west virginia department of environmental protection

Division of Air Quality
601 57th Street SE
Charleston, WV 25304
Phone (304) 926-0475 • FAX: (304) 926-0479

Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
www.dep.wv.gov

ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-3009
Plant ID No.:	059-00089
Applicant:	Cardinal States Gathering
Facility Name:	Grant Compressor Station
Location:	Mingo County
NAICS Code:	211111
Application Type:	Modification
Received Date:	October 30, 2012
Engineer Assigned:	Joe Kessler
Fee Amount:	$4,500
Date Received:	November 2, 2012
Complete Date:	November 29, 2012
Due Date:	February 27, 2012
Applicant Ad Date:	October 19, 2012
Newspaper:	*Williamson Daily News*
UTM's:	Easting: 408.462 km Northing: 4,167.913 km Zone: 17
Description:	Modification of the Glycol Dehydration Unit by increase of throughput from 100 mmscf/day to 112 mmscf/day. Existing General Permit Registration will be superceded by this permit and previously un-permitted Amine Stripper will be added.

On September 2, 2003 Cardinal States Gathering (Cardinal) was issued General Permit Registration Number G30-A52 for the modification of the existing Grant Compressor Station. The modification involved the addition of the Amine Stripper and Hot Oil Heater (RB2) to the facility. As Cardinal applied for registration with the General Permit, the existing 100 mmscf/day Glycol Dehydration Unit (GDU) was also included in the registration. The registration did not include the emissions from the Amine Stripper Still Vent.

DESCRIPTION OF PROCESS/MODIFICATIONS

Existing Facility

Grant Station is an existing compressor station that services a natural gas pipeline. The

primary purpose of the facility is to recompress natural gas flowing through a pipeline for transportation. The facility uses electric compressors to accomplish this goal. The facility also removes excess oxygen, carbon dioxide, and water from the gas prior to transportation off-site. Natural gas enters the facility via pipeline where the untreated gas is transferred to an oxygen reactor where O_2 levels in the gas are reduced. The untreated gas stream then enters the amine stripper tower where CO_2 is removed creating "sweet" gas. Next, the gas enters the glycol dehydration unit (GDU) to remove excess water. The treated gas is then electrically compressed and transmitted away from the facility.

Oxygen Reactor

When oxygen is found in a natural gas stream, it can cause various problems including degradation of process chemicals (e.g. amine) and increased corrosion in pipelines. These streams are also frequently in excess of the pipeline specifications (normally set at 200 ppm). In the Oxygen Reactor, the natural gas stream is heated via the Oxygen Preheater (RB1) to approximately 515°F. As the heated stream passes over a material comprising of metals - including nickel, cobalt, copper, iron, and silver - the oxygen present in the natural gas begins to react. The resulting exothermic reaction removes high levels of oxygen and produces carbon dioxide (CO_2) and water (H_2O). The Oxygen Preheater has an exhaust stack where the by-products of natural gas combustion are vented.

Amine Stripper Tower

The natural gas stream is next directed to the Amine Stripper Tower to remove the excess CO_2 produced by the oxygen reactor. Gases containing H_2S and CO_2 are commonly referred to as untreated gases. A typical amine gas treating process includes an absorber unit and a regenerator unit. In the absorber, the downflowing diglycolamine (DGA) solution absorbs CO_2 from the upflowing untreated gas to produce a treated gas stream (i .e., CO_2-free gas). The resultant "rich" amine is then routed into the regenerator (a stripper with a reboiler called the Hot-Oil Heater (RB2)) to produce regenerated or "lean" amine that is recycled for reuse in the absorber.

During the CO_2/H_2S absorption process, aromatic hydrocarbons including benzene, toluene, ethyl benzene and xylene (BTEX) and hexane present in the gas stream are absorbed along with the CO_2/H_2S into the DGA fluid . During the regeneration process, the BTEX and hexane compounds are released from the DGA solution. The Hot-Oil Heater has an exhaust stack where the by-products of natural gas combustion are vented. The Amine Stripper Still Vent emits VOCs and BTEX compounds depending on the concentration of those constituents in the untreated gas.

GDU

After the Amine Stripper Unit, the triethylene Glycol (TEG) Dehydration Unit removes excess water from the natural gas stream prior to being transferred. Water removal is necessary to prevent the formation of hydrates and corrosion in the pipeline. Pipeline quality natural gas has a moisture content of 7 pounds per million standard cubic feet. The TEG attracts and removes the water from the natural gas. TEG that is saturated with water is called "rich" TEG. The rich TEG is heated through the GDU Reboiler (RB3) where the water is boiled off through the still vent. Once the water has been removed from the TEG, it is called "lean" TEG. The lean TEG is recirculated through the unit where the process begins again.

