

INTERNAL PERMITTING DOCUMENT TRACKING MANIFEST

Company Name Antero Midstream LLC

Permitting Action Number R13-3184C Total Days 43 DAQ Days 21

Permitting Action:

- | | | |
|---|------------------------------------|---|
| <input type="radio"/> Permit Determination | <input type="radio"/> Temporary | <input checked="" type="radio"/> Modification |
| <input type="radio"/> General Permit | <input type="radio"/> Relocation | <input type="radio"/> PSD (Rule 14) |
| <input type="radio"/> Administrative Update | <input type="radio"/> Construction | <input type="radio"/> NNSR (Rule 19) |

Documents Attached:

- | | |
|--|--|
| <input checked="" type="radio"/> Engineering Evaluation/Memo | <input type="radio"/> Completed Database Sheet |
| <input checked="" type="radio"/> Draft Permit | <input type="radio"/> Withdrawal |
| <input checked="" type="radio"/> Notice | <input type="radio"/> Letter |
| <input type="radio"/> Denial | <input type="radio"/> Other (specify) _____ |
| <input type="radio"/> Final Permit/General Permit Registration | _____ |

Date	From	To	Action Requested
3/10/2016	Jerry <i>W</i>	Bev	Please review and approve to go to notice.
<i>3/14</i>	<i>Bev</i>	<i>Jerry</i>	<i>Go to Notice</i>
<i>3/17</i>	<i>Jerry</i>	<i>SANDIE</i>	<i>APPROVED FOR NOTICE</i>

NOTE: Retain a copy of this manifest for your records when transmitting your document(s).

Engineer	Jerry Williams, P.E.
Email Address	jerry.williams@wv.gov
Company Name	Antero Midstream LLC
Company ID	095-00037
Facility Name	Monroe Compressor Station
Permit Number	R13-3184C
County	Tyler
Newspaper	<i>Tyler Star News</i>
Company Email and "Attention To:"	Ward McNeilly wmneilly@anteroresources.com
Environmental Contact Email Address	NA
Regional Office (if applicable)	NA
New or Modified Source?	modified
Construction, Modification, or Relocation?	modification
Type of Facility	natural gas compressor station
"Located" or "To Be Located"?	located
Place where I can find electronic versions of your notice, engineering evaluation, and draft permit	Q:\AIR_QUALITY\Willi\Permit Applications Under Review\Antero Resources Appalachian 3184C Monroe Compressor Station

AIR QUALITY PERMIT NOTICE

Notice of Intent to Approve

On January 27, 2016, Antero Midstream LLC applied to the WV Department of Environmental Protection, Division of Air Quality (DAQ) for a permit to modify a natural gas compressor facility located on Conaway Run Road, Alma, Tyler County, WV at latitude 39.420649 and longitude - 80.863842. A preliminary evaluation has determined that all State and Federal air quality requirements will be met by the proposed facility. The DAQ is providing notice to the public of its preliminary determination to issue the permit as R13-3184C.

The following increase in potential emissions will be authorized by this permit action: Particulate Matter less than 10 microns, 3.83 tons per year (TPY); Sulfur Dioxide, 0.11 TPY; Total Hazardous Air Pollutants, 1.67 TPY.

The following decrease in potential emissions will be authorized by this permit action: Oxides of Nitrogen, 16.14 TPY; Carbon Monoxide, 14.83 TPY; Volatile Organic Compounds, 22.62 TPY.

Written comments or requests for a public meeting must be received by the DAQ before 5:00 p.m. on (Day of Week, Month, Day, Year). A public meeting may be held if the Director of the DAQ determines that significant public interest has been expressed, in writing, or when the Director deems it appropriate.

The purpose of the DAQ's permitting process is to make a preliminary determination if the proposed modification will meet all state and federal air quality requirements. The purpose of the public review process is to accept public comments on air quality issues relevant to this determination. Only written comments received at the address noted below within the specified time frame, or comments presented orally at a scheduled public meeting, will be considered prior to final action on the permit. All such comments will become part of the public record.

Jerry Williams, P.E.
WV Department of Environmental Protection
Division of Air Quality
601 57th Street, SE
Charleston, WV 25304
Telephone: 304/926-0499, ext. 1223
FAX: 304/926-0478

Additional information, including copies of the draft permit, application and all other supporting materials relevant to the permit decision may be obtained by contacting the engineer listed above. The draft permit and engineering evaluation can be downloaded at:

www.dep.wv.gov/daq/Pages/NSRPermitsforReview.aspx



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.: R13-3184C
Plant ID No.: 095-00037
Applicant: Antero Midstream LLC (Antero)
Facility Name: Monroe Compressor Station
Location: Alma, Tyler County
NAICS Code: 221210 (Natural Gas Distribution)
Application Type: Modification
Received Date: January 27, 2016
Engineer Assigned: Jerry Williams, P.E.
Fee Amount: \$4,500.00
Date Received: January 27, 2016
Complete Date: February 18, 2016
Due Date: May 18, 2016
Applicant Ad Date: January 27, 2016
Newspaper: *Tyler Star News*
UTM's: Easting: 511.720 km Northing: 4,363.467 km Zone: 17
Latitude: 39.420649
Longitude: -80.863842
Description: This application modifies the engine catalyst efficiencies based on new catalyst information, addition of two (2) new compressor engines, increase the glycol dehydrator throughputs, and remove the fuel limit on the compressor engines. The removal of the fuel limit results in the facility no longer being a synthetic minor.

Promoting a healthy environment.

DESCRIPTION OF PROCESS

Permit R13-3184A (Permit Application R13-3184B was withdrawn) was issued to Antero for this facility on April 20, 2015. This proposed permitting action results in the following:

- Updating compressor engine emissions to reflect catalyst data based on a new catalyst design from the manufacturer
- The installation of two new compressor engines and associated blowdown events
- Eliminating the compressor fuel use limit and synthetic minor status
- Increasing the dehydrator throughput to 72.5 MMscfd per dehydrator
- Modifying the dehydrator flash tank control efficiency based on new standardized guidance from WVDEP

The following process description was taken from Permit Application R13-3184C:

The Monroe Compressor Station is located in Tyler County, West Virginia. Gas from surrounding pipelines enters the facility through one (1) receiver and associated slug catcher. From there, the gas is metered and routed through a scrubber and filter separator. Any produced liquids from the scrubber or separator are sent to the 400 barrel settling tank (TK-1502). Gas from the filter separator is sent to one (1) of thirteen (13) 1,680 hp Waukesha compressor engines (C-100 – C-1300). The thirteen (13) compressor engines are controlled with non-selective catalytic reduction (NSCR) catalysts and air-fuel ratio controllers (1C – 11C, 15C, 16C). Produced fluids are routed to the settling tank and gas going to one of the two (2) triethylene glycol (TEG) dehydrators.

Each TEG dehydrator (DEHY1 – DEHY2) contains a flash gas tank and 1.5 million British Thermal Units per hour (MMBtu/hr) reboiler. Each dehydrator has a design rate of 72.5 million standard cubic feet per day (MMscf/day). Within the dehydrator unit, vent gas from the flash gas tank (DFLSH1 – DFLSH2) is routed to the reboiler (DREB1 – DREB2) and used as fuel. In the case where the flash tank gas cannot be used by the reboiler due to excess gas or the reboiler being offline, the gas will be sent to the vapor recovery units (VRUs) (VRU-100 and VRU-200) via the storage tanks (TK-1500 – TK-1502, TK-200 – TK-201) and thus controlled by 98%. Emissions from each reboiler are routed to the atmosphere. The dehydrator still vents (DEHY1 – DEHY2) are controlled by a flare with at least 98% control efficiency (FLARE1). Produced fluids from the dehydrator are routed to the settling tank. The dry gas from the dehydration process is either routed to a fuel gas scrubber, metered, and routed to the compressors as fuel gas or metered and sent to plant discharge.

All produced fluids enter one (1) 400 barrel settling tank (TK-1502) where the fluids settle out as either condensate or produced water. The produced water goes to two (2) 400 barrel produced water tanks (TK-1500 – TK-1501) and the condensate goes to two (2) 400 barrel condensate tanks (TK-200 – TK-201). Flashing only occurs at the settling tank as the fluids stabilize in the settling tank before going to the other storage tanks. All five (5) tanks are connected to a VRU (VRU-100) where tank vapors are collected and recycled back into the gas system right before the initial filter scrubber. A second VRU (VRU-200) is also connected to the tank as a backup unit. The produced fluids are trucked out via tanker trucks as needed (LDOUT1). The

anticipated production is 150 barrels per day of condensate and 45 barrels per day of produced water.

Two (2) natural gas microturbine generators, each rated at 600 kWe, supply power to the facility (GEN1 – GEN2). Each 600 kWe generator is actually comprised of three smaller units, each rated at 200 kWe. All generators (six 200 kWe) are wired together and operation between individual 200 kWe engines will rotate based on functionality of engines. No more than 600 kWe will be operational at any given time, except when units are being switched. Each individual engine will continuously record hours of operation and will be used interchangeably. A small 24,000 Btu/hr catalytic heater (CATHT-1) is used to heat fuel to power the generators.

There are also small storage tanks (1,000 to 2,000 gallons) located at the facility. Their ID number, description, and exact size are listed in the table below. Fugitive emissions from component leaks and emissions from venting or blowdown events also occur.

Tank ID	Storage Tank Description	Storage Tank Capacity (gal)
TK-300	Compressor Skid Settling Tank	1,000
TK-301	Used Oil Tank	1,000
TK-104	TEG Make-Up Tank	1,000
TK-106	Compressor Coolant Tank	2,000
TK-107	Engine Lube Oil Tank	2,000
TK-108	Compressor Lube Oil Tank	2,000

SITE INSPECTION

A site inspection was conducted on September 15, 2015 by Doug Hammell of the DAQ Enforcement Section. According to Mr. Hammell, facility was operating in compliance.

Directions as given in the permit application are as follows:

From Alma, WV on WV-18, turn west on Conaway Run Road (CR 48). After 1.6 miles, the facility entrance is on the right.

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. The following table indicates which methodology was used in the emissions determination:

Emission Unit ID#	Process Equipment	Calculation Methodology
C-100 – C-1300	1,680 hp Waukesha 7044 GSI Reciprocating Internal Combustion Engine (RICE) w/ NSCR	Manufacturer’s Data, EPA AP-42 Emission Factors
GEN1, GEN2	600 kW Capstone C200 NG Microturbine Generators	Manufacturer’s Data, EPA AP-42 Emission Factors
CATHT1	0.024 MMBTU/hr Catalytic Heater	EPA AP-42 Emission Factors
DEHY1, DEHY2	72.5 mmscfd TEG Dehydrator Still Vent w/ Condenser/Recycle and Flare	GRI-GlyCalc 4.0
DREB1, DREB2	1.5 MMBtu/hr TEG Dehydrator Reboiler	EPA AP-42 Emission Factors
TK-1500, TK-1501	400 bbl (16,800 gal) Produced Water Storage Tanks	EPA Tanks 4.09d
TK-1502	400 bbl (16,800 gal) Produced Water/Condensate Settling Tank	EPA Tanks 4.09d and ProMax Simulation (Flashing)
TK-200, TK-201	400 bbl (16,800 gal) Condensate Storage Tanks	EPA Tanks 4.09d
TK-300	1,000 gal Compressor Skid Settling Tank	Negligible
TK-301	1,000 gal Used Oil Tank	Negligible
TK-104	1,000 gal TEG Make-Up Tank	Negligible
TK-106	2,000 gal Compressor Coolant Tank	Negligible
TK-107	2,000 gal Engine Lube Oil Tank	Negligible
TK-108	2,000 gal Compressor Lube Oil Tank	Negligible
LDOUT1	71,175 bbl/yr (2,989,350 gal/yr) Product Loadout Rack	EPA AP-42 Emission Factors
VRU-100	Vapor Recovery Unit #1	Electric Driven
VRU-200	Vapor Recovery Unit #2	Electric Driven
FLARE1	4.8 MMBTU/hr Flare Control Device	EPA AP-42 Emission Factors

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

Emission Unit	Pollutant	Control Device	Control Efficiency
1,680 hp Waukesha 7044 GSI RICE w/ NSCR (C-100 – C-1300)	Nitrogen Oxides	NSCR	97.5 %
	Carbon Monoxide		97.5 %
	Volatile Organic Compounds		84 %
	Formaldehyde		90 %
	Methane		70 %
72.5 mmscfd TEG Dehydrator Still Vents (DEHY1, DEHY2)	Volatile Organic Compounds	Flare	98 %
	Hazardous Air Pollutants		98 %
72.5 mmscfd TEG Dehydrator Flash Tanks	Volatile Organic Compounds	Recycled Reboiler/ Condenser w VRU backup	98 %
	Hazardous Air Pollutants		98 %
Product Tanks (T01 – T05)	Volatile Organic Compounds	Vapor Recovery Units	98 %
	Hazardous Air Pollutants		98 %

The total facility PTE for the Monroe Compressor Station is shown in the following table:

Pollutant	R13-3184A PTE (tons/year)	R13-3184C PTE (tons/year)	PTE Change (tons/year)
Nitrogen Oxides	92.60	76.46	-16.14
Carbon Monoxide	94.00	79.17	-14.83
Volatile Organic Compounds	87.65	65.03	-22.62
Particulate Matter-10	12.04	15.87	3.83
Sulfur Dioxide	0.46	0.57	0.11
Total HAPs	11.12	12.79	1.67
Carbon Dioxide Equivalent	95,739	122,598	26,859

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

Antero Midstream LLC – Monroe Compressor Station (R13-3184C)

Emission Point ID#	Source	NO _x		CO		VOC		PM-10		SO ₂		Formaldehyde		Total HAPs		CO _{2e} 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	lb/hr	ton/year	
1E	Compressor Engine #1	1.27	5.56	1.18	5.15	0.27	1.19	0.27	1.18	<0.01	0.04	0.02	0.08	0.18	0.81	8731
2E	Compressor Engine #2	1.27	5.56	1.18	5.15	0.27	1.19	0.27	1.18	<0.01	0.04	0.02	0.08	0.18	0.81	8731
3E	Compressor Engine #3	1.27	5.56	1.18	5.15	0.27	1.19	0.27	1.18	<0.01	0.04	0.02	0.08	0.18	0.81	8731
4E	Compressor Engine #4	1.27	5.56	1.18	5.15	0.27	1.19	0.27	1.18	<0.01	0.04	0.02	0.08	0.18	0.81	8731
5E	Compressor Engine #5	1.27	5.56	1.18	5.15	0.27	1.19	0.27	1.18	<0.01	0.04	0.02	0.08	0.18	0.81	8731
6E	Compressor Engine #6	1.27	5.56	1.18	5.15	0.27	1.19	0.27	1.18	<0.01	0.04	0.02	0.08	0.18	0.81	8731
7E	Compressor Engine #7	1.27	5.56	1.18	5.15	0.27	1.19	0.27	1.18	<0.01	0.04	0.02	0.08	0.18	0.81	8731
8E	Compressor Engine #8	1.27	5.56	1.18	5.15	0.27	1.19	0.27	1.18	<0.01	0.04	0.02	0.08	0.18	0.81	8731
9E	Compressor Engine #9	1.27	5.56	1.18	5.15	0.27	1.19	0.27	1.18	<0.01	0.04	0.02	0.08	0.18	0.81	8731
10E	Compressor Engine #10	1.27	5.56	1.18	5.15	0.27	1.19	0.27	1.18	<0.01	0.04	0.02	0.08	0.18	0.81	8731
11E	Compressor Engine #11	1.27	5.56	1.18	5.15	0.27	1.19	0.27	1.18	<0.01	0.04	0.02	0.08	0.18	0.81	8731
28E	Compressor Engine #12	1.27	5.56	1.18	5.15	0.27	1.19	0.27	1.18	<0.01	0.04	0.02	0.08	0.18	0.81	8731
29E	Compressor Engine #13	1.27	5.56	1.18	5.15	0.27	1.19	0.27	1.18	<0.01	0.04	0.02	0.08	0.18	0.81	8731
12E, 13E	Microturbine Generators	0.24	1.11	0.66	3.06	0.06	0.28	0.04	0.19	0.02	0.10	<0.01	0.02	<0.01	0.03	3698
16E	Dehydrator Reboiler	0.18	0.81	0.15	0.68	0.01	0.04	0.01	0.06	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	771
19E	Dehydrator Reboiler	0.18	0.81	0.15	0.68	0.01	0.04	0.01	0.06	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	771
26E	Flare Combustion	0.33	1.44	1.78	7.79	2.42	10.64	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.34	1.52	2893
20E	Settling Storage Tank	0.00	0.00	0.00	0.00	2.65	11.61	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.36	29
21E, 22E	Condensate Storage Tanks	0.00	0.00	0.00	0.00	0.05	0.21	0.00	0.00	0.00	0.00	0.00	0.00	<0.01	<0.01	2
23E, 24E	Produced Water Storage Tanks	0.00	0.00	0.00	0.00	<0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	<0.01	<0.01	<1
37E	Product Loadout Rack	0.00	0.00	0.00	0.00	77.54	8.15	0.00	0.00	0.00	0.00	0.00	0.00	2.42	0.25	2
47E	Catalytic Heater	<0.01	0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	12
Total Point Source		17.44	76.46	18.08	79.17	86.25	46.46	3.58	15.65	0.13	0.57	0.25	1.07	5.21	12.74	121685
Fugitive	Component Leaks	0.00	0.00	0.00	0.00	1.79	7.84	0.00	0.00	0.00	0.00	0.00	0.00	<0.01	0.02	140
Fugitive	Venting	0.00	0.00	0.00	0.00	NA	10.73	0.00	0.00	0.00	0.00	0.00	0.00	NA	0.03	773
Fugitive	Dust	0.00	0.00	0.00	0.00	0.00	0.00	NA	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0
Total Fugitive		0.00	0.00	0.00	0.00	1.79	18.57	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.05	913
Total Site-wide		17.44	76.46	18.08	79.17	88.04	65.03	3.58	15.87	0.13	0.57	0.25	1.07	5.21	12.79	122598

REGULATORY APPLICABILITY

The following rules apply to this modification:

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)

A 45CSR13 modification permit applies to this source due to the fact that Antero is subject to a substantive requirement under 40CFR60 Subparts JJJJ, OOOO and 40CFR63 Subpart HH. Antero is no longer a synthetic minor due to the increased efficiency of the engine catalysts for nitrogen oxides.

Antero paid the appropriate application fee and published the required legal advertisement for a construction permit application.

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.

45CSR22 (Air Quality Management Fee Program)

Antero is not subject to 45CSR30. The Monroe Compressor Station is subject to 40CFR60 Subparts JJJJ and OOOO, however they are exempt from the obligation to obtain a permit under 40 CFR part 70 or 40 CFR part 71, provided they are not required to obtain a permit for a reason other than their status as an area source.

Antero is required to pay the appropriate annual fees and keep their Certificate to Operate current.

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 1,680 hp Waukesha 7044 GSI RICEs (C-1200, C-1300) were manufactured after the July 1, 2007 date for engines with a maximum rated power capacity greater than or equal to 500 hp.

The 1,680 hp Waukesha 7044 GSI RICEs (C-1200, C-1300) will be subject to the following emission limits: NO_x – 1.0 g/hp-hr (3.70 lb/hr); CO – 2.0 g/hp-hr (7.41 lb/hr); and VOC – 0.7 g/hp-hr (2.59 lb/hr). Based on the manufacturer's specifications for these engines, the emission standards will be met.

The 1,680 hp Waukesha 7044 GSI RICEs (C-100 – C-1300) are not certified by the manufacturer to meet the emission standards listed in 40CFR60 Subpart JJJJ. Therefore, Antero 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)

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 (SO₂) 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 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 Monroe Compressor Station. Therefore, all requirements regarding centrifugal compressors under 40 CFR 60 Subpart OOOO would not apply.

