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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-3048B
Plant ID No.:	009-00116
Applicant:	Appalachia Midstream Services, LLC (AMS)
Facility Name:	Buffalo Compressor Station
Location:	Bethany, Brooke County
NAICS Code:	213112 (Support Activities for Oil and Gas Operations)
Application Type:	Modification
Received Date:	February 7, 2018
Engineer Assigned:	Jerry Williams, P.E.
Fee Amount:	$2,000.00
Date Received:	February 7, 2018
Complete Date:	March 7, 2018
Due Date:	June 5, 2018
Applicant Ad Date:	February 9, 2018
Newspaper:	*Wheeling Intelligencer & News-Register*
UTM's:	Easting: 540.713 km Northing: 4,449.695 km Zone: 17
Latitude:	40.19667
Longitude:	-80.52167
Description:	Modification to account for facility build out.

PROPOSED CHANGES

The current permit (R13-3048A) does not include all potential emission sources at the facility.

- The previous application did not include the Compressor Rod Packing (CRP) emissions. This increases the VOC point source emission estimate by 48.02 tons/year (TPY).
- The 701 hp Cummins GTA28 Emergency Generator engine (GEN-2) will not be installed. Decreases the VOC point source emission estimate by 1.69 TPY.
- The previous application used less conservative parameters and assumptions for estimating the dehydrators (DHY-01 and DHY-02). Increases the VOC point source emission estimate by 4.15 TPY total for both dehydrators.
- The previous application used less conservative parameters and assumptions for estimating the compressor blowdowns (CBD) and did not include the emergency shutdown (ESD) testing emissions. Increases the VOC point source emission estimate by 17.27 TPY.
- The previous application used less conservative parameters and assumptions for estimating the piping and equipment leak (FUG-G, FUG-O) emissions and did not include engine crankcase (ECC) emissions. Increases the VOC point source emission estimate by 42.35 TPY.
- Remove the requirements to control the produced water (PW) storage tank (WTK-01 and WTK-02) and the PW truck load out (WTLO) emissions. The combined uncontrolled VOC emissions from WTK and WTLO operations is estimated to by 0.14 TPY.

DESCRIPTION OF PROCESS

The following process description was taken from Permit Application R13-3048B:

The natural gas inlet stream from surrounding area wells enters the facility at low pressure through a two-phase pressure inlet separator that will gravity separate the inlet stream into two (2) streams: gas and hydrocarbon/water liquids. Low-pressure inlet gas will be compressed via three-stage reciprocating compressors with inter-stage cooling. Discharge from the compressors will pass through filter/coalescor separators to remove any condensed or entrained liquids present.

After the inlet gas passes through compressors, it goes through the dehydration process before exiting the facility via a sales pipeline. A portion of the discharge gas is removed prior to outlet metering for use as fuel gas.

Triethylene glycol (TEG) dehydration units are used to remove water from the gas. The units are comprised of both a glycol contactor skid and glycol regeneration skid. In the dehydration process, gas passes through a contactor vessel where water is absorbed by the glycol. The "rich" glycol containing water goes to the glycol reboiler where heat is used to remove the water and regenerate the glycol. The heat is supplied by a natural gas-fired reboiler that exhausts to the atmosphere.

Flash tank off-gases from the glycol regenerator skid are routed to the reboiler to be burned as fuel (100% recycle). Overhead still column emissions from the glycol regeneration skid will be

controlled by an air-cooled condenser. The non-condensables from the still column overheads will be routed to the reboiler and burned with 95% destruction efficiency.

After dehydration, fuel gas is pulled from the discharge side of the process. A fuel gas skid (not an emission source) reduces the pressure of a portion of the discharge gas to a pressure suitable for use by fuel-burning equipment.

Inlet liquids will flow from the two-phase low-pressure inlet separator to a heater treater feed drum, a three-phase low pressure separator. Heavy liquids (water) will be separated and sent to atmospheric produced water storage tanks. Produced water will be transported off site via truck. Liquid hydrocarbons (condensate) will flow from the feed drum to the heater treater.

