facility, including a site visit, was most recently conducted on February 7, 2012. In addition, all reports and other data required by permit conditions or regulations, which are submitted to DEQ, are evaluated for compliance. Based on these compliance evaluations, the facility has not been found to be in violation of any state or federal applicable requirements at this time.

CHANGES TO EXISTING TITLE V PERMIT

The following are changes to the existing Title V permit since the last renewal:

- Facility Information: The names of the responsible official and contact person have been updated along with the Permittee address.
- Permit Formatting and General Conditions: The format of the permit and General Conditions were updated to reflect changes made to the Title V boilerplates since Columbia Gas' permit was issued.
- Fuel Burning Equipment: The requirements of 40 CFR 63 (MACT) Subpart ZZZZ for the existing natural gas-fired emergency generator were added to the Title V permit. The compliance date for the existing emergency generator is October 19, 2013.

EMISSION UNIT AND CONTROL DEVICE IDENTIFICATION

The emissions units at this facility consist of the following:

Table I. Significant Emission Units

Emission Unit ID	Stack ID	Emission Unit Description	Size/Rated Capacity*	Pollution Control Device Description (PCD)	PCD ID	Pollutant Controlled	Applicable Permit Date**
Combustion Turbines							
1	E01	Combustion Turbine #1 (Natural gas fired) Allison 501-KC5 (Constructed 1992)	48.6 MMBtu/hr (Input) 5,027 hp (Output)	-	-	-	8/23/1991, 1/27/1994, 3/10/1995, 8/6/1998, and 09/16/2008
2	E02	Combustion Turbine #2 (Natural gas fired) Allison 501-KC5 (Constructed 1992)	48.6 MMBtu/hr (Input) 5,027 hp (Output)	-	-	-	8/23/1991, 1/27/1994, 3/10/1995, 8/6/1998, and 09/16/2008
Fuel Burning Equipment							
G1	G1	Auxiliary Generator Waukesha F11GSI (Constructed 1992)	1.6 MMBtu/hr (Input) 135 hp (Output)	-	-	-	8/23/1991, 1/27/1994, 3/10/1995, 8/6/1998, and 9/16/2008
BLR1	BL1	Heating Boiler Hydrotherm MR-1500-BPV (Constructed 1992)	2.1 MMBtu/hr (Input)	-	-	-	8/23/1991, 1/27/1994, 3/10/1995, 8/6/1998, and 9/16/2008

* The Size/Rated capacity is provided for informational purposes only, and is not an applicable requirement.

** Permit issued on 8/23/91 and amended on 1/27/94, 3/10/95, 8/6/98 and 9/16/08.

EMISSIONS INVENTORY

A copy of the 2012 annual emission update is attached as Attachment A. Emissions are summarized in the following tables:

**Table II. 2012 Actual Criteria Pollutant Emissions
 for the Shenandoah Compressor Station**

2012 Criteria Pollutant Emission in Tons/Year*						
Emission Unit	VOC	CO	SO₂	PM₁₀	PM_{2.5}	NO_x
Combustion Turbine#1	0.45	7.85	2.1E-05	5.7E-05	5.7E-05	11.21
Combustion Turbine #2	0.46	7.97	2.2E-05	5.8E-05	5.8E-05	11.38
Generator	2.4E-05	1.4E-03	4.1E-07	1.1E-06	1.1E-06	1.4E-03
Boiler	2.2E-03	0.35	2.5E-03	3.1E-02	3.1E-02	0.41
Fugitive Emissions	2.16	--	--	--	--	--
Total	3.07	16.17	2.5E-03	3.1E-02	1.3E-04	23.00

* Values in emissions report are rounded

**Table III. 2012 Actual Hazardous Air Pollutant Emissions
 for the Shenandoah Compressor Station**

Pollutant	2012 Hazardous Air Pollutant Emission in Tons/Year
Formaldehyde	1.23

EMISSION UNIT APPLICABLE REQUIREMENTS - (Combustion Turbines #1 and #2)

Limitations

The following limitations are state BACT requirements from the minor NSR permit issued on 8/23/91, as amended on 1/27/94, 3/10/95, 8/6/98, and 9/16/08. Please note that the condition numbers are from Part I of the minor NSR permit. A copy of the permit is attached as Attachment B with the amendments as Attachment C, D, E and F:

- Condition 4: NO_x and CO emissions from the turbines shall be controlled by lean fuel-to-air ratio.
- Condition 6: The condition provides a limit on fuel consumption for the turbines.
- Condition 9: The condition provides the emission limits for criteria pollutants for each turbine.
- Condition 12: Visible emissions are limited to five percent for the turbines.
- Condition 15: The condition establishes a limit on type of fuel to be used in turbines; natural gas with a sulfur content no greater than 20 grains per 100 scf of sulfur, equivalent to 0.068% or less by weight.

Monitoring and Recordkeeping

The monitoring and recordkeeping requirements in Conditions 7, 17, and 18 of the NSR permit have been modified to meet Part 70 requirements.

Condition 7 of the NSR permit requires that each turbine have a permanently installed fuel flow rate gauge with a cubic feet per second readout, and be readily accessible. Condition 17 of the NSR permit includes requirements for maintaining records of all emission data and operating parameters. These records include monthly natural gas consumption (in million cubic feet) by each turbine, DEQ approved pollutant specific emission factors and sulfur content of the natural gas. The fuel consumption limits in Condition 6 of the minor NSR permit are based on the turbines operating at the rated capacity based on the manufacturer's recommendation. Calculations have been included in Attachment G to demonstrate how the emission limits were obtained. The fuel flow rate gauge and associated recordkeeping provide a means of establishing continued compliance with the fuel consumption limitations in Condition 6 of the minor NSR permit.

The turbines in operation at the Shenandoah Compressor Station are subject to 40 CFR 60 (NSPS) Subpart GG. The NSPS contains requirements for SO₂ and NO_x emissions. The permittee must comply with the alternative sulfur monitoring requirements of 60.334(h)(3), which have been incorporated into the permit. This requires the permittee to maintain records of

either a valid purchase contract or tariff sheet or transportation contracts or representative sampling data for the gaseous fuel, indicating that the maximum sulfur content of the fuel is 20.0 grains of sulfur (0.068% sulfur by weight) per 100 standard cubic feet or less. Compliance with SO₂ requirements is demonstrated by complying with the natural gas sulfur content limit of 20.0 grains of sulfur (0.068% sulfur by weight) per 100 standard cubic feet or less. Condition 18 of the NSR permit requires the facility to maintain records of either: a valid purchase contract, tariff sheet, transportation contracts, or representative sampling data for the gaseous fuel to indicate that maximum total sulfur content. The requirement to maintain records of the maximum total sulfur content provides a means to establish continued compliance with the sulfur content limitation in Condition 15 of the minor NSR permit.

Compliance with NO_x emission requirements was demonstrated by stack testing performed on July 1, 1993. Since the turbines are fueled only by pipeline-quality natural gas with no add-on controls, there is no reason to expect the NO_x emissions will exceed those measured during the stack test performed on July 1, 1993.

The hourly emission limits established during the ozone season of April 1 through October 31 for criteria pollutants (SO₂, NO_x, CO and VOC) are based on the manufacturer's specifications at the rated capacity of the turbines. Therefore, if the turbines are operated at capacity, or below, there should not be a violation of the hourly emission rates. Calculations have been included in Attachment G to demonstrate how the limits are obtained.

During the cold months, the manufacturer of the turbines (Allison Industrial & Marine Applications Engineering) has recommended different hourly emission rates. As with all turbines, the compressor turbines are sensitive to ambient temperatures which in turn affects the horsepower output and emissions from the turbines. Per the manufacturer, an absolute maximum horsepower is delivered by these turbines when operating at an ambient temperature of -20⁰ F. At this temperature, each turbine delivers 5810 hp and higher emissions are expected. The hourly emission limits established during the non-ozone season of November 1 through May 30 are based on absolute maximum horsepower of the turbines and based upon the manufacturer's recommendations.

Annual emissions from the operation of the turbine will be calculated using the following equation:

$$E = F \times N \times H \quad \text{..... Equation 1}$$

Where:

E = Emission Rate (lb/time period)
 F = Pollutant specific emission factors as follows:

SO₂ = 1.22E-04 lb/hp-hr

NO _x	=	3.17E-03 lb/hp-hr
CO	=	2.23E-03 lb/hp-hr
VOC	=	1.28E-04 lb/hp-hr
PM10	=	1.61E-04 lb/hp-hr

N	=	operating time period
H	=	horse power rating of the turbine

Calculations have been included in Attachment G to demonstrate how annual emission limits were obtained and practically prohibit the turbines from the ability to exceed the emission limitations specified in the permit.

There is no monitoring for the visible emission limits. The "EPA Final Periodic Monitoring Guidance" specifically gives the example of turbines burning pipeline natural gas only, and states that federally enforceable requirements for equipment maintenance can satisfy the requirement for periodic monitoring of compliance with the opacity standard. Condition 8 of the Title V permit requires the turbines to be controlled by proper operation and maintenance in addition to training in the operation of the equipment. Condition 12 of the Title V permit requires the facility to develop a maintenance schedule and maintain records of all scheduled and non-scheduled maintenance; Condition 14 of the Title V permit also requires the facility to records of the required turbine operator training including date and nature of training provided. The monitoring and recordkeeping in Conditions 12 and 14 of the Title V permit provide adequate means of demonstrating compliance with the maintenance and operating requirements in Condition 8 of the Title V permit.

Compliance Assurance Monitoring (CAM) Plan Applicability

The CAM plan does not apply to the combustion turbines; the combustion turbines do not use a control device to achieve compliance with the emission limitations.

Testing

The permit does not require source emission tests. Condition 15 of the Title V permit requires that if testing is conducted in addition to the monitoring specified in this permit, the permittee shall use the appropriate method(s) in accordance with procedures approved by the DEQ.

The Department and EPA have authority to require testing not included in this permit if necessary to determine compliance with an emission limit or standard.

Reporting

No specific reporting has been included in the permit.

Streamlined Requirements

Part I, Condition 16 has not been included, as all applicable requirements from NSPS Subpart GG, except for the requirement to determine fuel-bound nitrogen, have been included in the permit. As explained in the attached letter from EPA (Attachment H), nitrogen monitoring can be waived for pipeline quality natural gas, since there is no fuel-bound nitrogen and the free nitrogen does not contribute appreciably to NO_x emissions.

Part I, Condition 14 and Part II, Condition 2 which required Stack testing for NO_x were completed on July 1, 1993. Therefore, these stack testing requirements have not been included.

New source construction and start-up notification requirements in Part II, Condition 1 have not been included as they have already been fulfilled.

Facility design and construction requirements in Part II, Condition 3 have not been included.

Part II, Condition 8, regarding invalidation of permit if not constructed within 18 months from the date of the permit, has not been included.

The Combustion Turbines have the following applicable requirements from the NSPS (40 CFR 60) Subpart GG and 9 VAC 5-50-410:

§60.332 (a)(2): Allowable NO_x emissions shall not exceed the following:

$$STD = 0.150 \frac{14.4}{Y} + F$$

..... Equation 2

Where:

STD = Allowable NO_x emissions (percent by volume at 15 percent oxygen and on a dry basis).

Y = Manufacturer's rated heat rate at manufacturer's rated peak load (kilojoules per watt hour), or actual measured heat rate based on lower heating value of fuel as measured at actual peak load for the facility. The value of Y shall not exceed 14.4 kilojoules per watt hour.

F = NO_x emission allowance for fuel-bound nitrogen as defined in §60.332 (a)(3).

§60.334(h)(3): The owner or operator may elect not to monitor the total sulfur content of the gaseous fuel combusted in the turbine, if the gaseous fuel is demonstrated to meet the definition of natural gas in §60.331(u), regardless of whether an existing custom schedule

approved by the administrator for subpart GG requires such monitoring.

The allowable NO_x emission limit in the minor NSR permit (Condition 9 of 8/23/91 Permit as amended in 3/10/95) is more stringent than the one in Subpart GG (as shown in Attachment F). Therefore, the limit from the minor NSR permit has been included in the Title V permit.

The fuel sulfur content requirement in the NSR permit (Condition 15 of 8/23/91 Permit, as amended on 9/16/08) was changed to equal the natural gas fuel sulfur content limit in Subpart GG. Therefore, the limit from the minor NSR permit has been included in the Title V permit.

The sulfur dioxide standard at 40 CFR 60.333(b) is met as Columbia Gas does not burn fuel in the turbines containing total sulfur in excess of 0.8 percent by weight. Only natural gas is burned in the turbines.

The testing requirements of NSPS Subpart GG (40 CFR 60.335) have been fulfilled and have not been included in the Title V permit.

Remaining general conditions in Part II of the NSR permit have been modified to meet the general condition requirements of 40 CFR Part 70 and 9 VAC 5-80-110.

EMISSION UNIT APPLICABLE REQUIREMENTS - (Emission Units G1 & BLR1)

Limitations

The following limitations are state BACT requirements from the minor NSR permit issued on 8/23/91, and amended on 1/27/94, 3/10/95, 8/6/98 and 9/16/08. Please note that the condition numbers are from Part I of the minor NSR permit. A copy of the permit is attached as Attachment B with the amendments as Attachment C, D, E and F:

- Condition 5: Limit on operating hours for auxiliary generator.
- Condition 8: Limit on fuel consumption for the boiler.
- Condition 10: Emission limits for criteria pollutants for boiler.
- Condition 11: Emission limits for criteria pollutants for auxiliary generator.
- Condition 12: Visible emission limit of 5 percent for boiler stack.
- Condition 13: Visible emission limit of 10 percent for the auxiliary generator stack.
- Condition 15: Limit on type of fuel to be used in auxiliary generator and heating boiler.
Natural gas with a sulfur content of 0.068 percent or less by weight.

In addition to the minor NSR requirements, the emergency generator (G1) is subject to National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (40 CFR 63 Subpart ZZZZ). The emergency generator is an existing stationary spark-ignition (SI) engine with a site rating less than 500 horsepower (HP) located at an area source of HAPs. The following conditions have been added to the Title V permit; condition numbers refer to the Title V permit:

- Condition 24: The condition establishes that the emergency generator (G1) must be operated in accordance with MACT, Subpart ZZZZ, except where the Title V permit is more restrictive.
- Condition 25: The condition establishes the operational restrictions on the emergency generator (G1).
- Condition 26: The condition establishes the maintenance and work practice standards for the emergency generator (G1).
- Condition 27: During periods of startup the permittee must minimize the time spend at idle for the emergency engines (G1) and minimize the engine's startup time to a period needed for appropriate and safe loading of the engine, not

to exceed 30 minutes, after which time the non-startup emission limitations apply, in accordance with Table 2d of the MACT, Subpart ZZZZ.

The MACT establishes maintenance requirements for the generator (G1) as specified above. Additionally, the MACT establishes the operational conditions that define emergency operation.

Since the unit was constructed prior to June 12, 2006, the unit is not subject to the requirements of 40 CFR 60 Subpart JJJJ, as per 40 CFR 60.4230(a)(4).

Monitoring and Recordkeeping

The monitoring and recordkeeping requirements in Condition 17 of the NSR permit have been modified to meet Part 70 requirements.

The permit includes requirements for maintaining records of all emission data and operating parameters. These records include yearly natural gas consumption (in million cubic feet) by the boiler, and annual operating hours of the auxiliary generator.

The hourly emission limits established for boiler and auxiliary generator are based on the capacity of the boiler and generator, respectively. Therefore, if the boilers are operated at capacity, or below, there should not be a violation of the hourly emission rates. Calculations have been included in Attachment G to demonstrate how the limits are obtained.

The annual emission limits established for criteria pollutants are based on the natural gas throughput limit and operating hours limit contained within the permit. As long as the natural gas throughput limit and operating hours limit are not violated, there is very little chance that criteria pollutants emission limits will be violated. Therefore, recordkeeping demonstrating compliance with the natural gas throughput limit and operating hours limit can also be used to demonstrate compliance with criteria pollutant emission limits, satisfying the periodic monitoring requirement.

Actual emissions from the operation of the heating boiler will be calculated using the following equation:

$$E = F \times N \quad \text{..... Equation 3}$$

Where:

E = Emission Rate (lb/time period)
F = Pollutant specific emission factors as follows:

NO_x = 100 lb/million ft³

N = Natural gas consumed (million ft³/time period)

Actual emissions from the operation of the auxiliary generator will be calculated using the following equation:

$$E = F \times N \times H \quad \text{..... Equation 4}$$

Where:

E = Emission Rate (lb/time period)
 F = Pollutant specific emission factors as follows:
 CO = 3.08E-02 lb/hp-hr
 NO_x = 3.08E-02 lb/hp-hr
 N = operating period
 H = horsepower rating of the generator

Calculations have been included in Attachment G to demonstrate that if Columbia Gas operates this equipment at design capacity and in accordance with annual fuel throughput/hours of operation limitations, then the emission limits will not be violated.

There is no monitoring for the visible emission limits. As long as the natural gas-fired boiler and generator are operated properly, it can be assumed that the opacity limitations will not be violated. Maintenance of records demonstrating that the operators have been properly trained along with the maintenance of operating procedures, in accordance with Conditions 29 and 30 of the Title V permit, will ensure compliance with the opacity limitation and satisfy the periodic monitoring requirements.

In addition to the monitoring and recordkeeping established above, the following monitoring and recordkeeping conditions were established to determine compliance with the MACT Subpart ZZZZ limitations; Condition numbers refer to the Title V permit:

Condition 28 establishes that the permittee must install non-resettable hour meters on the emergency RICE in accordance with 40 CFR 63.6625(f) for the emergency generator (G1). The hour meter shall be provided with adequate access for inspection.

Condition 29 establishes that the permittee shall develop a maintenance plan that provides to the extent practicable for the maintenance and operation of each engine in a manner consistent with good air pollution control practice for minimizing emissions, for the emergency generator (G1) in accordance with 40 CFR 63.6625(e).

Condition 30 (c and d) establishes that the permittee must keep records of all

maintenance conducted on the emergency generator (G1) as well as hours of operation that are recorded on the hour meter.

The requirements for installation of non-resettable hour meters, provided in Condition 28, establishes the means of determining compliance with the hour limitations specified in Conditions 25 and 26 of the Title V permit. The facility is required to keep records of the hours of operation of each generator to ensure the limitations of Conditions 25 and 26 are met.

The required maintenance and operating plan (Condition 29 of the Title V permit) assures compliance with MACT requirements to maintain and operate the engine in accordance with the manufacturer's written instructions. The maintenance and operating plan, as well as records of all scheduled and unscheduled maintenance and operator training will also help to establish reasonable assurance of compliance with the emission limits and visible emission standards established in the permit. The facility is also required to maintain hours of operation for the emergency generator (G1), to ensure that each continues to meet the definition of emergency-use, as found in the Virginia Regulations and the MACT.

Compliance Assurance Monitoring (CAM) Plan Applicability

The CAM plan does not apply to the boiler (BLR1) and generator (G1), as these emission units do not use a control device to achieve compliance with the emission limitations.

Testing

The permit does not require source emission tests. A table of test methods has been included in the permit if testing is performed. The Department and EPA have authority to require testing not included in this permit if necessary to determine compliance with an emission limit or standard.

Reporting

The generator (G1) is exempt from notification requirements under 40 CFR 63.6645(a)(5), therefore there are no initial notification or reporting requirements associated with the MACT.

No specific reporting has been included in the permit.

Streamlined Requirements

There are no streamlined requirements for the boiler (BLR1) and generator (G1).

GENERAL CONDITIONS

The permit contains general conditions required by 40 CFR Part 70 and 9 VAC 5-80-110 that apply to all Federal-operating permitted sources. These include requirements for submitting semi-annual monitoring reports and an annual compliance certification report. The permit also requires notification of deviations from permit requirements or any excess emissions.

Comments on General Conditions

Permit Expiration (Conditions 36 to 41)

This condition refers to the Board taking action on a permit application. The Board is the State Air Pollution Control Board. The authority to take action on permit application(s) has been delegated to the Regions as allowed by §2.2-604 and §10.1-1185 of the *Code of Virginia*, and the “Department of Environmental Quality Agency Policy Statement No. 2-09”.