During the water absorption process, aromatic hydrocarbons including BTEX, hexane, and other VOCs and HAPs present in the gas stream are absorbed along with the water vapor into the glycol stream. As noted, the rich glycol stream flows to the reboiler for regeneration by heating to remove the water. Water and the adsorbed hydrocarbons are released from the glycol during the regeneration. Additionally, the GDU Reboiler has an exhaust stack where the by-products of natural gas combustion are vented.

Ancillary Operations/Processes

Other operations and processes at the gas compressor station include a 5,000 gallon condensate storage tank and truck loadout operations. However, based on an liquids analysis of the condensate (taken on January 9, 2013), the material contains only trace amounts of benzene and, when either stored or loaded out in trucks, does not represent a substantive emissions source.

Proposed Modifications

Cardinal is now proposing to modify the GDU by increasing of throughput from 100 mmscf/day to 112 mmscf/day. Additionally, as the General Permit G30-A does not include requirements for an Amine Stripper, they have requested a site-specific permit to be issued that will supercede and replace the General Permit.

SITE INSPECTION

Due to the nature of the modification, the writer did not conduct a site inspection. According to information in the DAQ database, the last full on-site inspection occurred on August 24, 2011 by Mr. John Moneypenny of the Compliance/Enforcement Section. On August 14, 2012, after Cardinal submitted additional information to DAQ, the facility was given a status code of "30 - In Compliance" as a result of the inspection. The Latitude and Longitude of the facility is: 37.65381, -82.037731.

AIR EMISSIONS AND CALCULATION METHODOLOGIES

Glycol Regenerator Column Emissions

VOC, HAP, and methane emissions from the GDU Still Vent (DH1) are based on the emissions calculation program GRI-GLYCalc Version 4.0. GRI-GLYCalc is a well-known program for estimating air emissions from glycol units using triethylene glycol (TEG), diethylene glycol (DEG) or ethylene glycol (EG). Included in Attachment N of the permit application is a copy of the appropriate GLY-Calc analysis sheets. Inputs to the program were based on an analysis (June 5, 2012) performed on the gas entering into the GDU. Annual emissions are based on the GDU operating 8,760 hours/year. The potential-to-emit (PTE) generated by the GDU Still Vent is given in the following table:

Table 1: GDU Still Vent PTE

Pollutant	lbs/hr	tons/year
VOC	1.46	6.39
Benzene	*0.06*	*0.27*
Ethylbenzene	*0.33*	*1.45*
Toluene	*0.18*	*0.80*
Xylene	*0.46*	*1.99*
Total HAPs	1.04	4.56
Methane	7.14	31.27
$CO_2e^{(1)}$	n/a	656.74

(1) Based on multiplying the mass amount of emissions for each of the six greenhouse gases by the gas's associated global warming potential published at Table A-1 to Subpart A of 40 CFR Part 98 - Global Warming Potentials. Used to determine major source status of facilities under 45CSR14.

Natural Gas Combustion Exhaust Emissions

Emissions from the combustion of natural gas in the Oxygen Preheater (RB1), the Hot Oil Heater (RB2), and the GDU Reboiler (RB3) were based on the emission factors provided for natural gas combustion as given in AP-42 (AP-42 is a database of emission factors maintained by USEPA) Section 1.4. Hourly emissions were based on the maximum design heat input (MDHI) of each unit and annual emissions were based on an annual operation of 8,760 hours. A heat content of the gas of 1,020 Btu/scf was used in the calculations. The potential-to-emit (PTE) generated by the combustion of natural gas is given in the following table:

Table 2: Natural Gas Combustion Exhaust PTE

Pollutant	Oxygen Preheater		Hot Oil Heater		GDU Reboiler	
	lbs/hr	tons/year	lbs/hr	tons/year	lbs/hr	tons/year
CO	0.66	2.89	1.95	8.55	0.09	0.40
NO_X	0.78	3.42	2.32	10.18	0.11	0.47
PM	*0.06*	*0.26*	*0.18*	*0.78*	*0.01*	*0.04*
SO_2	*0.01*	*0.02*	*0.01*	*0.06*	*~0.00*	*~0.00*
VOCs	*0.04*	*0.19*	*0.13*	*0.56*	*0.01*	*0.03*
CO_2	936.01	4,099.72	2,772.95	12,145.52	128.65	563.49

