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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-3164B
Plant ID No.:	083-00019
Applicant:	Columbia Gas Transmission LLC (CGT)
Facility Name:	Files Creek Compressor Station
Location:	Beverly, Randolph County
SIC Code:	4922
NAICS Code:	486210
Application Type:	Modification (Grandfathered Source)
Received Date:	January 28, 2016
Engineer Assigned:	Jerry Williams, P.E.
Fee Amount:	$2,000
Date Fee Received:	January 28, 2016
Complete Date:	February 24, 2016
Due Date:	May 24, 2016
Applicant Ad Date:	January 29, 2016
Newspaper:	*The Inter-Mountain*
UTM's:	Easting: 601.044 km Northing: 4,297.544 km Zone: 17
Description:	Installation of two (2) new natural gas-fired turbines, one (1) fuel gas heater and twenty two (22) catalytic space heaters. Additionally, two (2) existing emergency generators (306 hp each) will be removed.

NON-CONFIDENTIAL

DESCRIPTION OF PROCESS

This facility is a natural gas transmission compressor station. Pipeline transmission of natural gas requires that the gas be compressed. At the Files Creek Compressor Station, two (2) natural gas fired turbines installed in 2015 and four (4) reciprocating internal combustion engines (RICE) are used to drive natural gas compressors. This modification includes the installation of two (2) additional Solar Taurus 70 turbine-driven compressors, one (1) fuel gas heater and 22 catalytic heaters. Additionally two (2) existing emergency generators will be retired.

The power output from a natural gas fired turbine is directly related to the fuel input rate and to the ratio of combustion air to fuel. As ambient temperatures decrease, a turbine's maximum power output will increase due to the increased density of the inlet air. The Solar dry low NO_x (DLN) combustion system (known as SoLoNOx) limits formation of NO_x, CO, and VOC by pre-mixing air and fuel prior to combustion. When operating at ambient temperatures ≥ to 0 °F and at loads ≥ 50%, this DLN system is able to limit the exhaust gas concentration of these pollutants (corrected to 15% O_2) to 15 ppm NO_x, 25 ppm CO, and 25 ppm unburned hydrocarbons (UHC, containing at least 80% non-VOC methane and ethane; therefore, 5 ppm VOC). At ambient temperatures of 0 to -20 °F, additional pilot fuel is required by the turbine to maintain flame stability, which increases estimated emission concentrations to 42 ppm NO_x, 100 ppm CO, and 50 ppm UHC (10 ppm VOC). At ambient temperatures <-20 °F, additional pilot fuel is required by the turbine to maintain flame stability, which increases estimated emission concentrations (based on expected emissions at < 0 °F) to 120 ppm NO_x, 150 ppm CO, and 50 ppm UHC (10 ppm VOC). At turbine loads < 50%, additional pilot fuel and air flow are required to maintain flame stability and turbine responsiveness. These changes increase estimated emission concentrations to 70 ppm NO_x, 80,000 ppm CO, and 800 ppm UHC (160 ppm VOC). Should loads drop below 50%, Columbia will make every effort to either bring the load back above 50% or shut a turbine down (e.g., shut down other units and move that volume to the turbine, or shift the turbine volume to other units and shut down the turbine).

In addition, there are changes in NO_x, CO, and VOC emissions during the initial fuel light-off, turbine loading, and flame stabilization steps associated with turbine startup. There are also changes in emissions during the normal turbine shutdown sequence. For a Solar Taurus 70 turbine, the startup sequence takes less than 10 minutes to complete prior to engaging the DLN system. The shutdown sequence for a Taurus turbine requires approximately 10 minutes.

SITE INSPECTION

Due to the nature of the proposed modification, the writer did not perform a site inspection of the facility for this permitting action. The facility was last inspected by DAQ Compliance/ Enforcement (C/E) Inspector Dan Bauerle on May 7, 2015. This inspection found the facility be "Status 30 - In Compliance."

Directions to the facility from US 219. In the town of Beverly turn off of US 219 and onto CR 37-8 (Files Creek Road) travel east for approximately 3 miles and the facility is on the left.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

CGT provided detailed calculations of the facility-wide pre-modification PTE and the calculations of the PTE of the new emission units added under R13-3164B in Attachment N of the permit application. This information is substantively the same as previously submitted and reviewed in previous permit applications. This section will discuss the emissions from the Solar Taurus 70 turbines, fuel gas heater, and catalytic heaters which are the only emission units being substantively modified as part of this permitting action.