Any vapors evolved from the liquid to the feed drum will be routed to the electric-driven flash gas compressor and recycled to the two-phase low-pressure inlet separator. After stabilization, condensate will be sent to atmospheric condensate storage tanks. The stabilized condensate storage tanks include a vapor recovery unit (VRU) which operates at a minimum of 95% control efficiency.

Produced water and stabilized condensate will be transported off site via truck. Vapors evolved from truck loading stabilized condensate are routed to carbon canisters for VOC recovery with 70% collection effectiveness and 95% control efficiency (66.5% combined).

The facility will contain several gas recycle streams. All condensate storage tank emissions are controlled 95% by vapor recovery compression. The vapor recovery compressors discharge in the flash gas compressor. The flash gas compressor compresses these gases and discharge into the two-phase low-pressure inlet separator. Overhead gases from the heater-treater feed drum and heater treater are routed to the flash gas compressor and recycled to the two-phase low-pressure inlet separator.

The generators provide electric power to the vapor recovery and flash gas compressors, electric glycol pumps, and other electrical equipment. Fugitive emissions from component leaks will also occur.

The compressor station will have two (2) primary suction pressure operating points, 125 psig and 50 psig. The expected discharge pressure range is 900-1,250 psig. The facility will initially operate at 125 psig suction pressure and will continue to do so until such time that field production volumes decline. At that time, the suction pressure will be lowered to 50 psig, resulting in diminished facility capacity.

SITE INSPECTION

A site inspection was conducted on August 25, 2016 by Greig Paetzold of DAQ Enforcement Section. The facility was found out of compliance because the heater treater (EPHT-1) had an average hourly fuel usage limit of 375 cubic feet per hour in order to meet emission limits for NO_x and CO. The limit was exceeded during three (3) of the past eight (8) months. Vapor recovery monitoring/reporting requirement wasn't performed on storage tanks.

Directions as given in the permit application are as follows:

From Bethany: Head NE on Bethany Pike/WV 67 for approximately 2.8 miles. Turn left onto access road to site and travel approximately 0.3 miles.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions associated with this facility consist of the equipment listed in the following table and fugitive emissions. Fugitive emissions for the facility are based on calculation methodologies presented in EPA Protocol for Equipment Leak Emission Estimates and 40CFR98 Subpart W. The following table indicates which methodology was used in the emissions determination:

Emission Unit ID#	**Process Equipment**	**Calculation Methodology**
EUCE-1 – EUCE12	1,380 hp Caterpillar G3516B Reciprocating Internal Combustion Engine (RICE) w/ Oxidation Catalyst	Manufacturer's Data, EPA AP-42 Emission Factors
EUCRP	Compressor Rod Packing (12 units)	Manufacturer's Data
EUGEN-1	805 hp NG Microturbine Generator	Manufacturer's Data, EPA AP-42 Emission Factors
EUDHY1 – EUDEHY2	55/110 mmscfd Dehydrator Still Vent w/ BTEX Buster	GRI-GlyCalc 4.0
EURBL-1 – EURBL-2	1.0/2.0 MMBtu/hr Dehydrator Reboiler	EPA AP-42 Emission Factors
EUHT-1 – EUHT-2	0.5 MMBTU/hr Heater Treater Burner	EPA AP-42 Emission Factors
EUTK-1 – EUTK-8	400 bbl (16,800 gal) Stabilized Condensate Storage Tanks	EPA Tanks 4.09d
EUWTK-9 – EUWTK10	400 bbl (16,800 gal) Produced Water Storage Tanks	EPA Tanks 4.09d
EULOAD-1	Truck Loading – Stabilized Condensate (9,965 Mgal/yr)	EPA AP-42 Emission Factors
EULOAD-2	Truck Loading – Produced Water (1,533 Mgal/yr)	EPA AP-42 Emission Factors
EUBD	Compressor Blowdown/Emergency Shutdown Tests	Engineering Estimate
EUECC	Engine Crankcase Emissions	Manufacturer's Data