Amine Stripper Still Vent

Emissions from the Amine Stripper Still Vent (AM1) were calculated using GRI-HAPCalc Version 3.01 and were based on an input gas sample (taken on May 3, 2012) from the facility. GRI-HAPCalc is a Windows-based program that estimates emissions of HAPs and criteria air pollutants from natural gas industry operations. The PTE generated by the Amine Still Vent is given in the following table:

Table 3: Amine Stripper Still Vent PTE

Pollutant	lbs/hr	tons/year
VOC	0.13	0.58
Hexane	*~0.00*	*0.01*
Benzene	*0.07*	*0.29*
Ethylbenzene	*~0.00*	*0.00*
Toluene	*0.06*	*0.28*
Xylene	*~0.00*	*0.00*
Total HAPs	0.13	0.57

Fugitives

Cardinal based their fugitive equipment leak calculations on emission factors taken from the document EPA-453/R-95-017 - "Protocol for Equipment Leak Emission Estimates." Emission factors were taken from Table 2-4 and no control efficiency, as based on a Leak Detection and Repair (LDAR) protocol, was applied. The calculations themselves were run through GRI-HAPCalc 3.01.

Ancillary Operations/Processes

As mentioned above, other operations and processes at the gas compressor station include a 5,000 gallon condensate storage tank and truck loadout operations. However, based on an liquids analysis of the condensate (January 9, 2013), the material contains only trace amounts of benzene and, when either stored or loaded out in trucks, does not represent a substantive emissions source.

The total emissions from storage/loading were based on an assumption that all of the benzene in the condensate (4.76×10^{-4} lb/1,000-gal) volatilized and 1,040,000 gallons of year of condensate was stored/loaded out. The emissions were calculated to be less than 0.5 lbs-benzene/year.

Emissions Summary

Based on the above estimation methodology, which is determined to be appropriate, the post-modification PTE of the Grant Compressor Station is given in the following tables:

Table 4: Facility-Wide Aggregate Hourly (lb/hr) Criteria Pollutant PTE Summary.

Source	CO	NO_x	PM[(1)]	SO_2	VOCs	HAPs

Oxygen Pre-Heater	0.66	0.78	0.06	0.01	0.04	0.01
Hot Oil Heater	1.95	2.32	0.18	0.01	0.13	0.04
Amine Unit Still Vent	0.00	0.00	0.00	0.00	0.13	0.13
Glycol Dehydration Unit Reboiler	0.09	0.11	0.01	~0.00	0.01	~0.00
Glycol Dehydration Unit Still Vent	0.00	0.00	0.00	0.00	1.46	1.04
Equipment Leaks	0.00	0.00	0.00	0.00	0.13	~0.00
Facility-Wide Totals ➜	**2.70**	**3.21**	**0.25**	**0.02**	**1.90**	**1.23**

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

Table 5: Facility-Wide Aggregate Annual (ton/yr) Criteria Pollutant/GHG PTE Summary.

Source	CO	NO_x	PM[(1)]	SO_2	VOCs	HAPs	CO_2e[(2)]
Oxygen Pre-Heater	2.89	3.42	0.26	0.02	0.19	0.06	4,100
Hot Oil Heater	8.55	10.18	0.78	0.06	0.56	0.18	12,146
Amine Unit Still Vent	0.00	0.00	0.00	0.00	0.58	0.58	0
Glycol Dehydration Unit Reboiler	0.40	0.47	0.04	~0.00	0.03	0.01	563
Glycol Dehydration Unit Still Vent	0.00	0.00	0.00	0.00	6.39	4.56	657
Equipment Leaks	0.00	0.00	0.00	0.00	0.56	0.01	0
Facility-Wide Totals ➜	**11.84**	**14.07**	**1.08**	**0.08**	**8.31**	**5.41**	**17,466**

(1) All particulate matter emissions are assumed to be less than 2.5 microns. Includes condensables.
(2) Based on multiplying the mass amount of emissions for each of the six greenhouse gases by the gas's associated global warming potential published at Table A-1 to Subpart A of 40 CFR Part 98 - Global Warming Potentials. Used to determine major source status of facilities under 45CSR14.