These general condition cite(s) the Article(s) that follow(s):

Article 1 (9 VAC 5-80-50 et seq.), Part II of 9 VAC 5 Chapter 80. Federal Operating Permits for Stationary Sources.

These general conditions cite the sections that follow:

9 VAC 5-80-80. Application

9 VAC 5-80-140. Permit Shield

9 VAC 5-80-150. Action on Permit Applications

Deviation, Failure, or Malfunction Reporting (Conditions 46 to 47)

Section 9 VAC 5-20-180 requires malfunction and excess emission reporting within four hours of discovery. Section 9 VAC 5-80-250 of the Title V regulations also requires malfunction reporting; however, reporting is required within two days. Section 9 VAC 5-20-180 is from the general regulations. All affected facilities are subject to section 9 VAC 5-20-180 including Title V facilities. Section 9 VAC 5-80-250 is from the Title V regulations. Title V facilities are subject to both sections. A facility may make a single report that meets the requirements of 9 VAC 5-20-180 and 9 VAC 5-80-250. The report must be made within four daytime business hours of discovery of the malfunction.

Permit Modification (Condition 51)

This general condition cites the sections that follow:

9 VAC 5-80-50. Applicability, Federal Operating Permit For Stationary Sources

9 VAC 5-80-190. Changes to Permits.

9 VAC 5-80-260. Enforcement.

9 VAC 5-80-1100. Applicability, Permits For New and Modified Stationary Sources

9 VAC 5-80-1605. Applicability, Permits For Major Stationary Sources and Modifications

Located in Prevention of Significant Deterioration Areas
9 VAC 5-80-2000. Applicability, Permits for Major Stationary Sources and Major Modifications
Locating in Nonattainment Areas

Malfunction as an Affirmative Defense (Conditions 65 to 68)

The regulations contain two reporting requirements for malfunctions that coincide. The reporting requirements are listed in sections 9 VAC 5-80-250 and 9 VAC 5-20-180. The malfunction requirements are listed in Conditions 65 to 68 and Conditions 46 to 47. For further explanation see the comments on Conditions 46 to 47.

This general condition cites the sections that follow:

9 VAC 5-20-180. Facility and Control Equipment Maintenance or Malfunction

9 VAC 5-80-110. Permit Content

STATE ONLY APPLICABLE REQUIREMENTS

Columbia Gas Transmission Corporation did not identify any state-only requirements in their application, and all requirements in their minor NSR permits are federally enforceable. Therefore, no state-only requirements have been included in the permit.

FUTURE APPLICABLE REQUIREMENTS

Columbia Gas Transmission Corporation did not identify any future applicable requirements in their application, and the staff is unaware of any applicable requirements that the facility could become subject to during the life of the Title V permit. Therefore, no applicable requirements have been included in the permit.

INAPPLICABLE REQUIREMENTS

The provisions of 40 CFR Part 98 – Mandatory Greenhouse Gas Reporting require owners and operators of general stationary fuel combustion sources that emit 25,000 metric tons CO₂e or more per year in combined emissions from such units, to report greenhouse gas (GHG) emissions, annually. The definition of “applicable requirement” in 40 CFR 70.2 and 71.2 does not include requirements such as those included in Part 98, promulgated under Clean Air Act (CAA) section 114(a)(1) and 208. Therefore, the requirements of 40 CFR Part 98 are not applicable under the Title V permitting program.

As a result of several EPA actions regarding GHG under the CAA, emissions of GHG must be addressed for a Title V permit renewed after January 1, 2011. The current state minor NSR (or PSD) permit for the Columbia Gas facility contains no GHG-specific applicable requirements and there have been no modifications at the facility requiring a PSD permit. Therefore, there are no applicable requirements for the facility specific to GHG.

The nitrogen monitoring requirements of 40 CFR 60, Subpart GG, §60.334 have been waived in accordance with letter dated 8/14/87 from EPA Region III (Attachment G).

40 CFR 60, Subpart JJJJ, the Standards of Performance for Stationary Spark Ignition Internal Combustion Engines do not apply to the emergency generator (G1) at the Shenandoah Compressor Station; the engine was constructed before the June 12, 2006 applicability date.

40 CFR 60, Subpart KKKK, the Standards of Performance for Stationary Combustion Turbines does not apply to the two turbines (1 and 2) at the Shenandoah Compressor Station; the turbines were constructed before the February 18, 2005 applicability date in §60.4305(a).

40 CFR 63, Subpart JJJJJ, the National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boiler at Area Sources is not applicable to the boiler at the facility. The natural gas-fired boiler (BLR1), rated at 2.1 MMBtu/hr is not subject to the requirements of 40 CFR 63 Subpart JJJJJ in accordance with §63.11195(e) since it is a gaseous fueled boiler.

40 CFR 63, Subpart ZZZZ, the National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines are not applicable to the two turbines (1 and 2) at the Shenandoah Compressor Station. The turbines do not use reciprocating motion to convert heat energy into mechanical work, and therefore do not meet the regulatory definition of stationary reciprocating internal combustion engine in §63.6675. This subpart is applicable to the emergency generator (G1) and all requirements were incorporated as appropriate.

40 CFR 64, the Compliance Assurance Monitoring (CAM) rule does not currently apply to Shenandoah Compressor Station. CAM applies to pollutant-specific emission units with pre-control device emissions of regulated pollutants exceeding major source thresholds. The units must have control devices in place and applicable requirements for the subject pollutant. The rule requires sources to monitor the operation and maintenance of the control devices to ensure compliance with applicable requirements. The Shenandoah Compressor Station does not have any controls on its emission units. Therefore, the Compliance Assurance Monitoring Rules do not apply.

In addition to the standards listed above, the facility indicated that 40 CFR 63 Subpart YYYY, National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines, is not an applicable requirement for the Columbia Gas Transmission Corporation - Shenandoah Compressor Station. This standard applies to existing combustion turbines located at a major source of hazardous air pollutants (HAPs). This facility is not a major source of HAP emissions (defined as having the potential to emit 10 tons/yr for individual HAPs or 25 tons/yr for combined HAPs).

COMPLIANCE PLAN

The facility is currently in compliance with all applicable requirements. No compliance plan was included in the application or in the permit.

INSIGNIFICANT EMISSION UNITS

The insignificant emission units are presumed to be in compliance with all requirements of the Clean Air Act as may apply. Based on this presumption, no monitoring, recordkeeping or reporting shall be required for these emission units in accordance with 9 VAC 5-80-110.

Insignificant emissions units include the following:

Table V. Insignificant Emission Units

Emission Unit No.	Emission Unit Description	Citation¹ (9 VAC_)	Pollutant(s) Emitted (5-80-720 B)	Rated Capacity (5-80-720 C)
AO1	Pipeline Liquids Tank	5-80-720 B	VOC, benzene, ethylbenzene, hexane, toluene, xylene	1,000 gallons
AO2	Pipeline Liquids Tank	5-80-720 B	VOC, benzene, ethylbenzene, hexane, toluene, xylene	1,000 gallons
AO3	Water Mixture Tank (Wastewater)	5-80-720 B	VOC	1,000 gallons
FUG	Equipment Leaks and Blowdown	5-80-720 B	VOC	-

¹The citation criteria for insignificant activities are as follows:
 9 VAC 5-80-720 A - Listed Insignificant Activity, Not Included in Permit Application
 9 VAC 5-80-720 B - Insignificant due to emission levels
 9 VAC 5-80-720 C - Insignificant due to size or production rate

CONFIDENTIAL INFORMATION

The permittee did not submit a request for confidentiality. Therefore, all portions of the Title V application are suitable for public review.

PUBLIC PARTICIPATION

A public notice regarding the draft permit was placed in the *Page News & Courier*, on January 30, 2014. West Virginia, the only affected state, was sent a copy of the public notice in an email dated February 6, 2014. All persons on the Title V mailing list were also sent a copy of the public notice via either letter dated January 30, 2014 or email dated February 6, 2014. Public comments were accepted from January 30, 2014 to March 3, 2014. No public comments were received.

EPA was notified of the public notice and sent a copy of the Statement of Basis and draft permit on January 28, 2014. The 45-day EPA review period ran concurrently with the public comment period and ended on March 17, 2014. No comment we received from the EPA.

ATTACHMENTS

The following information is attached:

- ATTACHMENT A: 2012 Annual Emissions Update
- ATTACHMENT B: Minor New Source Review Permit Issued on 8/23/91
- ATTACHMENT C: Minor New Source Review Permit Amendment dated 1/27/94
- ATTACHMENT D: Minor New Source Review Permit Amendment dated 3/10/95
- ATTACHMENT E: Minor New Source Review Permit Amendment dated 8/6/98
- ATTACHMENT F: Minor New Source Review Permit Amendment dated 9/16/08
- ATTACHMENT G: Emission Calculations
- ATTACHMENT H: EPA letter dated 08/14/1987

ATTACHMENT A
2012 Annual Emissions Update

Commonwealth of Virginia
 Department of Environmental Quality
 Consolidated Plant Emissions Report

Registration No: S1139
 Plant Name: Shenandoah Compressor Station
 FIPS County Code: 139
 Plant ID: 00027
 Year of Emissions: 2012
 Last Annual Update: 2012

GENERAL INFORMATION

Facility Name: Columbia Gas Transmission LLC - Shenandoah
 Location Address: Rte 685
 Shenandoah VA 22849
 Mailing Address: PO Box 1273
 Charleston WV 25325
 Annual Update Contact: McCombs, Jeff
 Phone Number: (724) 223 - 2764
 Principal Product: nat gas transmission

UTM Zone: 17
 UTM Vertical (KM): 4271.3
 UTM Horizontal (KM): 707.2
 Latitude: 38 ° 34 ' 5 " N
 Longitude: -78 ° 37 ' 18 " W
 Property Area (Acres): 40
 No. of Employees: 2
 Primary SIC Code: 4922

Comments:

Facility Emissions	Pollutant	Emissions Value (tpy)	Allowable Value	Units
	NH3	0.0131520000		
	PM	0.0313518480		
	VOC	3.0743535675		
	CO	16.1668061000		
	SO2	0.0025091713		
	NO2	23.0096222500		
	PM 2.5	0.0001258965		
	PM 10	0.0313518497		

STACK INFORMATION:

Number: 1
 Description: Stack 1 Description
 Stack Height(ft): 40
 Stack Diameter(ft): 5.63
 Exit Gas Temperature(F): 1000
 Gas Flow Rate(ACFM): 21371
 Exit Gas Velocity(ft/sec): 14.31
 Stack Type: V
 Plume Height(ft): 0
 Permitted Equipment: N
 UTM Zone: 17
 UTM Vertical(KM): 4271.29
 UTM Horizontal(KM): 707.19
 GEP Stack Height: 0
 GEP Building Height: 0
 GEP Building Length: 0
 GEP Building Width: 0
 Rough Terrain: N
 Elevation (ft above MSL): 1100

Stack Emissions	Pollutant	Emissions Value (tpy)	Allowable Value	Units
	CO	7.8525396000		
	NO2	11.2128606000		
	PM	0.0000569486		

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SO2	Supplied factor (auto calc)	0.0000060000	0.000002122
PM	Supplied factor (auto calc)	0.0000160000	0.00005694
PM 10	Supplied factor (auto calc)	0.0000160000	0.00005694
PM 2.5	Supplied factor (auto calc)	0.0000160000	0.00005694
VOC	Supplied factor (auto calc)	0.1280000000	0.45275904
CO	Supplied factor (auto calc)	2.2200000000	7.85233960
NO2	Supplied factor (auto calc)	3.1700000000	11.21286060

STACK INFORMATION: Number: 2 Description: Stack 2 Description

Stack Height(ft):	40	UTM Zone:	17
Stack Diameter(ft):	5.63	UTM Vertical(KM):	4271.29
Exit Gas Temperature(F):	1000	UTM Horizontal(KM):	707.19
Gas Flow Rate(ACFM):	21371	GEP Stack Height:	0
Exit Gas Velocity(ft/sec):	14.31	GEP Building Height:	0
Stack Type:	V	GEP Building Length:	0
Plume Height(ft):	0	GEP Building Width:	0
Permitted Equipment:	N	Rough Terrain:	N
		Elevation (ft above MSL):	1160

Stack Emissions	Pollutant	Emissions Value (ppm)	Allowable Value	Units
	CO	7.9675800000		
	NO2	11.3843080000		
	PM	0.0000577829		
	PM 10	0.0000577829		
	PM 2.5	0.0000577829		
	SO2	0.0000215340		
	VOC	0.4593920000		

POINT INFORMATION: Number: 2 Description: Point 002 Description

Design Capacity & Units:	5027 HORSEPOWER	State Sensitive:	N
	Per	Permitted Equipment:	N
% Throughput:	DEC-FEB: 59 MAR-MAY: 6 JUN-AUG: 8 SEP-NOV: 27	Space Heat (%):	0

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Operating Schedule:	Hours/Day:	24 Days/Week:	7 Hours/Year:	1815	Air Program	Sub Part
Point Emissions	Pollutant	Emissions Value (tpy)	Allowable Value	Units		
	CO	7.9675800000	49.0000000000	tons/yr		
	NO2	11.3843080000	70.0000000000	tons/yr		
	PM	0.0000577829				
	PM 10	0.0000577829				
	PM 2.5	0.0000577829				
	SO2	0.0000215340	2.7000000000	tons/yr		
	VOC	0.4593920000	2.8000000000	tons/yr		

SEGMENT INFORMATION: Number: 1 Description: 2 ALLISON/NAT.GAS TURBINE

Source Classification Code: 28888803 SCC Description: Specify in Comments
 Actual Annual Throughput: 7178
 Max. Hourly Operation Rate: 0 SCC Units: 1000 Horsepower-Hours
 State Sensitive: N Trace%: 0 Ash%: 0 Sulfur%: 0
 Permitted Equipment: N Heat Content (MMBTU): 1000
 Insignificant Activity: N Throughput Limit:
 Pollution Prevention: N Throughput Unit:

Pollution Prevention Comments:
 Segment Comments:

Segment Emissions Pollutant	Method	Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
SO2	Supplied factor (auto calc)	0.0000060000					0.00002153		
PM	Supplied factor (auto calc)	0.0000160000					0.00005778		
PM 10	Supplied factor (auto calc)	0.0000160000					0.00005778		
PM 2.5	Supplied factor (auto calc)	0.0000160000					0.00005778		
VOC	Supplied factor (auto calc)	0.1280000000					0.45939200		

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 Consolidated Plant Emissions Report

CO	Supplied factor (auto calc)	2.2200000000	7.96758000
NO2	Supplied factor (auto calc)	3.1720000000	11.38490800

STACK INFORMATION: Number: 3 Description: Stack 3 Description

Stack Height(ft): 15
 Stack Diameter(ft): .33
 Exit Gas Temperature(F): 900
 Gas Flow Rate(ACFM): 724
 Exit Gas Velocity(ft/sec): 141.08
 Stack Type: V
 Plume Height(ft): 0
 Permitted Equipment: N

Stack Emissions Pollutant Emissions Value (tpy) Allowable Value Units
 CO 0.0014465000
 NO2 0.0014536500
 PM 0.0000011165
 PM 10 0.0000011182
 PM 2.5 0.0000111650
 SO2 0.0000004142
 VOC 0.0000242275

UTM Zone: 17
 UTM Vertical(KM): 4271.29
 UTM Horizontal(KM): 707.19
 GEP Stack Height: 0
 GEP Building Height: 0
 GEP Building Length: 0
 GEP Building Width: 0
 Rough Terrain: N
 Elevation (ft above MSL): 1100

POINT INFORMATION: Number: 3 Description: Point 003 Description

Design Capacity & Units: 135 HORSEPOWER
 Per
 % Throughput: DEC-FEB: 2 MAR-MAY: 6 JUN-AUG: 89 SEP-NOV: 3
 Operating Schedule: Hours/Day: 24 Days/Week: 7 Hours/Year: 76

Point Emissions Pollutant Emissions Value (tpy) Allowable Value Units
 CO 0.0014465000 3.6000000000 lbs/yr
 NO2 0.0014536500 0.3000000000 tons/yr
 PM 0.0000011165 3.6000000000 lbs/hr
 PM 10 0.0000011182 0.3000000000 tons/yr

State Sensitive: N
 Permitted Equipment: N
 Space Heat (%): 0
 Air Program: Sub Part

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PM 2.5 0.000011650
 SO2 0.000004342
 VOC 0.000024275

SEGMENT INFORMATION: Number: 1 Description: 3 WAUKESHA/AUX.GEN/NT.GAS

Source Classification Code: 20100202 SCC Description: Reciprocating
 Actual Annual Throughput: .11
 Max. Hourly Operation Rate: 0
 State Sensitive: N Trace%: 0 Ash%: 0 Sulfur%: 0
 Permitted Equipment: N Heat Content (MMBTU): 1000
 Insignificant Activity: N Throughput Limit:
 Pollution Prevention: N Throughput Unit:

Pollution Prevention Comments:
 Segment Comments:

Segment Emissions Pollutant	Method	Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
SO2	Supplied factor (auto calc)	0.0075300000					0.000000041		
PM	Supplied factor (auto calc)	0.0203000000					0.000001111		
PM 10	Supplied factor (auto calc)	0.0203000000					0.000001111		
PM 2.5	Supplied factor (auto calc)	0.2030000000					0.00001116		
VOC	Supplied factor (auto calc)	0.4405000000					0.00002422		
CO	Supplied factor (auto calc)	26.3000000000					0.00144650		
NO2	Supplied factor (auto calc)	26.4300000000					0.00145365		

STACK INFORMATION: Number: 4 Description: Stack 4 Description

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Stack Height(ft): 20
 Stack Diameter(ft): 1.33
 Exit Gas Temperature(F): 350
 Gas Flow Rate(ACFM): 1742
 Exit Gas Velocity(ft/sec): 20.9
 Stack Type: V
 Plume Height(ft): 0
 Permitted Equipment: N

UTM Zone: 17
 UTM Vertical(KM): 4271.29
 UTM Horizontal(KM): 707.19
 GEP Stack Height: 0
 GEP Building Height: 0
 GEP Building Length: 0
 GEP Building Width: 0
 Rough Terrain: N
 Elevation (ft above MSL): 1100

Stack Emissions	Pollutant	Emissions Value (tpy)	Allowable Value	Units
	CO	0.3452400000		
	NH3	0.0131520000		
	NO2	0.4110000000		
	PM	0.0312360000		
	PM 10	0.0312360000		
	SO2	0.0024660000		
	VOC	0.0021783000		

POINT INFORMATION: Number: 4 Description: Point 004

Design Capacity & Units: 2 MILLION BTUS Per HOUR
 % Throughput: DEC-FEB: 28 MAR-MAY: 16 JUN-AUG: 28 SEP-NOV: 28
 Operating Schedule: Hours/Day: 24 Days/Week: 7 Hours/Year: 7824

State Sensitive: N
 Permitted Equipment: N
 Space Heat (%): 0
 Air Program: Sub Part

Point Emissions	Pollutant	Emissions Value (tpy)	Allowable Value	Units
	CO	0.3452400000		
	NH3	0.0131520000		
	NO2	0.4110000000	0.2500000000	lbs/yr
	PM	0.0312360000	1.1000000000	tons/yr
	PM 10	0.0312360000		
	SO2	0.0024660000		
	VOC	0.0021783000		

SEGMENT INFORMATION: Number: 1 Description: 4 HYDRO-THERM/NAT.GAS BLR

Source Classification Code: 10200603
 Actual Annual Throughput: 8.22
 Max. Hourly Operation Rate: .002

SCC Description: < 10 Million Btu/yr
 SCC Units: Million Cubic Feet Burned

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N Trace%: 0 Ash%: 0 Sulfur%: 0
 N Heat Content (MMBTU): 1000
 N Throughput Limit:
 N Throughput Unit

Pollution Prevention Comments:
 Segment Comments:

Segment Emissions Pollutant	Method	Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
VOC	Supplied factor (auto calc)	0.5300000000					0.00217830		
SO2	Federal factor (auto calc)	0.6000000000					0.00246600		
NH3	Federal factor (auto calc)	3.2000000000					0.01315200		
PM	Federal factor (auto calc)	7.6000000000					0.03123600		
PM 10	Federal factor (auto calc)	7.6000000000					0.03123600		
CO	Federal factor (auto calc)	84.0000000000					0.34524000		
NO2	Federal factor (auto calc)	100.0000000000					0.41400000		

STACK INFORMATION: Number: 5 Description: Stack 5 Description

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Stack Height(ft):	20	UTM Zone:	17
Stack Diameter(ft):	1.33	UTM Vertical(KM):	4271.29
Exit Gas Temperature(F):	350	UTM Horizontal(KM):	707.19
Gas Flow Rate(ACFM):	1700	GEP Stack Height:	0
Exit Gas Velocity(ft/sec):	20.39	GEP Building Height:	0
Stack Type:	V	GEP Building Length:	0
Plume Height(ft):	0	GEP Building Width:	0
Permitted Equipment:	N	Rough Terrain:	N
		Elevation (ft above MSL):	1100

POINT INFORMATION: Number: 5 Description: VOC Fugitives

Design Capacity & Units:	2 MILLION BTUS	State Sensitive:	N
	Per HOUR	Permitted Equipment:	N
% Throughput:	DEC-FEB: 25 MAR-MAY: 25 JUN-AUG: 25 SEP-NOV: 25	Space Heat (%):	0
Operating Schedule:	Hours/Day: 24 Days/Week: 7 Hours/Year: 8760	Air Program	Sub Part

Point Emissions	Pollutant	Emissions Value (tpy)	Allowable Value	Units
	VOC	2.1600000000		

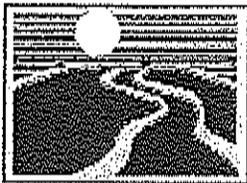
SEGMENT INFORMATION: Number: 1 Description: Fugitive Emissions

Source Classification Code:	68580001	SCC Description:	Equipment Leaks
Actual Annual Throughput:	2.16	SOC Units:	FACILITY-ANNUAL
Max. Hourly Operation Rate:	.002	Trace%:	0
State Sensitive:	N	Ash%:	0
Permitted Equipment:	N	Heat Content (MMBTU):	1000
Insignificant Activity:	N	Throughput Limit:	
Pollution Prevention:	N	Throughput Unit:	

Pollution Prevention Comments:
Segment Comments:

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Consolidated Plant Emissions Report

Segment Emissions Pollutant	Method	Factor	A/S/T	Primary Control	Secondary Control	Overall Efficiency %	Emissions Value (tpy)	Allowable Value	Units
VOC	Material balance (user calc)	0.000000000000					2.160000000		



DEQ

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

EMISSION STATEMENT CERTIFICATION FORM

(see other side for instructions)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering and evaluating the information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

RECEIVED
Shenandoah Valley
DEQ
APR 15 2013

SIGNATURE: [Signature] DATE: 4/18/13

ADY
4/18/13

PRINTED NAME: Mr. Robert W. Conrad

TITLE: Manager, Field Services – Operations

COMPANY: Columbia Gas Transmission Corp (Shenandoah Compressor Station)

REGISTRATION NUMBER: 81139

TELEPHONE NUMBER: (540)-465-6417



DEQ

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

2012 EMISSION STATEMENT

Please correct any errors in the information below (cross out & replace)

FACILITY NAME COLUMBIA GAS TRANSMISSION LLC SHENANDOAH COMPRESSOR STATION		REGISTRATION # 81139	CONTACT PERSON Jeff McCombs	
LOCATION Rte 685 Shenandoah, VA 22849			FACILITY JURISDICTION Page County	
MAILING ADDRESS COLUMBIA GAS TRANS LLC PO BOX 1273		MAILING CITY AND STATE CHARLESTON, WV	ZIP CODE 25325-1273	
PARENT COMPANY (IF APPLICABLE) Columbia Gas Transmission LLC		TELEPHONE NUMBER (724) 223-2764	PRIMARY SIC CODE 4922	For Agency Use Only T5

FACILITY TOTALS (Sum emissions from attached pages)

	ANNUAL	OZONE SEASON
TOTAL VOC EMISSIONS FOR 2012	3.10 TONS/YR	20.21 LBS/DAY
TOTAL NO _x EMISSIONS FOR 2012	23.14 TONS/YR	43.97 LBS/DAY
TOTAL SO ₂ EMISSIONS FOR 2012	0.05 TONS/YR	NA
TOTAL PM ₁₀ EMISSIONS FOR 2012	0.58 TONS/YR	NA
TOTAL PB EMISSIONS FOR 2012	0 TONS/YR	NA
TOTAL TRS EMISSIONS FOR 2012	0 TONS/YR	NA
TOTAL TNMOC EMISSIONS FOR 2012	0 TONS/YR	NA
TOTAL non-VOC/non-PM ₁₀ HAP EMISSIONS FOR 2012	1.23 TONS/YR	NA
TOTAL CO EMISSIONS FOR 2012	16.33 TONS/YR	NA
TOTAL PM _{2.5} EMISSIONS FOR 2012	0.58 TONS/YR	NA
TOTAL NH ₃ EMISSIONS FOR 2012	0.00 TONS/YR	NA

PLEASE ATTACH "ANNUAL UPDATE" FORM.

PLEASE ATTACH "EMISSION STATEMENT CERTIFICATION" with appropriate signature.

2012 EMISSION CALCULATIONS OPTION I: EMISSION FACTOR METHOD

REGISTRATION #: 81139 POINT NO. 001 SEGMENT NO. 01 SCC NO. 2888803

		ANNUAL		PEAK OZONE SEASON (JUNE, JULY, AUGUST)	
THRUPUT (with units)		7,074,361 Bhp-hrs / 83.32 MMSCF		629,453 Bhp-hrs / 8.82 MMSCF	
NO. OPERATING DAYS		107 days		19 days	
NO. OPERATING HOURS PER DAY		≤ 24 hrs/day 1,729 hrs/yr hours		≤ 24 hrs/day; 202 hours	
DAILY THRUPUT (with units) = Thruput ÷ days		N/A		33,129 Bhp-hrs / 0.46 MMSCF per day	
VOC EMISSION FACTOR (with units) = E.F.		1.280E-04 lb/Hp-hr		1.280E-04 lb/Hp-hr	
Emission Factor Source ¹	Control Efficiency Basis ²	O	N/A	O	N/A
VOC CONTROL DEVICE CODE ³		000		NA	
Avg. VOC CONTROL EFFICIENCY ⁴ = C.E.		NA %		NA %	
VOC EMISSIONS ⁵		0.45 tons VOC per yr		.81 lbs VOC per day	
NOx EMISSION FACTOR (with units) = E.F.		3.172E-03 lb/Hp-hr		3.172E-03 lb/Hp-hr	
Emission Factor Source ¹	Control Efficiency Basis ²	O	NA	O	NA
NOx CONTROL DEVICE CODE ³		000		NA	
Avg. NOx CONTROL EFFICIENCY ⁴ = C.E.		NA %		NA %	
NOx EMISSIONS ⁵		11.22 tons NOx per yr		20.10 lbs NOx per day	
SO2 EMISSION FACTOR (with units) = E.F.		6.00E-06 lb/Hp-hr			
Emission Factor Source ¹	Control Efficiency Basis ²	O	NA		
FUEL PARAMETER (% ash or % sulfur) = FP		< 0.01 %			
SO2 CONTROL DEVICE CODE ³		000			
Avg. SO2 CONTROL EFFICIENCY ⁴ = C.E.		NA %			
SO2 EMISSIONS ⁵		0.02 tons SO2 per yr		lbs SO2 per day	
PM10 EMISSION FACTOR (with units) = E.F.		1.610E-05 lb/Hp-hr			
Emission Factor Source ¹	Control Efficiency Basis ²	AP-42	NA		
FUEL PARAMETER (% ash or % sulfur) = FP		0 %			
PM10 CONTROL DEVICE CODE ³		000			
Avg. PM10 CONTROL EFFICIENCY ⁴ = C.E.		NA %			
PM10 EMISSIONS ⁵		0.28 tons PM10 per yr		lbs PM10 per day	
PB EMISSION FACTOR (with units) = E.F.		NA			
Emission Factor Source ¹	Control Efficiency Basis ²	NA	NA		
PB CONTROL DEVICE CODE ³		NA			
Avg. PB CONTROL EFFICIENCY ⁴ = C.E.		NA %			
PB EMISSIONS ⁵		NA tons PB per yr		lbs PB per day	

1. AP-42; ST = Stack test; CEMS; F = Federal factor (EPA standard factor from AIRS); O = Other (describe on separate sheet)

2. A = Tested (by EPA Reference Method); B = Tested (other); C = Material Balance; D = Design; O = Other

3. See 3-digit control device codes listed in appendix.

4. Note control efficiency will be zero if there is no control device OR the emission factor accounts for controls (i.e. E.F. is identified to be "with controls").

5. EMISSION = ANNUAL THRUPUT × E.F. × (100-C.E.)/100 OR DAILY THRUPUT × E.F. × (100-C.E.)/100

2012 EMISSION CALCULATIONS OPTION I: EMISSION FACTOR METHOD

REGISTRATION #: 81139 POINT NO. 001 SEGMENT NO. 01 SCC NO. 2888803

	ANNUAL	PEAK OZONE SEASON (JUNE, JULY, AUGUST)
THRUPUT (with units)	7,074,361 Bhp-hrs / 83.32 MMSCF	
NO. OPERATING DAYS	107	days
NO. OPERATING HOURS PER DAY	≤ 24 hrs/day 1,729 hrs/yr	hours
DAILY THRUPUT (with units) = Thruput + days	N/A	per day
TRS EMISSION FACTOR (with units) = E.F.	NA	
Emission Factor Source ¹ Control Efficiency Basis ²	NA	NA
TRS CONTROL DEVICE CODE ³	NA	
Avg. TRS CONTROL EFFICIENCY ⁴ = C.E.	NA	%
TRS EMISSIONS ⁵	NA	tons TRS per yr lbs TRS per day
TNMOC EMISSION FACTOR (with units) =	1.280E-04 lb/Hp-hr	
Emission Factor Source ¹ Control Efficiency Basis ²	0	NA
TNMOC CONTROL DEVICE CODE ³	000	
Avg. TNMOC CONTROL EFFICIENCY ⁴ = C.E.	NA	%
TNMOC EMISSIONS ⁵	NA	tons TNMOC per yr lbs per day
CO EMISSION FACTOR (with units) = E.F.	2.225E-03 lb/Hp-hr	
Emission Factor Source ¹ Control Efficiency Basis ²	0	NA
CO CONTROL DEVICE CODE ³	000	
Avg. CO CONTROL EFFICIENCY ⁴ = C.E.	NA	%
CO EMISSIONS ⁵	7.87	tons per yr lbs per day
PM 2.5 EMISSION FACTOR (with units) = E.F.	1.610E-05 lb/Hp-hr	
Emission Factor Source ¹ Control Efficiency Basis ²	AP-42	NA
FUEL Parameter (% ash or % sulfur) = FP	0	
PM 2.5 CONTROL DEVICE CODE ³	000	
Avg. PM 2.5 CONTROL EFFICIENCY ⁴ =	NA	%
PM 2.5 EMISSIONS ⁵	0.28	tons per yr lbs per day
NH3 EMISSION FACTOR (with units) = E.F.	NA	
Emission Factor Source ¹ Control Efficiency Basis ²	None Available	NA
NH3 CONTROL DEVICE CODE ³	NA	
Avg. NH3 CONTROL EFFICIENCY ⁴ = C.E.	NA	%
NH3 EMISSIONS ⁵	NA	tons per yr lbs per day

1. AP-42; ST = Stack test; CEMS; F = Federal factor (EPA standard factor from AIRS); O = Other (describe on separate sheet)
 2. A = Tested (by EPA Reference Method); B = Tested (other); C = Material Balance; D = Design; O = Other
 3. See 3-digit control device codes listed in appendix.
 4. Note control efficiency will be zero if there is no control device OR the emission factor accounts for controls (i.e. E.F. is identified to be "with controls").
 5. EMISSION = ANNUAL THRUPUT x E.F. x (100-C.E.)/100 OR DAILY THRUPUT x E.F. x (100-C.E.)/100

2012 EMISSION CALCULATIONS OPTION I: EMISSION FACTOR METHOD (HAPs)

REGISTRATION #: 81139 POINT NO. 001 SEGMENT NO. 01 SCC NO. 2888803

	ANNUAL	PEAK OZONE SEASON (JUNE, JULY, AUGUST)
THRUPUT (with units)	7,074,361 Bhp-hrs / 83.32 MMSCF	
NO. OPERATING DAYS	107 days	days
NO. OPERATING HOURS PER DAY	≤ 24 hrs/day 1,729 hrs/yr	hours
DAILY THRUPUT (with units) = Thruput ÷ days	N/A	N/A
HAP EMISSION FACTOR (with units) = E.F.	6.00E-06 lb/HP-hr	
Emission Factor Source ¹ Control Efficiency Basis ²	0	NA
HAP CONTROL DEVICE CODE ³	000	
Avg. HAP CONTROL EFFICIENCY ⁴ = C.E.	NA	%
HAP (Formaldehyde) EMISSIONS ⁵	0.61 tons per yr	lbs per day
HAP EMISSION FACTOR (with units) = E.F.		
Emission Factor Source ¹ Control Efficiency Basis ²		
HAP CONTROL DEVICE CODE ³		
Avg. HAP CONTROL EFFICIENCY ⁴ = C.E.	%	%
HAP () EMISSIONS ⁵	tons per yr	lbs per day
HAP EMISSION FACTOR (with units) = E.F.		
Emission Factor Source ¹ Control Efficiency Basis ²		
HAP CONTROL DEVICE CODE ³		
Avg. HAP CONTROL EFFICIENCY ⁴ = C.E.	%	%
HAP () EMISSIONS ⁵	tons per yr	lbs per day
HAP EMISSION FACTOR (with units) = E.F.		
Emission Factor Source ¹ Control Efficiency Basis ²		
HAP CONTROL DEVICE CODE ³		
Avg. HAP CONTROL EFFICIENCY ⁴ = C.E.	%	%
HAP () EMISSIONS ⁵	tons per yr	lbs per day
HAP EMISSION FACTOR (with units) = E.F.		
Emission Factor Source ¹ Control Efficiency Basis ²		
HAP CONTROL DEVICE CODE ³		
Avg. HAP CONTROL EFFICIENCY ⁴ = C.E.	%	%
HAP () EMISSIONS ⁵	tons per yr	lbs per day
HAP EMISSION FACTOR (with units) = E.F.		
Emission Factor Source ¹ Control Efficiency Basis ²		
HAP CONTROL DEVICE CODE ³		
Avg. HAP CONTROL EFFICIENCY ⁴ = C.E.	%	%
HAP () EMISSIONS ⁵	tons per yr	lbs per day

**2012 EMISSION CALCULATIONS
OPTION I: EMISSION FACTOR METHOD**

REGISTRATION #: 81139 POINT NO. 002 SEGMENT NO. 01 SCC NO. 2888803

	ANNUAL	PEAK OZONE SEASON (JUNE, JULY, AUGUST)
THRUPUT (with units)	7,177,993 Bhp-hrs / 86.94 MMSCF	551,471 Bhp-hrs / 9.34 MMSCF
NO. OPERATING DAYS	114 days	20 days
NO. OPERATING HOURS PER DAY	≤ 24 hrs/day 1,815 hrs/yr hours	222 hours
DAILY THRUPUT (with units) = Thruput ÷ days	N/A	27,574 Bhp-hrs / 0.47 MMSCF per day
VOC EMISSION FACTOR (with units) = E.F.	1.280E-04 lb/Hp-hr	1.280E-04 lb/Hp-hr
Emission Factor Source ¹ Control Efficiency Basis ²	O N/A	O N/A
VOC CONTROL DEVICE CODE ³	000	NA
Avg. VOC CONTROL EFFICIENCY ⁴ = C.E.	NA %	NA %
VOC EMISSIONS ⁵	0.46 tons VOC per yr	0.76 lbs VOC per day
NOx EMISSION FACTOR (with units) = E.F.	3.172E-03 lb/Hp-hr	3.172E-03 lb/Hp-hr
Emission Factor Source ¹ Control Efficiency Basis ²	O NA	O NA
NOx CONTROL DEVICE CODE ³	000	NA
Avg. NOx CONTROL EFFICIENCY ⁴ = C.E.	NA %	NA %
NOx EMISSIONS ⁵	11.38 tons NOx per yr	18.80 lbs NOx per day
SO2 EMISSION FACTOR (with units) = E.F.	6.00E-06 lb/Hp-hr	
Emission Factor Source ¹ Control Efficiency Basis ²	O NA	
FUEL PARAMETER (% ash or % sulfur) = FP	< 0.01 %	
SO2 CONTROL DEVICE CODE ³	000	
Avg. SO2 CONTROL EFFICIENCY ⁴ = C.E.	NA %	
SO2 EMISSIONS ⁵	0.02 tons SO2 per yr	lbs SO2 per day
PM10 EMISSION FACTOR (with units) = E.F.	1.610E-05 lb/Hp-hr	
Emission Factor Source ¹ Control Efficiency Basis ²	AP-42 NA	
FUEL PARAMETER (% ash or % sulfur) = FP	0 %	
PM10 CONTROL DEVICE CODE ³	000	
Avg. PM10 CONTROL EFFICIENCY ⁴ = C.E.	NA %	
PM10 EMISSIONS ⁵	0.29 tons PM10 per yr	lbs PM10 per day
PB EMISSION FACTOR (with units) = E.F.	NA	
Emission Factor Source ¹ Control Efficiency Basis ²	NA NA	
PB CONTROL DEVICE CODE ³	NA	
Avg. PB CONTROL EFFICIENCY ⁴ = C.E.	NA %	
PB EMISSIONS ⁵	NA tons PB per yr	lbs PB per day

1. AP-42; ST = Stack test; CEMS; F = Federal factor (EPA standard factor from AIRS); O = Other (describe on separate sheet)

2. A = Tested (by EPA Reference Method); B = Tested (other); C = Material Balance; D = Design; O = Other

3. See 3-digit control device codes listed in appendix.

4. Note control efficiency will be zero if there is no control device OR the emission factor accounts for controls (i.e. E.F. is identified to be "with controls").