The following table indicates the control device efficiencies that are required for this facility:

Emission Unit	Pollutant	Control Device	Control Efficiency
1,380 hp Caterpillar G3516B RICE w/ Oxidation Catalyst (EPCE-1 – EPCE-12)	Carbon Monoxide	Oxidation Catalyst	85 %
	Volatile Organic Compounds		81.3 %
	Formaldehyde		85 %
TEG Dehydrator Still Vents (EPSTL-1 & EPSTL-2)	Volatile Organic Compounds	Condensers, Recycled to Flame Zone of Reboilers	95 %
	Hazardous Air Pollutants		95 %
Storage Tanks (EPTK-1 – EPTK-8)	Volatile Organic Compounds	Vapor Recovery Unit	95 %
	Hazardous Air Pollutants		95 %
Truck Loading (EPLOAD-1, EPLOAD-2)	Volatile Organic Compounds	Carbon Canister	95 % (70% capture)
	Hazardous Air Pollutants		95 % (70% capture)

The total facility PTE (including fugitives) for the Buffalo Compressor Station is shown in the following table:

Pollutant	R13-3048A PTE (tons/year)	R13-3048B PTE (tons/year)	PTE Change (tons/year)
Nitrogen Oxides	95.19	83.98	-11.21
Carbon Monoxide	92.37	82.87	-9.50
Volatile Organic Compounds	93.19	201.21	108.02
Particulate Matter-10	6.30	6.24	-0.06
Sulfur Dioxide	0.47	0.38	-0.09
Formaldehyde	8.15	8.83	0.68
Total HAPs	22.70	20.86	-1.84
Carbon Dioxide Equivalent	93,762	113,589	19,827

Maximum detailed controlled point source emissions were calculated by AMS and checked for accuracy by the writer and are summarized in the table on the following page.

Appalachia Midstream Services, LLC – Buffalo Compressor Station (R13-3048B)