Solar Saturn Taurus 70 Turbines (T03, T04)

Potential emissions from the 10,418 hp (@ 32° F), 86.12 MMBtu/hr (HHV @ 32° F) natural gas-fired Solar Taurus 70 combustion turbines are based on emission factors provided from the vendor, based on the emission factors provided for natural gas combustion as given in AP-42 Section 3.1. (AP-42 is a database of emission factors maintained by USEPA), material balance, and on emission factors from 40 CFR 98, Subpart C. Emissions were based on the MDHI of the engine and annual emissions were based on the combination of potential operating modes (normal load @ 32° F, low temp (<0° F), low load (<50 %), startup/shutdown). The following table details the emission factor source and the PTE of each combustion turbine:

Pollutant	Emission Factor	Source	Hourly (lb/hr)(1)	Annual (ton/yr)(2)
NO_X	0.060 lb/MMBTU LHV	Vendor Data	4.66	21.36
CO	0.061 lb/MMBTU LHV	Vendor Data	4.72	47.76
$PM_{2.5}$	0.0066 lb/MMBTU HHV(4)	AP-42 Table 3.1-2a (4/00)	0.57	2.49
PM_{10}	0.0066 lb/MMBTU HHV(4)	AP-42 Table 3.1-2a (4/00)	0.57	2.49
SO_2	0.0571 lb/MMBTU HHV(4) (hourly) 0.000714 lb/MMBTU HHV(4) (annual)	20 grains S/100 scf (hourly) 0.25 grains S/100 scf (yearly)	4.92	0.27
VOC	0.007 lb/MMBTU LHV	Vendor Data (20% of UHC)(3)	0.54	2.69
Formaldehyde	0.00071 lb/MMBTU HHV(4)	AP-42, Table 3.1-3 (4/00)	0.06	0.27

Pollutant	Emission Factor	Source	Hourly (lb/hr)(1)	Annual (ton/yr)(2)
Total HAPs	0.00103 lb/MMBTU HHV[4]	AP-42, Table 3.1-3 (4/00)	0.09	0.39

(1) Maximum hourly emission rate based on normal operation at 32° F. Heat input, fuel consumption, and emissions increase as temperature decrease. For the purposes of this permit, hourly emissions are characterized at 32° F.
(2) Annual emission rate based on combination of potential operating modes for NOx, CO and VOC. All other pollutants based on horsepower and brake specific fuel consumption at 32° F.
(3) VOC based on 20% of vendor data for unburned hydrocarbons (UHC).
(4) HHV heat input based on HHV=1.1*LHV.

Fuel Gas Heater (HTR5)

Potential emissions from the 0.25 MMBTU/hr natural gas-fired process heater is based on the emission factors provided for natural gas combustion as given in AP-42 Section 1.4. (AP-42 is a database of emission factors maintained by USEPA), and on emission factors from 40 CFR 98, Subpart C. Emissions were based on the MDHI of the heater. The following table details the emission factor source and the PTE of the fuel gas heater:

Pollutant	Emission Factor		Source	Hourly (lb/hr)	Annual (ton/yr)
	lb/MMscf	lb/MMBTU			
NO_X	100	0.098	AP-42, Table 1.4-1 (7/98)	0.02	0.11
CO	84	0.082	AP-42, Table 1.4-1 (7/98)	0.02	0.09
$PM_{2.5}$	7.6	0.007	AP-42, Table 1.4-2 (7/98)	<0.01	0.01
PM_{10}	7.6	0.007	AP-42, Table 1.4-2 (7/98)	<0.01	0.01
SO_2	-	0.0571 (hourly) 0.000714 (annual)	20 grains S/100 scf (hourly) 0.25 grains S/100 scf (annually)	0.01	<0.01
VOC	5.5	0.005	AP-42, Table 1.4-2 (7/98)	<0.01	0.01
Formaldehyde	0.075	0.00007	AP-42, Table 1.4-3 (7/98)	<0.01	<0.01
Total HAPs	1.89	0.00185	AP-42, Table 1.4-3&4 (7/98)	<0.01	<0.01