- b. 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 internal combustion engines located at the Monroe Compressor Station that were constructed after August 23, 2011. Therefore, the requirements regarding reciprocating compressors under 40 CFR 60 Subpart OOOO will apply. Antero 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.

c. 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 August 23, 2011. Therefore, all requirements regarding pneumatic controllers under 40 CFR 60 Subpart OOOO would not apply.

- d. 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.

The storage vessels located at the Monroe Compressor Station are controlled by a VRU which will reduce the potential to emit to less than 6 tpy of VOC. Therefore, Antero is not required by this section to further reduce VOC emissions by 95%. Antero is claiming a control efficiency of 98% for the VRU. In able to claim a control efficiency greater than 95%, Antero is required to meet additional design/function requirements. Antero will be required to perform three (3) of the following additional requirements:

- *Additional sensing equipment.*
- *Properly designed bypass system.*
- *Appropriate gas blanket.*
- *A compressor that is suitable and has the ability to vary the drive speed.*

e. 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 §§60.5400, 60.5401, 60.5402, 60.5421 and 60.5422 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 §§60.5400, 60.5401, 60.5402, 60.5421 and 60.5422 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 Monroe 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.

- f. 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 (H₂S) in the acid gas (expressed as sulfur) are required to comply with recordkeeping and reporting requirements specified in §60.5423(c) but are not required to comply with §§60.5405 through 60.5407 and paragraphs 60.5410(g) and 60.5415(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 §§60.5405 through 60.5407, 60.5410(g), 60.5415(g), and 60.5423 of this subpart.

There are no sweetening units at the Monroe Compressor Station. Therefore, all requirements regarding sweetening units under 40 CFR 60 Subpart OOOO 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 Monroe 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 unit is 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 (CE-01 – CE-13) at the Monroe 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 proposed engine meets these standards.

Because these engines are not certified by the manufacturer, Antero will be required to perform an initial performance test within 180 days from startup, and subsequent testing every 8,760 hours or 3 years, whichever comes first.

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 Monroe Compressor Station is located in Tyler County, which is an unclassified county for all criteria pollutants, therefore the Monroe Compressor Station is not applicable to 45CSR19.

As shown in the following table, Antero 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)	Monroe PTE (tpy)	45CSR14 or 45CSR19 Review Required?
Carbon Monoxide	250	NA	79.17	No
Nitrogen Oxides	250	NA	76.46	No
Sulfur Dioxide	250	NA	0.57	No
Particulate Matter 2.5	250	NA	15.65	No
Ozone (VOC)	250	NA	46.46	No

45CSR30 (Requirements for Operating Permits)

Antero is not subject to 45CSR30. The Monroe Compressor Station is subject to 40CFR60 Subparts JJJJ and OOOO, however they are exempt from the obligation to obtain a permit under 40 CFR part 70 or 40 CFR part 71, provided they are not required to obtain a permit for a reason other than their status as an area source.

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

40CFR60 Subpart Kb does not apply to storage vessels with a capacity less than 75 cubic meters. The largest tanks that Antero has proposed to install are 63.60 cubic meters each. Therefore, Antero would not be subject to this rule.

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 Monroe Compressor Station is not a natural gas processing facility, therefore, Antero is not subject to this rule.

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

40CFR60 Subpart KKKK does not apply because there are no stationary combustion turbines at the facility with a heat input at peak load equal to or greater than 10 MMBTU/hr, based on the higher heating value of the fuel (§60.4305).

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 Monroe 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 compound refer to the IRIS database located at www.epa.gov/iris.

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) as seen 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 Monroe Compressor Station is located in Tyler County and will be operated by Antero.

1. The Monroe Compressor Station will operate under SIC code 4923 (Natural Gas Distribution). There are other facilities operated by Antero that share the same two-digit major SIC code of 49 for natural gas distribution. Therefore, the Monroe Compressor Station does share the same SIC code as other Antero facilities.
2. “Contiguous or Adjacent” determinations are made on a case by case basis. These determinations are proximity based, and it is important to focus on this and whether or not it meets the common sense notion of a plant. The terms “contiguous” or “adjacent” are not defined by USEPA. Contiguous has a dictionary definition of being in actual contact; touching along a boundary or at a point. Adjacent has a dictionary definition of not distant; nearby; having a common endpoint or border.

There are no Antero properties in question that are considered to be on contiguous or adjacent property with the Monroe Compressor Station.

3. Common control. The natural gas well sites that supply the incoming natural gas streams to the Monroe Compressor Station are owned and operated by Antero Resources.

Because the facilities are not considered to be on contiguous or adjacent properties, the emissions from the Monroe Compressor Station should not be aggregated with other facilities in determining major source or PSD status.

MONITORING OF OPERATIONS

Antero 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 Subpart HH.
- Monitor the presence of the flare pilot flame with a thermocouple or equivalent.

Antero 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 Subpart HH.
- Maintain records of the flare design evaluation.
- The records shall be maintained on site or in a readily available off-site location maintained by Antero for a period of five (5) years.

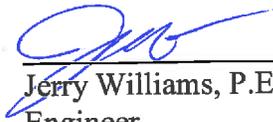
CHANGES TO PERMIT R13-3184A

- Section 1.0 (Emission Units) – Addition of compressor engines (CE-1200 and CE-1300)
- Section 1.0 (Emission Units) – Increase throughput to TEG dehydrators (DEHY1 and DEHY2)
- Section 1.0 (Emission Units) – Modified product loadout throughput
- Section 1.1 (Control Devices) – Modified control efficiencies for engine catalysts and flash tanks to account for VRU backup
- Section 4.1 – Updated LDAR language
- Section 5.0 – Eliminated annual limitation of natural gas consumption rate for engines (C-100 – C-1100). Due to the increased efficiencies of engine catalysts, this synthetic limit is no longer necessary.
- Section 5.0 – Added the two (2) new engines
- Section 5.1.1 – Change in emission limits due to operational conditions of NSCR and annual throughput limitation

- Section 5.1.2 – Updated the maximum yearly operation limitation language for the two (2) microturbines to reflect each 600 kW unit being comprised of 3-200 kW units.
- Section 6.1.1 – Change in throughput for the glycol dehydration units (DEHY1, DEHY2)
- Section 6.1.2 – Change in emission limits due to the increased throughput of the glycol dehydration units (DEHY1, DEHY2)
- Section 8.1.4 – Increase in VOC emissions from Settling Tank T03 to account for ProMax estimation method in lieu of VBE.
- Section 10.0 – Added the two (2) new engines
- Section 11.0 – Added the two (2) new engines
- Section 12.0 – Added the two (2) new engines

RECOMMENDATION TO DIRECTOR

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



Jerry Williams, P.E.
Engineer

MAR 10, 2016

Date

West Virginia Department of Environmental Protection
Earl Ray Tomblin
Governor

Division of Air Quality

Randy C. Huffman
Cabinet Secretary

Permit to Modify



R13- 3184C

This permit is issued in accordance with the West Virginia Air Pollution Control Act (West Virginia Code §§22-5-1 et seq.) and 45 C.S.R. 13 – Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits and Procedures for Evaluation. The permittee identified at the above-referenced facility is authorized to construct the stationary sources of air pollutants identified herein in accordance with all terms and conditions of this permit.

Issued to:

**Antero Midstream LLC
Monroe Compressor Station
095-00037**

William F. Durham
Director

Issued: Draft

This permit supercedes and replaces R13-3184A issued on April 20, 2015..

Facility Location: Alma, Tyler County, West Virginia
Mailing Address: 1615 Wynkoop Street, Denver, CO 80202
Facility Description: Natural gas compressor station
SIC/NAICS Codes: 4923/221210
UTM Coordinates: 511.720 km Easting • 4,363.467 km Northing • Zone 17
Permit Type: Modification
Description of Change: Modification of the engine catalyst efficiencies based on new catalyst information, addition of two (2) new compressor engines, increase the glycol dehydrator throughputs, and remove the fuel limit on the compressor engines. The removal of the fuel limit results in the facility no longer being a synthetic minor.

Any person whose interest may be affected, including, but not necessarily limited to, the applicant and any person who participated in the public comment process, by a permit issued, modified or denied by the Secretary may appeal such action of the Secretary to the Air Quality Board pursuant to article one [§§22B-1-1 et seq.], Chapter 22B of the Code of West Virginia. West Virginia Code §§22-5-14.

The source is not subject to 45CSR30.

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1.0. Emission Units

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed	Design Capacity	Control Device
C-100	1E	Waukesha 7044 GSI Compressor Engine	2014	1,680 HP	NSCR
C-200	2E	Waukesha 7044 GSI Compressor Engine	2014	1,680 HP	NSCR
C-300	3E	Waukesha 7044 GSI Compressor Engine	2014	1,680 HP	NSCR
C-400	4E	Waukesha 7044 GSI Compressor Engine	2014	1,680 HP	NSCR
C-500	5E	Waukesha 7044 GSI Compressor Engine	2014	1,680 HP	NSCR
C-600	6E	Waukesha 7044 GSI Compressor Engine	2014	1,680 HP	NSCR
C-700	7E	Waukesha 7044 GSI Compressor Engine	2014	1,680 HP	NSCR
C-800	8E	Waukesha 7044 GSI Compressor Engine	2014	1,680 HP	NSCR
C-900	9E	Waukesha 7044 GSI Compressor Engine	2014	1,680 HP	NSCR
C-1000	10E	Waukesha 7044 GSI Compressor Engine	2014	1,680 HP	NSCR
C-1100	11E	Waukesha 7044 GSI Compressor Engine	2014	1,680 HP	NSCR
C-1200	28E	Waukesha 7044 GSI Compressor Engine	2016	1,680 HP	NSCR
C-1300	29E	Waukesha 7044 GSI Compressor Engine	2016	1,680 HP	NSCR
GEN1	12E	Capstone C600 NG Microturbine Generator	2014	600 kWe	None
GEN2	13E	Capstone C600 NG Microturbine Generator	2014	600 kWe	None
DEHY1	14E	TEG Dehydration Unit	2014	72.5 mmscfd	FLARE1
DFLSH1	15E	Dehydrator Flash Tank	2014	72.5 mmscfd	Recycle/condenser
DREB1	16E	TEG Dehydration Unit Reboiler	2014	1.5 MMBtu/hr	None
DEHY2	17E	TEG Dehydration Unit	2014	72.5 mmscfd	FLARE1
DFLSH2	18E	Dehydrator Flash Tank	2014	72.5 mmscfd	Recycle/condenser
DREB2	19E	TEG Dehydration Unit Reboiler	2014	1.5 MMBtu/hr	None
TK-1502	20E	Produced Water/Condensate Settling Tank	2014	400 bbl (16,800 gal)	VRU-100/VRU-200 ¹
TK-200	21E	Condensate Storage Tank	2014	400 bbl (16,800 gal)	VRU-100/VRU-200 ¹
TK-201	22E	Condensate Storage Tank	2014	400 bbl (16,800 gal)	VRU-100/VRU-200 ¹
TK-1500	23E	Produced Water Storage Tank	2014	400 bbl (16,800 gal)	VRU-100/VRU-200 ¹
TK-1501	24E	Produced Water Storage Tank	2014	400 bbl (16,800 gal)	VRU-100/VRU-200 ¹

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed	Design Capacity	Control Device
TK-300	TK-300	Compressor Skid Oily Water Storage Tank	2014	1,000 gal	None
TK-301	TK-301	Used Oil Storage Tank	2014	1,000 gal	None
TK-104	TK-104	TEG Make-Up Storage Tank	2014	1,000 gal	None
TK-106	TK-106	Compressor Coolant Storage Tank	2014	2,000 gal	None
TK-107	TK-107	Engine Lube Oil Storage Tank	2014	2,000 gal	None
TK-108	TK-108	Compressor Lube Oil Storage Tank	2014	2,000 gal	None
LDOUT1	25E	Product Loadout Rack	2014	71,175 bbl/yr ²	None
CATHT1	27E	Catalytic Heater	2014	0.024 MMBTU/hr	None
FLARE1	26E	Flare Combustion Device	2014	4.8 MMBTU/hr	NA

1 – Working, Breathing, and Flashing losses routed to Vapor Recovery Unit (VRU)-100 for recirculation back into the process. VRU-200 is used as a back-up in case of VRU-100 malfunction.
 2 – 54,750 bbl/yr Condensate and 16,425 bbl/yr Produced Water

1.1. Control Devices

Emission Unit	Pollutant	Control Device	Control Efficiency
1,680 hp Waukesha 7044 GSI RICE w/ NSCR (C-100 – C-1300)	Nitrogen Oxides	NSCR	97.5 %
	Carbon Monoxide		97.5 %
	Volatile Organic Compounds		84 %
	Formaldehyde		90 %
72.5 mmscfd TEG Dehydrator Still Vents (DEHY1, DEHY2)	Volatile Organic Compounds	Flare	98 %
	Hazardous Air Pollutants		98 %
72.5 mmscfd TEG Dehydrator Flash Tanks (DFLSH1, DFLSH2)	Volatile Organic Compounds	Recycled Reboiler/ Condenser	98 %
	Hazardous Air Pollutants		98 %
Product Tanks (TK-1502, TK-200, TK-201, TK-1500, TK-1501)	Volatile Organic Compounds	Vapor Recovery Unit	98 %
	Hazardous Air Pollutants		98 %

2.0. General Conditions

2.1. Definitions

- 2.1.1. All references to the “West Virginia Air Pollution Control Act” or the “Air Pollution Control Act” mean those provisions contained in W.Va. Code §§ 22-5-1 to 22-5-18.
- 2.1.2. The “Clean Air Act” means those provisions contained in 42 U.S.C. §§ 7401 to 7671q, and regulations promulgated thereunder.
- 2.1.3. “Secretary” means the Secretary of the Department of Environmental Protection or such other person to whom the Secretary has delegated authority or duties pursuant to W.Va. Code §§ 22-1-6 or 22-1-8 (45CSR§30-2.12.). The Director of the Division of Air Quality is the Secretary’s designated representative for the purposes of this permit.

2.2. Acronyms

CAAA	Clean Air Act Amendments	NO_x	Nitrogen Oxides
CBI	Confidential Business Information	NSPS	New Source Performance Standards
CEM	Continuous Emission Monitor	PM	Particulate Matter
CES	Certified Emission Statement	PM_{2.5}	Particulate Matter less than 2.5 µm in diameter
C.F.R. or CFR	Code of Federal Regulations	PM₁₀	Particulate Matter less than 10µm in diameter
CO	Carbon Monoxide	Ppb	Pounds per Batch
C.S.R. or CSR	Codes of State Rules	Pph	Pounds per Hour
DAQ	Division of Air Quality	Ppm	Parts per Million
DEP	Department of Environmental Protection	Ppmv or ppmv	Parts per Million by Volume
dscm	Dry Standard Cubic Meter	PSD	Prevention of Significant Deterioration
FOIA	Freedom of Information Act	Psi	Pounds per Square Inch
HAP	Hazardous Air Pollutant	SIC	Standard Industrial Classification
HON	Hazardous Organic NESHAP	SIP	State Implementation Plan
HP	Horsepower	SO₂	Sulfur Dioxide
lbs/hr	Pounds per Hour	TAP	Toxic Air Pollutant
LDAR	Leak Detection and Repair	TPY	Tons per Year
M	Thousand	TRS	Total Reduced Sulfur
MACT	Maximum Achievable Control Technology	TSP	Total Suspended Particulate
MDHI	Maximum Design Heat Input	USEPA	United States Environmental Protection Agency
MM	Million	UTM	Universal Transverse Mercator
MMBtu/hr or mmbtu/hr	Million British Thermal Units per Hour	VEE	Visual Emissions Evaluation
MMCF/hr or mmcf/hr	Million Cubic Feet per Hour	VOC	Volatile Organic Compounds
NA	Not Applicable	VOL	Volatile Organic Liquids
NAAQS	National Ambient Air Quality Standards		
NESHAPS	National Emissions Standards for Hazardous Air Pollutants		

2.3. Authority

This permit is issued in accordance with West Virginia air pollution control law W.Va. Code §§ 22-5-1. et seq. and the following Legislative Rules promulgated thereunder:

- 2.3.1. 45CSR13 – *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits and Procedures for Evaluation;*

2.4. Term and Renewal

- 2.4.1. This permit supercedes and replaces R13-3184A. This Permit shall remain valid, continuous and in effect unless it is revised, suspended, revoked or otherwise changed under an applicable provision of 45CSR13 or any other applicable legislative rule;

2.5. Duty to Comply

- 2.5.1. The permitted facility shall be constructed and operated in accordance with the plans and specifications filed in Permit Applications R13-3184, R13-3184A, R13-3184C and any modifications, administrative updates, or amendments thereto. The Secretary may suspend or revoke a permit if the plans and specifications upon which the approval was based are not adhered to;
[45CSR§§13-5.11 and -10.3.]
- 2.5.2. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the West Virginia Code and the Clean Air Act and is grounds for enforcement action by the Secretary or USEPA;
- 2.5.3. Violations of any of the conditions contained in this permit, or incorporated herein by reference, may subject the permittee to civil and/or criminal penalties for each violation and further action or remedies as provided by West Virginia Code 22-5-6 and 22-5-7;
- 2.5.4. Approval of this permit does not relieve the permittee herein of the responsibility to apply for and obtain all other permits, licenses, and/or approvals from other agencies; i.e., local, state, and federal, which may have jurisdiction over the construction and/or operation of the source(s) and/or facility herein permitted.

2.6. Duty to Provide Information

The permittee shall furnish to the Secretary within a reasonable time any information the Secretary may request in writing to determine whether cause exists for administratively updating, modifying, revoking, or terminating the permit or to determine compliance with the permit. Upon request, the permittee shall also furnish to the Secretary copies of records to be kept by the permittee. For information claimed to be confidential, the permittee shall furnish such records to the Secretary along with a claim of confidentiality in accordance with 45CSR31. If confidential information is to be sent to USEPA, the permittee shall directly provide such information to USEPA along with a claim of confidentiality in accordance with 40 C.F.R. Part 2.

2.7. Duty to Supplement and Correct Information

Upon becoming aware of a failure to submit any relevant facts or a submittal of incorrect information in any permit application, the permittee shall promptly submit to the Secretary such supplemental facts or corrected information.

2.8. Administrative Update

The permittee may request an administrative update to this permit as defined in and according to the procedures specified in 45CSR13.
[45CSR§13-4.]

2.9. Permit Modification

The permittee may request a minor modification to this permit as defined in and according to the procedures specified in 45CSR13.
[45CSR§13-5.4.]

2.10 Major Permit Modification

The permittee may request a major modification as defined in and according to the procedures specified in 45CSR14 or 45CSR19, as appropriate.
[45CSR§13-5.1]

2.11. Inspection and Entry

The permittee shall allow any authorized representative of the Secretary, upon the presentation of credentials and other documents as may be required by law, to perform the following:

- a. At all reasonable times (including all times in which the facility is in operation) enter upon the permittee's premises where a source is located or emissions related activity is conducted, or where records must be kept under the conditions of this permit;
- b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
- c. Inspect at reasonable times (including all times in which the facility is in operation) any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under the permit;
- d. Sample or monitor at reasonable times substances or parameters to determine compliance with the permit or applicable requirements or ascertain the amounts and types of air pollutants discharged.

2.12. Emergency

- 2.12.1. An "emergency" means any situation arising from sudden and reasonable unforeseeable events beyond the control of the source, including acts of God, which situation requires immediate corrective action to restore normal operation, and that causes the source to exceed a technology-based emission limitation under the permit, due to unavoidable increases in emissions attributable to the emergency. An emergency shall not include noncompliance to the extent caused by

improperly designed equipment, lack of preventative maintenance, careless or improper operation, or operator error.