Emission	Source	NO_x		CO		VOC		PM-10		SO_2		Formaldehyde		Total HAPs		CO2e
Point ID#		lb/hr	ton/year	lb/hr	ton/year	lb/hr	ton/year	lb/hr	ton/year	lb/hr	ton/year	lb/hr	ton/year	lb/hr	ton/year	ton/year
EPCE-1	Compressor Engine #1	1.52	6.66	1.41	6.20	0.82	3.60	0.11	0.49	0.01	0.03	0.16	0.72	0.21	0.91	8564
EPCE-2	Compressor Engine #2	1.52	6.66	1.41	6.20	0.82	3.60	0.11	0.49	0.01	0.03	0.16	0.72	0.21	0.91	8564
EPCE-3	Compressor Engine #3	1.52	6.66	1.41	6.20	0.82	3.60	0.11	0.49	0.01	0.03	0.16	0.72	0.21	0.91	8564
EPCE-4	Compressor Engine #4	1.52	6.66	1.41	6.20	0.82	3.60	0.11	0.49	0.01	0.03	0.16	0.72	0.21	0.91	8564
EPCE-5	Compressor Engine #5	1.52	6.66	1.41	6.20	0.82	3.60	0.11	0.49	0.01	0.03	0.16	0.72	0.21	0.91	8564
EPCE-6	Compressor Engine #6	1.52	6.66	1.41	6.20	0.82	3.60	0.11	0.49	0.01	0.03	0.16	0.72	0.21	0.91	8564
EPCE-7	Compressor Engine #7	1.52	6.66	1.41	6.20	0.82	3.60	0.11	0.49	0.01	0.03	0.16	0.72	0.21	0.91	8564
EPCE-8	Compressor Engine #8	1.52	6.66	1.41	6.20	0.82	3.60	0.11	0.49	0.01	0.03	0.16	0.72	0.21	0.91	8564
EPCE-9	Compressor Engine #9	1.52	6.66	1.41	6.20	0.82	3.60	0.11	0.49	0.01	0.03	0.16	0.72	0.21	0.91	8564
EPCE-10	Compressor Engine #10	1.52	6.66	1.41	6.20	0.82	3.60	0.11	0.49	0.01	0.03	0.16	0.72	0.21	0.91	8564
EPCE-11	Compressor Engine #11	1.52	6.66	1.41	6.20	0.82	3.60	0.11	0.49	0.01	0.03	0.16	0.72	0.21	0.91	8564
EPCE-12	Compressor Engine #12	1.52	6.66	1.41	6.20	0.82	3.60	0.11	0.49	0.01	0.03	0.16	0.72	0.21	0.91	8564
EUCRP	Compressor Rod Packing	0	0	0	0	10.96	48.02	0	0	0	0	0	0	0.33	1.45	2423
EUGEN-1	Generator	0.48	2.10	1.32	5.78	0.13	0.57	0.05	0.20	0.01	0.02	0.01	0.04	0.01	0.06	3534
EPSTL-1	Dehydrator Still Vent	0	0	0	0	1.88	8.25	0	0	0	0	0	0	0.31	1.35	12
EPSTL-2	Dehydrator Still Vent	0	0	0	0	1.86	8.14	0	0	0	0	0	0	0.31	1.36	12
EURBL-1	Dehydrator Reboiler	0.10	0.43	0.08	0.36	0.01	0.02	0.01	0.03	0.01	0.01	0.00	0.00	0.00	0.01	518
EURBL-2	Dehydrator Reboiler	0.20	0.86	0.16	0.72	0.01	0.05	0.01	0.07	0.01	0.01	0.00	0.00	0.00	0.01	1037
EUHT-1	Heater Treater	0.06	0.21	0.05	0.18	0.01	0.01	0.01	0.02	0.01	0.01	0.00	0.00	0.01	0.01	259
EUHT-2	Heater Treater	0.06	0.21	0.05	0.18	0.01	0.01	0.01	0.02	0.01	0.01	0.00	0.00	0.01	0.01	259
EUTK1-8	Condensate Storage Tanks	0	0	0	0	0.32	1.36	0	0	0	0	0	0	0.09	0.40	0
EUWTK9-10	PW Storage Tanks	0	0	0	0	0.02	0.12	0	0	0	0	0	0	0.00	0.00	0
EULOAD-1	Condensate Loading	0	0	0	0	11.97	8.52	0	0	0	0	0	0	3.59	2.56	0
EULOAD-2	PW Loading	0	0	0	0	0.72	0.08	0	0	0	0	0	0	0.22	0.02	0
EUBD	Blowdown/Emerg Shutdown	0	0	0	0	31.45	27.70	0	0	0	0	0	0	0.95	0.84	1398
Total Point Source		**19.15**	**83.77**	**18.64**	**81.58**	**69.18**	**146.00**	**1.42**	**6.23**	**0.09**	**0.38**	**1.98**	**8.68**	**8.32**	**19.03**	**112214**
Fugitive	Piping & Equip Leaks - Gas	0	0	0	0	5.01	21.94	0	0	0	0	0	0	0.15	0.66	1107
Fugitive	Piping & Equip Leaks - Liq	0	0	0	0	7.46	32.68	0	0	0	0	0	0	0.23	0.99	0
Fugitive	Engine Crankcase	0.05	0.21	0.30	1.29	0.14	0.60	0.01	0.02	0.00	0.00	0.03	0.15	0.04	0.18	268
Total Fugitive		**0.05**	**0.21**	**0.30**	**1.29**	**12.61**	**55.21**	**0.01**	**0.02**	**0.00**	**0.00**	**0.03**	**0.15**	**0.42**	**1.83**	**1375**
Total Sitewide		**19.20**	**83.98**	**18.94**	**82.87**	**81.79**	**201.21**	**1.43**	**6.24**	**0.09**	**0.38**	**2.02**	**8.83**	**8.74**	**20.86**	**113589**

REGULATORY APPLICABILITY

The following rules apply to this facility:

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 reboilers (EURBL1-2) and heater treaters (EUHT1-2) are below 10 MMBTU/hr. Therefore, these units are exempt from the aforementioned sections of 45CSR2.