22 Catalytic Space Heaters (SH2)

Potential emissions from the 22 natural gas-fired catalytic space heaters (4 – 0.005 MMBTU/hr, 18 – 0.072 MMBTU/hr) are based on the emission factors provided for natural gas combustion as given in AP-42 Section 1.4. (AP-42 is a database of emission factors maintained by USEPA), and on emission factors from 40 CFR 98, Subpart C. Emissions were based on the MDHI of the heaters. The following table details the emission factor source and the PTE of the 22 catalytic space heaters:

Pollutant	Emission Factor		Source	Hourly (lb/hr)[1]	Annual (ton/yr)[2]
	lb/MMscf	lb/MMBTU			
NO_X	100	0.098	AP-42, Table 1.4-1 (7/98)	0.13	0.57
CO	84	0.082	AP-42, Table 1.4-1 (7/98)	0.11	0.47
$PM_{2.5}$	7.6	0.007	AP-42, Table 1.4-2 (7/98)	0.01	0.04
PM_{10}	7.6	0.007	AP-42, Table 1.4-2 (7/98)	0.01	0.04
SO_2	-	0.0571 (hourly) 0.000714 (annual)	20 grains S/100 scf (hourly) 0.25 grains S/100 scf (annually)	0.08	<0.01
VOC	5.5	0.005	AP-42, Table 1.4-2 (7/98)	0.01	0.03
Formaldehyde	0.075	0.00007	AP-42, Table 1.4-3 (7/98)	<0.01	<0.01
Total HAPs	1.89	0.00185	AP-42, Table 1.4-3&4 (7/98)	<0.01	0.01

2 Ingersol Rand Emergency Generators (Removed)

Potential emissions from the two (2) Ingersol Rand emergency generators (G1, G2) to be removed were based on the annual emission limits given under AP-42, Section 3.2 (other criteria pollutants, HAPs, and GHGs). When AP-42 emission factors were used, hourly emissions were based on the maximum design heat input (MDHI) of each unit (calculated @ 10,600 Btu/hp-hr) and annual emissions were based on an annual operation of 8,760 hours. The following table details the emission factor source and the PTE of each emergency generator:

Pollutant	Emission Factor	Source	Hourly (lb/hr)[1]	Annual (ton/yr)[2]
	lb/MMBTU			
NO_X	2.21	AP-42, Table 3.2-3 (7/00) 4SRB	7.89	1.79
CO	3.72	AP-42, Table 3.2-3 (7/00) 4SRB	13.27	3.02
$PM_{2.5}$	0.019	AP-42, Table 3.2-3 (7/00) 4SRB	0.07	0.02

Pollutant	Emission Factor lb/MMBTU	Source	Hourly (lb/hr)[1]	Annual (ton/yr)[2]
PM_{10}	0.019	AP-42, Table 3.2-3 (7/00) 4SRB	0.07	0.02
SO_2	0.0571 (hourly) 0.000714 (annual)	20 grains S/100 scf (hourly) 0.25 grains S/100 scf (annually)	0.20	<0.01
VOC	0.0296	AP-42, Table 3.2-3 (7/00) 4SRB	0.11	0.02
Formaldehyde	0.02050	AP-42, Table 3.2-3 (7/00) 4SRB	0.07	0.02
Total HAPs	0.03242	AP-42, Table 3.2-3 (7/00) 4SRB	0.12	0.03

Other Contemporaneous Changes

In 2015, two (2) natural gas fired Solar Taurus 70 turbines (T01, T02), one (1) emergency generator (G4), two (2) line heaters (H2, H4), and 85 catalytic space heaters were installed. In addition, six (6) RICE compressors (E01 – E06) were retired. There were also vented GHG and VOC emissions associated with these changes. The past actual baseline emissions of the RICE (E01 – E06) was determined from the period between June 2010 and May 2012.