- 2.12.2. Effect of any emergency. An emergency constitutes an affirmative defense to an action brought for noncompliance with such technology-based emission limitations if the conditions of Section 2.12.3 are met.
- 2.12.3. The affirmative defense of emergency shall be demonstrated through properly signed, contemporaneous operating logs, or other relevant evidence that:
 - a. An emergency occurred and that the permittee can identify the cause(s) of the emergency;
 - b. The permitted facility was at the time being properly operated;
 - c. During the period of the emergency the permittee took all reasonable steps to minimize levels of emissions that exceeded the emission standards, or other requirements in the permit; and
 - d. The permittee submitted notice of the emergency to the Secretary within one (1) working day of the time when emission limitations were exceeded due to the emergency and made a request for variance, and as applicable rules provide. This notice must contain a detailed description of the emergency, any steps taken to mitigate emissions, and corrective actions taken.
- 2.12.4. In any enforcement proceeding, the permittee seeking to establish the occurrence of an emergency has the burden of proof.
- 2.12.5. The provisions of this section are in addition to any emergency or upset provision contained in any applicable requirement.

2.13. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a permittee in an enforcement action that it should have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. However, nothing in this paragraph shall be construed as precluding consideration of a need to halt or reduce activity as a mitigating factor in determining penalties for noncompliance if the health, safety, or environmental impacts of halting or reducing operations would be more serious than the impacts of continued operations.

2.14. Suspension of Activities

In the event the permittee should deem it necessary to suspend, for a period in excess of sixty (60) consecutive calendar days, the operations authorized by this permit, the permittee shall notify the Secretary, in writing, within two (2) calendar weeks of the passing of the sixtieth (60) day of the suspension period.

2.15. Property Rights

This permit does not convey any property rights of any sort or any exclusive privilege.

2.16. Severability

The provisions of this permit are severable and should any provision(s) be declared by a court of competent jurisdiction to be invalid or unenforceable, all other provisions shall remain in full force and effect.

2.17. Transferability

This permit is transferable in accordance with the requirements outlined in Section 10.1 of 45CSR13. [45CSR§13-10.1.]

2.18. Notification Requirements

The permittee shall notify the Secretary, in writing, no later than thirty (30) calendar days after the actual startup of the operations authorized under this permit.

2.19. Credible Evidence

Nothing in this permit shall alter or affect the ability of any person to establish compliance with, or a violation of, any applicable requirement through the use of credible evidence to the extent authorized by law. Nothing in this permit shall be construed to waive any defense otherwise available to the permittee including, but not limited to, any challenge to the credible evidence rule in the context of any future proceeding.

3.0. Facility-Wide Requirements

3.1. Limitations and Standards

- 3.1.1. **Open burning.** The open burning of refuse by any person, firm, corporation, association or public agency is prohibited except as noted in 45CSR§6-3.1.
[45CSR§6-3.1.]
- 3.1.2. **Open burning exemptions.** The exemptions listed in 45CSR§6-3.1 are subject to the following stipulation: Upon notification by the Secretary, no person shall cause, suffer, allow or permit any form of open burning during existing or predicted periods of atmospheric stagnation. Notification shall be made by such means as the Secretary may deem necessary and feasible.
[45CSR§6-3.2.]
- 3.1.3. **Asbestos.** The permittee is responsible for thoroughly inspecting the facility, or part of the facility, prior to commencement of demolition or renovation for the presence of asbestos and complying with 40 C.F.R. § 61.145, 40 C.F.R. § 61.148, and 40 C.F.R. § 61.150. The permittee, owner, or operator must notify the Secretary at least ten (10) working days prior to the commencement of any asbestos removal on the forms prescribed by the Secretary if the permittee is subject to the notification requirements of 40 C.F.R. § 61.145(b)(3)(i). The USEPA, the Division of Waste Management, and the Bureau for Public Health - Environmental Health require a copy of this notice to be sent to them.
[40CFR§61.145(b) and 45CSR§34]
- 3.1.4. **Odor.** No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public.
[45CSR§4-3.1] *[State Enforceable Only]*
- 3.1.5. **Permanent shutdown.** A source which has not operated at least 500 hours in one 12-month period within the previous five (5) year time period may be considered permanently shutdown, unless such source can provide to the Secretary, with reasonable specificity, information to the contrary. All permits may be modified or revoked and/or reapplication or application for new permits may be required for any source determined to be permanently shutdown.
[45CSR§13-10.5.]
- 3.1.6. **Standby plan for reducing emissions.** When requested by the Secretary, the permittee shall prepare standby plans for reducing the emissions of air pollutants in accordance with the objectives set forth in Tables I, II, and III of 45CSR11.
[45CSR§11-5.2.]

3.2. Monitoring Requirements

[Reserved]

3.3. Testing Requirements

- 3.3.1. **Stack testing.** As per provisions set forth in this permit or as otherwise required by the Secretary, in accordance with the West Virginia Code, underlying regulations, permits and orders, the permittee shall conduct test(s) to determine compliance with the emission limitations set forth in this permit and/or established or set forth in underlying documents. The Secretary, or his duly authorized representative, may at his option witness or conduct such test(s). Should the Secretary exercise his option to conduct such test(s), the operator shall provide all necessary sampling

connections and sampling ports to be located in such manner as the Secretary may require, power for test equipment and the required safety equipment, such as scaffolding, railings and ladders, to comply with generally accepted good safety practices. Such tests shall be conducted in accordance with the methods and procedures set forth in this permit or as otherwise approved or specified by the Secretary in accordance with the following:

- a. The Secretary may on a source-specific basis approve or specify additional testing or alternative testing to the test methods specified in the permit for demonstrating compliance with 40 C.F.R. Parts 60, 61, and 63 in accordance with the Secretary's delegated authority and any established equivalency determination methods which are applicable. If a testing method is specified or approved which effectively replaces a test method specified in the permit, the permit may be revised in accordance with 45CSR§13-4. or 45CSR§13-5.4 as applicable.
- b. The Secretary may on a source-specific basis approve or specify additional testing or alternative testing to the test methods specified in the permit for demonstrating compliance with applicable requirements which do not involve federal delegation. In specifying or approving such alternative testing to the test methods, the Secretary, to the extent possible, shall utilize the same equivalency criteria as would be used in approving such changes under Section 3.3.1.a. of this permit. If a testing method is specified or approved which effectively replaces a test method specified in the permit, the permit may be revised in accordance with 45CSR§13-4. or 45CSR§13-5.4 as applicable.
- c. All periodic tests to determine mass emission limits from or air pollutant concentrations in discharge stacks and such other tests as specified in this permit shall be conducted in accordance with an approved test protocol. Unless previously approved, such protocols shall be submitted to the Secretary in writing at least thirty (30) days prior to any testing and shall contain the information set forth by the Secretary. In addition, the permittee shall notify the Secretary at least fifteen (15) days prior to any testing so the Secretary may have the opportunity to observe such tests. This notification shall include the actual date and time during which the test will be conducted and, if appropriate, verification that the tests will fully conform to a referenced protocol previously approved by the Secretary.
- d. The permittee shall submit a report of the results of the stack test within sixty (60) days of completion of the test. The test report shall provide the information necessary to document the objectives of the test and to determine whether proper procedures were used to accomplish these objectives. The report shall include the following: the certification described in paragraph 3.5.1.; a statement of compliance status, also signed by a responsible official; and, a summary of conditions which form the basis for the compliance status evaluation. The summary of conditions shall include the following:
 1. The permit or rule evaluated, with the citation number and language;
 2. The result of the test for each permit or rule condition; and,
 3. A statement of compliance or noncompliance with each permit or rule condition.

[WV Code § 22-5-4(a)(14-15) and 45CSR13]

3.4. Recordkeeping Requirements

- 3.4.1. **Retention of records.** The permittee shall maintain records of all information (including monitoring data, support information, reports, and notifications) required by this permit recorded in a form suitable and readily available for expeditious inspection and review. Support information includes all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation. The files shall be maintained for at least five (5) years following the date of each occurrence, measurement, maintenance, corrective action, report, or record. At a minimum, the most recent two (2) years of data shall be maintained on site. The remaining three (3) years of data may be maintained off site, but must remain accessible within a reasonable time. Where appropriate, the permittee may maintain records electronically (on a computer, on computer floppy disks, CDs, DVDs, or magnetic tape disks), on microfilm, or on microfiche.
- 3.4.2. **Odors.** For the purposes of 45CSR4, the permittee shall maintain a record of all odor complaints received, any investigation performed in response to such a complaint, and any responsive action(s) taken.
[45CSR§4. State Enforceable Only.]

3.5. Reporting Requirements

- 3.5.1. **Responsible official.** Any application form, report, or compliance certification required by this permit to be submitted to the DAQ and/or USEPA shall contain a certification by the responsible official that states that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.
- 3.5.2. **Confidential information.** A permittee may request confidential treatment for the submission of reporting required by this permit pursuant to the limitations and procedures of W.Va. Code § 22-5-10 and 45CSR31.
- 3.5.3. **Correspondence.** All notices, requests, demands, submissions and other communications required or permitted to be made to the Secretary of DEP and/or USEPA shall be made in writing and shall be deemed to have been duly given when delivered by hand, or mailed first class with postage prepaid to the address(es) set forth below or to such other person or address as the Secretary of the Department of Environmental Protection may designate:

If to the DAQ:
Director
WVDEP
Division of Air Quality
601 57th Street
Charleston, WV 25304-2345

If to the US EPA:
Associate Director
Office of Air Enforcement and Compliance
Assistance
(3AP20)
U.S. Environmental Protection Agency
Region III
1650 Arch Street
Philadelphia, PA 19103-2029

3.5.4. Operating Fee

- 3.5.4.1. In accordance with 45CSR22 – Air Quality Management Fee Program, the permittee shall not operate nor cause to operate the permitted facility or other associated facilities on the same or contiguous sites comprising the plant without first obtaining and having in current effect a

Certificate to Operate (CTO). Such Certificate to Operate (CTO) shall be renewed annually, shall be maintained on the premises for which the certificate has been issued, and shall be made immediately available for inspection by the Secretary or his/her duly authorized representative.

- 3.5.5. **Emission inventory.** At such time(s) as the Secretary may designate, the permittee herein shall prepare and submit an emission inventory for the previous year, addressing the emissions from the facility and/or process(es) authorized herein, in accordance with the emission inventory submittal requirements of the Division of Air Quality. After the initial submittal, the Secretary may, based upon the type and quantity of the pollutants emitted, establish a frequency other than on an annual basis.

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4.0. Source-Specific Requirements

4.1. Limitations and Standards

- 4.1.1. **Record of Monitoring.** The permittee shall keep records of monitoring information that include the following:
- The date, place as defined in this permit, and time of sampling or measurements;
 - The date(s) analyses were performed;
 - The company or entity that performed the analyses;
 - The analytical techniques or methods used;
 - The results of the analyses; and
 - The operating conditions existing at the time of sampling or measurement.
- 4.1.2. **Minor Source of Hazardous Air Pollutants (HAP).** HAP emissions from the facility shall be less than 10 tons/year of any single HAP or 25 tons/year of any combination of HAPs. Compliance with this Section shall ensure that the facility is a minor HAP source.
- 4.1.3. **Operation and Maintenance of Air Pollution Control Equipment.** The permittee shall, to the extent practicable, install, maintain, and operate all pollution control equipment listed in Section 1.0 and associated monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions, or comply with any more stringent limits set forth in this permit or as set forth by any State rule, Federal regulation, or alternative control plan approved by the Secretary.
[45CSR§13-5.11.]
- 4.1.4. **Record of Malfunctions of Air Pollution Control Equipment.** For all air pollution control equipment listed in Section 1.0, the permittee shall maintain records of the occurrence and duration of any malfunction or operational shutdown of the air pollution control equipment during which excess emissions occur. For each such case, the following information shall be recorded:
- The equipment involved.
 - Steps taken to minimize emissions during the event.
 - The duration of the event.
 - The estimated increase in emissions during the event.
- For each such case associated with an equipment malfunction, the additional information shall also be recorded:
- The cause of the malfunction.
 - Steps taken to correct the malfunction.
 - Any changes or modifications to equipment or procedures that would help prevent future recurrences of the malfunction.
- 4.1.5. Only those emission units/sources as identified in Table 1.0, with the exception of any *de minimis* sources as identified under Table 45-13B of 45CSR13, are authorized at the permitted facility.
- 4.1.6. The permittee shall install, maintain, and operate all above-ground piping, valves, pumps, etc. that service lines in the transport of potential sources of regulated air pollutants to minimize any fugitive escape of regulated air pollutants (leak). Any above-ground piping, valves, pumps, etc. that shows signs of excess wear and that have a reasonable potential for fugitive emissions of regulated air pollutants shall be replaced.

- 4.1.7. The permittee shall monitor and maintain quarterly records (calendar year) for each facility component that was inspected for fugitive escape of regulated air pollutants. Each component shall operate with no detectable emissions, as determined using audio-visual-olfactory (AVO) inspections, USEPA 40CFR60 Method 21, USEPA alternative work practice to detect leaks from equipment using optical gas imaging (OGI) camera (ex. FLIR camera), or some combination thereof. AVO inspections shall include, but not limited to, defects as visible cracks, holes, or gaps in piping; loose connections; liquid leaks; or broken or missing caps or other closure devices. If permittee uses USEPA Method 21, then no detectable emissions is defined as less than 500 ppm in accordance with Method 21. If permittee uses an OGI camera, then no detectable emissions is defined as no visible leaks detected in accordance with USEPA alternative OGI work practices.

If any leak is detected, the permittee shall repair the leak as soon as possible. The first attempt at repair must be made within five (5) calendar days of discovering the leak, and the final repair must be made within fifteen (15) calendar days of discovering the leak. The permittee shall record each leak detected and the associated repair. The leak will not be considered repaired until the same monitoring method or a more detailed instrument determines the leak is repaired.

Delay of repair of a closed vent system for which leaks or defects have been detected is allowed if the repair is technically infeasible without a shutdown, or if you determine that emissions resulting from immediate repair would be greater than the fugitive emissions likely to result from delay of repair. You must complete repair of such equipment by the end of the next shutdown.
[45CSR§13-5.11.]

5.0. Source-Specific Requirements (C-100 – C-1300, GEN1 – GEN2)

5.1. Limitations and Standards

5.1.1. Maximum emissions from each of the 1,680 hp natural gas fired reciprocating engines equipped with NSCR, Waukesha 7044 GSI (C-100 – C-1300) shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (ton/year)
Nitrogen Oxides	1.27	5.56
Carbon Monoxide	1.18	5.15
Volatile Organic Compounds	0.27	1.19
Formaldehyde	0.02	0.08

5.1.2. **Maximum Yearly Operation Limitation.** The two (2) 600 kW natural gas fired microturbine generators, Capstone C600 (GEN1, GEN2) are comprised of six (6) 200 kW individual generators and engines. The maximum combined yearly hours of operation for the six (6) individual hour meters on the six (6) 200 kW natural gas fired microturbine generators enclosed within the two Capstone C600 (GEN1, GEN2) shall not exceed 27,780 hours per year. Compliance with the Maximum Yearly Operation Limitation shall be determined using a twelve month rolling total. A twelve month rolling total shall mean the sum of the six (6) meters of the hours of operation at any given time during the previous twelve consecutive calendar months.

5.1.3 Maximum emissions from the two (2) 600 kW natural gas fired microturbine generators, Capstone C600 (GEN1, GEN2) shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (ton/year)
Nitrogen Oxides	0.24	1.11
Carbon Monoxide	0.66	3.06
Volatile Organic Compounds	0.06	0.28
Carbon Dioxide Equivalents	799	3,698

5.1.4. Requirements for Use of Catalytic Reduction Devices (NSCR for C-100 – C-1300)

- a. Rich-burn natural gas compressor engines (C-100 – C-1300) equipped with non-selective catalytic reduction (NSCR) air pollution control device shall be fitted with a closed-loop, automatic air/fuel ratio controller to ensure emissions of regulated pollutants do not exceed the potential to emit for any engine/NSCR combination under varying load. The closed-loop, automatic air/fuel ratio controller shall control a fuel metering valve to deliver additional fuel when required to ensure a fuel-rich mixture and a resultant exhaust oxygen content of less than or equal to 0.5%. The automatic air/fuel ratio controller shall also incorporate dual-point exhaust gas temperature and oxygen sensors which provide temperature and exhaust oxygen content differential feedback. Such controls shall ensure proper and efficient operation of the engine and NSCR air pollution control device;
- b. The automatic air/fuel ratio controller or closed-loop automatic feedback controller shall provide a warning or indication to the operator and/or be interlocked with the engine ignition

system to cease engine operation in case of a masking, poisoning or overrich air/fuel ratio situation which results in performance degradation or failure of the catalyst element; and

- c. No person shall knowingly:
 1. Remove or render inoperative any air pollution or auxiliary air pollution control device installed subject to the requirements of this permit;
 2. Install any part or component when the principal effect of the part or component is to bypass, defeat or render inoperative any air pollution control device or auxiliary air pollution control device installed subject to the requirements of this permit; or
 3. Cause or allow engine exhaust gases to bypass any catalytic reduction device.

5.2. Monitoring Requirements

5.2.1. Catalytic Oxidizer Control Devices (NSCR for C-100 – C-1300)

- a. The permittee shall regularly inspect, properly maintain and/or replace catalytic reduction devices and auxiliary air pollution control devices to ensure functional and effective operation of the engine's physical and operational design. The permittee shall ensure proper operation, maintenance and performance of catalytic reduction devices and auxiliary air pollution control devices by:
 1. Maintaining proper operation of the automatic air/fuel ratio controller or automatic feedback controller.
 2. Following operating and maintenance recommendations of the catalyst element manufacturer.

5.3. Testing Requirements

- 5.3.1. See Facility-Wide Testing Requirements Section 3.3 and Testing Requirements of Sections 10.5, 11.2, and 11.3.

5.4. Recordkeeping Requirements

- 5.4.1. To demonstrate compliance with sections 5.1.1 – 5.1.3, the permittee shall maintain records of the amount and type of fuel consumed in each engine and microturbine generator and the hours of operation of each engine and microturbine generator. Said records shall be maintained on site or in a readily accessible off-site location maintained by the permittee for a period of five (5) years. Said records shall be readily available to the Director of the Division of Air Quality or his/her duly authorized representative for expeditious inspection and review. Any records submitted to the agency pursuant to a requirement of this permit or upon request by the Director shall be certified by a responsible official.
- 5.4.2. To demonstrate compliance with section 5.1.4 the permittee shall maintain records of all catalytic reduction device maintenance. Said records shall be maintained on site or in a readily accessible off-site location maintained by the permittee for a period of five (5) years. Said records shall be readily available to the Director of the Division of Air Quality or his/her duly authorized representative for expeditious inspection and review. Any records submitted to the agency pursuant to a requirement of this permit or upon request by the Director shall be certified by a responsible official.

5.5. Reporting Requirements

- 5.5.1. See Facility-Wide Reporting Requirements Section 3.5 and Reporting Requirements of Sections 10.6 and 11.4.

6.0. Source-Specific Hazardous Air Pollutant Requirements (Natural Gas Dehydration Units Not Subject to MACT Standards and being controlled by a Flare Control Device)

6.1. Limitations and Standards

6.1.1. **Maximum Throughput Limitation.** The maximum wet natural gas throughput to the TEG dehydration units/still columns (DEHY1, DEHY2) shall not exceed 72.5 million standard cubic feet per day (mmscfd). Compliance with the Maximum Throughput Limitation shall be determined using a twelve month rolling total. A twelve month rolling total shall mean the sum of the monthly throughput at any given time during the previous twelve consecutive calendar months.