AMS 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 reboilers (EURBL1-2) and heater treaters (EUHT1-2) 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 modification has the potential to emit in excess of six (6) lbs/hour and ten (10) TPY of a regulated pollutant and, therefore, pursuant to §45-13-2.17, meets the definition of 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, AMS is required to obtain a permit under 45CSR13 for the modification of the facility.

As required under §45-13-8.3 ("Notice Level A"), AMS placed a Class I legal advertisement in a "newspaper of general circulation in the area where the source is . . . located." Additionally, AMS 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, Subparts JJJJ and OOOO. These requirements are discussed under that rule below.

45CSR30 (Requirements for Operating Permits)

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

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

40CFR60 Subpart JJJJ (Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (SI ICE))

40CFR60 Subpart JJJJ establishes emission standards for applicable SI ICE.

The twelve (12) 1,380 hp engines (EPCE-1 – EPCE-12) will be subject to this rule. The emission limits for these lean burn engines that were manufactured after July 1, 2010 are the following: NO_x – 1.0 g/hp-hr (3.04 lb/hr); CO – 2.0 g/hp-hr (6.08 lb/hr); and VOC – 0.7 g/hp-hr (2.13 lb/hr). Based on the manufacturer's specifications for these engines, the emission standards will be met.

These engines are not certified by the manufacturer to meet the emission standards listed in 40CFR60 Subpart JJJJ. Therefore, AMS will be required to conduct an initial performance test and conduct subsequent performance testing every 8,760 hours or three (3) years, whichever comes first, to demonstrate compliance.

40CFR60 Subpart OOOO (Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution for which Construction, Modification or Reconstruction Commenced after August 23, 2011, and on or before September 18, 2015)

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 and on or before September 18, 2015. No modification as defined in 40CFR60 Subpart OOOOa has occurred. The following affected sources which commence construction, modification or reconstruction after August 23, 2011 and on or before September 18, 2015 are subject to the applicable provisions of this subpart:

a. Each well affected facility, which is a single natural gas well.

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

b. Each centrifugal compressor affected facility, which is a single centrifugal compressor using wet seals that is located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment. For the purposes of this subpart, your centrifugal compressor is considered to have commenced construction on the date the compressor is installed (excluding relocation) at the facility. A centrifugal compressor located at a well site, or an adjacent well site and servicing more than one well site, is not an affected facility under this subpart.

There are no centrifugal compressors at the Buffalo Compressor Station. Therefore, all requirements regarding centrifugal compressors under 40 CFR 60 Subpart OOOOa would not apply.

c. Each reciprocating compressor affected facility, which is a single reciprocating compressor located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment. For the purposes of this subpart, your reciprocating compressor is considered to have commenced construction on the date the compressor is installed (excluding relocation) at the facility. A reciprocating compressor located at a well site, or an adjacent well site and servicing more than one well site, is not an affected facility under this subpart.

There are reciprocating compressors located at the Buffalo Compressor Station that were constructed after September 18, 2015. Therefore, the requirements regarding reciprocating compressors under 40 CFR 60 Subpart OOOOa will apply. AMS will be required to perform the following:

- Replace the reciprocating compressor rod packing at least every 26,000 hours of operation or 36 months or installation of a rod packing emissions collection system.
- Demonstrate initial compliance by continuously monitoring the number of hours of operation or track the number of months since the last rod packing replacement.
- Submit the appropriate start up notifications.
- Submit the initial annual report for the reciprocating compressors.
- Maintain records of hours of operation since last rod packing replacement, records of the date and time of each rod packing replacement, and records of deviations in cases where the reciprocating compressor was not operated in compliance.

d. Pneumatic Controllers

- Each pneumatic controller affected facility, which is a single continuous bleed natural gas-driven pneumatic controller operating at a natural gas bleed rate greater than 6 scfh which commenced construction after August 23, 2011, and is located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment and not located at a natural gas processing plant.