5. EMISSION = ANNUAL THRUPUT x E.F. x (100-C.E.)/100 OR DAILY THRUPUT x E.F. x (100-C.E.)/100

2012 EMISSION CALCULATIONS OPTION I: EMISSION FACTOR METHOD

REGISTRATION #: 81139 POINT NO. 002 SEGMENT NO. 01 SCC NO. 2888803

		ANNUAL		PEAK OZONE SEASON (JUNE, JULY, AUGUST)	
THRUPUT (with units)		7,177,993 Bhp-hrs / 86.94 MMSCF			
NO. OPERATING DAYS		114 days		days	
NO. OPERATING HOURS PER DAY		≤ 24 hrs/day 1,815 hrs/yr		hours	
DAILY THRUPUT (with units) = Thruput ÷ days		N/A		per day	
TRS EMISSION FACTOR (with units) = E.F.		NA			
Emission Factor Source ¹	Control Efficiency Basis ²	NA	NA		
TRS CONTROL DEVICE CODE ³		NA			
Avg. TRS CONTROL EFFICIENCY ⁴ = C.E.		NA %		%	
TRS EMISSIONS ⁵		NA tons TRS per yr		lbs TRS per day	
TNMOC EMISSION FACTOR (with units) =		1.280E-04 lb/Hp-hr			
Emission Factor Source ¹	Control Efficiency Basis ²	0	NA		
TNMOC CONTROL DEVICE CODE ³		000			
Avg. TNMOC CONTROL EFFICIENCY ⁴ = C.E.		NA %		%	
TNMOC EMISSIONS ⁵		NA tons TNMOC per yr		lbs per day	
CO EMISSION FACTOR (with units) = E.F.		2.225E-03 lb/Hp-hr			
Emission Factor Source ¹	Control Efficiency Basis ²	0	NA		
CO CONTROL DEVICE CODE ³		000			
Avg. CO CONTROL EFFICIENCY ⁴ = C.E.		NA %		%	
CO EMISSIONS ⁵		7.99 tons per yr		lbs per day	
PM 2.5 EMISSION FACTOR (with units) = E.F.		1.610E-05 lb/Hp-hr			
Emission Factor Source ¹	Control Efficiency Basis ²	AP-42	NA		
FUEL Parameter (% ash or % sulfur) = FP		0			
PM 2.5 CONTROL DEVICE CODE ³		000			
Avg. PM 2.5 CONTROL EFFICIENCY ⁴ =		NA %		%	
PM 2.5 EMISSIONS ⁵		0.29 tons per yr		lbs per day	
NH3 EMISSION FACTOR (with units) = E.F.		NA			
Emission Factor Source ¹	Control Efficiency Basis ²	None Available	NA		
NH3 CONTROL DEVICE CODE ³		NA			
Avg. NH3 CONTROL EFFICIENCY ⁴ = C.E.		NA %		%	
NH3 EMISSIONS ⁵		NA tons per yr		lbs per day	

1. AP-42; ST = Stack test; CEMS; F = Federal factor (EPA standard factor from AIRS); O = Other (describe on separate sheet)

2. A = Tested (by EPA Reference Method); B = Tested (other); C = Material Balance; D = Design; O = Other

3. See 3-digit control device codes listed in appendix.

4. Note control efficiency will be zero if there is no control device OR the emission factor accounts for controls (i.e. E.F. is identified to be "with controls").

5. EMISSION = ANNUAL THRUPUT × E.F. × (100-C.E.)/100 OR DAILY THRUPUT × E.F. × (100-C.E.)/100

2012 EMISSION CALCULATIONS OPTION I: EMISSION FACTOR METHOD (HAPs)

REGISTRATION #: 81139 POINT NO. 002 SEGMENT NO. 01 SCC NO. 28888803

	ANNUAL	PEAK OZONE SEASON (JUNE, JULY, AUGUST)
THRUPUT (with units)	7,177,993 Bhp-hrs / 86.94 MMSCF	
NO. OPERATING DAYS	114 days	days
NO. OPERATING HOURS PER DAY	≤ 24 hrs/day 1,815 hrs/yr	hours
DAILY THRUPUT (with units) = Thruput ÷ days	N/A	N/A
HAP EMISSION FACTOR (with units) = E.F.	6.00E-06 lb/HP-hr	
Emission Factor Source ¹ Control Efficiency Basis ²	0	NA
HAP CONTROL DEVICE CODE ³	000	
Avg. HAP CONTROL EFFICIENCY ⁴ = C.E.	NA	%
HAP (Formaldehyde) EMISSIONS ⁵	0.62 tons per yr	lbs per day
HAP EMISSION FACTOR (with units) = E.F.		
Emission Factor Source ¹ Control Efficiency Basis ²		
HAP CONTROL DEVICE CODE ³		
Avg. HAP CONTROL EFFICIENCY ⁴ = C.E.		%
HAP () EMISSIONS ⁵	tons per yr	lbs per day
HAP EMISSION FACTOR (with units) = E.F.		
Emission Factor Source ¹ Control Efficiency Basis ²		
HAP CONTROL DEVICE CODE ³		
Avg. HAP CONTROL EFFICIENCY ⁴ = C.E.		%
HAP () EMISSIONS ⁵	tons per yr	lbs per day
HAP EMISSION FACTOR (with units) = E.F.		
Emission Factor Source ¹ Control Efficiency Basis ²		
HAP CONTROL DEVICE CODE ³		
Avg. HAP CONTROL EFFICIENCY ⁴ = C.E.		%
HAP () EMISSIONS ⁵	tons per yr	lbs per day
HAP EMISSION FACTOR (with units) = E.F.		
Emission Factor Source ¹ Control Efficiency Basis ²		
HAP CONTROL DEVICE CODE ³		
Avg. HAP CONTROL EFFICIENCY ⁴ = C.E.		%
HAP () EMISSIONS ⁵	tons per yr	lbs per day
HAP EMISSION FACTOR (with units) = E.F.		
Emission Factor Source ¹ Control Efficiency Basis ²		
HAP CONTROL DEVICE CODE ³		
Avg. HAP CONTROL EFFICIENCY ⁴ = C.E.		%
HAP () EMISSIONS ⁵	tons per yr	lbs per day

2012 EMISSION CALCULATIONS OPTION I: EMISSION FACTOR METHOD

REGISTRATION #: 81139 POINT NO. 003 SEGMENT NO. 01 SCC NO. 28888803

		ANNUAL		PEAK OZONE SEASON (JUNE, JULY, AUGUST)	
THRUPUT (with units)		10,274 Bhp-hrs		9113 Bhp-hrs	
NO. OPERATING DAYS		11 days		5 days	
NO. OPERATING HOURS PER DAY		76.10 hrs/yr		67.50	
DAILY THRUPUT (with units) = Thruput ÷ days		N/A		1823 Bhp-hrs per day	
VOC EMISSION FACTOR (with units) = E.F.		6.608E-04 lb/Hp-hr		6.608E-04 lb/Hp-hr	
Emission Factor Source ¹	Control Efficiency Basis ²	O	N/A	O	N/A
VOC CONTROL DEVICE CODE ³		000		NA	
Avg. VOC CONTROL EFFICIENCY ⁴ = C.E.		NA %		NA %	
VOC EMISSIONS ⁵		0.00 tons VOC per yr		0.00 lbs VOC per day	
NOx EMISSION FACTOR (with units) = E.F.		2.646E-02 lb/Hp-hr		2.646E-02 lb/Hp-hr	
Emission Factor Source ¹	Control Efficiency Basis ²	O	NA	O	NA
NOx CONTROL DEVICE CODE ³		000		NA	
Avg. NOx CONTROL EFFICIENCY ⁴ = C.E.		NA %		NA %	
NOx EMISSIONS ⁵		0.14 tons NOx per yr		2.62 lbs NOx per day	
SO2 EMISSION FACTOR (with units) = E.F.		7.533E-06 lb/Hp-hr			
Emission Factor Source ¹	Control Efficiency Basis ²	O	NA		
FUEL PARAMETER (% ash or % sulfur) = FP		< 0.01 %			
SO2 CONTROL DEVICE CODE ³		000			
Avg. SO2 CONTROL EFFICIENCY ⁴ = C.E.		NA %		%	
SO2 EMISSIONS ⁵		0.00 tons SO2 per yr		lbs SO2 per day	
PM10 EMISSION FACTOR (with units) = E.F.		1.01E-04 lb/Hp-hr			
Emission Factor Source ¹	Control Efficiency Basis ²	AP-42	NA		
FUEL PARAMETER (% ash or % sulfur) = FP		0 %			
PM10 CONTROL DEVICE CODE ³		000			
Avg. PM10 CONTROL EFFICIENCY ⁴ = C.E.		NA %		%	
PM10 EMISSIONS ⁵		0.00 tons PM10 per yr		lbs PM10 per day	
PB EMISSION FACTOR (with units) = E.F.		NA			
Emission Factor Source ¹	Control Efficiency Basis ²	NA	NA		
PB CONTROL DEVICE CODE ³		NA			
Avg. PB CONTROL EFFICIENCY ⁴ = C.E.		NA %		%	
PB EMISSIONS ⁵		NA tons PB per yr		lbs PB per day	

1. AP-42; ST = Stack test; CEMS; F = Federal factor (EPA standard factor from AIRS); O = Other (describe on separate sheet)

2. A = Tested (by EPA Reference Method); B = Tested (other); C = Material Balance; D = Design; O = Other

3. See 3-digit control device codes listed in appendix.

4. Note control efficiency will be zero if there is no control device OR the emission factor accounts for controls (i.e. E.F. is identified to be "with controls").

5. EMISSION = ANNUAL THRUPUT x E.F. x (100-C.E.)/100 OR DAILY THRUPUT x E.F. x (100-C.E.)/100

**2012 EMISSION CALCULATIONS
OPTION I: EMISSION FACTOR METHOD**

REGISTRATION #: 81139 POINT NO. 003 SEGMENT NO. 01 SCC NO. 28888303

		ANNUAL	PEAK OZONE SEASON (JUNE, JULY, AUGUST)
THRUPUT (with units)		10,274 Bhp-hrs	
NO. OPERATING DAYS		11 days	days
NO. OPERATING HOURS PER DAY		76.10 hrs/yr	hours
DAILY THRUPUT (with units) = Thruput ÷ days		N/A	per day
TRS EMISSION FACTOR (with units) = E.F.		NA	
Emission Factor Source ¹	Control Efficiency Basis ²	NA	NA
TRS CONTROL DEVICE CODE ³		NA	
Avg. TRS CONTROL EFFICIENCY ⁴ = C.E.		NA	%
TRS EMISSIONS ⁵		NA tons TRS per yr	lbs TRS per day
TNMOC EMISSION FACTOR (with units) =		6.608E-04 lb/Hp-hr	
Emission Factor Source ¹	Control Efficiency Basis ²	0	NA
TNMOC CONTROL DEVICE CODE ³		000	
Avg. TNMOC CONTROL EFFICIENCY ⁴ = C.E.		NA	%
TNMOC EMISSIONS ⁵		NA tons TNMOC per yr	lbs per day
CO EMISSION FACTOR (with units) = E.F.		2.646 E-02 lb/Hp-hr	
Emission Factor Source ¹	Control Efficiency Basis ²	0	NA
CO CONTROL DEVICE CODE ³		000	
Avg. CO CONTROL EFFICIENCY ⁴ = C.E.		NA	%
CO EMISSIONS ⁵		0.14 tons per yr	lbs per day
PM 2.5 EMISSION FACTOR (with units) = E.F.		1.01E-04 lb/Hp-hr	
Emission Factor Source ¹	Control Efficiency Basis ²	AP-42	NA
FUEL Parameter (% ash or % sulfur) = FP		0	
PM 2.5 CONTROL DEVICE CODE ³		000	
Avg. PM 2.5 CONTROL EFFICIENCY ⁴ =		NA	%
PM 2.5 EMISSIONS ⁵		0.00 tons per yr	lbs per day
NH3 EMISSION FACTOR (with units) = E.F.		NA	
Emission Factor Source ¹	Control Efficiency Basis ²	None Available	NA
NH3 CONTROL DEVICE CODE ³		NA	
Avg. NH3 CONTROL EFFICIENCY ⁴ = C.E.		NA	%
NH3 EMISSIONS ⁵		NA tons per yr	lbs per day

1. AP-42; ST = Stack test; CEMS; F = Federal factor (EPA standard factor from AIRS); O = Other (describe on separate sheet)

2. A = Tested (by EPA Reference Method); B = Tested (other); C = Material Balance; D = Design; O = Other

3. See 3-digit control device codes listed in appendix.

4. Note control efficiency will be zero if there is no control device OR the emission factor accounts for controls (i.e. E.F. is identified to be "with controls").

5. EMISSION = ANNUAL THRUPUT × E.F. × (100-C.E.)/100 OR DAILY THRUPUT × E.F. × (100-C.E.)/100

2012 EMISSION CALCULATIONS OPTION I: EMISSION FACTOR METHOD (HAPs)

REGISTRATION #: 01139 POINT NO. 003 SEGMENT NO. 01 SCC NO. 2888803

	ANNUAL	PEAK OZONE SEASON (JUNE, JULY, AUGUST)
THRUPUT (with units)	10,274 Bhp-hrs	
NO. OPERATING DAYS	11 days	days
NO. OPERATING HOURS PER DAY	76.10 hrs/yr	hours
DAILY THRUPUT (with units) = Thruput ÷ days	N/A	N/A
HAP EMISSION FACTOR (with units) = E.F.	2.170E-04 lb/HP-hr	
Emission Factor Source ¹ Control Efficiency Basis ²	0	NA
HAP CONTROL DEVICE CODE ³	000	
Avg. HAP CONTROL EFFICIENCY ⁴ = C.E.	NA	%
HAP (Formaldehyde) EMISSIONS ⁵	0.00 tons per yr	lbs per day
HAP EMISSION FACTOR (with units) = E.F.		
Emission Factor Source ¹ Control Efficiency Basis ²		
HAP CONTROL DEVICE CODE ³		
Avg. HAP CONTROL EFFICIENCY ⁴ = C.E.	%	%
HAP () EMISSIONS ⁵	tons per yr	lbs per day
HAP EMISSION FACTOR (with units) = E.F.		
Emission Factor Source ¹ Control Efficiency Basis ²		
HAP CONTROL DEVICE CODE ³		
Avg. HAP CONTROL EFFICIENCY ⁴ = C.E.	%	%
HAP () EMISSIONS ⁵	tons per yr	lbs per day
HAP EMISSION FACTOR (with units) = E.F.		
Emission Factor Source ¹ Control Efficiency Basis ²		
HAP CONTROL DEVICE CODE ³		
Avg. HAP CONTROL EFFICIENCY ⁴ = C.E.	%	%
HAP () EMISSIONS ⁵	tons per yr	lbs per day
HAP EMISSION FACTOR (with units) = E.F.		
Emission Factor Source ¹ Control Efficiency Basis ²		
HAP CONTROL DEVICE CODE ³		
Avg. HAP CONTROL EFFICIENCY ⁴ = C.E.	%	%
HAP () EMISSIONS ⁵	tons per yr	lbs per day
HAP EMISSION FACTOR (with units) = E.F.		
Emission Factor Source ¹ Control Efficiency Basis ²		
HAP CONTROL DEVICE CODE ³		
Avg. HAP CONTROL EFFICIENCY ⁴ = C.E.	%	%
HAP () EMISSIONS ⁵	tons per yr	lbs per day

2012 EMISSION CALCULATIONS OPTION I: EMISSION FACTOR METHOD

REGISTRATION #: 81139 POINT NO. 004 SEGMENT NO. 01 SCC NO. 10200603

		ANNUAL		PEAK OZONE SEASON (JUNE, JULY, AUGUST)	
THRUPUT (with units)		8.22 MMSCF		2.32 MMscf	
NO. OPERATING DAYS		326 days		92 days	
NO. OPERATIONS HOURS PER DAY		7,824 hrs/yr hours		2208 hours	
DAILY THRUPUT (with units) = Thruput ÷ days		N/A		0.03 per day	
VOC EMISSION FACTOR (with units) = E.F.		5.300E-03 lb/MMBTU		5.300E-03 lb/MMBTU	
Emission Factor Source ¹	Control Efficiency Basis ²	AP-42	N/A	AP-42	N/A
VOC CONTROL DEVICE CODE ³		000		000	
Avg. VOC CONTROL EFFICIENCY ⁴ = C.E.		NA %		NA %	
VOC EMISSIONS ⁵		0.02 tons VOC per yr		0.12 lbs VOC per day	
NOx EMISSION FACTOR (with units) = E.F.		9.800E-02 lb/MMBTU		9.800E-02 lb/MMBTU	
Emission Factor Source ¹	Control Efficiency Basis ²	AP-42	NA	AP-42	NA
NOx CONTROL DEVICE CODE ³		000		NA	
Avg. NOx CONTROL EFFICIENCY ⁴ = C.E.		NA %		NA %	
NOx EMISSIONS ⁵		0.40 tons NOx per yr		2.45 lbs NOx per day	
SO2 EMISSION FACTOR (with units) = E.F.		7.140E-04 lb/MMBTU			
Emission Factor Source ¹	Control Efficiency Basis ²	O	NA		
FUEL PARAMETER (% ash or % sulfur) = FP		< 0.01 %			
SO2 CONTROL DEVICE CODE ³		000			
Avg. SO2 CONTROL EFFICIENCY ⁴ = C.E.		NA %			
SO2 EMISSIONS ⁵		0.00 tons SO2 per yr		lbs SO2 per day	
PM10 EMISSION FACTOR (with units) = E.F.		1.860 E-03 lb/MMBTU			
Emission Factor Source ¹	Control Efficiency Basis ²	AP-42	NA		
FUEL PARAMETER (% ash or % sulfur) = FP		0 %			
PM10 CONTROL DEVICE CODE ³		000			
Avg. PM10 CONTROL EFFICIENCY ⁴ = C.E.		NA %			
PM10 EMISSIONS ⁵		0.01 tons PM10 per yr		lbs PM10 per day	
PB EMISSION FACTOR (with units) = E.F.		NA			
Emission Factor Source ¹	Control Efficiency Basis ²	NA	NA		
PB CONTROL DEVICE CODE ³		NA			
Avg. PB CONTROL EFFICIENCY ⁴ = C.E.		NA %			
PB EMISSIONS ⁵		NA tons PB per yr		lbs PB per day	

1. AP-42; ST = Stack test; CEMS; F = Federal factor (EPA standard factor from AIRS); O = Other (describe on separate sheet)

2. A = Tested (by EPA Reference Method); B = Tested (other); C = Material Balance; D = Design; O = Other

3. See 3-digit control device codes listed in appendix.

4. Note control efficiency will be zero if there is no control device OR the emission factor accounts for controls (i.e. E.F. is identified to be "with controls").

5. EMISSION = ANNUAL THRUPUT × E.F. × (100-C.E.)/100 OR DAILY THRUPUT × E.F. × (100-C.E.)/100

2012 EMISSION CALCULATIONS OPTION I: EMISSION FACTOR METHOD

REGISTRATION #: 81139 POINT NO. 004 SEGMENT NO. 01 SCC NO. 10200603

		ANNUAL		PEAK OZONE SEASON (JUNE, JULY, AUGUST)
THRUPUT (with units)		8.22 MMSCF		
NO. OPERATING DAYS		326	days	days
NO. OPERATING HOURS PER DAY		7,824 hrs/yr	hours	hours
DAILY THRUPUT (with units) = Thruput ÷ days		N/A		per day
TRS EMISSION FACTOR (with units) = E.F.		NA		
Emission Factor Source ¹	Control Efficiency Basis ²	NA	NA	
TRS CONTROL DEVICE CODE ³		NA		
Avg. TRS CONTROL EFFICIENCY ⁴ = C.E.		NA	%	%
TRS EMISSIONS ⁵		NA	tons TRS per yr	lbs TRS per day
TNMOC EMISSION FACTOR (with units) =		5.300E-03 lb/MMBTU		
Emission Factor Source ¹	Control Efficiency Basis ²	AP-42	NA	
TNMOC CONTROL DEVICE CODE ³		000		
Avg. TNMOC CONTROL EFFICIENCY ⁴ = C.E.		NA	%	%
TNMOC EMISSIONS ⁵		NA	tons TNMOC per yr	lbs per day
CO EMISSION FACTOR (with units) = E.F.		8.240E-02 lb/MMBTU		
Emission Factor Source ¹	Control Efficiency Basis ²	AP-42	NA	
CO CONTROL DEVICE CODE ³		000		
Avg. CO CONTROL EFFICIENCY ⁴ = C.E.		NA	%	%
CO EMISSIONS ⁵		0.34	tons per yr	lbs per day
PM 2.5 EMISSION FACTOR (with units) = E.F.		1.860 E-03 lb/MMBTU		
Emission Factor Source ¹	Control Efficiency Basis ²	AP-42	NA	
FUEL Parameter (% ash or % sulfur) = FP		0		
PM 2.5 CONTROL DEVICE CODE ³		000		
Avg. PM 2.5 CONTROL EFFICIENCY ⁴ =		NA	%	%
PM 2.5 EMISSIONS ⁵		0.01	tons per yr	lbs per day
NH3 EMISSION FACTOR (with units) = E.F.		3.2 lbs/MMSCF		
Emission Factor Source ¹	Control Efficiency Basis ²	FIRE Database	NA	
NH3 CONTROL DEVICE CODE ³		000		
Avg. NH3 CONTROL EFFICIENCY ⁴ = C.E.		NA	%	%
NH3 EMISSIONS ⁵		0.00	tons per yr	lbs per day

1. AP-42; ST = Stack test; CEMS; F = Federal factor (EPA standard factor from AIRS); O = Other (describe on separate sheet)

2. A = Tested (by EPA Reference Method); B = Tested (other); C = Material Balance; D = Design; O = Other

3. See 3-digit control device codes listed in appendix.

4. Note control efficiency will be zero if there is no control device OR the emission factor accounts for controls (i.e. E.F. is identified to be "with controls").