6.1.2. Maximum emissions from the flare shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (ton/year)
Volatile Organic Compounds	2.42	10.64
Nitrogen Oxides	0.33	1.44
Carbon Monoxide	1.78	7.79

6.1.3. The flare subject to this section shall be designed and operated in accordance with the following:

- a. Flare shall be non-assisted.
- b. Flare shall be designed for and operated with no visible emissions, except for periods not to exceed a total of 5 minutes during any 2 consecutive hours.
- c. Flare shall be operated, with a flame present at all times whenever emissions may be vented to them, except during SSM (Startup, Shutdown, Malfunctions) events.
- d. A flare shall be used only where the net heating value of the gas being combusted is 11.2 MJ/scm (300 Btu/scf) or greater if the flare is steam-assisted or air-assisted; or where the net heating value of the gas being combusted is 7.45 MJ/scm (200 Btu/scf) or greater if the flares is non-assisted. The net heating value of the gas being combusted in a flare shall be calculated using the following equation:

$$H_T = K \sum_{i=1}^n C_i H_i$$

Where:

H_T=Net heating value of the sample, MJ/scm; where the net enthalpy per mole of off gas is based on combustion at 25 °C and 760 mm Hg, but the standard temperature for determining the volume corresponding to one mole is 20 °C.

K=Constant=

$$1.740 \times 10^{-7} \left(\frac{1}{ppmv} \right) \left(\frac{g\text{-mole}}{scm} \right) \left(\frac{MJ}{kcal} \right)$$

where the standard temperature for (g-mole/scm) is 20 °C.

C_i=Concentration of sample component i in ppmv on a wet basis, which may be measured for organics by Test Method 18, but is not required to be measured using Method 18 (unless designated by the Director).

H_i =Net heat of combustion of sample component i , kcal/g-mole at 25 °C and 760 mm Hg. The heats of combustion may be determined using ASTM D2382-76 or 88 or D4809-95 if published values are not available or cannot be calculated.

n =Number of sample components.

- e. Nonassisted flares shall be designed for and operated with an exit velocity less than 18.3 m/sec (60 ft/sec), except as provided by 6.1.3.f and 6.1.3.g of this section. The actual exit velocity of a flare shall be determined by dividing by the volumetric flow rate of gas being combusted (in units of emission standard temperature and pressure), by the unobstructed (free) cross-sectional area of the flare tip, which may be determined by Test Method 2, 2A, 2C, or 2D in appendix A to 40 CFR part 60, as appropriate, but is not required to be determined using these Methods (unless designated by the Director).
- f. Nonassisted flares designed for and operated with an exit velocity, as determined by the method specified in 6.1.3.e. of this section, equal to or greater than 18.3 m/sec (60 ft/sec) but less than 122 m/sec (400 ft/sec), are allowed if the net heating value of the gas being combusted is greater than 37.3 MJ/scm (1,000 Btu/scf).
- g. Nonassisted flares designed for and operated with an exit velocity, as determined by the method specified in 6.1.3.e. of this section, less than the velocity V_{max} , as determined by the calculation specified in this paragraph, but less than 122 m/sec (400 ft/sec) are allowed. The maximum permitted velocity, V_{max} , for flares complying with this paragraph shall be determined by the following equation:

$$\text{Log}_{10}(V_{max})=(H_T+28.8)/31.7$$

Where:

V_{max} =Maximum permitted velocity, m/sec.

28.8=Constant.

31.7=Constant.

H_T =The net heating value as determined in 6.1.3.d of this section

- 6.1.4. The permittee is not required to conduct a flare compliance assessment for concentration of sample (i.e. Method 18) and tip velocity (i.e. Method 2) until such time as the Director requests a flare compliance assessment to be conducted in accordance with section 6.3.2, but the permittee is required to conduct a flare design evaluation in accordance with section 6.4.2. Alternatively, the permittee may elect to demonstrate compliance with the flare design criteria requirements of section 6.1.3 by complying with the compliance assessment testing requirements of section 6.3.2.
- 6.1.5. Recycled reboilers controlling the Dehydrator Flash Tanks (DFLSH1, DFLSH2) shall be designed and operated in accordance with the following:
 - a. The vapors/overheads from the flash tanks shall be routed through a closed vent system to the reboiler at all times when there is a potential that vapors (emissions) can be generated from the flash tank.
 - b. The reboiler shall only be fired with vapors from the flash tank, and natural gas may be used as supplemental fuel.
 - c. The vapors/overheads from the flash tank shall be introduced into the flame zone of the reboiler.

6.2. Monitoring Requirements

- 6.2.1. In order to demonstrate compliance with the requirements of 6.1.3.c, the permittee shall monitor the presence or absence of a flare pilot flame using a thermocouple or any other equivalent device, except during SSM events.

- 6.2.2. The permittee shall monitor the throughput of wet natural gas fed to the dehydration system on a monthly basis for each glycol dehydration unit.

6.3. Testing Requirements

- 6.3.1. In order to demonstrate compliance with the flare opacity requirements of 6.1.3.b the permittee shall 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. The permittee shall 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.
- 6.3.2. The Director may require the permittee to conduct a flare compliance assessment to demonstrate compliance with section 6.1.3. This compliance assessment testing shall be conducted in accordance with Test Method 18 for organics and Test Method 2, 2A, 2C, or 2D in appendix A to 40 CFR part 60, as appropriate, or other equivalent testing approved in writing by the Director. Also, Test Method 18 may require the permittee to conduct Test Method 4 in conjunction with Test Method 18.
- 6.3.3. In order to demonstrate compliance with 4.1.2, upon request of the Director, the permittee shall demonstrate compliance with the HAP emissions thresholds using GLYCalc Version 3.0 or higher. The permittee shall sample in accordance with GPA Method 2166 and analyze the samples utilizing the extended GPA Method 2286 as specified in the GRI-GLYCalc V4 Technical Reference User Manual and Handbook.

6.4. Recordkeeping Requirements

- 6.4.1. For the purpose of demonstrating compliance with section 6.1.3.c and 6.2.1, the permittee shall maintain records of the times and duration of all periods which the pilot flame was absent.
- 6.4.2. For the purpose of demonstrating compliance with section 6.1.4 and 6.3.2, the permittee shall maintain a record of the flare design evaluation. The flare design evaluation shall include, net heat value calculations, exit (tip) velocity calculations, and all supporting concentration calculations and other related information requested by the Director.
- 6.4.3. For the purpose of demonstrating compliance with the requirements set forth in sections 6.1.3 and 6.3.3., the permittee shall maintain records of testing conducted in accordance with 6.3.3.
- 6.4.4. The permittee shall document and maintain the corresponding records specified by the on-going monitoring requirements of 6.2 and testing requirements of 6.3.
- 6.4.5. For the purpose of demonstrating compliance with section 6.1.3.b, the permittee shall maintain records of the visible emission opacity tests conducted per Section 6.3.1.
- 6.4.6. For the purpose of demonstrating compliance with section 4.1.2, the permittee shall maintain a record of all potential to emit (PTE) HAP calculations for the entire affected facility. These records shall include the natural gas compressor engines and ancillary equipment.

- 6.4.7. The permittee shall maintain a record of the wet natural gas throughput through the dehydration system to demonstrate compliance with section 6.1.1.
- 6.4.8. All records required under Section 6.4 shall be maintained on site or in a readily accessible off-site location maintained by the permittee for a period of five (5) years. Said records shall be readily available to the Director of the Division of Air Quality or his/her duly authorized representative for expeditious inspection and review. Any records submitted to the agency pursuant to a requirement of this permit or upon request by the Director shall be certified by a responsible official.

6.5. Reporting Requirements

- 6.5.1 If permittee is required by the Director to demonstrate compliance with section 6.3.3, then the permittee shall submit a testing protocol at least thirty (30) days prior to testing and shall submit a notification of the testing date at least fifteen (15) days prior to testing. The permittee shall submit the testing results within sixty (60) days of testing and provide all supporting calculations and testing data.
- 6.5.2. Any deviation(s) from the allowable visible emission requirement for any emission source discovered during observations using 40CFR Part 60, Appendix A, Method 9 or 22 shall be reported in writing to the Director of the Division of Air Quality as soon as practicable, but in any case within ten (10) calendar days of the occurrence and shall include at least the following information: the results of the visible determination of opacity of emissions, the cause or suspected cause of the violation(s), and any corrective measures taken or planned.
- 6.5.3. Any deviation(s) from the flare design and operation criteria in Section 6.1.3 shall be reported in writing to the Director of the Division of Air Quality as soon as practicable, but in any case within ten (10) calendar days of discovery of such deviation.

7.0. Source-Specific Requirements (Reboilers, DREB1, DREB2)

7.1. Limitations and Standards

- 7.1.1. **Maximum Design Heat Input.** The maximum design heat input for each TEG Dehydration Unit Reboiler (DREB1, DREB2) shall not exceed 1.5 MMBtu/hr. The quantity of natural gas that shall be consumed shall not exceed 1,838 cubic feet per hour or 16.1×10^6 cubic feet per year.
- 7.1.2. No person shall cause, suffer, allow or permit emission of smoke and/or particulate matter into the open air from any fuel burning unit which is greater than ten (10) percent opacity based on a six minute block average.
[45CSR§2-3.1.]

7.2. Monitoring Requirements

- 7.2.1. At such reasonable times as the Secretary may designate, the permittee shall conduct Method 9 emission observations for the purpose of demonstrating compliance with Section 7.1.2. Method 9 shall be conducted in accordance with 40 CFR 60 Appendix A.

7.3. Testing Requirements

- 7.3.1. Compliance with the visible emission requirements of section 7.1.2 shall be determined in accordance with 40 CFR Part 60, Appendix A, Method 9 or by using measurements from continuous opacity monitoring systems approved by the Director. The Director may require the installation, calibration, maintenance and operation of continuous opacity monitoring systems and may establish policies for the evaluation of continuous opacity monitoring results and the determination of compliance with the visible emission requirements of section 7.1.2. Continuous opacity monitors shall not be required on fuel burning units which employ wet scrubbing systems for emission control.
[45CSR§2-3.2.]

7.4. Recordkeeping Requirements

- 7.4.1. To demonstrate compliance with sections 7.1.1, the permittee shall maintain records of the amount of natural gas consumed in each of the reboilers (DREB1, DREB2). Said records shall be maintained on site or in a readily accessible off-site location maintained by the permittee for a period of five (5) years. Said records shall be readily available to the Director of the Division of Air Quality or his/her duly authorized representative for expeditious inspection and review. Any records submitted to the agency pursuant to a requirement of this permit or upon request by the Director shall be certified by a responsible official.
- 7.4.2. The permittee shall maintain records of all monitoring data required by Section 7.2.1 documenting the date and time of each visible emission check, the emission point or equipment/source identification number, the name or means of identification of the observer, the results of the check(s), whether the visible emissions are normal for the process, and, if applicable, all corrective measures taken or planned. The permittee shall also record the general weather conditions (i.e. sunny, approximately 80°F, 6 - 10 mph NE wind) during the visual emission check(s). Should a visible emission observation be required to be performed per the requirements specified in Method 9, the data records of each observation shall be maintained per the requirements of Method 9.

7.5. Reporting Requirements

- 7.5.1. Any deviation(s) from the allowable visible emission requirement for any emission source discovered during observations using 40CFR Part 60, Appendix A, Method 9 or 22 shall be reported in writing to the Director of the Division of Air Quality as soon as practicable, but in any case within ten (10) calendar days of the occurrence and shall include at least the following information: the results of the visible determination of opacity of emissions, the cause or suspected cause of the violation(s), and any corrective measures taken or planned.

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8.0. Source-Specific Requirements (Storage Tanks, TK-1502, TK-200, TK-201, TK-1501, TK-1502)

8.1. Limitations and Standards

- 8.1.1. The permittee shall route all VOC and HAP emissions from the Storage Tanks (TK-1502, TK-200, TK-201, TK-1500, TK-1501) to a vapor recovery system (VRU-100), prior to release to the atmosphere. When unavailable due to malfunction or maintenance, VRU-200 shall be used in lieu of VRU-100 and be subject to all the applicable requirements below. The vapor recovery system shall be designed to achieve a minimum guaranteed control efficiency of 98% for volatile organic compound (VOC) and hazardous air pollutants (HAP) emissions. Emissions from these tanks will be collected and compressed by the vapor recovery unit (VRU-100) whereby the vapors are sufficiently compressed to be introduced into the inlet gas line and processed with the inlet gas.
- 8.1.2. *Operation and Maintenance of Air Pollution Control Equipment.* The permittee shall, to the extent practicable, install, maintain, and operate the vapor recovery unit (VRU-100) and associated monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions, or comply with any more stringent limits set forth in this permit or as set forth by any State rule, Federal regulation, or alternative control plan approved by the Secretary.
[45CSR§13-5.11.]
- 8.1.3. The maximum annual throughput of product to the 400 bbl storage tanks shall not exceed the following:

Storage Tank ID	Product Stored	Maximum Annual Throughput (gal/yr)
TK-1502	Settling Tank (Condensate/Produced Water)	2,989,350
TK-200	Condensate	1,149,750
TK-201	Condensate	1,149,750
TK-1500	Produced Water	344,925
TK-1501	Produced Water	344,925

- 8.1.4. Maximum emissions from the Settling Tank (TK-1502) shall not exceed the following limits:

Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (ton/year)
Volatile Organic Compounds	2.54	11.11

- 8.1.5. In addition to the vapor recovery unit (VRU-100), the permittee shall utilize three (3) of the following requirements:
- Install additional sensing equipment to monitor the run status of the Vapor Recovery Unit (VRU-100).
 - Install a by-pass system which operates automatically whereby discharge is re-routed back to the inlet of the Vapor Recovery Unit (VRU-100) until the appropriate pressure is built up for the compressor to turn on.
 - Install a blanket gas and have automatic throttling valves to ensure oxygen does not enter the tanks.
 - Install a compressor that has the ability to vary the drive.

- 8.1.6. Emissions from the Storage Tanks (TK-1502, TK-200, TK-201, TK-1500, TK-1501) that are recovered and routed to the Vapor Recovery Unit (VRU-100) shall be designed and operated as specified in the paragraphs (a) through (c).
- a. The cover and all openings on the cover (e.g., access hatches, sampling ports, pressure relief valves and gauge wells) shall form a continuous impermeable barrier over the entire surface area of the liquid in the storage vessel.
 - b. Each cover opening shall be secured in a closed, sealed position (e.g., covered by a gasketed lid or cap) whenever material is in the unit on which the cover is installed except during those times when it is necessary to use an opening as follows:
 - (i) To add material to, or remove material from the unit (this includes openings necessary to equalize or balance the internal pressure of the unit following changes in the level of the material in the unit);
 - (ii) To inspect or sample the material in the unit;
 - (iii) To inspect, maintain, repair, or replace equipment located inside the unit; or
 - (iv) To vent liquids, gases, or fumes from the unit through a closed-vent system designed and operated in accordance with the requirements 8.1.7 of this section to a control device.
 - c. Each Condensate Tank thief hatch shall be weighted and properly seated. You must select gasket material for the hatch based on composition of the fluid in the storage vessel and weather conditions.
[45CSR§13-5.11]
- 8.1.7. The facility shall comply with the closed vent system requirements for the Storage Tanks (TK-1502, TK-200, TK-201, TK-1500, TK-1501) as noted below.
- a. You must design the closed vent system to route all gases, vapors, and fumes emitted from the material in the Condensate Tank Storage Tanks (TK-1502, TK-200, TK-201, TK-1500, TK-1501) to the VRU (VRU-100).
 - b. You must design and operate a closed vent system with no detectable emissions, as determined using olfactory, visual and auditory inspections.
 - c. You must meet the requirements specified in paragraphs (i) and (ii) of this section if the closed vent system contains one or more bypass devices that could be used to divert all or a portion of the gases, vapors, or fumes from entering the control device or to a process.
 - (i) Except as provided in paragraph (ii) of this section, you must comply with either paragraph (A) or (B) of this section for each bypass device.
 - A. You must properly install, calibrate, maintain, and operate a flow indicator at the inlet to the bypass device that could divert the stream away from the control device or process to the atmosphere that sounds an alarm, or initiates notification via remote alarm to the nearest field office, when the bypass device is open such that the stream is being, or could be diverted away from the control device or process to the atmosphere.
 - B. You must secure the bypass device valve installed at the inlet to the bypass device in the non-diverting position using a car-seal or a lock-and-key type configuration.

- (ii) Low leg drains, high point bleeds, analyzer vents, open-ended valves or lines, and safety devices are not subject to the requirements of paragraph (i) of this section.
[45CSR§13-5.11]

8.2. Monitoring Requirements

- 8.2.1. The permittee shall monitor the throughput to the vapor recovery unit (VRU-100) on a monthly basis.
- 8.2.2. To demonstrate compliance with section 8.1.1, the permittee shall monitor the vapor recovery unit (VRU-100) in accordance with the plans and specifications and manufacturer's recommendations.
- 8.2.3. To demonstrate compliance with the closed vent system requirements of Sections 8.1.6 and 8.1.7, the permittee shall:
- a. Initial requirements. Conduct an initial visual, olfactory, and auditory inspection for defects that could result in air emissions within 180 days of start-up. Defects include, but are not limited to, visible cracks, holes, or gaps in piping; loose connections; liquid leaks; or broken or missing caps or other closure devices.
 - i. The annual inspection shall include the bypass inspection, conducted according to paragraph (c) of this section.
 - ii. In the event that a leak or defect is detected, you must repair the leak or defect as soon as practicable. Grease or another applicable substance must be applied to deteriorating or cracked gaskets to improve the seal while awaiting repair.
 - iii. Delay of repair of a closed vent system for which leaks or defects have been detected is allowed if the repair is technically infeasible without a shutdown, or if you determine that emissions resulting from immediate repair would be greater than the fugitive emission likely to result from delay of repair. You must complete repair of such equipment by the end of the next shutdown.
 - b. Continuous requirements. Conduct an annual visual, olfactory, and auditory inspection for defects that could result in air emissions. Defect include, but are not limited to, visible cracks, holes, or gaps in piping, loose connections; liquid leaks; or broken or missing caps or other closure devices.
 - i. The annual inspection shall be conducted within 365 calendar days from the date of the previous inspection or earlier.
 - ii. The annual inspection shall include the bypass inspection, conducted according to paragraph (c) of this section.
 - c. Bypass inspection. Visually inspect the bypass valve during the initial and annual inspection for the presence of the car seal or lock-and-key type configuration to verify that the valve is maintained in the non-diverting position to ensure that the vent stream is not diverted through the bypass device. If an alternative method is used, conduct the inspection of the bypass as described in the operating procedures.
 - d. Unsafe to inspect requirements. You may designate any parts of the closed vent system as unsafe to inspect if the requirements in paragraphs (i) and (ii) of this section are met. Unsafe to inspect parts are exempt from the inspection requirements of paragraphs (a) and (b) of this section.

- i. You determine that the equipment is unsafe to inspect because inspecting personnel would be exposed to an imminent or potential danger as a consequence of complying with the requirements.
 - ii. You have a written plan that requires inspection of the equipment as frequently as practicable during safe-to-inspect times.
- e. Difficult to inspect requirements. You may designate any parts of the closed vent system as difficult to inspect, if the requirements in paragraphs (i) and (ii) of this section are met. Difficult to inspect parts are exempt from the inspection requirements of paragraphs (a) and (b) of this section.
- i. You determine that the equipment cannot be inspected without elevating the inspecting personnel more than 2 meters above a support surface.
 - ii. You have a written plan that requires inspection of the equipment at least once every 5 years.
- [45CSR§13-5.11]

8.3. Recordkeeping Requirements

- 8.3.1. All records required under Section 8.3 shall be maintained on site or in a readily accessible off-site location maintained by the permittee for a period of five (5) years. Said records shall be readily available to the Director of the Division of Air Quality or his/her duly authorized representative for expeditious inspection and review. Any records submitted to the agency pursuant to a requirement of this permit or upon request by the Director shall be certified by a responsible official.
- 8.3.2. *Record of Maintenance of VRU.* The permittee shall maintain accurate records of the vapor recovery unit (VRU-100) equipment inspection and/or preventative maintenance procedures.
- 8.3.3. *Record of Malfunctions of VRU.* The permittee shall maintain records of the occurrence and duration of any malfunction or operational shutdown of the vapor recovery unit (VRU-100) during which excess emissions occur. For each such case, the following information shall be recorded:
- a. The equipment involved.
 - b. Steps taken to minimize emissions during the event.
 - c. The duration of the event.
 - d. The estimated increase in emissions during the event.
- For each such case associated with an equipment malfunction, the additional information shall also be recorded:
- e. The cause of the malfunction.
 - f. Steps taken to correct the malfunction.
 - g. Any changes or modifications to equipment or procedures that would help prevent future recurrences of the malfunction.
- 8.3.4. To demonstrate compliance with section 8.1.3 and 8.1.4, the permittee shall maintain a record of the aggregate throughput for the storage tanks on a monthly and rolling twelve month total. Said

records shall be maintained on site or in a readily accessible off-site location maintained by the registrant for a period of five (5) years. Said records shall be readily available to the Director of the Division of Air Quality or his/her duly authorized representative for expeditious inspection and review. Any records submitted to the agency pursuant to a requirement of this permit or upon request by the Director shall be certified by a responsible official.