- Each pneumatic controller affected facility, which is a single continuous bleed natural gas-driven pneumatic controller which commenced construction after August 23, 2011, and is located at a natural gas processing plant.

All pneumatic controllers at the facility will be air driven. Therefore, there are no applicable pneumatic controllers which commenced construction after September 18, 2015. Therefore, all requirements regarding pneumatic controllers under 40 CFR 60 Subpart OOOOa would not apply.

e. 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 OOOOa 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.

The potential for VOC emissions must be calculated using a generally accepted model or calculation methodology, based on the maximum average daily throughput for a 30-day period of production prior to the applicable emission determination deadline specified in this subsection. The determination may take into account requirements under a legally and practically enforceable limit in an

operating permit or other requirement established under a federal or state authority. 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 storage vessels located at the Buffalo Compressor Station are controlled by a VRU which will reduce the potential to emit to less than 6 tpy of VOC. Therefore, AMS is not required by this section to further reduce VOC emissions by 95%.

f. The group of all equipment, except compressors, within a process unit is an affected facility.

- Addition or replacement of equipment for the purpose of process improvement that is accomplished without a capital expenditure shall not by itself be considered a modification under this subpart.

- Equipment associated with a compressor station, dehydration unit, sweetening unit, underground storage vessel, field gas gathering system, or liquefied natural gas unit is covered by §§60.5400a, 60.5401a, 60.5402a, 60.5421a and 60.5422a of this subpart if it is located at an onshore natural gas processing plant. Equipment not located at the onshore natural gas processing plant site is exempt from the provisions of §§60.5400a, 60.5401a, 60.5402a, 60.5421a and 60.5422a of this subpart.

- The equipment within a process unit of an affected facility located at onshore natural gas processing plants and described in paragraph (f) of this section are exempt from this subpart if they are subject to and controlled according to subparts VVa, GGG or GGGa of this part.

The Buffalo Compressor Station is not a natural gas processing plant. Therefore, Leak Detection and Repair (LDAR) requirements for onshore natural gas processing plants would not apply.

g. Sweetening units located at onshore natural gas processing plants that process natural gas produced from either onshore or offshore wells.

- Each sweetening unit that processes natural gas is an affected facility; and

- Each sweetening unit that processes natural gas followed by a sulfur recovery unit is an affected facility.

- Facilities that have a design capacity less than 2 long tons per day (LT/D) of hydrogen sulfide (H_2S) in the acid gas (expressed as sulfur) are required to comply with recordkeeping and reporting requirements specified in §60.5423a(c) but are not required to comply with §§60.5405a through 60.5407a and paragraphs 60.5410a(g) and 60.5415a(g) of this subpart.

- Sweetening facilities producing acid gas that is completely reinjected into oil-or-gas-bearing geologic strata or that is otherwise not released to the atmosphere are not subject to §§60.5405a through 60.5407a, 60.5410a(g), 60.5415a(g), and 60.5423a of this subpart.

There are no sweetening units at the Buffalo Compressor Station. Therefore, all requirements regarding sweetening units under 40 CFR 60 Subpart OOOOa would not apply.