5. EMISSION = ANNUAL THRUPUT × E.F. × (100-C.E.)/100 OR DAILY THRUPUT × E.F. × (100-C.E.)/100

2012 EMISSION CALCULATIONS OPTION I: EMISSION FACTOR METHOD

REGISTRATION #: 81139 POINT NO. 005 SEGMENT NO. 01 SCC NO. 10200603

		ANNUAL		PEAK OZONE SEASON (JUNE, JULY, AUGUST)	
THRUPUT (with units)		Fugatives		0.00	
NO. OPERATING DAYS		365 days		92 days	
NO. OPERATING HOURS PER DAY		24 hrs/day hours		24 hrs/day hours	
DAILY THRUPUT (with units) = Thruput ÷ days		N/A		0 per day	
VOC EMISSION FACTOR (with units) = E.F.		See attached		See attached	
Emission Factor Source ¹	Control Efficiency Basis ²	AP-42	N/A	AP-42	N/A
VOC CONTROL DEVICE CODE ³		000		000	
Avg. VOC CONTROL EFFICIENCY ⁴ = C.E.		NA %		NA %	
VOC EMISSIONS ⁵		2.16 tons VOC per yr		18.52 lbs VOC per day	
NOx EMISSION FACTOR (with units) = E.F.		NA		NA	
Emission Factor Source ¹	Control Efficiency Basis ²	NA	NA	NA	NA
NOx CONTROL DEVICE CODE ³		NA		NA	
Avg. NOx CONTROL EFFICIENCY ⁴ = C.E.		NA %		NA %	
NOx EMISSIONS ⁵		NA tons NOx per yr		NA lbs NOx per day	
SO2 EMISSION FACTOR (with units) = E.F.		NA			
Emission Factor Source ¹	Control Efficiency Basis ²	NA	NA		
FUEL PARAMETER (% ash or % sulfur) = FP		NA %			
SO2 CONTROL DEVICE CODE ³		NA			
Avg. SO2 CONTROL EFFICIENCY ⁴ = C.E.		NA %			
SO2 EMISSIONS ⁵		NA tons SO2 per yr		lbs SO2 per day	
PM10 EMISSION FACTOR (with units) = E.F.		NA			
Emission Factor Source ¹	Control Efficiency Basis ²	NA	NA		
FUEL PARAMETER (% ash or % sulfur) = FP		NA %			
PM10 CONTROL DEVICE CODE ³		NA			
Avg. PM10 CONTROL EFFICIENCY ⁴ = C.E.		NA %			
PM10 EMISSIONS ⁵		NA tons PM10 per yr		lbs PM10 per day	
PB EMISSION FACTOR (with units) = E.F.		NA			
Emission Factor Source ¹	Control Efficiency Basis ²	NA	NA		
PB CONTROL DEVICE CODE ³		NA			
Avg. PB CONTROL EFFICIENCY ⁴ = C.E.		NA %			
PB EMISSIONS ⁵		NA tons PB per yr		lbs PB per day	

1. AP-42; ST = Stack test; CEMS; F = Federal factor (EPA standard factor from AIRS); O = Other (describe on separate sheet)

2. A = Tested (by EPA Reference Method); B = Tested (other); C = Material Balance; D = Design; O = Other

3. See 3-digit control device codes listed in appendix.

4. Note control efficiency will be zero if there is no control device OR the emission factor accounts for controls (i.e. E.F. is identified to be "with controls").

5. EMISSION = ANNUAL THRUPUT x E.F. x (100-C.E.)/100 OR DAILY THRUPUT x E.F. x (100-C.E.)/100

2012 EMISSION CALCULATIONS OPTION I: EMISSION FACTOR METHOD

REGISTRATION #: 81139 POINT NO. 004 SEGMENT NO. 01 SCC NO. 10200603

		ANNUAL		PEAK OZONE SEASON (JUNE, JULY, AUGUST)	
THRUPUT (with units)		Fugatives			
NO. OPERATING DAYS		365	days		days
NO. OPERATING HOURS PER DAY		24 hrs/day	hours		hours
DAILY THRUPUT (with units) = Thruput + days		N/A			per day
TRS EMISSION FACTOR (with units) = E.F.		NA			
Emission Factor Source ¹	Control Efficiency Basis ²	NA	NA		
TRS CONTROL DEVICE CODE ³		NA			
Avg. TRS CONTROL EFFICIENCY ⁴ = C.E.		NA	%		%
TRS EMISSIONS ⁵		NA	tons TRS per yr		lbs TRS per day
TNMOC EMISSION FACTOR (with units) =		See attached			
Emission Factor Source ¹	Control Efficiency Basis ²	NA	NA		
TNMOC CONTROL DEVICE CODE ³		NA			
Avg. TNMOC CONTROL EFFICIENCY ⁴ = C.E.		NA	%		%
TNMOC EMISSIONS ⁵		NA	tons TNMOC per yr		lbs per day
CO EMISSION FACTOR (with units) = E.F.		NA			
Emission Factor Source ¹	Control Efficiency Basis ²	NA	NA		
CO CONTROL DEVICE CODE ³		NA			
Avg. CO CONTROL EFFICIENCY ⁴ = C.E.		NA	%		%
CO EMISSIONS ⁵		NA	tons per yr		lbs per day
PM 2.5 EMISSION FACTOR (with units) = E.F.		NA			
Emission Factor Source ¹	Control Efficiency Basis ²	NA	NA		
FUEL Parameter (% ash or % sulfur) = FP		NA			
PM 2.5 CONTROL DEVICE CODE ³		NA			
Avg. PM 2.5 CONTROL EFFICIENCY ⁴ =		NA	%		%
PM 2.5 EMISSIONS ⁵		NA	tons per yr		lbs per day
NH3 EMISSION FACTOR (with units) = E.F.		NA			
Emission Factor Source ¹	Control Efficiency Basis ²	NA	NA		
NH3 CONTROL DEVICE CODE ³		NA			
Avg. NH3 CONTROL EFFICIENCY ⁴ = C.E.		NA	%		%
NH3 EMISSIONS ⁵		NA	tons per yr		lbs per day

1. AP-42; ST = Stack test; CEMS; F = Federal factor (EPA standard factor from AIRS); O = Other (describe on separate sheet)

2. A = Tested (by EPA Reference Method); B = Tested (other); C = Material Balance; D = Design; O = Other

3. See 3-digit control device codes listed in appendix.

4. Note control efficiency will be zero if there is no control device OR the emission factor accounts for controls (i.e. E.F. is identified to be "with controls").

5. EMISSION = ANNUAL THRUPUT x E.F. x (100-C.E.)/100 OR DAILY THRUPUT x E.F. x (100-C.E.)/100

2012 EMISSION CALCULATIONS
OPTION I: EMISSION FACTOR METHOD (continued)

STACK NO. 001REGISTRATION #: 81139

	Annual
STACK HEIGHT (ft)	40
STACK DIAMETER (ft)	5.64
EXIT GAS TEMPERATURE (° F)	1000
EXIT GAS VELOCITY (ft per second)	14.3
ELEVATION	1100
GAS FLOW RATE (cu. ft per minute)	21,371

STACK NO. 002

	ANNUAL
STACK HEIGHT (ft)	40
STACK DIAMETER (ft)	5.64
EXIT GAS TEMPERATURE (° F)	1000
EXIT GAS VELOCITY (ft per second)	14.3
ELEVATION	1100
GAS FLOW RATE (cu. ft per minute)	21,371

STACK NO. 003

	ANNUAL
STACK HEIGHT (ft)	15
STACK DIAMETER (ft)	0.33
EXIT GAS TEMPERATURE (° F)	900
EXIT GAS VELOCITY (ft per second)	141.2
ELEVATION	1100
GAS FLOW RATE (cu. ft per minute)	724

STACK NO. 004

	ANNUAL
STACK HEIGHT (ft)	20
STACK DIAMETER (ft)	1.33
EXIT GAS TEMPERATURE (° F)	350
EXIT GAS VELOCITY (ft per second)	20.9
ELEVATION	1100
GAS FLOW RATE (cu. ft per minute)	1742

SHENANDOAH 6C3310 Annual Emission Report for 2012

Report Generated: 2/28/2013

Start Date: January 1, 2012

Area:

State: VA

TPY Criteria Emission Summary by Source

	Carbon Monoxide	Nitrogen Oxides (NOx)	PM10	Sulfur Dioxide	VOC	
HEATING SYSTEM BOILER #1	0.34	0.40	0.01	0.00	0.02	
RECIP ENG/GEN	0.14	0.14	0.00	0.00	0.00	
TURB ENG/CENT COM #1	7.87	11.22	0.56	0.02	0.45	
TURB ENG/CENT COM #2	7.99	11.38	0.57	0.02	0.46	
Total	16.33	23.14	1.15	0.05	0.94	

Report Printed: 2/28/2013

AnnualEmis.rpt

Page 1

Area:

State: VA

Criteria & HAP Emission Summary

<u>Criteria Pollutant</u>	<u>Lb/Yr</u>	<u>Ton/Yr</u>
Carbon Monoxide	32,660.29	16.33
Nitrogen Oxides (NOx)	46,285.44	23.14
PM10	1,153.66	0.58
Sulfur Dioxide	91.42	0.05
VOC	1,875.37	0.94
Total Criteria Pollutant	82,066.2	41.0
<u>Hazardous Air Pollutants</u>	<u>Lb/Yr</u>	<u>Ton/Yr</u>
Formaldehyde	2,456.49	1.23
Total Hazardous Air Pollutants	2,456.5	1.2

Area: State: VA

Emission Point: BL1

Unit Name: HEATING SYSTEM BOILER #1, Unit ID: HEATING SYSTEM BOILER #1_BLR1 Agency ID: BLR1
 Manufacturer: HYDROTHERM MR-1500-BPV, 2.1 mmBtu/hr SCC: 10200603, Regulatory Status: SIGNIFICANT

Emissions Statistics	Chemical	Emission Factor Reference, lb/mmBtu	Control	Ozone Season		Annual	
				(Lb.)	(Tons)	(Lb.)	(Tons)
	Carbon Monoxide	0.0824000 AP-42 Tbl 1.4-1, small Bhrs <100 MMB (7/98)	0%	280.32	0.14	676.93	0.34
	Nitrogen Oxides (NOx)	0.0980000 AP-42 Tbl 1.4-1, small Bhrs <100 MMB (7/98)	0%	333.40	0.17	805.09	0.40
	PM10	0.0018600 AP-42 Tbl 1.4-2 (filterable) (7/98)	0%	6.33	0.00	15.28	0.01
	Sulfur Dioxide	0.0007100 Calc.: 0.25 gr S/100scf	0%	2.42	0.00	5.83	0.00
	VOC	0.0053900 AP-42 Tbl 1.4-2 (7/98)	0%	18.34	0.01	44.28	0.02
	Carbon Dioxide	120.0000000 US Dept of Energy 1605b Guidelines	0%	408,240.00	204.12	985,824.00	492.91
	Nitrous Oxide	0.0022000 GHGCalc Emission Factor (GR/EPA Study 1996)	0%	7.48	0.00	18.07	0.01
	Methane	0.0023000 GHGCalc Emission Factor (GR/EPA Study 1996)	0%	7.82	0.00	18.89	0.01

Annual Production Statistics for 2012		Month	Op. Percent	Hours	Days	MMBtu	MMScf
		February	8.9	696.00	29	730.80	0.73
		January	9.5	744.00	31	781.20	0.78
		March	9.5	744.00	31	781.20	0.78
	Quarter 1 Totals:		27.9	2,184.00	91	2,293.20	2.29
		May	4.0	312.00	13	327.60	0.33
		April	2.5	192.00	8	201.60	0.20
		June	9.2	720.00	30	756.00	0.76
	Quarter 2 Totals:		15.6	1,224.00	51	1,285.20	1.29
		July	9.5	744.00	31	781.20	0.78
		August	9.5	744.00	31	781.20	0.78
		September	9.2	720.00	30	756.00	0.76
	Quarter 3 Totals:		28.2	2,208.00	92	2,318.40	2.32
		October	9.5	744.00	31	781.20	0.78
		November	9.2	720.00	30	756.00	0.76
		December	9.5	744.00	31	781.20	0.78
	Quarter 4 Totals:		28.2	2,208.00	92	2,318.40	2.32
	Annual Totals:			7,824.00	326	8,215.20	8.22
	Ozone Season Totals:		41.4	3,240.00	135	3,402.00	3.40

Area: State: VA

Emission Point: E01

Unit Name: TURB ENG/CENT COM #1, Unit ID: TURB ENG/CENT COM #1
 Manufacturer: ALLISON 501-KC5, 5027 hp

Agency ID: 1
 SCC: 20200201, Regulatory Status: SIGNIFICANT

Chemical	Emission Factor Reference, lb/bhp_hr	Control	Ozone Season		Annual	
			(Lb.)	(Tons)	(Lb.)	(Tons)
Carbon Monoxide	0.0022250 Manufacturer Guarantee (LIMIT)	0%	1,814.88	0.91	15,740.47	7.87
Nitrogen Oxides (NOx)	0.0031720 Manufacturer Guarantee (LIMIT)	0%	2,587.33	1.29	22,439.90	11.22
PM10	0.0000700 AP-42 Tbl 3.1-2a @ 10600 Btu/Hp-hr, (04/2000)	0%	65.09	0.03	564.53	0.28
PM10	0.0000798 AP-42 Tbl 3.1-2a @ 8400 Btu/Hp-hr, (04/2000)	0%	65.09	0.03	564.53	0.28
Sulfur Dioxide	0.0000060 Calc.: 0.25 gr S/100 scf @ 8,400 Btu/Hp-hr	0%	4.89	0.00	42.45	0.02
VOC	0.0001280 Manufacturer Guarantee (LIMIT)	0%	104.41	0.05	905.52	0.45
Formaldehyde	0.0001722 AP-42 Tbl 3.1-3 @ 8400 Btu/Hp-hr, (04/2000)	0%	140.46	0.07	1,218.21	0.61
Formaldehyde	0.0000075 AP-42 Tbl 3.1-3 @ 10600 Btu/Hp-hr, (04/2000)	0%	140.46	0.07	1,218.21	0.61
Carbon Dioxide	0.9802800 US Dept of Energy 1605b Guidelines	0%	799,591.56	399.80	6,934,861.81	3,467.43
Nitrous Oxide	0.0000431 GHGCalc Emission Factor (GRI/EPA Study 1996)	0%	35.11	0.02	304.55	0.15
Methane	0.0000722 GHGCalc Emission Factor (GRI/EPA Study 1996)	0%	58.92	0.03	511.05	0.26

Annual Production Statistics for 2012	Month	Op. Percent	Hours	Days	BHP-Hr	MMScf
	February	15.7	260.37	13	1,110,097.17	12.88
	January	17.9	288.93	19	1,264,896.98	14.35
	March	4.4	72.90	6	313,841.14	3.58
Quarter 1 Totals:		38.0	622.20	38	2,688,835.29	30.81
	May	1.9	32.45	2	132,290.12	1.49
	April	0.0	0.00	0	0.00	0.00
	June	3.4	62.67	5	238,080.29	2.84
Quarter 2 Totals:		5.2	95.12	7	370,370.41	4.33
	July	4.6	110.38	10	327,766.69	4.78
	August	0.9	28.93	4	63,605.78	1.20
	September	0.8	24.53	2	53,933.01	1.02
Quarter 3 Totals:		6.3	163.85	16	445,305.48	7.00
	October	0.6	18.97	2	41,695.49	0.84
	November	26.5	431.95	22	1,874,315.04	21.08
	December	23.4	396.78	22	1,653,839.60	19.26
Quarter 4 Totals:		50.5	847.70	46	3,569,850.13	41.18
Annual Totals:			1,728.87	107	7,074,361.31	83.32
Ozone Season Totals:		11.5	258.97	23	815,675.89	11.33

Area: State: VA

Emission Point: E02

Unit Name: TURB ENG/CENT COM #2, Unit ID: TURB ENG/CENT COM #2
 Manufacturer: ALLISON 501-KC5, 5027 hp

Agency ID: 2
 SCC: 20200201, Regulatory Status: SIGNIFICANT

Emissions Statistics

Chemical	Emission Factor Reference, lb/bhp_hr	Control	Ozone Season		Annual	
			(Lb.)	(Tons)	(Lb.)	(Tons)
Carbon Monoxide	0.0022250 Manufacturer Guarantee (LIMIT)	0%	1,565.30	0.78	15,971.05	7.99
Nitrogen Oxides (NOx)	0.0031720 Manufacturer Guarantee (LIMIT)	0%	2,231.52	1.12	22,768.62	11.38
PM10	0.0000798 AP-42 Tbl 3.1-2a @ 8400 Btu/Hp-hr, (04/2000)	0%	56.14	0.03	572.80	0.29
PM10	0.0000700 AP-42 Tbl 3.1-2a @ 10600 Btu/Hp-hr, (04/2000)	0%	56.14	0.03	572.80	0.29
Sulfur Dioxide	0.0000060 Calc.: 0.25 gr S/100 scf @ 8,400 Btu/Hp-hr	0%	4.22	0.00	43.07	0.02
VOC	0.0001280 Manufacturer Guarantee (LIMIT)	0%	90.05	0.05	918.78	0.46
Formaldehyde	0.0000075 AP-42 Tbl 3.1-3 @ 10600 Btu/Hp-hr, (04/2000)	0%	121.14	0.06	1,236.05	0.62
Formaldehyde	0.0001722 AP-42 Tbl 3.1-3 @ 8400 Btu/Hp-hr, (04/2000)	0%	121.14	0.06	1,236.05	0.62
Carbon Dioxide	0.9802800 US Dept of Energy 1605b Guidelines	0%	689,632.50	344.82	7,036,450.13	3,518.23
Nitrous Oxide	0.0000431 GHGCalc Emission Factor (GRJ/EPA Study 1996)	0%	30.29	0.02	309.01	0.15
Methane	0.0000722 GHGCalc Emission Factor (GRJ/EPA Study 1996)	0%	50.82	0.03	518.54	0.26

Annual Production Statistics for 2012		Month	Op. Percent	Hours	Days	BHP-Hr	MMScf
		February	16.0	267.05	14	1,151,946.50	13.23
		January	19.1	347.83	21	1,374,270.23	16.99
		March	4.3	69.93	6	305,301.55	3.44
	Quarter 1 Totals:		39.4	684.82	41	2,831,518.28	33.66
		May	1.5	25.60	2	107,146.15	1.18
		April	0.0	0.00	0	0.00	0.00
		June	3.4	68.55	6	246,010.62	3.07
	Quarter 2 Totals:		4.9	94.15	8	353,156.77	4.25
		July	3.1	117.20	10	225,133.05	4.76
		August	1.1	36.23	4	80,327.79	1.51
		September	0.6	20.43	2	44,887.32	0.85
	Quarter 3 Totals:		4.9	173.87	16	350,348.16	7.12
		October	0.2	21.08	2	15,524.85	0.86
		November	26.0	422.13	23	1,868,399.25	20.68
		December	24.5	419.02	24	1,759,045.84	20.37
	Quarter 4 Totals:		50.8	862.23	49	3,642,969.94	41.91
	Annual Totals:			1,815.07	114	7,177,993.15	86.94
	Ozone Season Totals:		9.8	268.02	24	703,504.93	11.37

Area: State: VA

Emission Point: G1

Unit Name: RECIP ENG/GEN, Unit ID: RECIP ENG/GEN_G1
 Manufacturer: WAUKESHA VSG11GSI, 135 hp