- 8.3.5. The permittee shall maintain a copy all design records of the process, maintenance records of equipment and any downtime hours associated with the vapor recovery unit (VRU-100).
- 8.3.6. The permittee shall maintain records of the additional monitoring required in Section 8.1.5 to demonstrate compliance with the 98% control efficiency claimed and the Section 8.1.1.
- 8.3.7. To demonstrate compliance with the closed vent monitoring requirements, the following records shall be maintained.
 - i. The initial compliance requirements;
 - ii. Each annual visual inspection conducted to demonstrate continuous compliance, including records of any repairs that were made as results of the inspection;
 - iii. Bypass requirements.
 - a. Each inspection or each time the key is checked out or a record each time the alarm is sounded;
 - b. Each occurrence that the control device was bypassed. If the device was bypassed, the records shall include the date, time, and duration of the event and shall provide the reason the event occurred. The record shall also include the estimate of emissions that were released to the environment as a result of the bypass.
 - iv. Any part of the system that has been designated as “unsafe to inspect” in accordance with 8.2.3.d or “difficult to inspect” in accordance with 8.2.3.e.
[45CSR§13-5.11]

8.4. Reporting Requirements

- 8.4.1. Upon request by the Director, the permittee shall report deviations within a requested time from of any occurrences when the control device was operated outside of the parameters defined in the monitoring plan.
- 8.4.2. The permittee shall notify the Director of any downtime of the VRU in excess of 2%, based on the 12 month rolling total, in writing to the Director of the Division of Air Quality as soon as practicable, but within ten (10) calendar days of the discovery and shall include, at a minimum, the following information: the dates and durations of each downtime event, the cause or suspected causes for each downtime event, any corrective measures taken or planned for each downtime event.

9.0. Source-Specific Requirements (Product Loadout Rack, LDOUT1)

9.1. Limitations and Standards

- 9.1.1. *[Reserved]*
- 9.1.2. *Operation and Maintenance of Air Pollution Control Equipment.* The permittee shall, to the extent practicable, install, maintain, and operate the vapor recovery unit (VRU-200) and associated monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions, or comply with any more stringent limits set forth in this permit or as set forth by any State rule, Federal regulation, or alternative control plan approved by the Secretary.
[45CSR§13-5.11.]
- 9.1.3. The maximum quantity of condensate that shall be loaded shall not exceed 2,300,000 gallons per year. Compliance with the Maximum Yearly Operation Limitation shall be determined using a twelve month rolling total. A twelve month rolling total shall mean the sum of the hours of operation at any given time during the previous twelve consecutive calendar months.
- 9.1.4. The maximum quantity of produced water that shall be loaded shall not exceed 690,000 gallons per year. Compliance with the Maximum Yearly Operation Limitation shall be determined using a twelve month rolling total. A twelve month rolling total shall mean the sum of the hours of operation at any given time during the previous twelve consecutive calendar months.
- 9.1.5. The Condensate Truck Loading and Produced Water Truck Loading shall be operated in accordance with the plans and specifications filed in Permit Application R13-3184C.
- 9.1.5. All trucks shall be loaded using the submerged-fill method. The “submerged-fill method” shall, for the purposes of this permit, mean either bottom-filling or filling by extending the pipe to near the bottom of the tank, and as soon as is practicable, below the level of liquid.

9.2. Monitoring Requirements

- 9.2.1. *[Reserved]*

9.3. Recordkeeping Requirements

- 9.3.1. All records required under Section 9.3 shall be maintained on site or in a readily accessible off-site location maintained by the permittee for a period of five (5) years. Said records shall be readily available to the Director of the Division of Air Quality or his/her duly authorized representative for expeditious inspection and review. Any records submitted to the agency pursuant to a requirement of this permit or upon request by the Director shall be certified by a responsible official.
- 9.3.2. *[Reserved]*
- 9.3.3. *[Reserved]*
- 9.3.4. To demonstrate compliance with section 9.1.3 and 9.1.4, the permittee shall maintain a record of the aggregate throughput for the product loadout rack (LDOUT1) on a monthly and rolling twelve month total. Said records shall be maintained on site or in a readily accessible off-site location maintained by the registrant for a period of five (5) years. Said records shall be readily available to the Director of the Division of Air Quality or his/her duly authorized representative for expeditious inspection and review. Any records submitted to the agency pursuant to a requirement of this permit or upon request by the Director shall be certified by a responsible official.

10.0. Source-Specific Requirements (40CFR60 Subpart JJJJ Requirements, C-100 – C-1300)

10.1. Limitations and Standards

- 10.1.1. The provisions of this subpart are applicable to owners, and operators of stationary spark ignition (SI) internal combustion engines (ICE) as specified below. For the purposes of this subpart, the date that construction commences is the date the engine is ordered by the owner or operator.
- a. Owners and operators of stationary SI ICE that commence construction after June 12, 2006, where the stationary SI ICE are manufactured:
 1. On or after July 1, 2007, for engines with a maximum engine power greater than or equal to 500 HP (except lean burn engines with a maximum engine power greater than or equal to 500 HP and less than 1,350 HP);
 2. *Reserved*;
 3. on or after July 1, 2008, for engines with a maximum engine power less than 500 HP; or
 4. *Reserved*.
 - b. Owners and operators of stationary SI ICE that commence modification or reconstruction after June 12, 2006.
[40CFR§60.4230(a)]
- 10.1.2. The provisions of this subpart are not applicable to stationary SI ICE being tested at an engine test cell/stand. **[40CFR§60.4230(b)]**
- 10.1.3. If you are an owner or operator of an area source subject to this subpart, you are exempt from the obligation to obtain a permit under 40 CFR part 70 or 40 CFR part 71, provided you are not required to obtain a permit under 40 CFR 70.3(a) or 40 CFR 71.3(a) for a reason other than your status as an area source under this subpart. Notwithstanding the previous sentence, you must continue to comply with the provisions of this subpart as applicable. **[40CFR§60.4230(c)]**
- 10.1.4. Stationary SI ICE may be eligible for exemption from the requirements of this subpart as described in 40 CFR part 1068, subpart C (or the exemptions described in 40 CFR parts 90 and 1048, for engines that would need to be certified to standards in those parts), except that owners and operators, as well as manufacturers, may be eligible to request an exemption for national security. **[40CFR§60.4230(e)]**
- 10.1.5. Owners and operators of facilities with internal combustion engines that are acting as temporary replacement units and that are located at a stationary source for less than 1 year and that have been properly certified as meeting the standards that would be applicable to such engine under the appropriate nonroad engine provisions, are not required to meet any other provisions under this subpart with regard to such engines. **[40CFR§60.4230(f)]**

10.2. Emission Standards for Owners and Operators

- 10.2.1. Owners and operators of stationary SI ICE with a maximum engine power greater than or equal to 75 KW (100 HP) (except gasoline and rich burn engines that use LPG) must comply with the emission standards in Table 1 to this subpart for their stationary SI ICE. For owners and operators of stationary SI ICE with a maximum engine power greater than or equal to 100 HP (except gasoline and rich burn engines that use LPG) manufactured prior to January 1, 2011 that were certified to the certification emission standards in 40 CFR part 1048 applicable to engines that are not severe duty engines, if such stationary SI ICE was certified to a carbon monoxide (CO) standard above the standard in Table 1 to this subpart, then the owners and operators may meet the

CO certification (not field testing) standard for which the engine was certified.
[40CFR§60.4233(e)]

- 10.2.2. Owners and operators of stationary SI ICE that are required to meet standards that reference 40 CFR 1048.101 must, if testing their engines in use, meet the standards in that section applicable to field testing, except as indicated in paragraph (e) of this section. [40CFR§60.4233(h)]
- 10.2.3. Owners and operators of stationary SI ICE must operate and maintain stationary SI ICE that achieve the emission standards as required in §60.4233 over the entire life of the engine. [40CFR§60.4234]

10.3. Other Requirements for Owners and Operators

- 10.3.1. After July 1, 2010, owners and operators may not install stationary SI ICE with a maximum engine power of less than 500 HP that do not meet the applicable requirements in §60.4233. [40CFR§60.4236(a)]
- 10.3.2. After July 1, 2009, owners and operators may not install stationary SI ICE with a maximum engine power of greater than or equal to 500 HP that do not meet the applicable requirements in §60.4233, except that lean burn engines with a maximum engine power greater than or equal to 500 HP and less than 1,350 HP that do not meet the applicable requirements in §60.4233 may not be installed after January 1, 2010. [40CFR§60.4236(b)]
- 10.3.3. For emergency stationary SI ICE with a maximum engine power of greater than 19 KW (25 HP), owners and operators may not install engines that do not meet the applicable requirements in §60.4233 after January 1, 2011. [40CFR§60.4236(c)]
- 10.3.4. In addition to the requirements specified in §§60.4231 and 60.4233, it is prohibited to import stationary SI ICE less than or equal to 19 KW (25 HP), stationary rich burn LPG SI ICE, and stationary gasoline SI ICE that do not meet the applicable requirements specified in paragraphs (a), (b), and (c) of this section, after the date specified in paragraph (a), (b), and (c) of this section. [40CFR§60.4236(d)]
- 10.3.5. The requirements of this section do not apply to owners and operators of stationary SI ICE that have been modified or reconstructed, and they do not apply to engines that were removed from one existing location and reinstalled at a new location. [40CFR§60.4236(e)]
- 10.3.6. Starting on January 1, 2011, if the emergency stationary SI internal combustion engine that is greater than or equal to 130 HP and less than 500 HP that was built on or after January 1, 2011, does not meet the standards applicable to non-emergency engines, the owner or operator must install a non-resettable hour meter. [40CFR§60.4237(b)]

10.4. Compliance Requirements for Owners and Operators

- 10.4.1. If you are an owner or operator of a stationary SI internal combustion engine and must comply with the emission standards specified in §60.4233(d) or (e), you must demonstrate compliance according to one of the methods specified in paragraphs (b)(1) and (2) of this section.
 - a. Purchasing an engine certified according to procedures specified in this subpart, for the same model year and demonstrating compliance according to one of the methods specified in paragraph (a) of this section.

- b. Purchasing a non-certified engine and demonstrating compliance with the emission standards specified in §60.4233(d) or (e) and according to the requirements specified in §60.4244, as applicable, and according to paragraphs (b)(2)(i) and (ii) of this section.
 1. If you are an owner or operator of a stationary SI internal combustion engine greater than 25 HP and less than or equal to 500 HP, you must keep a maintenance plan and records of conducted maintenance and must, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. In addition, you must conduct an initial performance test to demonstrate compliance.
 2. If you are an owner or operator of a stationary SI internal combustion engine greater than 500 HP, you must keep a maintenance plan and records of conducted maintenance and must, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. In addition, you must conduct an initial performance test and conduct subsequent performance testing every 8,760 hours or 3 years, whichever comes first, thereafter to demonstrate compliance.

[40CFR§60.4243(b)]

- 10.4.2. If you are an owner or operator of a stationary SI internal combustion engine that must comply with the emission standards specified in §60.4233(f), you must demonstrate compliance according to paragraph (b)(2)(i) or (ii) of this section, except that if you comply according to paragraph (b)(2)(i) of this section, you demonstrate that your non-certified engine complies with the emission standards specified in §60.4233(f). **[40CFR§60.4243(c)]**
- 10.4.3. Emergency stationary ICE may be operated for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by Federal, State or local government, the manufacturer, the vendor, or the insurance company associated with the engine. Maintenance checks and readiness testing of such units is limited to 100 hours per year. There is no time limit on the use of emergency stationary ICE in emergency situations. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that Federal, State, or local standards require maintenance and testing of emergency ICE beyond 100 hours per year. Emergency stationary ICE may operate up to 50 hours per year in non-emergency situations, but those 50 hours are counted towards the 100 hours per year provided for maintenance and testing. The 50 hours per year for non-emergency situations cannot be used for peak shaving or to generate income for a facility to supply power to an electric grid or otherwise supply power as part of a financial arrangement with another entity. For owners and operators of emergency engines, any operation other than emergency operation, maintenance and testing, and operation in non-emergency situations for 50 hours per year, as permitted in this section, is prohibited. **[40CFR§60.4243(d)]**
- 10.4.4. Owners and operators of stationary SI natural gas fired engines may operate their engines using propane for a maximum of 100 hours per year as an alternative fuel solely during emergency operations, but must keep records of such use. If propane is used for more than 100 hours per year in an engine that is not certified to the emission standards when using propane, the owners and operators are required to conduct a performance test to demonstrate compliance with the emission standards of §60.4233. **[40CFR§60.4243(e)]**
- 10.4.5. If you are an owner or operator of a stationary SI internal combustion engine that is less than or equal to 500 HP and you purchase a non-certified engine or you do not operate and maintain your certified stationary SI internal combustion engine and control device according to the manufacturer's written emission-related instructions, you are required to perform initial performance testing as indicated in this section, but you are not required to conduct subsequent performance testing unless the stationary engine is rebuilt or undergoes major repair or maintenance. A rebuilt stationary SI ICE means an engine that has been rebuilt as that term is defined in 40 CFR 94.11(a). **[40CFR§60.4243(f)]**

- 10.4.6. It is expected that air-to-fuel ratio controllers will be used with the operation of three-way catalysts/non-selective catalytic reduction. The AFR controller must be maintained and operated appropriately in order to ensure proper operation of the engine and control device to minimize emissions at all times. [40CFR§60.4243(g)]
- 10.4.7. If you are an owner/operator of an stationary SI internal combustion engine with maximum engine power greater than or equal to 500 HP that is manufactured after July 1, 2007 and before July 1, 2008, and must comply with the emission standards specified in sections 60.4233(b) or (c), you must comply by one of the methods specified in paragraphs (h)(1) through (h)(4) of this section.
- Purchasing an engine certified according to 40 CFR part 1048. The engine must be installed and configured according to the manufacturer's specifications.
 - Keeping records of performance test results for each pollutant for a test conducted on a similar engine. The test must have been conducted using the same methods specified in this subpart and these methods must have been followed correctly.
 - Keeping records of engine manufacturer data indicating compliance with the standards.
 - Keeping records of control device vendor data indicating compliance with the standards.
- [40CFR§60.4243(h)]

10.5. Testing Requirements for Owners and Operators

- 10.5.1. Owners and operators of stationary SI ICE who conduct performance tests must follow the procedures in paragraphs (a) through (f) of this section.
- Each performance test must be conducted within 10 percent of 100 percent peak (or the highest achievable) load and according to the requirements in §60.8 and under the specific conditions that are specified by Table 2 to this subpart. [40CFR§60.4244(a)]
 - You may not conduct performance tests during periods of startup, shutdown, or malfunction, as specified in §60.8(c). If your stationary SI internal combustion engine is non-operational, you do not need to startup the engine solely to conduct a performance test; however, you must conduct the performance test immediately upon startup of the engine. [40CFR§60.4244(b)]
 - You must conduct three separate test runs for each performance test required in this section, as specified in §60.8(f). Each test run must be conducted within 10 percent of 100 percent peak (or the highest achievable) load and last at least 1 hour. [40CFR§60.4244(c)]
 - To determine compliance with the NO_x mass per unit output emission limitation, convert the concentration of NO_x in the engine exhaust using Equation 1 of this section:

$$ER = \frac{C_a \times 1.912 \times 10^{-3} \times Q \times T}{HP - hr} \quad (\text{Eq. 1})$$

Where:

ER = Emission rate of NO_x in g/HP-hr.

C_a = Measured NO_x concentration in parts per million by volume (ppmv).

1.912×10⁻³ = Conversion constant for ppm NO_x to grams per standard cubic meter at 20 degrees Celsius.

Q = Stack gas volumetric flow rate, in standard cubic meter per hour, dry basis.

T = Time of test run, in hours.

HP-hr = Brake work of the engine, horsepower-hour (HP-hr).

[40CFR§60.4244(d)]

- e. To determine compliance with the CO mass per unit output emission limitation, convert the concentration of CO in the engine exhaust using Equation 2 of this section:

$$ER = \frac{C_d \times 1.164 \times 10^{-3} \times Q \times T}{HP - hr} \quad (\text{Eq. 2})$$

Where:

ER = Emission rate of CO in g/HP-hr.

C_d = Measured CO concentration in ppmv.

1.164×10⁻³ = Conversion constant for ppm CO to grams per standard cubic meter at 20 degrees Celsius.

Q = Stack gas volumetric flow rate, in standard cubic meters per hour, dry basis.

T = Time of test run, in hours.

HP-hr = Brake work of the engine, in HP-hr.

[40CFR§60.4244(e)]

- f. For purposes of this subpart, when calculating emissions of VOC, emissions of formaldehyde should not be included. To determine compliance with the VOC mass per unit output emission limitation, convert the concentration of VOC in the engine exhaust using Equation 3 of this section:

$$ER = \frac{C_d \times 1.833 \times 10^{-3} \times Q \times T}{HP - hr} \quad (\text{Eq. 3})$$

Where:

ER = Emission rate of VOC in g/HP-hr.

C_d = VOC concentration measured as propane in ppmv.

1.833×10⁻³ = Conversion constant for ppm VOC measured as propane, to grams per standard cubic meter at 20 degrees Celsius.

Q = Stack gas volumetric flow rate, in standard cubic meters per hour, dry basis.

T = Time of test run, in hours.

HP-hr = Brake work of the engine, in HP-hr.

[40CFR§60.4244(f)]

- g. If the owner/operator chooses to measure VOC emissions using either Method 18 of 40 CFR part 60, appendix A, or Method 320 of 40 CFR part 63, appendix A, then it has the option of correcting the measured VOC emissions to account for the potential differences in measured values between these methods and Method 25A. The results from Method 18 and Method 320 can be corrected for response factor differences using Equations 4 and 5 of this section. The corrected VOC concentration can then be placed on a propane basis using Equation 6 of this section.

$$RF_i = \frac{C_{Mi}}{C_{Ai}} \quad (\text{Eq. 4})$$

Where:

RF_i = Response factor of compound i when measured with EPA Method 25A.

C_{Mi} = Measured concentration of compound i in ppmv as carbon.

C_{Ai} = True concentration of compound i in ppmv as carbon.

$$C_{i\text{corr}} = RF_i \times C_{i\text{meas}} \quad (\text{Eq. 5})$$

Where:

$C_{i\text{corr}}$ = Concentration of compound i corrected to the value that would have been measured by EPA Method 25A, ppmv as carbon.

$C_{i\text{meas}}$ = Concentration of compound i measured by EPA Method 320, ppmv as carbon.

$$C_{\text{Peq}} = 0.6098 \times C_{i\text{corr}} \quad (\text{Eq. 6})$$

Where:

C_{Peq} = Concentration of compound i in mg of propane equivalent per DSCM.

[40CFR§60.4244(g)]

10.6. Notification, Reports, and Records for Owners and Operators

- 10.6.1. Owners or operators of stationary SI ICE must meet the following notification, reporting and recordkeeping requirements.