Emission Source	NO_x Increase (ton/yr)
Solar Taurus Turbine (T01)	23.25
Solar Taurus Turbine (T02)	23.25
Emergency Generator (G4)	0.97
Line Heater (H2)	0.28
Line Heater (H4)	0.21
85 Catalytic Heaters (SH1)	1.21
Total	**49.18**

Emission Source	NO_x Decrease (ton/yr)
Cooper-Bessemer GMV-8SFT (E01)	117.12
Cooper-Bessemer GMV-8SFT (E02)	109.04
Cooper-Bessemer GMV-8SFT (E03)	114.86
Cooper-Bessemer GMV-8SFT (E04)	122.58
Cooper-Bessemer GMV-8SFT (E05)	114.17
Cooper-Bessemer GMV-8SFT (E06)	77.96
Total	**655.73**

Project Emissions Summary

Based on the above estimation methodology, which is determined to be appropriate, a summary of the post-modification PTE change is given in the following table:

Annual (ton/yr) Criteria Pollutant/HAP/GHG PTE Summary

Source	NO_x	CO	PM[1]	SO_2	VOCs	HAPs	CO2e
Turbine (T03)	21.36	47.76	2.49	0.27	2.69	0.39	44,173
Turbine (T04)	21.36	47.76	2.49	0.27	2.69	0.39	44,173
Fuel Gas Heater (H5)	0.11	0.09	0.01	<0.01	0.01	<0.01	128
Catalytic Heaters (SH2)	0.57	0.47	0.04	<0.01	0.03	0.01	675
Equipment Leaks[2]	0	0	0	0	0.40	0	258
Venting	0	0	0	0	26.01	0	16,837
New Equipment Increase →	***43.39***	***96.09***	***5.03***	***0.54***	***31.43***	***0.79***	***105,985***
Emergency Generator (G1)	-1.79	-3.02	-0.02	-<0.01	-0.02	-0.03	-95
Emergency Generator (G2)	-1.79	-3.02	-0.02	-<0.01	-0.02	-0.03	-95
Removed Equipment Decrease →	***-3.58***	***-6.03***	***-0.03***	***-<0.01***	***-0.05***	***-0.05***	***-190***

(1) All particulate matter emissions are assumed to be less than 2.5 microns. Includes condensables.
(2) Fugitive emissions are not part of the PSD or Title V applicability analysis.

Net NO_x Emissions Increase (ton/year) Summary

Total Potential Emissions from Project	43.39
Contemporaneous Emissions Increase	49.18
Baseline Emissions (past actual) 6/2010 – 5/2012	-655.73
Net Change (project+CE-baseline)	-563.16
PSD Significance Level	40

Facility-Wide PTE (Post R13-3164B Modification)

The following table details the proposed post-modification facility-wide PTE of the Files Creek Compressor Station.

Source	NO_x	CO	PM[1]	SO_2	VOCs	CO_2e	HAPs
Solar Taurus Turbine (T01)	23.25	81.83	6.88	0.27	3.19	44,772	0.39
Solar Taurus Turbine (T02)	23.25	81.83	6.88	0.27	3.19	44,772	0.39
Cooper-Bessemer RICE (E07)	221.63	9.81	3.55	0.05	8.83	8,617	5.85
Cooper-Bessemer RICE (E08)	221.63	9.81	3.55	0.05	8.83	8,617	5.85
Cooper-Bessemer RICE (E09)	221.63	9.81	3.55	0.05	8.83	8,617	5.85
Cooper-Bessemer RICE (E10)	221.63	9.81	3.55	0.05	8.83	8,617	5.85
Waukesha Emerg Generator (G4)	0.97	0.63	0.02	<0.01	0.12	200	0.12
Line Heater (H2)	0.28	0.23	0.02	<0.01	0.02	333	0.01
Line Heater (H4)	0.21	0.18	0.02	<0.01	0.01	256	<0.01
Space Heaters (H1)	0.41	0.35	0.03	<0.01	0.02	495	0.01
Catalytic Heaters (SH1)	1.21	1.02	0.09	<0.01	0.07	1,445	0.02
Solar Taurus Turbine (T03)	21.36	47.76	2.49	0.27	2.69	44,173	0.39
Solar Taurus Turbine (T04)	21.36	47.76	2.49	0.27	2.69	44,173	0.39
Fuel Gas Heater (H5)	0.11	0.09	0.01	<0.01	0.01	128	<0.01
Catalytic Heaters (SH2)	0.57	0.47	0.04	<0.01	0.03	675	0.01
Equipment Leaks	0	0	0	0	0.80	516	0
Venting	0	0	0	0	51.11	32,637	0
Facility Wide Total	**979.50**	**301.42**	**33.19**	**1.32**	**98.46**	**248,974**	**25.15**

(1) All particulate matter emissions are assumed to be less than 2.5 microns. Includes condensables.