Table 6: Facility-Wide Aggregate Annual (ton/yr) Speciated HAP Summary[(1)]

Pollutant	ton/yr
Formaldehyde	0.01
Hexane	0.13
Benzene	0.57
Toluene	1.09
Xylene	1.99
Ethylbenzene	1.45
Total HAPs	5.24

(1) As the PTE of all individual HAPs is less than 10 TPY and the PTE of total HAPs is less than 25 TPY, the Grant Compressor Station is defined as a minor source of HAPs for purposes of 40 CFR 61, 40CFR63, and Title V.

The change in annual PTE, as based on emissions given on the front of G30-A052, is given in the following table:

Table 7: Post-Modification Change in Annual PTE

Source	NO_x	CO	VOCs	SO_2	PM[(1)]	HAPs	CO_2e[(3)]
G30-A052	20.94	7.10	0.39	0.00	1.01	0.00	n/a
R13-3009	14.07	11.84	8.31	0.08	1.08	5.41	17,466
Change	***(6.87)***	***4.74***	***7.92***	***0.08***	***0.07***	***5.41***	***17,466***

(1) All particulate matter emitted is assumed to be $PM_{2.5}$ or less.

REGULATORY APPLICABILITY

This section will address the potential regulatory applicability/non-applicability of substantive state and federal air quality rules relevant to the Grant Compressor Station.

45CSR2: To Prevent and Control Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers

The Oxygen Preheater, the Hot Oil Heater, and the GDU Reboiler have each been determined to meet the definition of a "fuel burning unit" under 45CSR2 and are, therefore, subject to the applicable requirements therein. However, pursuant to the exemption given under §45-2-11, as the MDHI of the Oxygen Preheater and the GDU Reboiler are each less than 10 mmBtu/hr, those units are not subject to sections 4, 5, 6, 8 and 9 of 45CSR2. The only remaining substantive requirement for those units is under Section 3.1 - Visible Emissions Standards.

45CSR2 Opacity Standard - Section 3.1

Pursuant to 45CSR2, Section 3.1, the Oxygen Preheater, the Hot Oil Heater, and the GDU Reboiler are subject to an opacity limit of 10%. Proper maintenance and operation of the units (and use of natural gas as fuel) should keep the opacity of the units well below 10% during normal operations.

45CSR2 Weight Emission Standard - Section 4.1.b

The allowable particulate matter (non-condensable total PM) emission rate for the Hot Oil Heater, identified as Type "b" fuel burning units, per 45CSR2, Section 4.1.a, is the product of 0.09 and the total design heat input of the unit in million Btu per hour. The maximum aggregate design heat input (short-term) of the Hot Oil Heater will be 23.7 mmBtu/hr. Using the above equation, the 45CSR2 PM emission limit of the unit will be 2.13 lbs/hr. The maximum potential hourly PM emissions (including condensables) from the Hot Oil Heater is estimated to be 0.18 lbs/hr. This emission rate is 8.45% of the 45CSR2 limit.

45CSR2 Control of Fugitive Particulate Matter- Section 5

Section 5 of 45CSR2 requires a fugitive particulate matter control system for any source of fugitive particulate matter associated with the fuel burning units. Using natural gas as the fuel of

the Hot Oil Heater will result in no potential for substantive fugitive emissions.

45CSR2 Testing, Monitoring, Record-keeping, & Reporting (TMR&R) - Section 8

Section 8 of Rule 2 requires testing for initial compliance with the limits therein, monitoring for continued compliance, and keeping records of that compliance. The TMR&R requirements are clarified under 45CSR2A and discussed below.

45CSR2A Applicability - Section 3

Pursuant to §45-2A-3, as an applicable "fuel burning unit" under 45CSR2 with an MDHI less than 100 mmBtu/hr, the Hot Oil Heater is not subject to the Testing and MRR Requirements under 45CSR2A.

45CSR10: To Prevent and Control Air Pollution from the Emission of Sulfur Oxides (non-applicability)

45CSR10 has requirements limiting SO_2 emissions from "fuel burning units," limiting in-stack SO_2 concentrations of "manufacturing processes," and limiting H_2S concentrations in process gas streams. The only potential applicability of 45CSR10 to the Grant Compressor Station is the limitations on fuel burning units. The Oxygen Preheater, the Hot Oil Heater, and the GDU Reboiler have each been determined to meet the definition of a "fuel burning unit" under 45CSR10. However, pursuant to the exemption given under §45-10-10.1, as the MDHI of the Oxygen Preheater and the GDU Reboiler are less than 10 mmBtu/hr, those units are not subject to the limitations on fuel burning units under 45CSR10.