- a. Owners and operators of all stationary SI ICE must keep records of the information in paragraphs (a)(1) through (4) of this section.
1. All notifications submitted to comply with this subpart and all documentation supporting any notification.
 2. Maintenance conducted on the engine.
 3. If the stationary SI internal combustion engine is a certified engine, documentation from the manufacturer that the engine is certified to meet the emission standards and information as required in 40 CFR parts 90 and 1048.
 4. If the stationary SI internal combustion engine is not a certified engine or is a certified engine operating in a non-certified manner and subject to §60.4243(a)(2), documentation that the engine meets the emission standards.

[40CFR§60.4245(a)]

- b. For all stationary SI emergency ICE greater than or equal to 500 HP manufactured on or after July 1, 2010, that do not meet the standards applicable to non-emergency engines, the owner or operator of must keep records of the hours of operation of the engine that is recorded through the non-resettable hour meter. For all stationary SI emergency ICE greater than or equal to 130 HP and less than 500 HP manufactured on or after July 1, 2011 that do not meet the standards applicable to non-emergency engines, the owner or operator of must keep records of the hours of operation of the engine that is recorded through the non-resettable hour meter. For all stationary SI emergency ICE greater than 25 HP and less than 130 HP manufactured on or after July 1, 2008, that do not meet the standards applicable to non-emergency engines, the owner or operator of must keep records of the hours of operation of the engine that is recorded through the non-resettable hour meter. The owner or operator must document how many hours are spent for emergency operation, including what classified the operation as emergency and how many hours are spent for non-emergency operation. **[40CFR§60.4245(b)]**
- c. Owners and operators of stationary SI ICE greater than or equal to 500 HP that have not been certified by an engine manufacturer to meet the emission standards in §60.4231 must submit an initial notification as required in §60.7(a)(1). The notification must include the information in paragraphs (c)(1) through (5) of this section.
1. Name and address of the owner or operator;
 2. The address of the affected source;
 3. Engine information including make, model, engine family, serial number, model year, maximum engine power, and engine displacement;
 4. Emission control equipment; and
 5. Fuel used.
- [40CFR§60.4245(c)]**
- d. Owners and operators of stationary SI ICE that are subject to performance testing must submit a copy of each performance test as conducted in §60.4244 within 60 days after the test has been completed. **[40CFR§60.4245(d)]**

11.0. Source-Specific Requirements (40CFR60 Subpart OOOO Requirements, Reciprocating Compressor Engines, C-100 – C-1300)

11.1. Limitations and Standards

- 11.1.1. You must comply with the standards in paragraphs (a) through (d) of this section for each reciprocating compressor affected facility.
- a. You must replace the reciprocating compressor rod packing according to either paragraph (a)(1) or (2) of this section.
 1. Before the compressor has operated for 26,000 hours. The number of hours of operation must be continuously monitored beginning upon initial startup of your reciprocating compressor affected facility, or October 15, 2012, or the date of the most recent reciprocating compressor rod packing replacement, whichever is later.
 2. Prior to 36 months from the date of the most recent rod packing replacement, or 36 months from the date of startup for a new reciprocating compressor for which the rod packing has not yet been replaced.
 - b. You must demonstrate initial compliance with standards that apply to reciprocating compressor affected facilities as required by § 60.5410.
 - c. You must demonstrate continuous compliance with standards that apply to reciprocating compressor affected facilities as required by § 60.5415.
 - d. You must perform the required notification, recordkeeping, and reporting as required by § 60.5420.

[40CFR§60.5385, Reciprocating Compressor Engines]

11.2. Initial Compliance Demonstration

- 11.2.1. You must determine initial compliance with the standards for each affected facility using the requirements in paragraph (c) of this section. The initial compliance period begins on October 15, 2012 or upon initial startup, whichever is later, and ends no later than one year after the initial startup date for your affected facility or no later than one year after October 15, 2012. The initial compliance period may be less than one full year.
- c. To achieve initial compliance with the standards for each reciprocating compressor affected facility you must comply with paragraphs (c)(1) through (4) of this section.
 1. During the initial compliance period, you must continuously monitor the number of hours of operation or track the number of months since the last rod packing replacement.
 2. Reserved.
 3. You must submit the initial annual report for your reciprocating compressor as required in § 60.5420(b).
 4. You must maintain the records as specified in § 60.5420(c)(3) for each reciprocating compressor affected facility.

[40CFR§60.5410]

11.3. Continuous Compliance Demonstration

11.3.1. For each reciprocating compressor affected facility, you must demonstrate continuous compliance according to paragraphs (1) through (3) of this section.

1. You must continuously monitor the number of hours of operation for each reciprocating compressor affected facility or track the number of months since initial startup, or October 15, 2012, or the date of the most recent reciprocating compressor rod packing replacement, whichever is later.
2. You must submit the annual report as required in § 60.5420(b) and maintain records as required in § 60.5420(c)(3).
3. You must replace the reciprocating compressor rod packing before the total number of hours of operation reaches 26,000 hours or the number of months since the most recent rod packing replacement reaches 36 months.
[40CFR§60.5415]

11.3.2. Affirmative defense for violations of emission standards during malfunction. In response to an action to enforce the standards set forth in §§ 60.5375, you may assert an affirmative defense to a claim for civil penalties for violations of such standards that are caused by malfunction, as defined at § 60.2. Appropriate penalties may be assessed, however, if you fail to meet your burden of proving all of the requirements in the affirmative defense. The affirmative defense shall not be available for claims for injunctive relief.

(1) To establish the affirmative defense in any action to enforce such a standard, you must timely meet the reporting requirements in § 60.5415(h)(2), and must prove by a preponderance of evidence that:

(i) The violation:

(A) Was caused by a sudden, infrequent, and unavoidable failure of air pollution control equipment, process equipment, or a process to operate in a normal or usual manner; and

(B) Could not have been prevented through careful planning, proper design or better operation and maintenance practices; and

(C) Did not stem from any activity or event that could have been foreseen and avoided, or planned for; and

(D) Was not part of a recurring pattern indicative of inadequate design, operation, or maintenance; and

(ii) Repairs were made as expeditiously as possible when a violation occurred. Off-shift and overtime labor were used, to the extent practicable to make these repairs; and

(iii) The frequency, amount and duration of the violation (including any bypass) were minimized to the maximum extent practicable; and

(iv) If the violation resulted from a bypass of control equipment or a process, then the bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; and

(v) All possible steps were taken to minimize the impact of the violation on ambient air quality, the environment and human health; and

(vi) All emissions monitoring and control systems were kept in operation if at all possible, consistent with safety and good air pollution control practices; and

(vii) All of the actions in response to the violation were documented by properly signed, contemporaneous operating logs; and

(viii) At all times, the affected source was operated in a manner consistent with good practices for minimizing emissions; and

(ix) A written root cause analysis has been prepared, the purpose of which is to determine, correct, and eliminate the primary causes of the malfunction and the violation resulting from the malfunction event at issue. The analysis shall also specify, using best monitoring methods and engineering judgment, the amount of any emissions that were the result of the malfunction.

(2) Report. The owner or operator seeking to assert an affirmative defense shall submit a written report to the Administrator with all necessary supporting documentation, that it has met the requirements set forth in paragraph (h)(1) of this section. This affirmative defense report shall be included in the first periodic compliance, deviation report or excess emission report otherwise required after the initial occurrence of the violation of the relevant standard (which may be the end of any applicable averaging period). If such compliance, deviation report or excess emission report is due less than 45 days after the initial occurrence of the violation, the affirmative defense report may be included in the second compliance, deviation report or excess emission report due after the initial occurrence of the violation of the relevant standard.

[40CFR§60.5415]

11.4. Notification, Recordkeeping and Reporting Requirements

11.4.1. You must submit the notifications according to paragraphs (a)(1) and (2) of this section if you own or operate one or more of the affected facilities specified in § 60.5365 that was constructed, modified, or reconstructed during the reporting period.

[40CFR§60.5420(a)]

11.4.2. Reporting requirements. You must submit annual reports containing the information specified in paragraphs (b)(1) and (4) of this section to the Administrator and performance test reports as specified in paragraph (b)(7) of this section. The initial annual report is due no later than 90 days after the end of the initial compliance period as determined according to § 60.5410. Subsequent annual reports are due no later than same date each year as the initial annual report. If you own or operate more than one affected facility, you may submit one report for multiple affected facilities provided the report contains all of the information required as specified in paragraphs (b)(1) and (4) of this section. Annual reports may coincide with title V reports as long as all the required elements of the annual report are included. You may arrange with the Administrator a common schedule on which reports required by this part may be submitted as long as the schedule does not extend the reporting period.

(1) The general information specified in paragraphs (b)(1)(i) through (iv) of this section.

(i) The company name and address of the affected facility.

(ii) An identification of each affected facility being included in the annual report.

(iii) Beginning and ending dates of the reporting period.

(iv) A certification by a responsible official of truth, accuracy, and completeness. This certification shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

(4) For each reciprocating compressor affected facility, the information specified in paragraphs (b)(4)(i) through (ii) of this section.

(i) The cumulative number of hours of operation or the number of months since initial startup, since October 15, 2012, or since the previous reciprocating compressor rod packing replacement, whichever is later.

(ii) Records of deviations specified in paragraph (c)(3)(iii) of this section that occurred during the reporting period.

(7)(i) Within 60 days after the date of completing each performance test (see § 60.8 of this part) as required by this subpart you must submit the results of the performance tests required by this subpart to EPA's WebFIRE database by using the Compliance and Emissions Data Reporting Interface (CEDRI) that is accessed through EPA's Central Data Exchange (CDX) (www.epa.gov/cdx). Performance test data must be submitted in the file format generated through use of EPA's Electronic Reporting Tool (ERT) (see <http://www.epa.gov/ttn/chief/ert/index.html>). Only data collected using test methods on the ERT Web site are subject to this requirement for submitting reports electronically to WebFIRE. Owners or operators who claim that some of the information being submitted for performance tests is confidential business information (CBI) must submit a complete ERT file including information claimed to be CBI on a compact disk or other commonly used electronic storage media (including, but not limited to, flash drives) to EPA. The electronic media must be clearly marked as CBI and mailed to U.S. EPA/OAPQS/CORE CBI Office, Attention: WebFIRE Administrator, MD C404-02, 4930 Old Page Rd., Durham, NC 27703. The same ERT file with the CBI omitted must be submitted to EPA via CDX as described earlier in this paragraph. At the discretion of the delegated authority, you must also submit these reports, including the confidential business information, to the delegated authority in the format specified by the delegated authority.

(ii) All reports required by this subpart not subject to the requirements in paragraph (a)(2)(i) of this section must be sent to the Administrator at the appropriate address listed in § 63.13 of this part. The Administrator or the delegated authority may request a report in any form suitable for the specific case (e.g., by commonly used electronic media such as Excel spreadsheet, on CD or hard copy). The Administrator retains the right to require submittal of reports subject to paragraph (a)(2)(i) and (ii) of this section in paper format.

[40CFR§60.5420]

11.4.3. Recordkeeping requirements. You must maintain the records identified as specified in § 60.7(f) and in paragraph (c)(1) of this section. All records must be maintained for at least 5 years.

(3) For each reciprocating compressors affected facility, you must maintain the records in paragraphs (c)(3)(i) through (iii) of this section.

(i) Records of the cumulative number of hours of operation or number of months since initial startup or October 15, 2012, or the previous replacement of the reciprocating compressor rod packing, whichever is later.

(ii) Records of the date and time of each reciprocating compressor rod packing replacement.

(iii) Records of deviations in cases where the reciprocating compressor was not operated in compliance with the requirements specified in § 60.5385.

[40CFR§60.5420]

12.0. Source-Specific Requirements (40CFR63 Subpart ZZZZ Requirements, C-100 – C-1300)

12.1. Limitations and Standards

- 12.1.1. The permittee must comply with the applicable operating limitations in this section no later than October 19, 2013.

[40 C.F.R. § 63.6595(a)]

- 12.1.2. *Stationary RICE subject to Regulation under 40 CFR Part 60.* An affected source that meets any of the criteria in paragraphs (c)(1) through (7) of this section must meet the requirements of this part by meeting the requirements of 40 CFR part 60 subpart IIII, for compression ignition engines or 40 CFR part 60 subpart JJJJ, for spark ignition engines. No further requirements apply for such engines under this part.

The permittee meets the criteria of paragraph (c)(1), which is for a new or reconstructed stationary RICE located at an area source. The permittee must meet the requirements of this part by meeting the requirements of 40 CFR part 60 subpart JJJJ.

[40 C.F.R. § 63.6590(c)]

CERTIFICATION OF DATA ACCURACY

I, the undersigned, hereby certify that, based on information and belief formed after reasonable inquiry, all information contained in the attached _____, representing the period beginning _____ and ending _____, and any supporting documents appended hereto, is true, accurate, and complete.

Signature¹ _____ Date _____
(please use blue ink) Responsible Official or Authorized Representative

Name & Title _____ Title _____
(please print or type) Name

Telephone No. _____ Fax No. _____

- ¹ This form shall be signed by a "Responsible Official." "Responsible Official" means one of the following:
- a. For a corporation: The president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit and either:
 - (i) the facilities employ more than 250 persons or have a gross annual sales or expenditures exceeding \$25 million (in second quarter 1980 dollars), or
 - (ii) the delegation of authority to such representative is approved in advance by the Director;
 - b. For a partnership or sole proprietorship: a general partner or the proprietor, respectively;
 - c. For a municipality, State, Federal, or other public entity: either a principal executive officer or ranking elected official. For the purposes of this part, a principal executive officer of a Federal agency includes the chief executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., a Regional Administrator of U.S. EPA); or
 - d. The designated representative delegated with such authority and approved in advance by the Director.



Permit / Application Information Sheet
Division of Environmental Protection
West Virginia Office of Air Quality

Company:	Antero Resources Corporation	Facility:	Monroe Station
Region:	2	Plant ID:	095-00037
Engineer:	Williams, Jerry	Application #:	13-3184C
Physical Address:	RT. 48 Alma WV	Category:	SIC: [4923] ELECTRIC, GAS AND SANITARY SERVICES - GAS TRANSMISSION AND DISTRIBUTION NAICS: [221210] Natural Gas Distribution
County:	Tyler		
Other Parties:	VICE PRES - McNeilly, Ward 303-357-6822 ENV_MGR - Schatz, Barry 303-357-7276 Consultant - Steyskal, Michele 719-632-3593		

Information Needed for Database and AIRS
 1. Need valid physical West Virginia address with zip

Regulated Pollutants

Summary from this Permit 13-3184C		
Air Programs	Fee	Applicable Regulations
Fee Program	\$4,500.00	Application Type MODIFICATION

Notes from Database

Activity Dates
 APPLICATION RECIEVED 01/27/2016
 APPLICATION FEE PAID 01/27/2016
 ASSIGNED DATE 01/27/2016

NON-CONFIDENTIAL

Please note, this information sheet is not a substitute for file research and is limited to data entered into the AIRTRAX database.

Company ID: 095-00037
 Company: Antero Resources Corporation
 Printed: 01/27/2016
 Engineer: Williams, Jerry

Williams, Jerry

From: Williams, Jerry
Sent: Thursday, February 18, 2016 11:01 AM
To: 'wmcneilly@anteroresources.com'; Barry Schatz
Cc: McKeone, Beverly D
Subject: WV DAQ NSR Permit Application Complete for Antero Midstream LLC Monroe Compressor Station

**RE: Application Status: Complete
Antero Midstream LLC Monroe Compressor Station
Permit Application R13-3184C
Plant ID No. 095-00037**

Mr. McNeilly,

Your application for a modification permit for a natural gas compressor station was received by this Division on January 27, 2016 and assigned to the writer for review. Upon review of said application, it was determined that the application was incomplete and additional information was requested. The requested information has been received, therefore, the statutory review period commenced on February 18, 2016.

In the case of this application, the agency believes it will take approximately 90 days to make a final permit determination.

This determination of completeness shall not relieve the permit applicant of the requirement to subsequently submit, in a timely manner, any additional or corrected information deemed necessary for a final permit determination.

Should you have any questions, please contact Jerry Williams at (304) 926-0499 ext. 1223 or reply to this email.

Jerry Williams, P.E.
Engineer
WVDEP – Division of Air Quality
601 57th Street, SE
Charleston, WV 25304
(304) 926-0499 ext. 1223
jerry.williams@wv.gov



 Please consider the environment before printing this email.

NON-CONFIDENTIAL

February 5, 2016



Mr. Jerry Williams
Division of Air Quality
WV Department of Environmental Protection
601 57th Street, SE
Charleston, WV 25304

Antero Resources
1615 Wynkoop Street
Denver, CO 80202
Office 303.357.7310
Fax 303.357.7315

Dear Mr. Williams:

Re: **Original Affidavit of Publication**
Monroe Compressor Station – Permit No. R13-3184A



Antero Midstream would like to submit the Original Affidavit of Publication from *The Tyler Star News*. This is being submitted in accordance with a permit application requirement for an oil and gas compressor station.

Sincerely,

A handwritten signature in black ink that reads "Barry Schatz".

Barry Schatz
Senior Environmental & Regulatory Manager

Encl.

ID # 045-00037
Reg R13-3184A
Company Antero
Facility Monroe Initials JS

NON-CONFIDENTIAL

TYLER STAR NEWS



AIR QUALITY PERMIT NOTICE
Notice of Application - **Monroe Compressor Station**

Notice is given that **Midstream LLC** has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a modification to the existing 45CSR13 Citrus, for a modification to the Natural Gas Compressor Station located north of Conway Run Road, Permit R13-3184A for the County of Tyler, West Virginia, near Alma, in Tyler County, West Virginia. The coordinates are: 39.4280, 80.8100.

The applicant estimates the potential to discharge of the following pollutants will be:
Sulfur Dioxide (SO₂) - 11 tpy
Nitrogen Dioxide (NO₂) - 16.00 tpy
Carbon Monoxide (CO) - 83 tpy
Total Volatile Organic Compounds (VOC) - 87 tpy
Particulate Matter less than 10 μm (PM₁₀) - 0.07 tpy
Particulate Matter less than 2.5 μm (PM_{2.5}) - 0.07 tpy
Toluene - 0.09 tpy
Benzene - 0.07 tpy
Xylenes - 0.07 tpy
Ethylene Glycol (EG) - 26,636 tpy

The applicant estimates the discharge of the following pollutants will be:
Nitrogen Dioxide (NO₂) - 16.00 tpy
Carbon Monoxide (CO) - 83 tpy
Total Volatile Organic Compounds (VOC) - 87 tpy

Written comments received from the Department of Environmental Quality, 601 E. Virginia Ave., Charleston, West Virginia, at least 30 days from the date of this notice.

Any questions should be directed to the Air Quality Supervisor at (304) 926-1615 during normal business hours. Dated this 20th day of January 2016.

By: Antero Barry Scott, Supervisor
Midstream
1615 W. Denver
TSN 2016

Sistersville, WV January 27, 2016

State of West Virginia, County of Tyler:

Personally appeared before the undersigned, a Notary Public,
Brian Clutter who, being duly sworn,

states that he is the manager of the Tyler Star News, a weekly newspaper of general circulation, published at Sistersville, County of Tyler, State of West Virginia, and that a copy of the notice attached hereto was published for 1 successive

weeks in the Tyler Star News, beginning on the 27 day of January 2016 and ending on the 27 day of January, 2016.

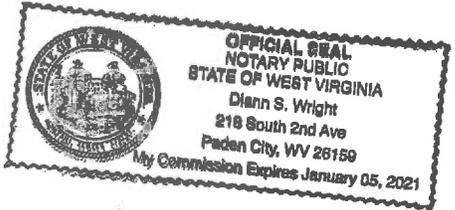
.....
Manager, Tyler Star News

Subscribed and sworn to before me, a Notary Public of said County, on this 27 day of January, 2016.

..... Notary Public

My commission expires on the 5th day of January, 2021.

Printers Fee.....