Facility-Wide Emissions Increase

Based on this changes described above, the following table lists the increase in facility-wide emissions at the Files Creek Compressor Station:

Change in Facility-Wide Post-Modification Annual (ton/yr) PTE

Source	NO_x	CO	PM[1]	SO_2	VOCs	CO_2e	HAP
R13-3164A	939.70	211.40	28.19	0.77	67.08	143,179	24.41
R13-3164B	979.50	301.42	33.19	1.32	98.46	248,974	25.15
Change in Emissions →	**64.92**	**90.02**	**5.00**	**0.55**	**31.38**	**105,795**	**0.74**

(1) All particulate matter emissions are assumed to be less than 2.5 microns. Includes condensables.

REGULATORY APPLICABILITY

The following rules and regulations apply to this permitting action:

45CSR2 (Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers)

The purpose of 45CSR2 is to establish emission limitations for smoke and particulate matter which are discharged from fuel burning units. 45CSR2 states that any fuel burning unit that has a heat input under ten (10) million B.T.U.'s per hour is exempt from sections 4 (weight emission standard), 5 (control of fugitive particulate matter), 6 (registration), 8 (testing, monitoring, recordkeeping, reporting) and 9 (startups, shutdowns, malfunctions). However, failure to attain acceptable air quality in parts of some urban areas may require the mandatory control of these sources at a later date.

The individual heat input of the heaters (H5, SH2) are below 10 MMBTU/hr. Therefore, these units are exempt from the aforementioned sections of 45CSR2.

CGT would also be subject to the opacity requirements in 45CSR2, which is 10% opacity based on a six minute block average.

45CSR10 (To Prevent and Control Air Pollution from the Emissions of Sulfur Oxides)

The purpose of 45CSR10 is to establish emission limitations for sulfur dioxide which are discharged from fuel burning units. 45CSR10 states that any fuel burning unit that has a heat input under ten (10) million B.T.U.'s per hour is exempt from sections 3 (weight emission standard), 6 (registration), 7 (permits), and 8 (testing, monitoring, recordkeeping, reporting). However, failure to attain acceptable air quality in parts of some urban areas may require the mandatory control of these sources at a later date.

The individual heat input of the heaters (H5, SH2) are below 10 MMBTU/hr. Therefore, these units are exempt from the aforementioned sections of 45CSR10.

45CSR13 (Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation)

The proposed installation and operation of the Solar Taurus Turbines have the potential to increase the PTE of the Files Creek Compressor Station in excess of six (6) lbs/hour and ten (10) TPY of a regulated pollutant and, therefore, pursuant to §45-13-2.17, the change is defined as a "modification" under 45CSR13. Pursuant to §45-13-5.1, "[n]o person shall cause, suffer, allow or permit the construction, modification, relocation and operation of any stationary source to be commenced without . . . obtaining a permit to construct." Therefore, CGT is required to obtain a permit under 45CSR13 for the modification of the facility.

As required under §45-13-8.3 ("Notice Level A"), CGT placed a Class I legal advertisement in a "newspaper of general circulation in the area where the source is . . . located." Additionally, CGT paid the appropriate application fee.

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

45CSR16 applies to this source by reference of 40CFR60 Subpart KKKK. These requirements are discussed under that rule below.

45CSR30 (Requirements for Operating Permits)

CGT is subject to 45CSR30. The Files Creek Compressor Station has the potential to emit more than major regulatory threshold for NO_x and CO. Due to this facility's potential to emit over 100 tons per year of criteria pollutant, CGT is required to have an operating permit pursuant to Title V of the Federal Clean Air Act as amended and 45CSR30.

CGT is required to pay the appropriate annual fees and submit an annual Certified Emissions Statement.

