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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-3164A
Plant ID No.:	083-00019
Applicant:	Columbia Gas Transmission LLC (Columbia)
Facility Name:	Files Creek Compressor Station
Location:	near Beverly, Randolph County
SIC Code:	4922
NAICS Code:	486210
Application Type:	Modification (Grandfathered Source)
Received Date:	July 1, 2014
Engineer Assigned:	David Keatley
Fee Amount:	$3,500
Date Fee Received:	July 7, 2014
Complete Date:	November 5, 2014
Due Date:	February 3, 2014
Applicant Ad Date:	July 2, 2014
Newspaper:	*The Inter-Mountain*
UTM's:	Easting: 601.044 km Northing: 4,297.544 km Zone: 17
Description:	Installation and operation of a new 0.65 Btu/hr line heater HTR4. Correcting line heater HTR2 to a maximum capacity of 0.65 MMBtu/hr. Installation and operation of a new 1,000 gallon glycol tank, a 1,000 gallon used glycol tank, 1,000 gallon used lube oil tank, 1,000 gallon waste oil tank, and a 1,000 gallon oil/water tank.

DESCRIPTION OF PROCESS

This facility is a natural gas transmission compressor station. The facility receives natural gas via pipeline from an upstream compressor station, compresses it using reciprocating internal combustion engines (RICE), and then transmits the natural gas via pipeline to a downstream station. Pipeline transmission of natural gas requires that the gas be compressed. The Files Creek Compressor Station has exclusively used RICEs to drive centrifugal gas compressors.

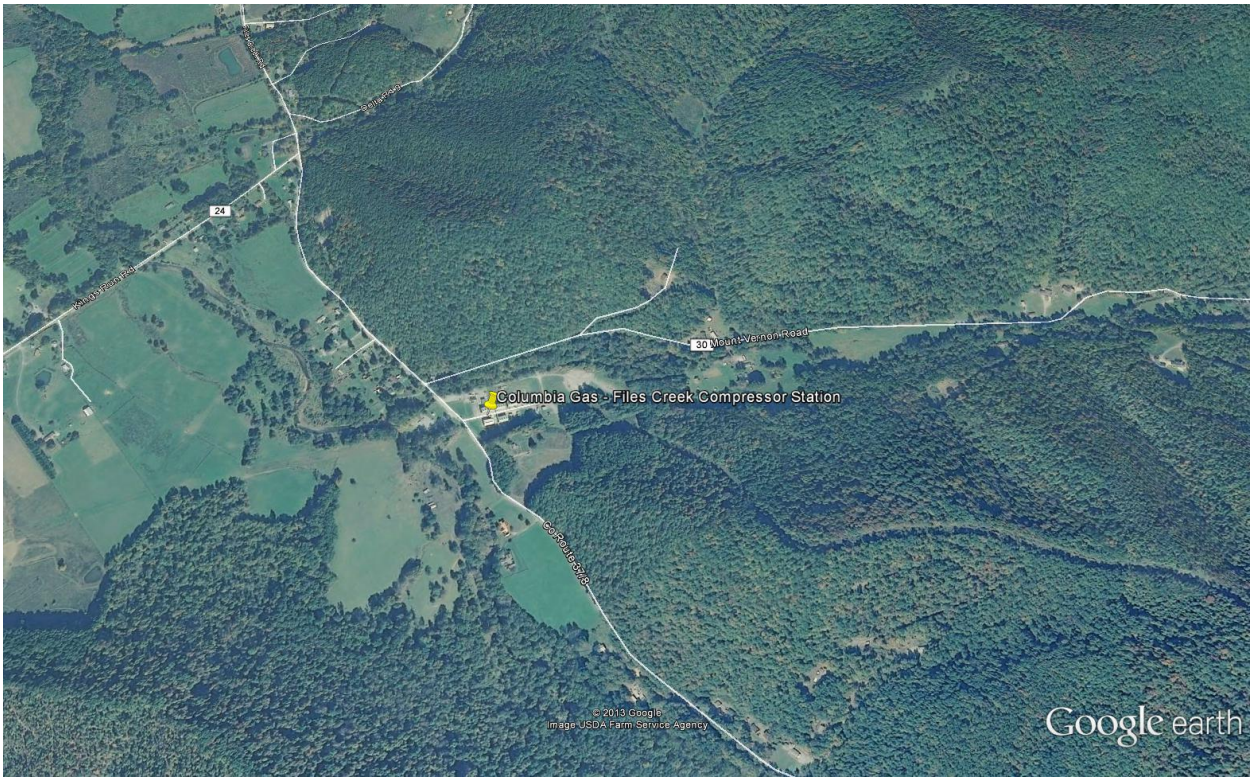
The power output from a natural gas fired turbine is directly related to the fuel input rate and to the ratio of combustion air to fuel. As ambient temperatures decrease, a turbine's maximum power output will increase due to the increased density of the inlet air. The Solar dry low NO_x (DLN) combustion 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 $\geq$ to 0 ^oF and at loads $\geq$ 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 ^oF, 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 ^oF, additional pilot fuel is required by the turbine to maintain flame stability, which increases estimated emission concentrations (based on expected emissions at < 0 ^oF) 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

A site inspection was conducted by Mike Kolb of the DAQ Enforcement Section on February 20, 2013. The facility was operating in compliance at that time.