Williams, Jerry

From: Michele Steyskal <MSteyskal@kleinfelder.com>
Sent: Monday, February 01, 2016 1:14 PM
To: Williams, Jerry
Cc: Barry Schatz (bschatz@anteroresources.com)
Subject: Monroe and Nichols CS additional information
Attachments: Att I - Emission Unit Table_Rev1.pdf; Att N-Monroe Compressor Station Emissions_Rev1.pdf; Monroe Promax.pdf

Hi Jerry,

On Friday we discussed three items you needed as part of your application review:

1. Monroe CS ProMax run for the tank emissions as Vasquez Beggs is no longer accepted. Attached is the ProMax run and updated emissions. Note that we did not change throughput or any other parameters, so the difference in emissions is just due to ProMax. The attached Revision 1 of the Monroe emissions has flashing, working and breathing using ProMax.
2. Monroe CS Attachment I including truck loading. This form is attached.
3. A discussion on the differences in HAPs and GHG from truck loading between the two compressor stations.
 - a. Previously the main difference between Monroe and Nichols for the HAPs and GHG from truck loading was the percentage of HAPs and GHG used in the off gas. For Monroe, since Vasquez Beggs was used, a standard 1% HAPs, 70% VOC, and 20% methane was used. For Nichols, because ProMax was used, the modeled weight percentages were used and those are 73% VOC, 5.8% HAPs and 8% methane.
 - b. In the updated Monroe CS emissions, because ProMax was used for the tanks, the truck loading emissions could also be updated with more accurate modeled numbers. The truck loading emissions now use molecular weight, vapor pressure, and temperature from ProMax as well as modeled weight percents. Those values are 79% VOC, 2.5% HAPs and 1% methane. So the HAPs and GHG compared to Nichols will still vary due to them having different representative samples for the ProMax runs. Note also that because the Monroe liquid sample has higher VOCs, the flashing emissions as compared to Nichols are also higher.

Please let me know if you have further questions.

Michele

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ID # 095-00037
Reg R13-3184C
Company ANTERO
Facility Monroe Initials ds

NON-CONFIDENTIAL

Process Streams	Condensate		Flash Gas		Pressurized Condensate		Pressurized Water		Produced Water	
	Phase	Total	Solved	Settling Tank	Solved	Settling Tank	Solved	Settling Tank	Solved	Settling Tank
Property	Units	From Block To Block	Solved	Settling Tank	Solved	Settling Tank	Solved	Settling Tank	Solved	Settling Tank
Temperature	°F		65.08	65.08	120	120	65.08	65.08	119.793	119.793
Pressure	psig		0	0	300	300	0	0	0	300
Mole Fraction Vapor	%		0	0	100	100	0	0	0	0
Mole Fraction Light Liquid	%		100	100	0	0	0	0	0	0
Mole Fraction Heavy Liquid	%		0	0	0	0	0	0	0	0
Molecular Weight	lb/lbmol		105.786	41.0885	91.5956	91.5956	18.0161	18.0161	33.8876	33.8876
Mass Density	lb/ft³		44.1935	0.108813	41.1450	41.1450	62.3189	62.3189	66.1124	66.1124
Molar Flow	lbmol/h		14.5661	4.22841	14.5640	14.5640	36.4401	36.4401	42.9269	42.9269
Mass Flow	lb/h		1540.89	173.572	1340.99	1340.99	656.508	656.508	45.3568	45.3568
Vapor Volumetric Flow	ft³/h		34.8668	1595.13	32.5917	32.5917	19.7006	10.5346	2370.97	2370.97
Liquid Volumetric Flow	ft³/h		4.34703	198.874	4.06338	4.06338	2.45618	1.31341	6.51737	6.51737
Std Vapor Volumetric Flow	gpm		0.132663	0.0384926	0.133338	0.133338	0.369700	0.331883	0.503038	0.503038
Std Liquid Volumetric Flow	sgpm		4.37500	0.716336	3.98358*	3.98358*	2.42026*	1.31250	6.40384	6.40384
Compressibility			0.00624658	0.984933	0.112617	0.112617	0.0245517	0.989197	0.0478959	0.0478959
Specific Gravity			0.708581	1.4798	0.659703	0.659703	0.838261	0.989197	0.727217	0.727217
API Gravity			67.3067		73.1098	73.1098	33.2532	10.0157	55.9839	55.9839
Enthalpy	Btu/h		-1.37147E+06	-195447	-1.20095E+06	-1.20095E+06	-4.79421E+06	-4.48583E+06	-5.99516E+06	-5.99516E+06
Mass Enthalpy	Btu/lb		-890.051	-1126.03	-895.574	-895.574	-4654.67	-6832.87	-2528.57	-2528.57
Mass Cp	Btu/(lb*°F)		0.489379	0.408507	0.535294	0.535294	0.820776	0.983557	0.659155	0.659155
Ideal Gas Cp/Cv Ratio			1.05236	1.12537	1.05643	1.05643	1.21803	1.32606	1.12268	1.12268
Dynamic Viscosity	cP		0.486277	0.00845042	0.280616	0.280616	0.425769	1.06256	0.340651	0.340651
Kinematic Viscosity	cSt		0.686918	4.85387	0.6636448	0.6636448	0.228079	0.344706	0.457573	0.457573
Thermal Conductivity	Btu/(ft²·h·°F)		0.0702006	0.0111460	0.0636448	0.0636448	4642.61	0.0665448	0.125584	0.125584
Net Ideal Gas Heating Value	Btu/ft³		5339.96	2136.71	19078.1	19078.1	4998.76	50.3926	1725.67	1725.67
Net Liquid Heating Value	Btu/lb		18998.3	19589.7	4998.76	4998.76	545.182	1.55037	14848.2	14848.2
Gross Ideal Gas Heating Value	Btu/ft³		5742.75	2325.37	20553.6	20553.6	7419.98	1.55037	14848.2	14848.2
Gross Liquid Heating Value	Btu/lb		20443.3	21333.0						

Promax AP-42 Emissions Report		Promax AP-42 Emissions Report		Promax AP-42 Emissions Report	
Annual Emissions		Annual Emissions		Annual Emissions	
Settling Tank	Total Losses (ton/yr)	Single Condensate Tank	Total Losses (ton/yr)	Single Produced Water Tank	Total Losses (ton/yr)
Components		Components		Components	
Mixture	11.41	Mixture	10.11	Mixture	0.05152
Methane	0.07983	Methane	0.0707	Methane	0.0003518
Ethane	2.257	Ethane	1.999	Ethane	0.0008686
Propane	3.221	Propane	2.852	Propane	0.0003316
i-Butane	8.58E-01	i-Butane	0.7601	i-Butane	8.38E-06
n-Butane	2.21E+00	n-Butane	1.959	n-Butane	3.86E-05
i-Pentane	8.17E-01	i-Pentane	0.7235	i-Pentane	3.48E-06
n-Pentane	9.46E-01	n-Pentane	0.8381	n-Pentane	2.82E-06
2-Methylpentane	4.15E-01	2-Methylpentane	0.3679	2-Methylpentane	1.79E-07
n-Heptane	2.27E-01	n-Heptane	0.2011	n-Heptane	2.20E-08
n-Octane	7.56E-02	n-Octane	0.06694	n-Octane	1.03E-09
n-Nonane	1.21E-02	n-Nonane	0.01073	n-Nonane	1.06E-10
n-Hexane	2.66E-01	n-Hexane	0.2353	n-Hexane	5.88E-08
Benzene	2.83E-03	Benzene	0.002503	Benzene	6.57E-07
Toluene	6.42E-03	Toluene	0.005682	Toluene	3.20E-07
Ethylbenzene	2.43E-03	Ethylbenzene	0.002153	Ethylbenzene	3.70E-08
p-Xylene	5.94E-03	p-Xylene	0.005256	p-Xylene	7.43E-08
Nitrogen	3.72E-05	Nitrogen	3.30E-05	Nitrogen	5.14E-07
Carbon Dioxide	0.008188	Carbon Dioxide	0.007251	Carbon Dioxide	0.0001474
Water	3.44E-05	Water	3.04E-05	Water	0.04976
Decanes+	9.57E-04	Decanes+	0.0008473	Decanes+	2.22E-13
					18.49

EMISSIONS SUMMARY TOTAL

Company:	Antero Midstream LLC
Facility Name:	Monroe Compressor Station
Facility Location:	Tyler County, West Virginia

UNCONTROLLED POTENTIAL EMISSION SUMMARY

Source	NOx		CO		VOC		SO _x		PM-10		HAP's		Formaldehyde		CO ₂ e tpy
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	
Engines															
Compressor Engine 1	50.74	222.24	47.04	206.02	1.70	7.46	0.008	0.04	0.27	1.18	0.35	1.54	0.19	0.81	9,109
Compressor Engine 2	50.74	222.24	47.04	206.02	1.70	7.46	0.008	0.04	0.27	1.18	0.35	1.54	0.19	0.81	9,109
Compressor Engine 3	50.74	222.24	47.04	206.02	1.70	7.46	0.008	0.04	0.27	1.18	0.35	1.54	0.19	0.81	9,109
Compressor Engine 4	50.74	222.24	47.04	206.02	1.70	7.46	0.008	0.04	0.27	1.18	0.35	1.54	0.19	0.81	9,109
Compressor Engine 5	50.74	222.24	47.04	206.02	1.70	7.46	0.008	0.04	0.27	1.18	0.35	1.54	0.19	0.81	9,109
Compressor Engine 6	50.74	222.24	47.04	206.02	1.70	7.46	0.008	0.04	0.27	1.18	0.35	1.54	0.19	0.81	9,109
Compressor Engine 7	50.74	222.24	47.04	206.02	1.70	7.46	0.008	0.04	0.27	1.18	0.35	1.54	0.19	0.81	9,109
Compressor Engine 8	50.74	222.24	47.04	206.02	1.70	7.46	0.008	0.04	0.27	1.18	0.35	1.54	0.19	0.81	9,109
Compressor Engine 9	50.74	222.24	47.04	206.02	1.70	7.46	0.008	0.04	0.27	1.18	0.35	1.54	0.19	0.81	9,109
Compressor Engine 10	50.74	222.24	47.04	206.02	1.70	7.46	0.008	0.04	0.27	1.18	0.35	1.54	0.19	0.81	9,109
Compressor Engine 11	50.74	222.24	47.04	206.02	1.70	7.46	0.008	0.04	0.27	1.18	0.35	1.54	0.19	0.81	9,109
Compressor Engine 12	50.74	222.24	47.04	206.02	1.70	7.46	0.008	0.04	0.27	1.18	0.35	1.54	0.19	0.81	9,109
Compressor Engine 13	50.74	222.24	47.04	206.02	1.70	7.46	0.008	0.04	0.27	1.18	0.35	1.54	0.19	0.81	9,109
Turbines															
Microturbine Generators	0.24	1.11	0.66	3.06	0.60	0.28	0.021	0.10	0.041	0.19	0.063	0.029	0.0044	0.020	3,698
Catalytic Heater for Generator Fuel	0.0029	0.013	0.0025	0.011	0.00016	0.00071	0.000018	0.000077	0.00022	0.0010	0.000055	0.00024	0.0000022	0.000010	12
Dehydrator															
TEG Dehydrator 1	---	---	---	---	60.75	266.07	---	---	---	---	8.75	38.32	---	---	9,832
TEG Dehydrator 2	---	---	---	---	60.75	266.07	---	---	---	---	8.75	38.32	---	---	9,832
Reboiler 1	0.18	0.81	0.15	0.68	0.010	0.044	0.0011	0.0048	0.014	0.061	0.0035	0.015	0.00014	0.00060	771
Reboiler 2	0.18	0.81	0.15	0.68	0.010	0.044	0.0011	0.0048	0.014	0.061	0.0035	0.015	0.00014	0.00060	771
Combustors															
Flare and Pilot	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Hydrocarbon Loading															
Truck Loadout	---	---	---	---	77.54	8.16	---	---	---	---	2.42	0.25	---	---	1.88
Fugitive Emissions															
Component Leak Emissions	---	---	---	---	1.79	7.84	---	---	---	---	0.0045	0.020	---	---	140
Venting Emissions	---	---	---	---	---	10.73	---	---	---	---	---	0.027	---	---	773
Fugitive Dust Emissions	---	---	---	---	---	---	---	---	0.051	0.22	---	---	---	---	---
Storage Tanks															
Produced Water Tanks	---	---	---	---	0.00018	0.00077	---	---	---	---	5.23E-07	2.29E-06	---	---	0.018
Settler Tank	---	---	---	---	128.93	564.69	---	---	---	---	4.00	17.52	---	---	1,427
Condensate Tanks	---	---	---	---	3.67	16.06	---	---	---	---	0.11	0.50	---	---	3.5
Total Facility PTE =	660.24	2,891.91	612.45	2,682.71	355.64	1,237.00	0.13	0.57	3.63	15.90	28.60	115.03	2.41	10.57	145,678

EMISSIONS SUMMARY TOTAL

Company:	Antero Midstream LLC
Facility Name:	Monroe Compressor Station
Facility Location:	Tyler County, West Virginia

CONTROLLED POTENTIAL EMISSION SUMMARY

Source	NOx		CO		VOC		SO _x		PM-10		HAPs		Formaldehyde		CO ₂ e tpy
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	
Engines															
Compressor Engine 1	1.27	5.56	1.18	5.15	0.27	1.19	0.0082	0.036	0.27	1.18	0.18	0.81	0.019	0.081	8,731
Compressor Engine 2	1.27	5.56	1.18	5.15	0.27	1.19	0.0082	0.036	0.27	1.18	0.18	0.81	0.019	0.081	8,731
Compressor Engine 3	1.27	5.56	1.18	5.15	0.27	1.19	0.0082	0.036	0.27	1.18	0.18	0.81	0.019	0.081	8,731
Compressor Engine 4	1.27	5.56	1.18	5.15	0.27	1.19	0.0082	0.036	0.27	1.18	0.18	0.81	0.019	0.081	8,731
Compressor Engine 5	1.27	5.56	1.18	5.15	0.27	1.19	0.0082	0.036	0.27	1.18	0.18	0.81	0.019	0.081	8,731
Compressor Engine 6	1.27	5.56	1.18	5.15	0.27	1.19	0.0082	0.036	0.27	1.18	0.18	0.81	0.019	0.081	8,731
Compressor Engine 7	1.27	5.56	1.18	5.15	0.27	1.19	0.0082	0.036	0.27	1.18	0.18	0.81	0.019	0.081	8,731
Compressor Engine 8	1.27	5.56	1.18	5.15	0.27	1.19	0.0082	0.036	0.27	1.18	0.18	0.81	0.019	0.081	8,731
Compressor Engine 9	1.27	5.56	1.18	5.15	0.27	1.19	0.0082	0.036	0.27	1.18	0.18	0.81	0.019	0.081	8,731
Compressor Engine 10	1.27	5.56	1.18	5.15	0.27	1.19	0.0082	0.036	0.27	1.18	0.18	0.81	0.019	0.081	8,731
Compressor Engine 11	1.27	5.56	1.18	5.15	0.27	1.19	0.0082	0.036	0.27	1.18	0.18	0.81	0.019	0.081	8,731
Compressor Engine 12	1.27	5.56	1.18	5.15	0.27	1.19	0.0082	0.036	0.27	1.18	0.18	0.81	0.019	0.081	8,731
Compressor Engine 13	1.27	5.56	1.18	5.15	0.27	1.19	0.0082	0.036	0.27	1.18	0.18	0.81	0.019	0.081	8,731
Turbines															
Microturbine Generators	0.24	1.11	0.66	3.06	0.60	0.28	0.021	0.10	0.41	0.19	0.063	0.029	0.044	0.020	3,698
Catalytic Heater for Generator Fuel	0.0029	0.013	0.0025	0.011	0.00016	0.00071	0.000018	0.000077	0.00022	0.0010	0.000055	0.00024	0.0000022	0.000010	12
Dehydrator															
TEG Dehydrator 1	---	---	---	---	1.21	5.32	---	---	---	---	0.17	0.76	---	---	214
TEG Dehydrator 2	---	---	---	---	1.21	5.32	---	---	---	---	0.17	0.76	---	---	214
Reboiler 1	0.18	0.81	0.15	0.68	0.010	0.044	0.0011	0.0048	0.014	0.061	0.0035	0.015	0.00014	0.00060	771
Reboiler 2	0.18	0.81	0.15	0.68	0.010	0.044	0.0011	0.0048	0.014	0.061	0.0035	0.015	0.00014	0.00060	771
Combustion															
Flare and Pilot	0.33	1.44	1.78	7.79	0.00010	0.00045	0.000011	0.000049	0.00014	0.00062	0.000035	0.00015	---	---	2,465
Hydrocarbon Loading															
Truck Loadout	---	---	---	---	77.54	8.16	---	---	---	---	2.42	0.25	---	---	1.88
Fugitive Emissions															
Component Leak Emissions	---	---	---	---	1.79	7.84	---	---	---	---	0.0045	0.020	---	---	140
Venting Emissions	---	---	---	---	---	10.73	---	---	---	---	---	0.027	---	---	773
Fugitive Dust Emissions	---	---	---	---	---	---	---	---	0.051	0.22	---	---	---	---	---
Storage Tanks															
Produced Water Tanks	---	---	---	---	3.53E-06	1.54E-05	---	---	---	---	1.05E-08	4.58E-08	---	---	0.00065
Settler Tank	---	---	---	---	2.58	11.29	---	---	---	---	0.080	0.35	---	---	29.27
Condensate Tanks	---	---	---	---	0.073	0.32	---	---	---	---	0.0023	0.010	---	---	0.085
Total Facility PTE =	17.43	76.40	18.04	79.16	88.03	64.87	0.13	0.57	3.63	15.90	5.21	12.78	0.25	1.08	122,988

Compressor Engine Emission Calculations

Company:	Antero Midstream LLC
Facility Name:	Monroe Compressor Station
Facility Location:	Tyler County, West Virginia
Source Description:	Compressor Engines

Source Information-Per Engine

Emission Unit ID:	C-100 - C-1300
Engine Make/Model:	Waukesha 7044 GSI
Service:	Compression
Controls - Y or N / Type:	Y NSCR/AFRC
Site Horsepower Rating ¹ :	1,680 hp
Fuel Consumption (BSFC) ¹ :	8.272 Btu/(hp-hr)
Heat Rating ² :	13.90 MMBtu/hr
Fuel Consumption ³ :	106.17 MMBtu/yr
Fuel Consumption ¹ :	12,120 scf/yr
Fuel Heating Value:	1,149 Btu/scf
Operating Hours:	8,760 hrs/yr

- Notes:
1. Values from Waukesha specification sheet
 2. Calculated values
 3. Annual fuel consumption is 100% of maximum fuel consumption at 100% load.