Agency ID: G1
 SCC: 20200253, Regulatory Status: SIGNIFICANT

Emissions Statistics	Chemical	Emission Factor Reference, lb/bhp_hr	Control	Ozone Season		Annual	
				(Lb.)	(Tons)	(Lb.)	(Tons)
	Carbon Monoxide	0.0264600 Manufacturer Data, 9/9/96	0%	258.98	0.13	271.84	0.14
	Nitrogen Oxides (NOx)	0.0264600 Manufacturer Data, 9/9/96	0%	258.98	0.13	271.84	0.14
	PM10	0.0001010 AP-42 Table 3.2-3, 7/2000 @ 10,600 Btu/Hp-hr	0%	0.99	0.00	1.04	0.00
	Sulfur Dioxide	0.0000076 Eng. Calc.: 0.25 gr/scf @ 10,600 Btu/Hp-hr	0%	0.07	0.00	0.08	0.00
	VOC	0.0006608 Manufacturer Data, 9/9/96	0%	6.47	0.00	6.79	0.00
	Formaldehyde	0.0002170 AP-42 Table 3.2-3, 7/2000 @ 10,600 Btu/Hp-hr	0%	2.12	0.00	2.23	0.00
	Carbon Dioxide	1.2370200 US Dept of Energy 1605b Guidelines	0%	12,107.35	6.05	12,708.54	6.35
	Nitrous Oxide	0.0003300 GHGCalc Emission Factor (GRI/EPA Study 1996)	0%	3.23	0.00	3.39	0.00
	Methane	0.0024380 GHGCalc Emission Factor (GRI/EPA Study 1996)	0%	23.86	0.01	25.05	0.01

Annual Production Statistics for 2012	Month	Op. Percent	Hours	Days	BHP-Hr	MMScf
	February	0.0	0.00	0	0.00	0.00
	January	1.3	1.00	1	135.00	0.00
	March	0.0	0.00	0	0.00	0.00
	Quarter 1 Totals:	1.3	1.00	1	135.00	0.00
	May	5.3	4.00	1	540.00	0.01
	April	1.3	1.00	1	135.00	0.00
	June	5.3	4.00	1	540.00	0.01
	Quarter 2 Totals:	11.8	9.00	3	1,215.00	0.01
	July	82.8	63.00	3	8,505.00	0.09
	August	0.7	0.50	1	67.50	0.00
	September	1.3	1.00	1	135.00	0.00
	Quarter 3 Totals:	84.8	64.50	5	8,707.50	0.09
	October	1.6	1.20	1	162.00	0.00
	November	0.0	0.00	0	0.00	0.00
	December	0.5	0.40	1	54.00	0.00
	Quarter 4 Totals:	2.1	1.60	2	216.00	0.00
	Annual Totals:		76.10	11	10,273.50	0.11
	Ozone Season Totals:		72.50	7	9,787.50	0.10

ATTACHMENT B

Minor NSR Permit dated 8/23/91

WALLACE E. REED, CHAIRMAN
CHARLOTTESVILLE

ELIZABETH H. HASKELL, VICE CHAIRMAN
MARTINSVILLE

TIMOTHY E. BARROW
VIRGINIA BEACH

SAM C. BROWN, JR.
RICHMOND

MANUEL DEESE
RICHMOND



COMMONWEALTH of VIRGINIA

Department of Air Pollution Control

ROOM 801, NINTH STREET OFFICE BUILDING

POST OFFICE BOX 10009

RICHMOND, VIRGINIA 23240

(804) 786-2378

FAX # (804) 225-3033

TDD # (804) 371-8471

WALLACE N. DAVIS
EXECUTIVE DIRECTOR

NEW SOURCE PERFORMANCE STANDARDS PERMIT

STATIONARY SOURCE PERMIT TO CONSTRUCT AND OPERATE

In compliance with the Federal Clean Air Act and the Commonwealth of Virginia Regulations for the Control and Abatement of Air Pollution,

Columbia Gas Transmission Corporation
P.O. Box 1273
Charleston, West Virginia 25325-1273

Registration No. 21139
County-Plant No. 2320-0027

is authorized to construct and operate

a natural gas transmission
compressor station

located

on northwest side of State Road 685,
approximately 1.7 miles southwest of
the northernmost intersection with
U.S. 340 in Page County

in accordance with Part I - Specific Conditions (emission limitations,
monitoring and testing requirements), Part II - General Conditions, and Part
III - Document List of this permit.

Approved this twenty-third day of August, 1991

Wallace N. Davis
Executive Director

- Permit Consists of 10 pages.
- Part I - Specific Conditions 1 to 18.
- Part II - General Conditions 1 to 14.
- Part III - Document List, 7 items.
- Part IV - Source Testing Report Format.

PART I - SPECIFIC CONDITIONS - the regulatory reference and authority for each condition is listed in parentheses () after each condition.

1. The natural gas transmission station is located on the northwest side of State Road 685, approximately 1.7 miles southwest of the northernmost intersection with U.S. 340 in Page County.
2. Construction and operation shall be as proposed in the permit application dated December 4, 1990.
(Section 120-02-11 of State Regulations)
3. The equipment to be constructed consists of:
 - two 5027 horsepower gas-fired combustion turbines
 - one 135 horsepower gas-fired auxiliary generator
 - one 2.1×10^6 Btu per hour gas-fired heating boiler
4. Nitrogen oxide (NO_x) and carbon monoxide (CO) emissions from the turbines shall be controlled by combustion with a lean fuel-to-air ratio. The turbines and control room shall be provided with adequate access for inspection.
(Section 120-08-01 of State Regulations)
5. The auxiliary generator shall not operate more than 168 hours per year.
(Section 120-02-11 of State Regulations)
- ✓ 6. The turbines shall consume no more than 394 million cubic feet of natural gas per turbine per year; 45,000 cubic feet, per turbine hour.
(Section 120-02-11 of State Regulations)
7. The permittee shall have for each turbine a permanently installed gage of the flowrate of fuel (natural gas). The gage shall have a readout in cubic feet per second and shall be readily accessible for inspection to determine compliance with specific condition No. 6.
8. The heating boiler shall consume no more than 18.4 million cubic feet of natural gas per year.

X 9. Emissions from the operation of each turbine shall not exceed the limitations specified below:

Sulfur Dioxide		0.62 lbs/hr	2.7 tons/yr
Oxides of nitrogen as Nitrogen Dioxide	80 ppmv (on basis of 15% O ₂ , dry, ISO standard ambient conditions)	16.0 lbs/hr	70.0 tons/yr
Carbon Monoxide		11.2 lbs/hr	49.0 tons/yr
Volatile Organic Compounds (Section 120-05-0403 of State Regulations)		0.64 lbs/hr	2.8 tons/yr

10. Emissions from the operation of the heating boiler shall not exceed the limitations specified below:

Oxides of Nitrogen as Nitrogen Dioxide		0.25 lbs/yr	1.1 tons/yr
---	--	----------------	-------------

11. Emissions from the operation of the auxiliary generator shall not exceed the limitations specified below:

Oxides of nitrogen as Nitrogen Dioxide		3.6 lbs/hr	0.3 tons/yr
Carbon Monoxide		3.6 lbs/hr	0.3 tons/yr

12. Visible emissions from the turbines and heating boiler exhausts shall not exceed 5 percent opacity.
(Section 120-02-11 of State Regulations)

13. Visible emissions from the auxiliary generator shall not exceed 10 percent opacity.
(Section 120-02-11 of State Regulations)

✓14. Within the time limits specified in General Condition No. 2 of this permit, stack emission tests for nitrogen oxides from each turbine shall be conducted. Stack tests for new or modified sources shall be conducted and reported and data reduced as set forth in Sections 120-05-03 of State Regulations and the test methods and procedures contained in each applicable section or

subpart listed in Sections 120-05-0502, Subpart 6G. The details of the emission tests are to be arranged with the Director, Region VII.
(Section 120-08-01 H of State Regulations and 40 CFR 60.8 and 60.335 of Federal Regulations)

15. The approved fuel for the turbines, auxiliary generator, and heating boiler is natural gas with a sulfur content of 0.01 percent or less by weight. A change in the fuel may require a permit to modify and operate.
(Section 120-08-01 of State Regulations)
16. The permittee shall comply with all applicable provisions of the Federal Standards of Performance for Stationary Gas Turbines, 40 CFR 60, Subpart 6G, except for the requirement to determine fuel-bound nitrogen.
(Section 120-05-0502 of State Regulations)
17. The permittee shall retain monthly records on site, available for inspection upon request to include:
 - a) Fuel consumption in cubic feet by each turbine.
 - b) Fuel consumption in cubic feet by the heating boiler.
 - c) Hours of operation of the auxiliary generator.
(Section 120-02-11 of State Regulations)
- X 18. Fuel Monitoring of the sulfur content shall be conducted as follows:
 - a. Sulfur Monitoring
 1. Analysis for fuel content of the natural gas shall be conducted using one of the approved ASTM reference methods for the measurement of sulfur in gaseous fuels, or an approved alternative method. The reference methods are: ASTM D1072-80; ASTM D3031-81; ASTM D3246-81; and ASTM D4084-82 as referenced in 40 CFR 60.335(b)(2). Usage of the Barton Model 286 or 342 titration analytical methods are approved alternative methods.
 2. Sulfur monitoring shall be conducted twice monthly for the first six months following startup of the turbines. If this monitoring shows little variability in the fuel sulfur content, and indicates consistent compliance with allowable permit conditions, then sulfur monitoring shall be conducted once per quarter for six quarters.
 3. If after the monitoring required in item a.(2) above, the sulfur content of the fuel shows little

variability and, calculated as sulfur dioxide, represents consistent compliance with the sulfur dioxide emission limits specified herein, sample analysis may be discontinued upon request, by the permittee, and approval by the Department.

4. If any sulfur analysis as required in item a.(2) above indicates noncompliance, the owner or operator shall notify the Department of Air Pollution Control (Region VII) of such excess emissions and this custom schedule shall be re-examined by the Department. Sulfur monitoring shall be conducted weekly during the interim period when this custom schedule is being re-examined.
- b. If there is a change in fuel supply, the owner or operator must notify the Department (Region VII) of such change for re-examination of this custom schedule. A substantial change in fuel quality shall be considered as a change in fuel supply. Sulfur monitoring shall be conducted weekly during the interim period when this custom schedule is being re-examined.
- c. Records of sample analysis and fuel supply pertinent to this custom schedule shall be retained for a period of three years, and be available for inspection by personnel of federal, state, and local air pollution control agencies. (Section 120-02-11 of State Regulations)

PART II - GENERAL CONDITIONS

1. The permittee shall furnish written notification to the Department (Director, Region VII) of:
 - a. The actual date on which construction of the compressor station commenced within 30 days after such date.
 - b. The anticipated start-up date of the compressor station postmarked not more than 60 days nor less than 30 days prior to such date.
 - c. The actual start-up date of the compressor station within 15 days after such date.
 - d. The anticipated date of stack emission tests of the compressor station postmarked at least 30 days prior to such date.

Copies of written notification referenced in items a, b, and c above to be sent to:

NSPS Coordinator
Air, Radiation, and Toxics Division (3AM21)
U. S. Environmental Protection Agency
Region III
841 Chestnut Street
Philadelphia, PA 19107

(Section 120-02-11 and 120-05-05 of State Regulations)

- ✓ 2. Stack testing, as required in Part I of this permit, shall be performed to determine compliance with the emission limits contained herein within 60 days after achieving the maximum production rate but in no event later than 180 days after start-up of the permitted facility. Compliance test results shall be reported to the Department (Director, Region VII) in writing within 45 days after test completion and shall conform to the test report format enclosed with this permit.
(Sections 120-05-03 and 120-06-03 of State Regulations)
- ✓ 3. The permitted facility shall be designed and constructed to allow emissions testing using appropriate methods upon reasonable notice at any time.
(Sections 120-05-03 of State Regulations)
4. The permittee shall retain records of all emission data and operating parameters required, to include fuel throughputs, by the terms of this permit. These records shall be maintained by the source for the most current three year period.
(Sections 120-05-05 of State Regulations)
- ✓ 5. If, for any reason, the permitted facility or related air pollution control equipment fails or malfunctions and may cause excess emissions for more than one hour, the owner shall notify the Department (Director, Region VII) by telephone or telegraph within 4 business hours. In addition, the owner shall provide a written statement explaining the problem and the estimated duration of the breakdown/shut down.
(Section 120-02-34 of State Regulations)
6. This permit may be modified or revoked in whole or in part for cause, including, but not limited to, the following:
 - a. Violation of any terms or conditions of this permit;
 - b. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts;

- c. A change in any condition that requires either a temporary or permanent reduction or elimination of a permitted discharge; or
 - d. Information that the permitted discharge of any pollutant poses a threat to human health, welfare, or the environment.
(Sections 120-02-11 and 120-08-01 of State Regulations)
7. The permitted facility is to be constructed and operated as represented in the permit application referenced in Condition 2 of Part I. No changes in the permit application specifications or any existing facilities shall be made which alter the emissions into the ambient air or alter the impact of the facility on air quality without the prior written approval of the Board.
(Sections 120-02-11 and 120-08-01 of State Regulations)
8. This permit shall become invalid if construction is not commenced within eighteen months from the date of this permit or if it discontinued for a period of eighteen months.
(Section 120-08-01 I of State Regulations)
9. In the event of any change in control of ownership of the permitted source, the permittee shall notify the succeeding owner of the existence of this permit by letter and send a copy of that letter to the Department (Director, Region VII).
(Section 120-02-11 of State Regulations)
10. The conditions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the remainder of this permit, shall not be affected thereby.
(Section 120-02-11 of State Regulations)
11. This permit approval is only applicable to the permit requirements of the State Air Pollution Control Board and does not alter permit requirements by any other local, state, or federal government agency. The permittee is cautioned that approval of this permit should not be construed to mean its operation is automatically in compliance with all aspects of the Regulations for the Control and Abatement of Air Pollution. Initial compliance shall be verified by stack test if required, visible emission evaluation if appropriate, and by other means (process rate, operating practice, etc.) as applicable. Continuing compliance shall be verified by Department personnel by constant surveillance in accordance with the State Air Pollution Control Board regulations. Compliance with all air pollution regulations must be a continuing, full time effort.
(Section 120-02-11 of State Regulations)

12. Annual requirements to fulfill legal obligations to maintain current stationary source emissions data will necessitate your prompt response to requests for information to include, as appropriate: fuel consumption by type, heat value, sulfur and ash content; process and production data; refuse disposal by incineration including auxiliary fuels burned; storage, handling and use of liquid organic compounds; and, changes in stack data, control equipment, and operating schedules. Such requests for information from the Department will either be in writing or by personal contact. The availability of information submitted to the Department or the Board will be governed by applicable provisions of the Freedom of Information Act, §§ 2.1-340 through 2.1-348 of the Code of Virginia, § 10.1-1314 (addressing information provided to the Board), and § 120-02-30 of the State Air Pollution Control Board Regulations. Information provided to federal officials is subject to appropriate federal law and regulations governing confidentiality of such information. (Section 120-02-31 of State Regulations)
13. A copy of this permit shall be maintained on the premises of the facility to which it applies. (Section 120-02-11 of State Regulations)
14. The permittee shall allow authorized state and federal representatives, upon the presentation of credentials:
 - a. to enter upon the permittee's premises on which the facility is located or in which any records are required to be kept under the terms and conditions of this permit;
 - b. to have access to and copy at reasonable times any records required to be kept under the terms and conditions of this permit or the State Air Pollution Control Board Regulations;
 - c. to inspect at reasonable times any facility, equipment, or process subject to the terms and conditions of this permit or the State Air Pollution Control Board Regulations; and
 - d. to sample or test at reasonable times. For purposes of this section, the time for inspection shall be deemed reasonable during regular business hours or whenever the facility is in operation. Nothing contained herein shall make an inspection time unreasonable during an emergency. (Section 120-02-11 of State Regulations)

PART III - DOCUMENT LIST

1. Columbia Gas Transmission Corporation permit application, dated December 4, 1990 and signed by J.H. Deakin, Vice President Engineering.
2. Columbia Gas Transmission Corporation Air Quality Impact Analysis, prepared by Dames & Moore, dated November 26, 1990.
3. Department of Air Pollution Control, Region VII engineering analysis, dated June 6, 1991.
4. Letter from Shenandoah National Park Superintendent, dated January 24, 1991, commenting about application.
5. Approved Page County zoning request applications (2).
6. Federal NSPS Regulation Part 60, Subpart GG, Standards of Performance for Stationary Gas Turbines.
7. Letter from F. A. Decker, III, Columbia Gas Transmission Corporation, dated August 5, 1991, confirming permit changes requested at public hearing.

PART IV - SOURCE TESTING REPORT FORMAT

Cover

1. Plant name and location
2. Units sampled at source (indicate Reference No. used by source in permit or registration)
3. Testing company or agency, name, address and report date

Certification

1. Certification by team leader
2. Certification by reviewer (P.E.)

Introduction

1. Test purpose
2. Test location, type of process
3. Test dates
4. Pollutants tested
5. Test Methods used
6. Observers' names (industry and agency)
7. Any other important background information

Summary of Results

1. Emission results
2. Input during test vs. rated capacity
3. Allowable emissions
4. Description of collected samples
5. Visible emissions summary
6. Discussion of errors, both real and apparent

Source Operation

1. Description of process and control devices
2. Process and control equipment flow diagram
3. Process data

Sampling and Analysis Procedures

1. Sampling port location and dimensioned cross section
2. Sampling point description
3. Sampling train description
4. Brief description of sampling procedures with discussion of deviations from standard methods
5. Brief description of analytical procedures with discussion of deviation from standard methods

Appendix

1. Process data and emission results example calculations
2. Raw field data
3. Laboratory reports
4. Raw production data
5. Calibration procedures and results
6. Project participants and titles
7. Related correspondence
8. Standard procedures

ATTACHMENT C

Minor NSR Permit Amendment dated 1/27/94



R VII-110-94

COMMONWEALTH of VIRGINIA
DEPARTMENT OF ENVIRONMENTAL QUALITY

Richard N. Burton
Director

Air Regional Office
Springfield Corporate Center, Suite 310
6225 Brandon Avenue
Springfield, Virginia 22150
(703) 644-0311

Alan L. Laubscher, P.E.
Regional Director

January 27, 1994

Mr. J.H. Deakin
Vice President, Engineering
Columbia Gas Transmission Corp.
P.O. Box 1273
Charleston, West Virginia 25325-1273

Location: Page County
Registration No. 21139
County-Plant No. 2320-0027

Dear Mr. Deakin:

This letter is in response to Mr. P. M. Hoffman's letter of December 22, 1993 requesting an amendment to your permit and his letter of August 30, 1993 which forwarded the Emission Test Report for emissions retesting of unit #2, which was conducted on July 1, 1993. Also referenced are memos from Mr. Bruce Rising, Allison Industrial Applications Engineering, dated July 28 and August 24, 1993.

The Emission Test Report indicates that unit #2 now meets the mass NO_x emission rate limit of 16.0 lbs/hour and 70.0 tons/year which are contained in the permit. Units #1 and #2 continue to fail to meet the NO_x concentration limit of 80 ppmv (on the basis of 15% O₂, dry, ISO standard ambient conditions).

According to the information provided, the NO_x concentration limit specified in the permit was based on an overly optimistic prediction of the performance of this unit, which was a new design.

The NO_x concentration (on the basis of 15% O₂, dry, ISO standard ambient conditions) of 87 ppmv for unit #1 and 98 ppmv for unit #2 easily meet the NSPS standard of 165 ppmv for these units under these conditions.

Accordingly, condition 9 of your permit dated August 23, 1991 is amended as follows (the change has been underlined):

- "9. Emissions from the operation of each turbine shall not exceed the limitations specified below:

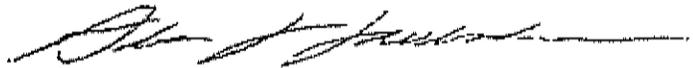
Sulfur Dioxide	0.62	2.7 tons/yr
	lbs/hr	

Nitrogen Dioxide	110 ppmv (on basis of 15% O ₂ , dry, ISO standard ambient conditions)	6.0 lbs/hr	70.0 tons/yr
Carbon Monoxide		11.2 lbs/hr	49.0 tons/yr
Volatile Organic Compounds (Section 120-05-0403 of State Regulations)"		0.64 lbs/yr	2.8 tons/yr

You are reminded that there may be other regulations, Federal, State and local regarding this location and process.