45CSR10 Fuel Burning Units - Section 3

The allowable SO_2 emission rate for the Hot Oil Heater, identified as Type "b" fuel burning units, per 45CSR10, Section 3.2(c), is the product of 1.6 and the total design heat input of the Hot Oil Heater in million Btu per hour. The MDHI (short-term) of the Hot Oil Heater will be 23.7 mmBtu/hr. Using the above equation, the 45CSR10 SO_2 emission limit of the unit will be 37.92 lb/hr. The maximum potential hourly SO_2 emissions from the Hot Oil Heater is estimated to be 0.01 lbs/hr. This emission rate is only a trace of the 45CSR10 limit.

45CSR10 Testing, Monitoring, Record-keeping, & Reporting (TMR&R) - Section 8

Section 8 of Rule 10 requires to test for initial compliance with the limits therein, monitor for continued compliance, and keep records of that compliance. The TMR&R requirements are clarified under 45CSR10A and discussed below.

45CSR10A Applicability - Section 3

Pursuant to §45-10A-3.1(b), as the Hot Oil Heater "combust natural gas, wood or distillate oil, alone or in combination," the unit is not subject to the Testing and MRR Requirements under 45CSR10A.

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 modificationsat the existing Grant Compressor Station has the potential to emit aggregate HAPs in excess of five (5) TPY (as based on a comparison of the post-modification PTE evaluated herein and the PTE as given in G30-A052) that would, pursuant to §45-13-2.17(b), define the installation as a "modification" under 45CSR13. Pursuant to §45-13-5.1, "[n]o person shall cause, suffer, allow or permit the modification . . . and operation of any stationary source to be commenced without . . . obtaining a permit to construct." Therefore, Cardinal was required to obtain a permit under 45CSR13 for the modification.

As required under §45-13-8.3 ("Notice Level A"), Cardinal placed a Class I legal advertisement in a "newspaper of general circulation in the area where the source is . . . located." The ad ran on October 19, 2012 in *Williamson Daily News* and the affidavit of publication for this legal advertisement was submitted on November 2, 2012.

45CSR14 Major Modification Non-Applicability

The post-modification PTE of Grant Station is below the levels that would define the source as "major" under either 45CSR14 and, therefore, the modification evaluated herein is not subject to the provisions of 45CSR14.

45CSR30: Requirements for Operating Permits

45CSR30 provides for the establishment of a comprehensive air quality permitting system consistent with the requirements of Title V of the Clean Air Act. The post-modification potential-to-emit of the Grant Compressor Station is below the levels that would define the source as "major" under 45CSR30 and no emissions source at the facility is subject to requirements promulgated under §111 or §112(r) of the Clean Air Act that does not also have a specific exemption from Title V permitting.

40 CFR 63 Subpart HH: National Emission Standards for Hazardous Air Pollutants From Oil and Natural Gas Production Facilities (non-delegation)

The GDU appears to be subject to the area source requirements of 40 CFR 63, Subpart HH. However, the DAQ has not been delegated authority from USEPA to enforce the area source requirements of this rule. Therefore, unless otherwise stated, DAQ did not formally determine whether the permittee is subject to an area source air toxics standard requiring Generally Achievable Control Technology (GACT) promulgated after January 1, 2007 pursuant to 40 CFR 63, including the area source air toxics provisions of 40 CFR 63, Subpart HH.

TOXICITY ANALYSIS OF NON-CRITERIA REGULATED POLLUTANTS

This section provides an analysis for those regulated pollutants that may be emitted from the

Grant Compressor Station and that are not classified as "criteria pollutants." 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). These 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. As noted above, Grant Station has the potential to emit the following HAPs: Formaldehyde, Hexane, Benzene, Toluene, Ethyl-benzene, and Xylene. The following table lists each HAP's carcinogenic risk (as based on analysis provided in the Integrated Risk Information System (IRIS)):

Table 8: Potential HAPs - Carcinogenic Risk

HAPs	Type	Known/Suspected Carcinogen	Classification
Formaldehyde	VOC	Yes	B1 - Probable Human Carcinogen
Hexane	VOC	No	Inadequate Data
Benzene	VOC	Yes	Category A - Known Human Carcinogen
Toluene	VOC	No	Inadequate Data
Ethyl-benzene	VOC	No	Category D - Not Classifiable
Xylene	VOC	No	Inadequate Data

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. As stated previously, *there are no federal or state ambient air quality standards for these specific chemicals*. For a complete discussion of the known health effects of each compound refer to the IRIS database located at *www.epa.gov/iris*.