Latitude: 38.337239
Longitude: -82.044403



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

Emissions associated with this application consist of the combustion emissions from four one (1) existing corrected line heater (H2) and one (1) new line heater (H4). The emissions from the tanks being installed with this modification will be considered negligible due to tank size, tank contents, and tank throughput.

Table 1: Calculation Methodology

Emission Unit ID#	**Process Equipment**	**Calculation Methodology**
H2	0.65 MMBTU/hr Line Heater	EPA AP-42 Emission Factors
H4	0.65 MMBTU/hr Line Heater	EPA AP-42 Emission Factors

Table 2: Maximum Estimated Controlled Modified PTE Air Emissions

Source ID	Emission Source	Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (tpy)
H2	Line Heater 0.65 MMBtu/hr	Nitrogen Oxides	0.06	0.28
		Carbon Monoxide	0.05	0.23
		Volatile Organic Compounds	<0.01	0.02
		Total Particulate Matter	<0.01	0.02
		PM_{10}	<0.01	0.02
		CO_2e	76	333
H4	Line Heater 0.65 MMBtu/hr	Nitrogen Oxides	0.06	0.28
		Carbon Monoxide	0.05	0.23
		Volatile Organic Compounds	<0.01	0.02
		Total Particulate Matter	<0.01	0.02
		PM_{10}	<0.01	0.02
		CO_2e	76	333

Table 3: Estimated Maximum Controlled Facility Wide PTE Air Emissions

Pollutant	**Current Facility PTE (tpy)**	**Net Change in PTE (tpy)**	**New Facility PTE (tpy)**
Carbon Monoxide	211.36	0.07	211.43
Nitrogen Oxides	939.69	0.09	939.78
Particulate Matter-10	28.19	0.01	28.20
Sulfur Dioxide	0.77	0	0.77
Volatile Organic Compounds	67.08	0	67.08
Greenhouse Gas (CO_2e)	143,181	107	143,288
Formaldehyde	16.92	0	16.92
Total HAPs	24.43	-0.02	24.41

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 proposed space heaters and line heater are below 10 MMBTU/hr. Therefore, these units are exempt from the aforementioned sections of 45CSR2.

Proposed emission units line heater H2 and line heater H4 will be subject to the opacity requirements in 45CSR2, which is 10% opacity based on a six minute block average.

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

This facility shall not cause the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public. 45CSR4 states that an objectionable odor is an odor that is deemed objectionable when in the opinion of a duly authorized representative of the Air Pollution Control Commission (Division of Air Quality), based upon their investigations and complaints, such odor is objectionable.

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 proposed line heaters (H2 and H4) 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)

45CSR13 applies to this source due to the fact that Columbia exceeds the regulatory emission threshold for criteria pollutants of 6 lb/hr and 10 ton/year. The permitting action is a Modification because the facility is subject to a substantive requirement of an emission control rule promulgated by the Secretary (40 CFR 63 Subpart DDDDD).

In addition, because Columbia utilized the netting process to remain below major source thresholds for 45CSR14 (NO_x, CO, $PM_{2.5}$), Columbia is subject to Notice Level C (45CSR13 Section 8.5) and will be required to publish a commercial display ad (45CSR13 Section 8.4.a) and post a visible sign at their facility (45CSR13 Section 8.5.a).

45CSR30 (Requirements for Operating Permits)

Columbia is subject to 45CSR30. The Files Creek Compressor Station has the potential to emit more than major regulatory threshold for NO_x, CO, CO_2e and HAPs. Due to this facility's potential to emit over 100 tons per year of criteria pollutant and 10 tons per year of a hazardous air pollutant, Columbia is required to have an operating permit pursuant to Title V of the Federal Clean Air Act as amended and 45CSR30.

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

0CFR63 Subpart DDDDD (National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters)

The corrected 0.65 MMBTU/hr line heater (H2) and proposed 0.65 MMBTU/hr line heater (H2) are new affected source (gas 1 subcategory) and is less than 5 MMBTU/hr. Therefore, both are not subject to 40 CFR 63 Subpart DDDDD emission limitations, but both are subject to tune-ups every five (5) years.