Thank you for your concern for Virginia's clean air.

Sincerely,



Alan L. Laubscher
Regional Director

for

Richard N. Burton
Director

ALL\TJG\tjg

cc: Director, Office of Permit Evaluation
Manager, Air Toxics, Enforcement and Compliance
Chief, Air Enforcement Branch (3AT20), U.S. EPA Region III

ATTACHMENT D

Minor NSR Permit Amendment dated 3/10/95



RGVII-274-95

COMMONWEALTH of VIRGINIA
DEPARTMENT OF ENVIRONMENTAL QUALITY

Peter W. Schmidt
Director

Air Regional Office
Springfield Corporate Center, Suite 310
6225 Brandon Avenue
Springfield, Virginia 22150
(703) 644-0311

Alan L. Laubscher, F
Regional Director

March 10, 1995

Robert W. Welch, Jr.
Vice President Environmental Affairs
Columbia Gas Transmission Corp.
P.O. Box 1273
Charleston, WV 25325-1273

Registration No: 21139
Location: Page County

Dear Mr. Welch:

This letter is in response to your request for a permit amendment to address an increase in hourly emissions during extreme cold weather operation at the Shenandoah Compressor Station. This letter references your initial request dated December 7, 1994, letters from Vincent J. Ammirato dated January 17 and January 27, 1995, P.M. Hoffman's letter dated February 8, 1995, and the calculations provided by Allison Industrial Applications Engineering (ALLISON) which were attached to the referenced letters.

According to the information you supplied, each of the two (2) gas fired turbines at the compressor station are capable of delivering a maximum of 5810 horsepower (SHP) when operating at an ambient temperature of minus twenty (-20) degrees fahrenheit. While operating at this temperature, the turbines are burning fuel at a rate of 51,951,000 btu(s) per hour. Your original permit states that the same compressors each deliver 5027 SHP when operating at the annual average ambient temperature for the station's location of 53.7° fahrenheit. While operating at this temperature, the turbines are burning fuel at a rate of 44,883,000 btu(s) per hour. As a result of the increase in fuel burned during cold weather operation, there is also an increase in the hourly rate of pollutants emitted from the station. This amendment to your original permit will increase the maximum allowable hourly

emissions from the station when operating at colder temperatures which are typically found outside of the ozone season (November 1 through March 31).

Also included in your request for a permit amendment was to address the calculated difference in volumetric flow rates of fuel required for the turbines when rates are estimated using the lower heating value (LHV) of natural gas as opposed to its higher heating value (HHV). According to ALLISON, at a given operating temperature, the maximum fuel flow (btu/hr) that their natural gas fired turbines are capable of burning is always stated in terms of the LHV for the fuel. The LHV for natural gas in line at the Shenandoah station on March 11, 1993 was determined to be 936 btu(s) per cubic foot. This determination was made by using the fuel gas analysis data from the Columbia Gas stack test dated April 21, 1993 and Table 43 from the Standard Handbook for Mechanical Engineers.

Also stated in the letters referenced, the heating value of gas within the pipeline over the last several years has varied up to 4% at any given time. On an hourly basis, the fluctuation in heating value could cause the maximum hourly fuel consumption rate of the turbines to exceed the rate contained in your permit. The maximum fuel flow rates listed in your permit were calculated using an average annual ambient operating temperature of 53.7° F and an average higher heating value of 1000 btu(s) per cubic foot of natural gas.

In response to your requests, this amendment will increase your maximum allowable hourly fuel rate to account for cold weather operation, the LHV of the fuel, and the fluctuations in heat content of the fuel. The maximum allowable hourly emission rate and concentration of pollutants will also be increased by this amendment to account for cold weather operation outside of the ozone season. The increase in allowable nitrogen oxide concentration is below the NSPS of 171 ppmv (on the basis of 15% O₂, dry, ISO standard ambient conditions). This amendment will also increase the maximum allowable annual fuel rate to account for the calculations being made on a LHV basis. Because increases and decreases in the LHV for natural gas are believed to be periodic in frequency, this amendment will not account for these fluctuations in your maximum annual fuel rate. The annual emission limits for pollutants from the station will not be affected by this amendment due to the fact that emissions are still being calculated based on operation at the annual average temperature (53.7°F) as opposed to cold weather operation (-20°F).

This amendment to your permit supersedes your previous

amendment dated January 27, 1994. Accordingly, Conditions 6 and 9 of your permit, dated August 23, 1991, are amended as follows (the changes have been underlined):

- "6. While operating during the ozone season of April 1 through October 31, each turbine shall consume no more than 49,870 cubic feet of natural gas per hour. While operating outside of the ozone season from November 1 to March 31, each turbine shall consume no more than 57,723 cubic feet of natural gas per hour. Each turbine shall consume no more than 420 million cubic feet of natural gas per year, calculated monthly, as the sum of each consecutive 12 month period.
(Section 120-02-11 of State Regulations)
9. While operating during the ozone season of April 1 through October 31, emissions from the operation of each turbine shall not exceed the limitations specified below:

Sulfur Dioxide 0.62 lbs/hr

Oxides of Nitrogen as
Nitrogen Dioxide 110 ppmv (on 16.0 lbs/hr
basis of 15%
O₂, dry, ISO
standard
ambient
conditions)

Carbon Monoxide 11.2 lbs/hr

Volatile Organic 0.64 lbs/hr
Compounds

While operating outside of the ozone season from November 1 through March 31, emissions from the operation of each turbine shall not exceed the limitations specified below:

Sulfur Dioxide 0.62 lbs/hr

Oxides of Nitrogen as
Nitrogen Dioxide 169 ppmv (on 29.1 lbs/hr
basis of 15%
O₂, dry, ISO
standard
ambient
conditions)

Carbon Monoxide	<u>13.0</u> lbs/hr
Volatile Organic Compounds	<u>0.74</u> lbs/hr

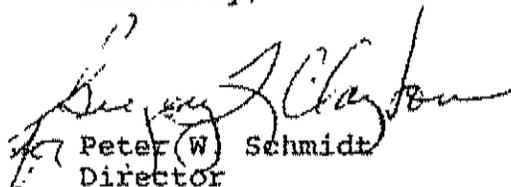
The annual emissions from the operation of each turbine shall not exceed the limitations specified below:

Sulfur Dioxide	2.7 tons/year
Oxides of Nitrogen as Nitrogen Dioxide	70.0 tons/year
Carbon Monoxide	49.0 tons/year
Volatile Organic Compounds	2.8 tons/year

(Section 120-05-0403 of State Regulations)"

All other conditions of your permit dated August 23, 1991 remain in force. If you have any questions concerning this amendment to your permit, please contact the Northern Virginia Regional Permits Manager at (703) 644-0311.

Sincerely,


Peter W Schmidt
Director

PWS/GLC/MPH

cc: Director, Office of Permit Evaluations
Manager, Air Enforcement and Compliance
Chief, Air Enforcement Branch (3AT20), USEPA, Region III

ATTACHMENT E

Minor NSR Permit Amendment dated 8/6/98



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

Valley Regional Office

James S. Gilmore, III
Governor

Street address: 4411 Early Road, Harrisonburg, Virginia 22801
Mailing address: P.O. Box 1129, Harrisonburg, VA 22801-1129
Telephone (540) 574-7800 Fax (540) 574-7878
<http://www.deq.state.va.us>

Dennis H. Treacy
Director

John Paul Woodley, Jr.
Secretary of Natural Resources

R. Bradley Chewning, P.E.
Valley Regional Director

August 6, 1998

Mr. S. M. Wilner
Vice President - Environmental Affairs
Columbia Gas Transmission Corporation
P.O. Box 1273
Charleston, West Virginia 25325-1273

Location: Page County
Registration No: 21139
County-Plant No: 139-0027

Dear Mr. Wilner:

This letter is an amendment to your permit dated August 23, 1991. Department of Environmental Quality is initiating this amendment in response to Mr. P. M. Hoffman's letter of July 2, 1998 requesting a change to Condition 18.

Condition 18 of the current permit has a custom fuel schedule for monitoring of sulfur in natural gas. This condition also allows to discontinue fuel monitoring of the sulfur content, if after the collection and analysis of at least two years of fuel samples, it is demonstrated that the turbines are in compliance with fuel sulfur limitations. However, EPA's policy requires that fuel sampling be conducted at least semi-annually regardless of sulfur content or variability.

Accordingly, Condition 18 of your permit dated August 23, 1991 is amended as follows:

"18. Fuel monitoring of the sulfur content shall be conducted as follows:

- a. Analysis for sulfur content of the natural gas shall be conducted using one of the approved ASTM reference methods for the measurement of sulfur in gaseous fuels, or an approved alternative method. The reference methods are: ASTM D1072-80; ASTM D3031-81; ASTM D3246-81; and ASTM D4084-82 as referenced in 40 CFR 60.335 (b)(2). Usage of the Barton Model 286 or 342 titration analytical methods are approved alternative methods.

Mr. S. M. Wilner
August 6, 1998
Page 2

- b. The permittee shall monitor the sulfur content of the natural gas twice per annum during the first and third quarters of each calendar year, and maintain records of the monitoring. These records shall be available for inspection by DEQ. Such records shall be current for the most recent three years."

The amended permit condition is legally enforceable. Failure to comply may result in a Notice of Violation and civil penalty. Please read this condition carefully. All other terms of your August 23, 1991 permit remain in effect.

This permit amendment approval shall not relieve Columbia Gas Transmission Corporation of the responsibility to comply with all other local, state and federal permit regulations.

9 VAC 5-170-200 of the Board's Regulations provides that you may request a formal hearing from this case decision by filing a petition with the Board within 30 days after this case decision notice was mailed or delivered to you. Please consult the relevant regulations for additional requirements for such requests.

Additionally, as provided by Rule 2A:2 of the Supreme Court of Virginia, you have 30 days from the date you actually received this permit amendment or the date on which it was mailed to you, whichever occurred first, within which to initiate an appeal to court by filing a Notice of Appeal with:

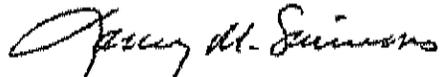
Dennis H. Treacy, Director
Department of Environmental Quality
P.O. Box 10009
Richmond, Virginia 23240-0009

In the event that you receive this permit amendment by mail, three days are added to the period in which to file an appeal. Please refer to Part Two A of the Rules of the Supreme Court of Virginia for additional information including filing dates and the required content of the Notice of Appeal.

Mr. S. M. Wilner
August 6, 1998
Page 3

If you have any questions concerning this amendment, please call Janardan R. Pandey at (540) 574-7817.

Sincerely,



Larry M. Simmons, P.E.
Regional Permit Manager

cc: Director, OPATS (electronic file submission)
Manager, Data Analysis (electronic file submission)
Chief, Air Enforcement Branch (3AT13), U.S. EPA, Region III

ATTACHMENT F

Minor NSR Permit Amendment dated 9/16/08



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

VALLEY REGIONAL OFFICE

4411 Early Road, P.O. Box 3000, Harrisonburg, Virginia 22801

(540) 574-7800 Fax (540) 574-7878

www.deq.virginia.gov

L. Preston Bryant, Jr.
Secretary of Natural Resources

David K. Paylor
Director

Amy Thatcher Owens
Regional Director

September 16, 2008

Mr. C.F. Montgomery, Jr.
Regional Director
Columbia Gas Transmission Corporation
P.O. Box 1273
Charleston, West Virginia 25325-1273

Facility: Shenandoah Compressor Station
Location: Page County
Registration No.: 81139
Plant ID No.: 51-139-0027

Dear Mr. Montgomery:

This letter is an amendment to your minor New Source Review (NSR) permit dated August 23, 1991, as amended January 27, 1994, March 10, 1995 and August 6, 1998. The Department of Environmental Quality (DEQ) is initiating this action in response to your Form 7 application dated June 16, 2008, and received on June 20, 2008. Your application requests incorporation of the revisions to 40 Code of Federal Regulations (CFR) 60 Subpart GG, Standards of Performance for Stationary Gas Turbines, dated July 8, 2004, into your existing NSR permit. This incorporation would allow alternative sulfur monitoring conditions pursuant to 40 CFR 60.334 (h)(3).

In the course of evaluating the application and arriving at a final decision to approve the amendment, the DEQ deemed the application complete on June 20, 2008.

Recent amendments (69 FR 41363-July 2004) to New Source Performance Standards for Stationary Gas Turbines 40 CFR 60, subpart GG, impacts Condition 18 of your permit dated August 23, 1991, as amended January 27, 1994, March 10, 1995 and August 6, 1998 because your facility's two 5,027 hp stationary turbines are fueled solely with natural gas. Accordingly, 40 CFR 60.334(h)(3) allows the owner or operator of any stationary gas turbine subject to the provisions of subpart GG to elect not to monitor the total sulfur content of the gaseous fuel combusted in the turbine if the gaseous fuel is demonstrated to meet the definition of natural gas as defined under 40 CFR 60.331(u).

In §60.331(u) of the subpart, the EPA defines natural gas as "a naturally occurring fluid mixture of hydrocarbons (e.g. methane, ethane, or propane) produced in geological formations below the Earth's surface that maintains a gaseous state at standard atmospheric temperature and pressure under ordinary conditions. Natural gas contains 20 grains or less of total sulfur per 100 standard cubic feet." Subpart GG further gives an equivalent in another unit as containing 0.068 weight percent total sulfur. Per Condition 15 of your facility's current permit, natural gas is limited to a sulfur content of 0.01 percent by weight so this will be amended accordingly to 0.068 weight percent sulfur to align with current NSPS limit of 20 grains per 100 standard cubic feet (scf).

Accordingly, Condition 18 of your facility's minor NSR permit dated August 23, 1991, as amended January 27, 1994, March 10, 1995, and August 6, 1998, is replaced with the following language:

18. The owner or operator must maintain records of either a valid purchase contract, tariff sheet or transportation contracts or representative sampling data for the gaseous fuel specified in Condition 15, indicating that the maximum total sulfur content of the fuel is 20.0 grains per 100 scf or less.
(9 VAC 5-80-1180, 40 CFR 60.331 and 40 CFR 60.334(h)(3))

This amended permit condition is legally enforceable. Failure to comply may result in a Notice of Violation and civil penalty. Please read this condition carefully. All other terms of your August 23, 1991 permit, as amended January 27, 1994, March 10, 1995, and August 6, 1998 remain in effect.

This permit amendment shall not relieve Columbia Gas Transmission Corporation of the responsibility to comply with all other local, state and federal permit regulations.

The Board's Regulations as contained in Title 9 of the Virginia Administrative Code 5-170-200 provide that you may request a formal hearing from this case decision by filing a petition with the Board within 30 days after this case decision notice was mailed or delivered to you. 9 VAC 5-170-200 provides that you may request direct consideration of the decision by the Board if the Director of the DEQ made the decision. Please consult the relevant regulations for additional requirements for such requests.

As provided by Rule 2A:2 of the Supreme Court of Virginia, you have 30 days from the date you actually received this permit amendment or the date on which it was mailed to you, whichever occurred first, within which to initiate an appeal of the decision by filing a Notice of Appeal with:

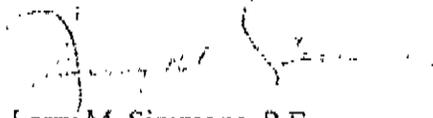
David K. Paylor, Director
Department of Environmental Quality
P.O. Box 1105
Richmond, Virginia 23218

Mr. C.F. Montgomery, Jr.
September 16, 2008
Page 3

If this permit amendment was delivered to you by mail, three days are added to the thirty-day period in which to file an appeal. Please refer to Part Two A of the Rules of the Supreme Court of Virginia for information on the required content of the Notice of Appeal and for additional requirements governing appeals from decisions of administrative agencies.

If you have any questions concerning this amendment, please call Debbie Medlin of the Valley Regional Office at (540) 574-7809.

Sincerely,



Larry M. Simmons, P.E.
Deputy Regional Director

cc: Kasey Gabbard, Columbia Gas HQ PO Box 1273 Charleston, WV 25325-1273
Director, OAPP (electronic file submission)
Manager, Data Analysis (electronic file submission)
Chief, Air Enforcement Branch (3AP13), U. S. EPA. Region III

ATTACHMENT G
Emission Calculations

Emission Calculations for the Turbine:

Design Rating: 5027 hp

1. Hourly limitations during the ozone season of April 1 through October 31:

Pollutant	Emission Factor (lb/hp-hr)	Emissions* (lb/hr)
SO ₂	1.22E-04	0.61
NO _x	3.17E-03	15.9
CO	2.23E-03	11.0
VOCs	1.28E-04	0.64

* Emissions calculated using the design rating of the turbine

2. Hourly limitations during the outside ozone season from November 1 through March 31

Pollutant	Emission Factor* (lb/hr)	Limitations (lb/hr)
SO ₂	0.62	0.62
NO _x	29.1	29.1
CO	13.0	13.0
VOCs	0.74	0.74

* Emission Factor based upon manufacturer's recommendation during cold season

3. Annual Emissions :

Pollutant	Emission Factor (lb/hp-hr)	Emissions* (tons/yr)
SO ₂	1.22E-04	2.67
NO _x	3.17E-03	69.8
CO	2.23E-03	49.0
VOCs	1.28E-04	2.8

*Annual emissions calculated with design rating of 5027 hp and 8760 hours of operation

Emission Calculations for the Auxiliary Generator:

Design Rating: 135 hp

Permitted operating hour: 168 hours per year

Pollutant	Emission Factor (lb/hp-hr)	Emissions* (lb/hr)	Emissions** (tons/yr)
NO _x	3.08E-02	4.12	0.35
CO	3.08E-02	4.12	0.35

*Emissions calculated using design rating of 135 hp

**Emissions calculated with permitted 168 operating hours

Emission Calculations for the Heating Boiler

Boiler Design Capacity: 2.1 MMBtu/hr

Pollutant	Emission Factor (lb/MMBtu)	Hourly Throughput (MMBtu/hr)	Emission (lb/hr)	Emission* (tons/yr)
NO _x	100	0.0021	0.21	0.92

*Emissions calculated at the boiler capacity

Fuel Consumption Calculations for the Turbine

1. Ozone Season (April 1 through October 31)

Assuming operating temperature of 53.7⁰F

Maximum fuel capacity per turbine (at 5027 hp) = 44,883,000 Btu/hr (based on LHV of fuel)

Lower Heating Value of fuel (natural gas) = 936 Btu/ft³

Maximum burn rate = (44,883,000 Btu/hr) / (936 Btu/ft³) = 47,952 ft³/hr

Maximum fuel rate allowed (assuming 4% variation in natural gas heating content) = 47,952 x 1.04 = 49,870 ft³/hr

Maximum annual fuel rate allowed = 47,952 ft³/hr x 8760 hr/yr = 420 x 10⁶ ft³/yr

2. Non-ozone Season (November 1 through March 31)

Assuming operating temperature of -20⁰F

Maximum fuel capacity per turbine (at 5810 hp) = 51,951,000 Btu/hr (based on LHV of fuel)

Lower Heating Value of fuel (natural gas) = 936 Btu/ft³

Maximum burn rate = (51,951,000 Btu/hr) / (936 Btu/ft³) = 55,503 ft³/hr

Maximum fuel rate allowed (assuming 4% variation in natural gas heating content) = 55,503 x 1.04 = 57,723 ft³/hr

Allowable NO_x Emissions (as per NSPS):

Allowable NO_x emissions shall not exceed the following:

$$\text{STD} = .0150 \frac{14.4}{Y} + F$$

where:

STD = Allowable NO_x emissions (percent by volume at 15 percent oxygen and on a dry basis).