40CFR60 Subpart KKKK (Standards of Performance for Stationary Combustion Turbines)

Per §60.4305, Subpart KKKK applies to combustion turbines with a peak heat input of 10 MMBTU/hr or greater. Since the new Solar Taurus turbines are rated at 86.12 MMBTU/hr it will be subject to the rule. §60.4320 requires the turbines to meet the NO_x requirement in Table 1 of the rule. Since the Taurus turbine is a new, natural gas fired turbine between 50 and 850 MMBTU/hr, Table 1 requires it to meet a NO_x limit of 25 ppm at 15% O_2 or 150 ng/J of useful output. To demonstrate compliance with the limit, §60.4400(a) requires both an initial (within 180 days of startup or 60 days of achieving full load operation) and annual (not to exceed 14 months from previous test) performance

test. However, §60.4340 allows the permittee to be exempted from the annual testing if continuous emission monitors or continuous parameter monitoring systems are installed that meet the requirements of the section. Additionally, if the NO_x testing results show emissions less than 75% of the limit, testing frequency can be reduced to once every 2 years (with no more than 26 months after the previous test.)

The rule also limits SO_2 emissions from the turbines. §60.4330(a)(2) allows the facility to meet this limit by burning fuel with a total potential SO_2 emissions of less than 0.06 lb/MMBTU. Additionally, §60.4365(a) exempts the permittee from monitoring fuel sulfur content if a source burns only natural gas that is covered by a purchase or transportation contract that limits sulfur to no more than 20 grains per 100 scf. CGT qualifies for this exemption.

40CFR63 Subpart DDDDD (NESHAP for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters)

This rule applies to existing and new applicable units at major sources of HAPs. The new fuel has heater is a new affected source (gas 1 subcategory) and is less than 5 MMBTU/h heat input. Therefore, it is not subject to Subpart DDDDD emissions limitations but is subject to tune-ups every five (5) years.

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

The Files Creek Compressor Station is an existing Major Stationary Source with respect to PSD because they have actual emissions of nitrogen oxides in excess of 250 tons per year. The Files Creek Compressor Station is not one of the listed 28 major stationary sources whose emissions threshold is 100 tpy as defined in 40CFR52.21(b)(1)(i) and 45CSR14 Section 2.43. In order for a project to become subject to PSD review, the major stationary source must have a significant emissions increase from the project and a significant net emissions increase as calculated over the 5 year contemporaneous period. The first step is to determine if the proposed project results in a significant emissions increase utilizing the calculation procedures in 45CSR14 (Permits for Construction and Major Modification of Major Stationary Sources for the Prevention of Significant Deterioration of Air Quality) Section 3.4. The procedure for calculating whether a significant emissions increase will occur depends on the type of emissions units being modified. The procedure for calculating whether a significant net emissions increase will occur at the major stationary source, which is the second step in the process, is contained in 45CSR14 Section 2.46. Regardless of any such preconstruction projections, a major modification results if the project causes a significant emissions increase and a significant net emissions increase.

In determining whether a significant emissions increase occurs, 45CSR14 provides two (2) ways to make that determination. These calculations are based on whether or not it is an existing emissions unit or a new emissions unit.

45CSR14 Section 2.27 defines an 'emissions unit' as any part of a stationary source that emits or would have the potential to emit any regulated NSR pollutant and includes an electric utility steam generating unit as defined in subsection 2.25. For the purposes of this rule, there are two types of emissions units as described in subdivisions 2.27.a and 2.27.b.

2.27.a. A new emissions unit is any emissions unit that is (or will be) newly constructed and that has existed for less than 2 years from the date such emissions unit first operated.

2.27.b. An existing emissions unit is any emissions unit that does not meet the requirements in subdivision 2.27.a. A replacement unit, as defined in subsection 2.68, is an existing emissions unit.

Because the turbines, fuel gas heater and catalytic heaters at the Files Creek Compressor Station would be new emissions units, they would fall under 2.27.a.

Therefore, since emissions units at Files Creek Compressor Station would be considered new units, 45CSR14 Section 3.4.d states that an Actual-to-Potential test would be utilized. A significant emissions increase of a regulated NSR pollutant is projected to occur if the sum of the difference between the potential to emit (as defined in subsection 2.58) and the baseline actual emissions (as defined in subdivisions 2.8.a and 2.8.b), for each existing emissions unit, equals or exceeds the significant amount of that pollutant (as defined in subsection 2.74).

The first step is to determine whether or not the proposed project results in a significant emissions increase utilizing the Actual-to-Potential test. The result of that test will be compared to PSD Significant Emission Rates (SER) to determine PSD applicability. If the resultant emissions are below the PSD SER then the project is not subject to PSD review. If the project's emissions are greater that the PSD SER then all contemporaneous increases and decreases must be examined to determine if the project is subject to PSD Review. The potential to emit from the emissions units associated with this project were based on the proposed engines.