40CFR63 Subpart HH (National Emission Standards for Hazardous Air Pollutants for Oil and Natural Gas Production Facilities)

Subpart HH establishes national emission limitations and operating limitations for HAPs emitted from oil and natural gas production facilities located at major and area sources of HAP emissions. The glycol dehydration units at the Buffalo Compressor Station are subject to the area source requirements for glycol dehydration units. However, because the facility is an area source of HAP emissions and the actual average benzene emissions from the glycol dehydration units are below 0.90 megagram per year (1.0 tons/year) it is exempt from all requirements of Subpart HH except to maintain records of actual average flowrate of natural gas to demonstrate a continuous exemption status.

40CFR63 Subpart ZZZZ (National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines)

Subpart ZZZZ establishes national emission limitations and operating limitations for HAPs emitted from stationary RICE located at major and area sources of HAP emissions. This subpart also establishes requirements to demonstrate initial and continuous compliance with the emission limitations and operating limitations. The engines (EPCE-1 – EPCE-12) at the Buffalo Compressor Station are subject to the area source requirements for non-emergency spark ignition engines.

The applicability requirements for new stationary RICEs located at an area source of HAPs, is the requirement to meet the standards of 40CFR60 Subpart JJJJ. These requirements were outlined above. The engines meet these standards.

The following rules do not apply to the facility:

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

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

The Buffalo Compressor Facility is located in Brooke County, which is considered attainment with an approved maintenance plan for Particulate Matter 2.5. Because Brooke County is an attainment county, 45CSR19 does not apply to this facility.

As shown in the following table, AMS is not a major source subject to 45CSR14 or 45CSR19 review. According to 45CSR14 Section 2.43.e, fugitive emissions are not included in the major source determination because it is not listed as one of the source categories in Table 1. Therefore, the fugitive emissions are not included in the PTE below.

Pollutant	**PSD (45CSR14) Threshold (tpy)**	**NANSR (45CSR19) Threshold (tpy)**	**Buffalo PTE (tpy)**	**45CSR14 or 45CSR19 Review Required?**
Carbon Monoxide	250	NA	81.58	No
Nitrogen Oxides	250	NA	83.77	No
Sulfur Dioxide	250	NA	0.38	No
Particulate Matter 2.5	250	NA	6.23	No
Ozone (VOC)	250	NA	146.00	No

40CFR60 Subpart Kb (Standards of Performance for VOC Liquid Storage Vessels)

40CFR60 Subpart Kb applies to storage vessels with a capacity greater than or equal to 75 cubic meters (19,812.9 gal). No storage vessels exceed this size. Additionally, this rule does not apply to storage vessels less than or equal to 1,589.874 cubic meters (420,000 gal) that are used for petroleum or condensate storage prior to custody transfer.

40CFR60 Subpart KKK (Standards of Performance for Equipment Leaks of VOC from Onshore Natural Gas Processing Plants)

40CFR60 Subpart KKK applies to onshore natural gas processing plants that commenced construction after January 20, 1984, and on or Before August 23, 2011. The Buffalo Compressor Station is not a natural gas processing facility therefore, AMS is not subject to this rule.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

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 Buffalo Compressor Station is classified as an area source of hazardous air pollutants. Listed below is a description of the primary hazardous air pollutants for this facility.

Acetaldehyde
Acetaldehyde is mainly used as an intermediate in the synthesis of other chemicals. It is common in the environment and may be formed in the body from the breakdown of ethanol. Acute (short-term) exposure to acetaldehyde results in effects including irritation of the eyes, skin, and respiratory tract. Symptoms of chronic (long-term) intoxication of acetaldehyde resemble those of alcoholism. Acetaldehyde is considered a probable human carcinogen (Group B2) based on human cancer studies and animal studies that have shown nasal tumors in rats and laryngeal tumors in hamsters.

Acrolein
Acrolein is primarily used as an intermediate in the synthesis of acrylic acid and as a biocide. It may be formed from the breakdown of certain pollutants in outdoor air or from the burning of organic matter including tobacco, or fuels such as gasoline or oil. It is toxic to humans following inhalation, oral or dermal exposures. Acute (short-term) inhalation exposure may result in upper respiratory tract irritation and congestion. No information is available on its reproductive, developmental, or carcinogenic effects in humans, and the existing animal cancer data are considered inadequate to make a determination that acrolein is carcinogenic to humans.