The following rules and regulations do not apply to this permitting action:

40CFR60 Subpart Dc (Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units)

This rule applies to steam generating units with a heat input capacity of 100 MMBTU/hr or less, but greater than or equal to 10 MMBTU/hr for which construction commenced after June 9, 1989. Columbia does not have an applicable unit, therefore, Columbia would not be subject to this rule.

40CFR60 Subpart OOOO (Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution)

EPA published in the Federal Register new source performance standards (NSPS) and air toxics rules for the oil and gas sector on August 16, 2012. 40CFR60 Subpart OOOO establishes emission standards and compliance schedules for the control of volatile organic compounds (VOC) and sulfur dioxide (SO_2) emissions from affected facilities that commence construction, modification or reconstruction after August 23, 2011. The following affected sources which commence construction, modification or reconstruction after August 23, 2011 are subject to the applicable provisions of this subpart:
Each gas well affected facility, which is a single natural gas well.

There are no gas wells at this facility. Therefore, all requirements regarding gas well affected facilities under 40 CFR 60 Subpart OOOO would not apply.

a. Each storage vessel affected facility, which is a single storage vessel, located in the oil and natural gas production segment, natural gas processing segment or natural gas transmission and storage segment.

40CFR60 Subpart OOOO defines a storage vessel as a unit that is constructed primarily of non-earthen materials (such as wood, concrete, steel, fiberglass, or plastic) which provides structural support and is designed to contain an accumulation of liquids or other materials. The following are not considered storage vessels:

- Vessels that are skid-mounted or permanently attached to something that is mobile (such as trucks, railcars, barges or ships), and are intended to be located at a site for less than 180 consecutive days. If the source does not keep or are not able to produce records, as required by §60.5420(c)(5)(iv), showing that the vessel has been located at a site for less than 180 consecutive days, the vessel described herein is considered to be a storage vessel since the original vessel was first located at the site.

- Process vessels such as surge control vessels, bottoms receivers or knockout vessels.

- Pressure vessels designed to operate in excess of 204.9 kilopascals and without emissions to the atmosphere.

This rule requires that the permittee determine the VOC emission rate for each storage vessel affected facility utilizing a generally accepted model or calculation methodology within 30 days of startup, and minimize emissions to the extent practicable during the 30 day period using good engineering practices. For each storage vessel affected facility that emits more than 6 tpy of VOC, the permittee must reduce VOC emissions by 95% or greater within 60 days of startup. The compliance date for applicable storage vessels is October 15, 2013.

There are no applicable storage vessels located at the Files Creek Compressor Station that were installed after August 23, 2011. Therefore, all requirements regarding storage vessels under 40 CFR 60 Subpart OOOO would not apply.

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, line heaters, emergency generator engine, 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).

Table 4: Emission Increase Due to This Modification vs. PSD SER

Pollutant	**New Emissions Unit Increase (tpy)**	**PSD SER (tpy)**
NO_x	49.27	40
CO	165.81	100
SO_2	0.56	40
$PM_{2.5}$	13.92	10
VOC	31.69	100
CO_2e	108,137	100,000

The NO_x, CO, and $PM_{2.5}$ 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.

Table 5: 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 emissions by comparing the new equipment emissions (T01, T02, G4, SH1, H2) and the decrease in emissions associated with the retired engines (E01-E06).

Table 6: Emissions PSD Comparison

	NO_x (tpy)	CO (tpy)	$PM_{2.5}$ (tpy)
Total Project Emissions	49.18	165.73	13.91
Proposed Reductions from Baseline Emissions	-655.73	-74.53	-5.71
Net Change in Emissions	-606.46	91.28	8.21
PSD Significance Level	**40**	**100**	**10**

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

If you want to obtain additional information about certain hazardous air pollutants feel free to visit [http://www.epa.gov/ttn/atw/hlthef/hapindex.html].

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

Columbia will be required to perform the following monitoring and recordkeeping:

- Monitor and record quantity of natural gas consumed and hours of operation for all combustion sources.
- Maintain records of all applicable monitoring, recordkeeping, reporting and testing conducted in accordance with the permit (40 CFR 63 Subpart DDDDD).
- Maintain records of the visible emission opacity tests conducted per the permit.
- The records shall be maintained on site or in a readily available off-site location maintained by Columbia for a period of five (5) years.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates compliance with all state and federal air quality requirements will be satisfied. Therefore, I recommend to the Director of Air Quality the issuance of permit R13-3164A to Columbia Gas Transmission LLC.

David Keatley
Permit Writer – NSR Permitting

November 5, 2014

Date