The following table indicates what Files Creek Compressor Station's potential emissions increase would be with the installation of the New Emissions Units (turbines, line heater, emergency generator engine and catalytic heaters).

Emission Increase Due to This Modification vs. PSD SER

Pollutant	New Emissions Unit Increase (tpy)	PSD SER (tpy)
NO_x	43.39	40
CO	96.09	100
SO_2	0.54	40
$PM_{2.5}$	5.03	10
VOC	5.43	100

The NO_x emissions increase associated with the new equipment exceeds the PSD SER. Therefore, it is necessary to calculate the net emissions increase over a 5 year contemporaneous period.

Baseline emissions from the six (6) Cooper-Bessemer engines (E01-E06) being retired are shown in the following table. There are no other contemporaneous changes being made other than the retirement of these engines. The baseline (past actual) emissions are based on June 2010 through May 2012 operating records.

Baseline Emissions

Emission Source	NO_x (tpy)	CO (tpy)	$PM_{2.5}$ (tpy)
E01	117.12	13.31	1.02
E02	109.04	12.39	0.95
E03	114.86	13.05	1.00
E04	122.58	13.93	1.07
E05	114.17	12.98	0.99
E06	77.96	8.86	0.68
Total	**655.73**	**74.53**	**5.71**

The following table indicates the net change in NO_x emissions by comparing the new equipment emissions (T03, T04, H5, SH2), the contemporaneous emission increases and the decrease in emissions associated with the retired engines (E01-E06).

Emissions PSD Comparison

Total Potential Emissions from Project	43.39
Contemporaneous Emissions Increase	49.18
Baseline Emissions (past actual) 6/2010 – 5/2012	-655.73
Net Change (project+CE-baseline)	-563.16
PSD Significance Level	40

Final Conclusion

Because there was not an emissions increase above the PSD SER and a significant net emissions increase as calculated over any consecutive 24 month period during the 5 year contemporaneous period, PSD review is not required.

45CSR19 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution which Cause or Contribute to Nonattainment)

The Files Creek Compressor Station is located in Randolph County, which is an attainment county for all criteria pollutants, therefore the Files Creek Compressor Station is not applicable to 45CSR19.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

This section provides an analysis for those regulated pollutants that may be emitted from the new/modified equipment and that are not classified as "criteria pollutants" or Greenhouse Gases. Criteria pollutants are defined as Carbon Monoxide (CO), Lead (Pb), Oxides of Nitrogen (NO_x), Ozone, Particulate Matter (PM), Particulate Matter less than 10 microns (PM_{10}), Particulate Matter less than 2.5 microns ($PM_{2.5}$), and Sulfur Dioxide (SO_2). Criteria pollutants have National Ambient Air Quality Standards (NAAQS) set for each that are designed to protect the public health and welfare. Other pollutants of concern, although designated as non-criteria and without national concentration standards, are regulated through various federal and programs designed to limit their emissions and public exposure. These programs include federal source-specific Hazardous Air Pollutants (HAPs) limits promulgated under 40 CFR 61 (NESHAPS) and 40 CFR 63 (MACT). Any potential applicability to these programs were discussed above under REGULATORY APPLICABILITY.

The majority of non-criteria regulated pollutants fall under the definition of HAPs which, with some revision since, were 188 compounds identified under Section 112(b) of the Clean Air Act (CAA) as pollutants or groups of pollutants that EPA knows or suspects may cause cancer or other serious human health effects. The following table lists formaldehyde's general carcinogenic risk as based on analysis provided in the Integrated Risk Information System. EPA's Integrated Risk Information System (IRIS) is a human health assessment program that evaluates information on health effects that may result from exposure to environmental contaminants. For a complete discussion of the known health effects of each compound, and the underlying studies supporting these assessments, refer to the IRIS database located at *www.epa.gov/iris*.