Y = Manufacturer's rated heat rate at manufacturer's rated peak load (kilojoules per watt hour), or actual measured heat rate based on lower heating value of fuel as measured at actual peak load for the facility. The value of Y shall not exceed 14.4 kilojoules per watt hour.

F = NO_x emission allowance for fuel-bound nitrogen as defined in 40 CFR 60.332 (a)(3)

1. Ozone Season (April 1 through October 31)

$$Y = 44883000 \text{ Btu/hr} \times 1054.68 \text{ Joule/Btu} \times 1 \text{ KJ/1000 J} \times 1/5027 \times 1\text{hp}/745.7\text{W} = 12.6279 \text{ KJ/w-hr}$$

$$F = 0$$

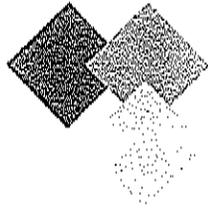
$$\text{STD} = 0.0150(14.4/12.6279) = 0.0171 \% \text{ volume} = 171 \text{ ppm}$$

2 Non-ozone season (November 1 through March 31)

$$Y = 51951000 \text{ Btu/hr} \times 1054.68 \text{ Joule/Btu} \times 1 \text{ KJ/1000 J} \times 1/5810 \text{ hp} \times 1\text{hp}/745.7\text{W} = 12.6466 \text{ KJ/w-hr}$$

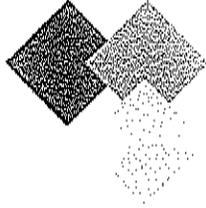
$$F = 0$$

$$\text{STD} = 0.0150(14.4/12.6466) = 0.0171 \% \text{ volume} = 171 \text{ ppm}$$



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Appendix A: Summary of Potential Emissions



Potential Emissions Detail

Potential Emissions Detail for Saturday, January 01, 2011

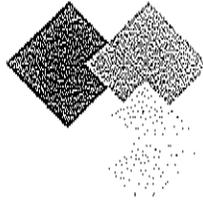
Report Generated on: Sunday, August 18, 2012

Potential-to-Emit Summary for SHENANDOAH 6C3310

Area: 12

State: Virginia

Criteria Pollutant	Units	Value	Units	Value
Carbon Monoxide	lb/yr	27.15	lb/yr	198,264.08
Nitrogen Oxides (NOx)	lb/yr	36.79	lb/yr	482,471.89
PM10	lb/yr	0.20	lb/yr	1,459.11
Sulfur Dioxide	lb/yr	1.45	lb/yr	10,812.56
VOC	lb/yr	4.83	lb/yr	18,045.49
Unregulated Air Pollutants				
Formaldehyde	lb/yr	0.10	lb/yr	450.52
Total HAP				
	lb/yr	0.10	lb/yr	531
Unregulated				
	lb/yr	9.53	lb/yr	83,473.08
Acehalone	lb/yr		lb/yr	41.74



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Potential Emissions Detail for SEHNANDOLAH 6C3310

Facility Established on: January 1, 2011

Report Period: see Appendix B, 2012

Area: 12

State: Virginia

Equipment Category: ENGINE

Emission Point: 001

Unit Name: TURB ENG/CENT COM #1, Sub Unit: TURB ENG/CENT COM #1

Description: TURBINE

Rating: 5027 hp

Manufacturer: ALLISON 300-R35

End Potential Production Basis for Hours

Parameter	Value
Operating Hours	8,700

SCC: 30200201, Regulatory Status: SIGNIFICANT

Agency ID: 1

Chemical	Potential Emissions in Lb/Year		Potential Emissions in Tons/Year		Control
	Value	TYR	Value	TYR	
Carbon Monoxide	11.20	40.01	0.005	0.006%	
Formaldehyde	0.035	0.13	0.00001	0.00001%	
Nitrogen Dioxide (NO2)	10.00	69.60	0.005	0.006%	
PM10	0.003	0.15	0.00001	0.00001%	
Sulfur Dioxide	0.62	2.70	0.0003	0.0003%	
VOC	0.64	2.80	0.0003	0.0003%	

Emission Point: 002

Unit Name: TURB ENG/CENT COM #2, Sub Unit: TURB ENG/CENT COM #2

Description: TURBINE

Rating: 5027 hp

Manufacturer: ALLISON 300-R35

End Potential Production Basis for Hours

Parameter	Value
Operating Hours	8,700

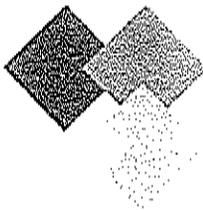
SCC: 30200201, Regulatory Status: SIGNIFICANT

Agency ID: 2

Chemical	Potential Emissions in Lb/Year		Potential Emissions in Tons/Year		Control
	Value	TYR	Value	TYR	
Carbon Monoxide	11.20	40.01	0.005	0.006%	
Formaldehyde	0.035	0.13	0.00001	0.00001%	
Nitrogen Dioxide (NO2)	10.00	69.60	0.005	0.006%	
PM10	0.003	0.15	0.00001	0.00001%	
Sulfur Dioxide	0.62	2.70	0.0003	0.0003%	
VOC	0.64	2.80	0.0003	0.0003%	

Report Printed on: 01/14/2012

PTCEDetail.rpt



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Potential Emissions Detail for SHELVANINDOAH GC3310

Report Generated on: January 3, 2011

Area: 12

State: Missouri

Report Generated on: August 13, 2012

Equipment Category: ENGINE

Emission Policy: GH

Unit Name: RECIP ENGINE, Sub Unit: RECIP ENGINE_G1

Registration: F-RICH

Manufacturer: WAIKESHA VSC1(CSI)

Rating: E15 hp

SCC: 20100251, Regulatory Status: SIGNIFICANT

Agency ID: 01

Light Potential Production Data for Hours

Parameter	Value
Base Horsepower	149
Operating Hours	1,000

Light Potential Production Basis for Year

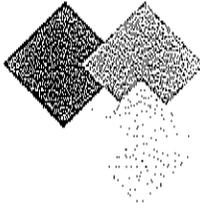
Parameter	Value
Base Horsepower	135
Operating Hours	1,000

Potential Emissions in 1 hr/Year

Chemical	Unit	Value	Control
Carbon Monoxide	Lb.	4.59	0.50%
Formaldehyde	Lb.	0.032	0.50%
Nitrogen Oxides	Lb.	4.59	0.50%
Particulate Matter	Lb.	0.001	0.50%
Sulfur Dioxide	Lb.	0.005	0.50%
VOC	Lb.	0.005	0.50%

Potential Emissions in 10,000 hr/Year

Chemical	Unit	Value	Control
Carbon Monoxide	Lb.	4,590	0.50%
Formaldehyde	Lb.	0.32	0.50%
Nitrogen Oxides	Lb.	4,590	0.50%
Particulate Matter	Lb.	0.01	0.50%
Sulfur Dioxide	Lb.	0.05	0.50%
VOC	Lb.	0.05	0.50%



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Potential Emissions Detail for SITTENAUDDOAH #C3310

Report Generated on: January 1, 2011

Report Generated on: August 18, 2011

Area: 12

State: Michigan

Facility Name: FUG

Agency ID: FUG_BD

Unit Name: FUGITIVE EMISSIONS, Sub-Unit: FUGITIVE EMISSIONS_BLOWDOWNS

Description: VOC EMISSIONS FROM BLOWDOWNS

Manufacturer: GNRU

Rating: 0.0

SCC: Regulatory Status: SIGNIFICANT

Unit Potential Production Basis for Year

Parameter	Value
Operating Hours	1,600

Potential Emissions in Tons/Year

Parameter	Value
Baseline Rate Reference	1.00
2010 EPA Air Toxics and Acid Deposition Rule, etc.	0.00%

Chemical

VOC

Agency ID: FUG_BD

Rating: 0.0

SCC: Regulatory Status: SIGNIFICANT

Unit Potential Production Basis for Year

Parameter	Value
Count Compressor Seals	4,000
Count Connectors	354
Count OEL	7,000
Count Pressure Relief Valves	3,000
Count Valves	101
Emission Factor per Compressor Seal	2.63
Emission Factor per Connector	0.00079
Emission Factor per OEL	0.00042
Emission Factor per Pressure Relief Valv	0.00469
Emission Factor per Valve	1.000

Potential Emissions in Tons/Year

Parameter	Value
Count Compressor Seals	4,000
Count Connectors	354
Count OEL	7,000
Count Pressure Relief Valves	3,000
Count Valves	101
Emission Factor per Compressor Seal	2.63
Emission Factor per Connector	0.00079
Emission Factor per OEL	0.00042
Emission Factor per Pressure Relief Valv	0.00469
Emission Factor per Valve	1.000

Chemical

Acid Air

VOC

Agency ID: FUG_BD

Rating: 0.0

SCC: Regulatory Status: SIGNIFICANT

Unit Potential Production Basis for Year

Parameter	Value
Count Compressor Seals	4,000
Count Connectors	354
Count OEL	7,000
Count Pressure Relief Valves	3,000
Count Valves	101
Emission Factor per Compressor Seal	2.63
Emission Factor per Connector	0.00079
Emission Factor per OEL	0.00042
Emission Factor per Pressure Relief Valv	0.00469
Emission Factor per Valve	1.000

Potential Emissions in Tons/Year

Parameter	Value
Count Compressor Seals	4,000
Count Connectors	354
Count OEL	7,000
Count Pressure Relief Valves	3,000
Count Valves	101
Emission Factor per Compressor Seal	2.63
Emission Factor per Connector	0.00079
Emission Factor per OEL	0.00042
Emission Factor per Pressure Relief Valv	0.00469
Emission Factor per Valve	1.000

Chemical

Acid Air

VOC

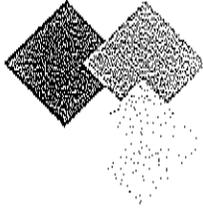
Agency ID: FUG_BD

Rating: 0.0

SCC: Regulatory Status: SIGNIFICANT

Report Printed on: 8/18/2011

RTED01101



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Potential Emissions Detail for SHEENANDOHAI 00310

Potential Emissions on: January 1, 2011

Report Generated on: August 14, 2012

Area: 12

State: Vermont

Equipment Category: FUGITIVE

Equipment Label: FUG

Unit Name: FUGITIVE EMISSIONS, SHL Unit: FUGITIVE EMISSIONS_EQ_UK_LIQ

Agency ID: FUG_EIL

Description: VOC EMISSIONS FROM EQUIPMENT LEAKS

SCC: Regulatory Status: SIGNIFICANT

Manufacturer: INPO

Relief: 0.0

Unit Potential Production Basis for Hours

Parameter	Value
Count Connectors	80
Count Pressure Relief Valves	2,068
Count Valves	29
Emission Factor per Compressor Seal	2.137
Emission Factor per OEL	0.00079
Emission Factor per Pressure Relief Valv	0.08045
Emission Factor per Valve	0.03240
Operating Hours	0.00488
Potential Emissions in Lb/Hour	1.000

Chemical
VOC

Lb,
0.23

TPY
1.05

Control
0.07%

Unit Potential Production Basis for Year

Parameter	Value
Count Connectors	80
Count Pressure Relief Valves	2,068
Count Valves	29
Emission Factor per Compressor Seal	2.137
Emission Factor per OEL	0.00079
Emission Factor per Pressure Relief Valv	0.08045
Emission Factor per Valve	0.03240
Operating Hours	0.00488
Potential Emissions in Ton/Year	0.760

Emulsion Pumps: BIL1

Unit Name: HEATING SYSTEM BOILER #1, SHL Unit: HEATING SYSTEM BOILER #1_BLR1

Description: HEATING SYSTEM BOILER

Manufacturer: HYDROTHERM Mfg. - ENH-DPV

Rating: 2.1 mscf/hr

Agency ID: BLR1

SCC: Regulatory Status: SIGNIFICANT

Unit Potential Production Basis for Hours

Parameter	Value
Count Connectors	14
Count Pressure Relief Valves	0.17
Count Valves	0.21
Emission Factor per Compressor Seal	0.00079
Emission Factor per OEL	0.00045
Emission Factor per Pressure Relief Valv	0.03240
Emission Factor per Valve	0.00488
Operating Hours	1.000
Potential Emissions in Lb/Hour	0.011

Chemical

Carbon Monoxide

Nitrogen Dioxide (NO2)

PM10

Sulfur Dioxide

VOC

Lb,
0.17

TPY
0.76

Control
0.00%

Unit Potential Production Basis for Year

Parameter	Value
Count Connectors	14
Count Pressure Relief Valves	0.17
Count Valves	0.21
Emission Factor per Compressor Seal	0.00079
Emission Factor per OEL	0.00045
Emission Factor per Pressure Relief Valv	0.03240
Emission Factor per Valve	0.00488
Operating Hours	1.000
Potential Emissions in Ton/Year	0.009

Chemical

Carbon Monoxide

Nitrogen Dioxide (NO2)

PM10

Sulfur Dioxide

VOC

Lb,
0.17

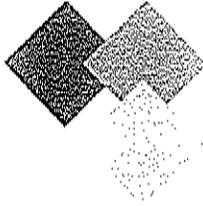
TPY
0.76

Control
0.00%

Report Number: 8/14/2012

PTTECH0110

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Potential Emissions Detail for SEJUNANINDOAH 6C3310

Revised/Established on: January 1, 2011

Report Generated on: August 18, 2012

Area: 12 State: Michigan

Equipment Category: TANK

Emission Factor: A61

Unit Name: PIPELINES LIQUIDS TANK, Sub Unit PIPELINE LIQUIDS TANK_A61

Description: PIPELINE LIQUIDS, HORIZONTAL, ABOVE GROUND

Manufacturer: (NFS)

Agency ID: A61

Rating: 1000 gallon

SECC: 00381099

Regulatory Status: NONREGULATORY

Unit Potential Emission Basis for Hours

Parameter	Value
Overall tank posit. vent. absorbance	0.54026
Tank diameter	4.000
Maximum liquid height in tank	12
Tank vent height	12
Working loss product factor	1.000
Length of tank	12
Atmospheric pressure	15
Breaker vent pressure setting	0.02000
Monthly net throughput	1.000

Unit Potential Emission Basis for Year

Parameter	Value
Overall tank posit. vent. absorbance	0.54026
Tank diameter	4.000
Maximum liquid height in tank	12
Tank vent height	12
Working loss product factor	1.000
Length of tank	12
Atmospheric pressure	15
Breaker vent pressure setting	0.02000
Monthly net throughput	1.000

Potential Emissions in 24-hour

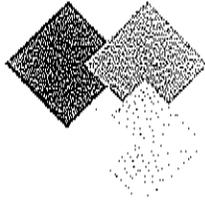
EPA Toxic Emission Procedures	Lb./Day
	1.36

Potential Emissions in 1 Year

EPA Toxic Emission Procedures	TPY
	0.905

Created:
Pipelines Field by d-37

Checked:
TPY 0.905
0.905



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Potential Emissions Detail for SHENANDOAH 6C3310

Potential Established on: January 1, 2011

Report Generated on: August 18, 2012

Area: 12 State: Virginia

Equipment Category: TANK Agency ID: A02

Equipment Name: A02

Unit Name: PIPELINE LIQUIDS TANK, SUB LINE: PIPELINE LIQUIDS TANK_A02

Description: PIPELINE LIQUIDS, HORIZONTAL, ABOVE GROUND

Manufacturer: OVRU

SCC: 60000000, Regulatory Status: INSIGNIFICANT

Rating: 1000 gal/yr

Unit Potential Production Basis for Hours

Parameter	Value
Overall tank plate solar absorptance	0.54000
Tank diameter	4.000
Maximum liquid height in tank	12
Tank shell height	12
Working loss product factor	1.000
Length of tank	12
Atmospheric pressure	15
Breather vent pressure setting	0.03000
Monthly net throughput	1.000

Unit Potential Production Basis for Year

Parameter	Value
Overall tank plate solar absorptance	0.54000
Tank diameter	4.000
Maximum liquid height in tank	12
Tank shell height	12
Working loss product factor	1.000
Length of tank	12
Atmospheric pressure	15
Breather vent pressure setting	0.03000
Monthly net throughput	1.000

Potential Emissions in Lb/Year

Parameter	Value	Unit	Control
EPA Toxic Equivalents Procedures	1.36	Lb	0.00%

Control: Pipeline Liquid (ep 0.4)

Potential Emissions Detail for 001

Unit Name: WATER MIXTURE TANK, SUB LINE: WATER MIXTURE TANK_001

Description: WASTEWATER, HORIZONTAL, BELOW GROUND

Manufacturer: OVRU

Rating: 1000 gal/yr

SCC: 60000000, Regulatory Status: INSIGNIFICANT

Agency ID: 001

Unit Potential Production Basis for Hours

Parameter	Value
Tank diameter	4.000
Working loss product factor	1.000
Length of tank	12
Monthly net throughput	1.000

Unit Potential Production Basis for Year

Parameter	Value
Tank diameter	4.000
Working loss product factor	1.000
Length of tank	12
Monthly net throughput	1.000

Potential Emissions in Lb/Year

Parameter	Value	Unit	Control
EPA Toxic Equivalents Procedures	0.0000	Lb	0.00%

Control: Tank Vapor

Report Produced on: 8/18/2012

PTL20120818.plt

ATTACHMENT H

EPA Letter dated August 14, 1987

Determination Detail

Control Number: NS33

Category: NSPS
EPA Office: SSCD
Date: 08/14/1987
Title: Delegation of Authority to Regions for Custom Fuel Monitoring
Recipient: Regions
Author: Rasnic, John B.
Comments:

Abstract:

Can Regions approve custom fuel monitoring schedules under Subpart GG?

Yes, schedules that the Regions issue for pipeline quality natural gas should be no less stringent than the following: sulfur monitoring should be bimonthly, followed by quarterly and then semiannually, and nitrogen monitoring can be waived. Requests by sources using oil should be consulted on, but the Regions need not send the request itself to SSCD.

Letter:

Control Number: NS33

August 14, 1987

MEMORANDUM

SUBJECT: Authority for Approval of Custom Fuel Monitoring Schedules under NSPS Subpart GG

FROM: John B. Rasnic, Chief
Compliance Monitoring Branch

TO: Air Compliance Branch Chiefs
Regions II, III, IV, V, VI, and IX

Air Programs Branch Chiefs Regions I-X

The NSPS for Stationary Gas Turbines (Subpart GG) at 40 CFR 60.334(b)(2) allows for the development of custom fuel monitoring schedules as an alternative to daily monitoring of the sulfur and nitrogen content of fuel fired in the turbines. Regional Offices have been forwarding custom fuel monitoring schedules to the Stationary Source Compliance Division (SSCD) for consideration since it was understood that authority for approval of these schedules was not delegated to the Regions. However, in consultation with the Emission Standards and Engineering Division, it has been determined that the Regional Offices do have the authority to approve Subpart GG custom fuel monitoring schedules. Therefore it is no longer necessary to forward these requests to Headquarters for approval.

Over the past few years, SSCD has issued over twenty custom schedules for sources using pipeline quality natural gas. In order to maintain national consistency, we recommend that any schedules Regional Offices issue for natural gas be no less stringent than the following: sulfur monitoring should be bimonthly, followed by quarterly, then semiannual, given at least six months of data demonstrating little variability in sulfur content and compliance with 60.333 at each monitoring frequency; nitrogen monitoring can be waived for pipeline quality natural gas, since there is no fuel-bound nitrogen and since the free nitrogen does not contribute appreciably to NOx emissions. Please see the attached sample custom schedule for details. Given the increasing trend in the use of pipeline quality natural gas, we are investigating the possibility of amending Subpart GG to allow for less frequent sulfur monitoring and a waiver of nitrogen monitoring where natural gas is used.

Where sources using oil request custom fuel monitoring schedules, Regional Offices are encouraged to contact SSCD for consultation on the appropriate fuel monitoring schedule. However, Regions are not required to send the request itself to SSCD for approval.

If you have any questions, please contact Sally M. Farrell at FTS 382-2875.

Attachment

cc: John Crenshaw
George Walsh
Robert Ajax
Earl Salo