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

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

Methanol
Methanol is released to the environment during industrial uses and naturally from volcanic gases, vegetation, and microbes. Exposure may occur from ambient air and during the use of solvents. Acute (short-term) or chronic (long-term) exposure of humans to methanol by inhalation or ingestion may result in blurred vision, headache, dizziness, and nausea. No information is available on the reproductive, developmental, or carcinogenic effects of methanol in humans. Birth defects have been observed in the offspring of rats and mice exposed to methanol by inhalation. EPA has not classified methanol with respect to carcinogenicity.

Methanol is primarily used as an industrial solvent for inks, resins, adhesives, and dyes. It is also used as a solvent in the manufacture of cholesterol, streptomycin, vitamins, hormones, and other pharmaceuticals. Methanol is also used as an antifreeze for automotive radiators, an ingredient of gasoline (as an antifreezing agent and octane booster), and as fuel for picnic stoves. Methanol is also an ingredient in paint and varnish removers. Methanol is also used as an alternative motor fuel.

All HAPs have other non-carcinogenic chronic and acute effects. These adverse health effects 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 re natural gas processing plants and described *www.epa.gov/iris*.

AIR QUALITY IMPACT ANALYSIS

Modeling was not required of this source because the facility is not subject to 45CSR14 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollutants) as shown in the table listed in the Regulatory Discussion Section.

SOURCE AGGREGATION

"Building, structure, facility, or installation" is defined as all the pollutant emitting activities which belong to the same industrial grouping, are located on one or more contiguous and adjacent properties, and are under the control of the same person.

The Source Determination Rule for the oil and gas industry was published in the Federal Register on June 3, 2016 and became effective on August 2, 2016. EPA defined the term "adjacent" and stated that equipment and activities in the oil and gas sector that are under common control will be considered part of the same source if they are located on the same site or on sites that share equipment and are within ¼ mile of each other.

The Buffalo Compressor Station will operate under SIC code 1389 (Support Activities for Oil and Gas Operatons). There are other compressor stations operated by AMS that share the same

two-digit major SIC code of 13. However, this compressor station is not located on "contiguous or adjacent" property.

Because there are no facilities that are under common control, located on contiguous or adjacent properties and operating under the same standard industrial classification code, the emissions from the Buffalo Compressor Station should not be aggregated with other facilities in determining major source or PSD status.

MONITORING OF OPERATIONS

AMS will be required to perform the following monitoring:

- Monitor and record quantity of natural gas consumed for all engines and combustion sources.
- Monitor all applicable requirements of 40CFR60 Subparts JJJJ and OOOO and 40CFR63 Subparts HH and ZZZZ.

AMS will be required to perform the following recordkeeping:

- Maintain records of the amount of natural gas consumed and hours of operation for all engines and combustion sources.
- Maintain records of testing conducted in accordance with the permit. Said records shall be maintained on-site or in a readily accessible off-site location
- Maintain the corresponding records specified by the on-going monitoring requirements of and testing requirements of the permit.
- Maintain records of the visible emission opacity tests conducted per the permit.
- Maintain a record of all potential to emit (PTE) HAP calculations for the entire facility. These records shall include the natural gas compressor engines and ancillary equipment.
- Maintain records of all applicable requirements of 40CFR60 Subparts JJJJ and OOOO and 40CFR63 Subparts HH and ZZZZ.
- The records shall be maintained on site or in a readily available off-site location maintained by AMS for a period of five (5) years.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates that AMS meets all the requirements of applicable regulations. Therefore, impact on the surrounding area should be minimized and it is recommended that the Buffalo Compressor Station should be granted a 45CSR13 modification permit for their facility.

Jerry Williams, P.E.
Engineer

3/29/2018
Date