Table 6: Potential HAPs - Carcinogenic Risk

HAPs	Type	Known/Suspected Carcinogen	Classification
Formaldehyde	VOC	Yes	B1 - Probable Human Carcinogen

All HAPs have other non-carcinogenic chronic and acute effects. These adverse health affects may be associated with a wide range of ambient concentrations and exposure times and are influenced by source-specific characteristics such as emission rates and local meteorological conditions. Health impacts are also dependent on multiple factors that affect variability in humans such as genetics, age, health status (e.g., the presence of pre-existing disease) and lifestyle (e.g., smoking). As stated previously, *there are no federal or state ambient air quality standards for these specific chemicals.*

The majority of non-criteria regulated pollutants fall under the definition of HAPs which, with some revision since, were 188 compounds identified under Section 112(b) of the Clean Air Act (CAA) as pollutants or groups of pollutants that EPA knows or suspects may cause cancer or other serious human health effects. As the net PTE change of HAPs from the modifications discussed herein is a decrease, no toxicity analysis is required.

AIR QUALITY IMPACT ANALYSIS

Modeling was not required of this source due to the fact that the facility is not subject to 45CSR14 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollutants) or 45CSR19 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution which Cause or Contribute to Nonattainment) as seen in the table listed in the Regulatory Discussion section under 45CSR14/45CSR19.

MONITORING OF OPERATIONS

The following substantive monitoring, compliance demonstration, reporting and recording requirements (MRR) shall be required for the new equipment (the MRR requirements for the existing equipment will substantively remain the same as under R13-3164A):

- CGT shall be required to calculate and record, on a monthly and rolling twelve month basis, the emissions of each pollutant listed in R13-3164B and generated by turbines T03 and T04. The calculation shall be based on the emission factors used in permit application R13-3164B and the following information:
    - CGT shall be required to monitor and record the number of hours that the turbines T03 and T04 operate in the following operational modes:

      (1) Normal Load @ 32° F;
      (2) Low Temp: < 0° F; and
      (3) Low-Load: < 50% Load.

    - CGT shall be required to monitor and record the number of startup/shutdowns of each turbine;

    - CGT shall be required to monitor and record the actual heat input to the turbines.

- CGT shall be required to meet all applicable Monitoring, Compliance Demonstration, Source-Specific Recording and Reporting Requirements as given under 40 CFR 60, Subpart KKKK and 40 CFR 63, Subpart ZZZZ.

PERFORMANCE TESTING OF OPERATIONS

The following performance testing requirements shall be required for the new equipment:

- In addition to the NO_x performance testing as required under 40 CFR 60, Subpart KKKK, within 60 days after achieving full load, but not later than 180 days after initial startup, and at such times thereafter as may be required by the Director, CGT shall be required to conduct, or have conducted, a performance test on each turbine to determine compliance with the "normal load" CO emission limit specified under the permit.

- In addition to the NO_x performance testing as required under 40 CFR 60, Subpart KKKK, within 60 days after achieving full load, but not later than 180 days after initial startup, and at such times thereafter as may be required by the Director, CGT shall be required to conduct, or have conducted, a performance test on each turbine to determine compliance with the particulate matter emission limit (including condensables) specified under the permit. The testing shall take place while the turbines are operating at 100% of load or, if this is not practicable, the results of the test shall scaled up by an appropriate ration to represent operation at 100% load.

- CGT shall be required to meet all applicable testing requirements as given under 40 CFR 60, Subpart KKKK and 40 CFR 63, Subpart ZZZZ.

CHANGES TO PERMIT R13-3164A

The following substantive changes were made to Permit Number R13-3164A:

- The Emissions Units Table 1.0 was revised to reflect the changes evaluated herein;

- Requirement 4.1.5 was removed due to the turbines already undergoing 180 day shakedown period;

- Section 5.0 was revised to include turbines T03 and T04. Additionally, revisions were made to T01 and T02 to account for variations in hourly emission limits based on temperature and loading;

- Section 7.0 was revised to include heaters HTR5 and HTR6;

- Section 8.0 was revised to include heater HTR5;

- Due to the restructuring of the permit, some existing requirements were moved to other places in the permit and, therefore, the requirement numbers changed.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application and subsequent revisions thereto indicates that compliance with all applicable state and federal air quality regulations will be achieved. Therefore, I recommend to the Director the issuance of Permit Number R13-3164B to Columbia Gas Transmission LLC for the above discussed modifications at the Files Creek Compressor Station located in Beverly, Randolph County, WV.

Jerry Williams, P.E.
Permit Engineer

MAR 31, 2016
Date