AIR QUALITY IMPACT ANALYSIS

The proposed modification does not meet the definition of a "major modification" pursuant to 45CSR14 and, therefore, an air quality impact (computer modeling) analysis was not required.

Additionally, based on the nature of the proposed modification, modeling was not required under 45CSR13, Section 7.

MONITORING, COMPLIANCE DEMONSTRATIONS, RECORD-KEEPING, AND REPORTING REQUIREMENTS

The following substantive monitoring, compliance demonstration, and record-keeping requirements shall be required:

- For the purposes of demonstrating compliance with the maximum wet gas throughput limit set forth in 4.1.4. of the draft permit, Cardinal shall be required to monitor and maintain daily, monthly, and rolling twelve month records of the wet gas throughput of the Glycol Dehydration Unit.

- For the purposes of demonstrating compliance with maximum limit for the loadout of condensate/liquids set forth in 4.1.8 of the draft permit, Cardinal shall be required to monitor and record the monthly and rolling twelve month total of condensate/liquids (in gallons) unloaded from the storage tank.

- For the purposes of demonstrating compliance with visible emissions limitations set forth in 4.1.2(d), 4.1.3(d), and 4.1.6(d) of the draft permit, Cardinal shall be required to:

    - Conduct an initial Method 22 visual emission observation on RB1, RB2, and RB3 to determine the compliance with the visible emission provisions. The initial test shall be conducted in accordance with 4.3.2 of the draft permit.

    - Conduct monthly Method 22 visible emission observations of the RB1, RB2, and RB3 stacks to ensure proper operation for a minimum of ten (10) minutes each month RB1 through RB3 is in operation.

    - In the event visible emissions are observed in excess of the limitations given under 4.1.2(d), 4.1.3(d), and 4.1.6(d) of the draft permit, Cardinal shall be required to take immediate corrective action.

    - Cardinal shall be required to maintain records of all visual emission observations pursuant to 4.2.3. of the draft permit including any corrective action taken.

PERFORMANCE TESTING OF OPERATIONS

The following substantive performance testing requirements shall be required:

- At such reasonable time(s) as the Secretary may designate, in accordance with the provisions of 3.3 of the draft permit, Cardinal shall be required to conduct or have conducted test(s) to

determine compliance with the emission limitations established in this permit and/or applicable regulations.

- In order to demonstrate compliance with 4.1.5 of the draft permit, pursuant to 3.3.1, once per each 3-year period or at such reasonable time(s) as the Secretary may designate, Cardinal shall be required to demonstrate compliance with the HAP emissions limits using GLYCalc Version 4.0 or higher. Cardinal shall be required to sample in accordance with GPA Method 2166 and analyze the samples utilizing the extended EPA Method TO3 (Modified) unless granted approval by the Director for use of an alternative test method.

- In order to demonstrate compliance with 4.1.7 of the draft permit, pursuant to 3.3.1, once per each 3-year period or at such reasonable time(s) as the Secretary may designate, Cardinal shall be required to demonstrate compliance with the HAP emissions limits using GRI-HAPCalc Version 3.01. Cardinal shall be required to sample in accordance with GPA Method 2286 unless granted approval by the Director for use of an alternative test method.

- In order to demonstrate compliance with the opacity requirements of 4.1.2(d), 4.1.3(d), and 4.1.6(d) of the draft permit, Cardinal shall be required to conduct a Method 22 opacity test for at least two hours. This test shall demonstrate no visible emissions are observed for more than a total of 5 minutes during any 2 consecutive hour period using 40CFR60 Appendix A Method 22. Cardinal shall be required to conduct this test within one (1) year of permit issuance or initial startup whichever is later. The visible emission checks shall determine the presence or absence of visible emissions. At a minimum, the observer must be trained and knowledgeable regarding the effects of background contrast, ambient lighting, observer position relative to lighting, wind, and the presence of uncombined water (condensing water vapor) on the visibility of emissions. This training may be obtained from written materials found in the References 1 and 2 from 40 CFR part 60, appendix A, Method 22 or from the lecture portion of 40 CFR part 60, appendix A, Method 9 certification course.

CHANGES TO G30-A082

The proposed permit is presented in the standard permitting boilerplate and is completely different from the G30-A Coal General Permit.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates that compliance with all applicable regulations will be achieved. Therefore, I recommend to the Director the issuance of a Permit Number R13-3009 to Cardinal States Gathering for the modifications discussed herein at the Grant Compressor Station located near Varney, Mingo County, WV.

Joe Kessler, PE

Engineer

_____

Date