Potential Emissions per Engine

Pollutant	Uncontrolled			Controlled			Source of Emissions Factors
	Emission Factor (lb/MMBtu)	Estimated Emissions (lb/yr)	Estimated Emissions (tpy)	Emission Factor (g/bhp-hr)	Estimated Emissions (lb/yr)	Estimated Emissions (tpy)	
NOx ^{1,4}	13.7	50.74	222.24	0.34	1.27	5.56	Manufacturer's Specs - uncontrolled, Catalyst Specs - controlled
CO ^{1,4}	---	47.04	206.02	0.32	1.18	5.15	Manufacturer's Specs - uncontrolled, Catalyst Specs - controlled
VOC ^{1,4}	0.46	1.70	7.46	0.074	0.27	1.19	Manufacturer's Specs - uncontrolled, Catalyst Specs - controlled
SO ₂	5.88E-04	0.0082	0.036	5.88E-04	0.0082	0.036	AP-42, Chapter 3.2, Table 3.2-3
PM _{2.5} /PM ₁₀	1.94E-02	0.27	1.18	1.94E-02	0.27	1.18	AP-42, Chapter 3.2, Table 3.2-3
Total PM	1.94E-02	0.27	1.18	1.94E-02	0.27	1.18	AP-42, Chapter 3.2, Table 3.2-3
1,1,2,2-Tetrachloroethane	2.53E-05	0.00035	3.08	2.53E-05	0.00035	3.08	AP-42, Chapter 3.2, Table 3.2-3
1,3-Butadiene	6.63E-04	0.0092	80.71	6.63E-04	0.0092	80.71	AP-42, Chapter 3.2, Table 3.2-3
Acetaldehyde	2.79E-03	0.039	339.65	2.79E-03	0.039	339.65	AP-42, Chapter 3.2, Table 3.2-3
Acrolein	2.63E-03	0.037	320.17	2.63E-03	0.037	320.17	AP-42, Chapter 3.2, Table 3.2-3
Benzene	1.58E-03	0.022	192.35	1.58E-03	0.022	192.35	AP-42, Chapter 3.2, Table 3.2-3
Ethylbenzene	2.48E-05	0.00034	3.02	2.48E-05	0.00034	3.02	AP-42, Chapter 3.2, Table 3.2-3
Formaldehyde ^{1,4}	---	0.05	1.622	---	0.005	0.019	Manufacturer's Specs - uncontrolled, Catalyst Specs - controlled
Methanol	3.06E-03	0.043	372.52	3.06E-03	0.043	372.52	AP-42, Chapter 3.2, Table 3.2-3
Methylene Chloride	4.12E-05	0.00057	5.02	4.12E-05	0.00057	5.02	AP-42, Chapter 3.2, Table 3.2-3
PAH	1.41E-04	0.0020	17.16	1.41E-04	0.0020	17.16	AP-42, Chapter 3.2, Table 3.2-3
Toluene	5.58E-04	0.0078	67.93	5.58E-04	0.0078	67.93	AP-42, Chapter 3.2, Table 3.2-3
Xylenes	1.95E-04	0.0027	23.74	1.95E-04	0.0027	23.74	AP-42, Chapter 3.2, Table 3.2-3
Other HAPs ²	2.10E-04	0.0029	25.54	2.10E-04	0.0029	25.54	AP-42, Chapter 3.2, Table 3.2-3
Total HAPs	0.35	3.073	1.54	---	0.18	1.613	---
Pollutant	Emission Factor (kg/MMBtu)	Estimated Emissions (lb/yr)	Estimated Emissions (tpy)	Emission Factor (g/bhp-hr)	Estimated Emissions (lb/yr)	Estimated Emissions (tpy)	Source of Emissions Factors
CO ₂ ¹	528	1,956	8,566	528	1,956	8,566	Manufacturer's Specs
CH ₄ ^{1,4}	---	4.93	.22	---	0.40	1.48	Manufacturer's Specs - uncontrolled, Catalyst Specs - controlled
N ₂ O	0.0001	0.003	0.013	---	0.003	0.013	40 CFR Part 98, Subpart C, Table C-2
CO ₂ e ²	---	2,080	9,109	---	1,993	8,731	40 CFR Part 98, Subpart A, Table A-1, effective January 2014

- Notes:
1. Due to variable load conditions, the catalyst efficiency may vary. The catalyst efficiencies used in the emissions are typical based on expected operating conditions. The catalyst specification sheet shows typical destruction efficiencies that were used in the calculations. The emission factors shown on the catalyst specification sheet are not site specific, so those will vary; however the efficiencies will be the same.
 2. Example Calculations
 $lb/hr = (g/bhp-hr) \cdot (hp) \cdot (1 \text{ lb}/453.6 \text{ g})$ or $(lb/MMBtu) \cdot (MMBtu/hr)$
 $tpy = (MMBtu/yr) \cdot (Btu/scf) \cdot (g/bhp-hr) / (Btu/hp-hr) \cdot (1 \text{ lb}/453.6 \text{ g}) \cdot (1 \text{ ton}/2000 \text{ lb})$ or $(t/MMBtu) \cdot (1 \text{ ton}/2000 \text{ lb})$

Microturbine Generator Emission Calculations

Company:	Antero Midstream LLC
Facility Name:	Monroe Compressor Station
Facility Location:	Tyler County, West Virginia
Source Description:	Microturbine Generators

Source Information

Emission Unit ID:	GEN1 - GEN2
Make/Model:	Capstone C600 Standard
Microturbine Rating:	600 kW/e
Net Heat Rate:	10,300 Btu/kWhe
Heat Input ¹ :	6.18 MMBtu/hr
Operating Hours ⁴ :	9,280 hrs/yr

Notes:

- 1) Calculated
- 2) The C600 is sold as three (3) C200 units in operation together. Thus emission factors for the C600 are the same as the C200 (just three times the kW/e). There will be two C600 units (six C200 units on location).
- 3) No more than 600 kW/e will be operational at one time, except when C200 units are being switched. All units are wired together and operation between individual C200 units will rotate based on functionality of units (e.g., during repairs).
- 4) Annual operation for 600 kW will be for a maximum of 8,760 hours. It is expected that no more than 500 hours of back up power will be utilized during repairs or during unit switches. Each C200 has an hour meter, so it will be known how much each C200 unit is operating and will be used interchangeably.

Potential Emissions

Pollutant	Uncontrolled			Controlled			Source of Emissions Factors
	Emission Factor (lb/MMBtu)	Estimated Emissions ¹ (lb/yr)	(tpy)	Emission Factor (lb/MMWhe)	Estimated Emissions ¹ (lb/yr)	(tpy)	
NOx	0.40	0.24	1.11	0.40	0.24	1.11	Manufacturer Specifications
CO	1.10	0.66	3.06	1.10	0.66	3.06	Manufacturer Specifications
VOC	0.10	0.060	0.28	0.10	0.060	0.28	Manufacturer Specifications
SO ₂	3.40E-03	0.021	0.10	3.40E-03	0.021	0.10	AP-42, Chapter 3.1, Table 3.1-2a
PM ₁₀ /PM _{2.5}	6.60E-03	0.041	0.19	6.60E-03	0.041	0.19	AP-42, Chapter 3.1, Table 3.1-2a
1,3-Butadiene	4.30E-07	0.02	0.00001	4.30E-07	0.025	0.00001	AP-42, Chapter 3.1, Table 3.1-3
Acetaldehyde	4.00E-05	2.29	0.001	4.00E-05	2.47E-04	0.001	AP-42, Chapter 3.1, Table 3.1-3
Acrolein	3.96E-05	0.37	0.0002	6.40E-06	3.96E-05	0.0002	AP-42, Chapter 3.1, Table 3.1-3
Benzene	1.20E-05	0.69	0.0003	1.20E-05	7.42E-05	0.0003	AP-42, Chapter 3.1, Table 3.1-3
Ethylbenzene	3.20E-05	1.83	0.0009	3.20E-05	1.98E-04	1.83	AP-42, Chapter 3.1, Table 3.1-3
Formaldehyde	7.10E-04	40.63	0.02	7.10E-04	4.39E-03	40.63	AP-42, Chapter 3.1, Table 3.1-3
Naphthalene	1.30E-06	0.07	0.00004	1.30E-06	8.03E-06	0.074	AP-42, Chapter 3.1, Table 3.1-3
PAH	2.20E-06	0.13	0.00006	2.20E-06	1.36E-05	0.13	AP-42, Chapter 3.1, Table 3.1-3
Propylene Oxide	2.90E-05	1.66	0.0008	2.90E-05	1.79E-04	1.66	AP-42, Chapter 3.1, Table 3.1-3
Toluene	1.30E-04	7.44	0.004	1.30E-04	8.03E-04	7.44	AP-42, Chapter 3.1, Table 3.1-3
Xylenes	6.40E-05	3.66	0.002	6.40E-05	3.96E-04	3.66	AP-42, Chapter 3.1, Table 3.1-3
Total HAPS		58.79	0.03		0.006	58.79	
Pollutant	Uncontrolled			Controlled			Source of Emissions Factors
	Emission Factor (kg/MMBtu)	Estimated Emissions ¹ (lb/yr)	(tpy)	Emission Factor (lb/MMWhe)	Estimated Emissions ¹ (lb/yr)	(tpy)	
CO ₂	1,330	798	3,695	1,330	798	3,695	Manufacturer Specifications
CH ₄	0.001	0.01	0.06	0.001	0.01	0.06	40 CFR Part 98, Subpart C, Table C-2
N ₂ O	0.0001	0.001	0.006	0.0001	0.001	0.006	40 CFR Part 98, Subpart C, Table C-2
CO ₂ e		798	3,698		799	3,698	40 CFR Part 98, Subpart A, Table A-1, effective January 2014

Example Calculations

$$lb/yr = (lb/MMWhe) \cdot kW/e \cdot (1 MW/1000 kW/e) \cdot (MMBtu/hr) \cdot (kg/MMBtu) \cdot (MMBtu/hr) \cdot (2.21 lb/kg)$$

$$tpy = (lb/yr) \cdot (hr/yr) \cdot (ton/2000 lb)$$

Natural Gas Fueled Catalytic Heater Emissions

Company:	Antero Midstream LLC
Facility Name:	Monroe Compressor Station
Location:	Tyler County, West Virginia
Source Description:	Catalytic Heater for Generator Fuel

Source Information

Emission Unit ID:	CATH1
Source Description:	Generator Fuel Heater
Hours of Operation	8,760 hr/yr
Design Heat Rate	0.024 MMBtu/hr
Heater Efficiency	80%
Fuel Heat Value	1,020 Btu/scf
Fuel Use	0.26 MMscf/yr

Emission Calculations per Heater

Pollutant	Emission Factor (lb/MMscf)	Emissions (lb/hr)	Emissions (tpy)	Emission Factor Source
NO _x	100	0.0029	0.013	AP-42 Ch. 1.4 Table 1.4-1
CO	84	0.0025	0.011	AP-42 Ch. 1.4 Table 1.4-1
VOC	5.5	0.00016	0.00071	AP-42 Ch. 1.4 Table 1.4-2
PM ₁₀	7.6	0.00022	0.0010	AP-42 Ch. 1.4 Table 1.4-2
SO ₂	0.6	0.000018	0.000077	AP-42 Ch. 1.4 Table 1.4-2
Formaldehyde	0.075	0.0000022	0.000010	AP-42 Ch. 1.4 Table 1.4-3
Total HAPs (including HCHO) ¹	1.9	0.000055	0.00024	AP-42 Ch. 1.4 Table 1.4-3
Pollutant	Emission Factor (kg/MMBtu)	Emissions (lb/hr)	Emissions (tpy)	Emission Factor Source
Carbon Dioxide	53.06	2.81	12	40 CFR Part 98, Subpart C, Table C-1
Methane	0.001	0.0001	0.00023	40 CFR Part 98, Subpart C, Table C-2
Nitrous Oxide	0.0001	0.00001	0.000023	40 CFR Part 98, Subpart C, Table C-2
CO _{2e}	---	2.82	12	40 CFR Part 98, Subpart A, Table A-1

1. Only those HAP pollutants above detection thresholds were included.

Sample Calculations:

$$\text{Fuel Consumption (MMscf/yr)} = \frac{\text{Heater Size (MMBtu/hr)} * \text{Hours of Operation (hrs/yr)}}{\text{Fuel Heat Value (Btu/scf)} * \text{Heater Efficiency}}$$

$$\text{Emissions (tons/yr)} = \frac{\text{Emission Factor (lbs/MMscf)} * \text{Fuel Consumption (MMscf/yr)}}{2,000 \text{ (lbs/ton)}}$$

Dehydrator Emissions

Company:	Antero Midstream LLC
Facility Name:	Monroe Compressor Station
Facility Location:	Tyler County, West Virginia
Source Description:	Dehydrator Units

Potential Emissions per Dehydrator

Pollutant	Emission Unit ID: DEHY1/DEHY2		Emission Unit ID: DFLSH1/DFLSH2	
	Dehydrator Still Vent		Flash Tank Gas	
	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Uncontrolled Emissions ¹				
VOC	15.71	68.82	45.03	197.25
Total HAPs	6.40	28.02	2.35	10.30
Benzene	1.58	6.92	0.39	1.72
Toluene	2.45	10.72	0.46	2.01
Xylenes	2.00	8.77	0.18	0.78
n-Hexane	0.37	1.61	1.32	5.79
Methane	17.86	78.24	71.77	314.34
Carbon Dioxide	0.55	2.39	3.44	15.07
CO ₂ e	447	1,958	1,798	7,874
Controlled Emissions ^{2,3}				
VOC	0.31	1.37	0.90	3.94
Total HAPs	0.13	0.56	0.047	0.21
Benzene	0.031	0.14	0.0079	0.034
Toluene	0.049	0.21	0.0092	0.040
Xylenes	0.040	0.17	0.0036	0.016
n-Hexane	0.0074	0.032	0.026	0.12
Methane	0.36	1.56	1.44	6.29
Carbon Dioxide	0.55	2.39	3.44	15.07
CO ₂ e	9.5	41.5	39.3	172

Pollutant	Unit ID: DEHY + DFLSH	
	Dehydrator Emission Totals (lb/hr)	(tpy)
Uncontrolled Emissions ¹		
VOC	60.75	266.07
Total HAPs	8.75	38.32
Benzene	1.97	8.64
Toluene	2.91	12.73
Xylenes	2.18	9.55
n-Hexane	1.69	7.40
Methane	89.63	392.58
Carbon Dioxide	3.99	17.46
CO ₂ e	2,245	9,832
Controlled Emissions ^{2,3}		
VOC	1.21	5.32
Total HAPs	0.17	0.76
Benzene	0.039	0.17
Toluene	0.058	0.25
Xylenes	0.043	0.19
n-Hexane	0.034	0.15
Methane	1.79	7.85
Carbon Dioxide	3.99	17.46
CO ₂ e	48.8	213.7

¹Output from GRI-GLYCalc 4.0 for both the still vent and flash tank gas emissions

²Controlled emissions assume that the glycol still vent is equipped with a condenser and is controlled by a combustor with 98% control efficiency.

³Flash tank gas is used in the reboiler as the primary fuel source. However, in the case that gas cannot be used in the reboiler, the gas is sent to the primary/backup VRU system via the storage tanks for 98% control.

Natural Gas Fueled Dehydrator Reboiler Emissions

Company:	Antero Midstream LLC
Facility Name:	Monroe Compressor Station
Location:	Tyler County, West Virginia
Source Description:	Dehydrator Reboilers

Source Information

Emission Unit ID:	DREB1 - DREB2
Source Description:	Dehydrator Reboiler
Hours of Operation	8,760 hr/yr
Design Heat Rate	1.5 MMBtu/hr
Heater Efficiency	0.8
Fuel Heat Value	1,020 Btu/scf
Fuel Use	16.1 MMscf/yr

Emission Calculations per Reboiler

Pollutant	Emission Factor (lb/MMscf)	Emissions (lb/hr)	Emissions (tpy)	Emission Factor Source
NO _x	100	0.18	0.81	AP-42 Ch. 1.4 Table 1.4-1
CO	84	0.15	0.68	AP-42 Ch. 1.4 Table 1.4-1
VOC	5.5	0.010	0.044	AP-42 Ch. 1.4 Table 1.4-2
PM ₁₀	7.6	0.014	0.061	AP-42 Ch. 1.4 Table 1.4-2
SO ₂	0.6	0.0011	0.0048	AP-42 Ch. 1.4 Table 1.4-2
Formaldehyde	0.075	0.00014	0.00060	AP-42 Ch. 1.4 Table 1.4-3
Total HAPs (including HCHO)	1.9	0.0035	0.015	AP-42 Ch. 1.4 Table 1.4-3
Pollutant	Emission Factor (kg/MMBtu)	Emissions (lb/hr)	Emissions (tpy)	Emission Factor Source
Carbon Dioxide	53.06	175.89	770	40 CFR Part 98, Subpart C, Table C-1
Methane	0.001	0.0033	0.015	40 CFR Part 98, Subpart C, Table C-2
Nitrous Oxide	0.0001	0.00033	0.0015	40 CFR Part 98, Subpart C, Table C-2
CO _{2e}	---	176.1	771	40 CFR Part 98, Subpart A, Table A-1

Sample Calculations:

$$\text{Fuel Consumption (MMscf/yr)} = \frac{\text{Heater Size (MMBtu/hr)} * \text{Hours of Operation (hrs/yr)}}{\text{Fuel Heat Value (Btu/scf)} * \text{Heater Efficiency}}$$

$$\text{Emissions (tons/yr)} = \frac{\text{Emission Factor (lbs/MMscf)} * \text{Fuel Consumption (MMscf/yr)}}{2,000 \text{ (lbs/ton)}}$$

Flare Emissions

Company:	Antero Midstream LLC
Facility Name:	Monroe Compressor Station
Facility Location:	Tyler County, West Virginia
Source Description:	Flare for Dehydrator Still Vent Gas
Emission Unit ID:	FLARE1

Combusted Gas Emissions

Flare Heat Input :	4.80	MMBtu/hr
Vent Gas to Flare Rate:	4,176	scf/hr
Gas Heating Value:	1,149	Btu/scf
Hours of Operation:	8,760	hr/yr

Pollutant	Emission Factor ¹ (lb/MMBtu)	Emissions (lbs/hr)	Emissions (tons/yr)
Particulate Matter (PM/PM ₁₀ /PM _{2.5})	N/A - Smokeless Design		
Nitrogen Oxides (NO _x)	0.068	0.33	1.43
Carbon Monoxide (CO)	0.37	1.78	7.78

¹ Emission Factors from Table 13.5-1 of AP-42 Section 13.5 (Sept 1991)

Pilot Emissions

Pilot Heating Value:	1,149	Btu/scf
Hours of Operation:	8,760	hr/yr
Total Pilot Natural Gas Usage:	1.64E-05	MMscf/hr

Pollutant	Emission Factor (lb/MMscf)	Emissions (lbs/hr)	Emissions (tons/yr)
Particulate Matter (PM/PM ₁₀ /PM _{2.5}) ²	7.6	1.40E-04	6.15E-04
Nitrogen Oxides (NO _x)	100	1.85E-03	8.09E-03
Sulfur Dioxide (SO ₂) ²	0.6	1.11E-05	4.86E-05
Carbon Monoxide (CO) ²	84	1.55E-03	6.80E-03
Volatile Organic Compounds (VOC) ²	5.5	1.02E-04	4.45E-04
Total HAPs ^{2,3}	1.88	3.47E-05	1.52E-04

² Emission Factors from AP-42 Tables 1.4-1, 1.4-2, 1.4-3, and 1.4-4 (7/98).

³ Sum of Emissions Factors published for pollutants classified as "HAPS" under AP-42 Table 1.4-3.

Total Flare Emissions

Pollutant	Total Potential Emission Rate (tons/year)
Particulate Matter (PM/PM ₁₀ /PM _{2.5})	6.15E-04
Nitrogen Oxides (NO _x)	1.44
Sulfur Dioxide (SO ₂)	4.86E-05
Carbon Monoxide (CO)	7.79
Volatile Organic Compounds (VOC)	4.45E-04
Total HAPs	1.52E-04

Greenhouse Gas Emissions

Pollutant	Emission Factor (kg/MMBtu)	Emissions (lb/hr)	Emissions (tpy)	Emission Factor Source
Carbon Dioxide	53.06	562.86	2,465	40 CFR Part 98, Subpart C, Table C-1
Methane	0.001	0.01	0.05	40 CFR Part 98, Subpart C, Table C-2
Nitrogen Dioxide	0.0001	0.001	0.005	40 CFR Part 98, Subpart C, Table C-2
CO ₂ e	----	562.86	2,465	40 CFR Part 98, Subpart A, Table A-1

Settling Tank Flashing Emissions

Company:	Antero Midstream LLC
Facility Name:	Monroe Compressor Station
Facility Location:	Tyler County, West Virginia
Source Description:	Settling Tank
Emission Unit ID:	TK-1502

Settling Tank Flashing Emissions

Component	Uncontrolled Flashing Emissions ¹ (lb/hr)	Uncontrolled Flashing Emissions (tons/yr)	Controlled Flashing Emissions ^{2,3} (lb/hr)	Controlled Flashing Emissions ^{2,3} (tons/yr)
Methane	13.00	56.95	0.26	1.14
Ethane	31.90	139.71	0.64	2.79
Propane	45.56	199.57	0.91	3.99
i-Butane	12.01	52.60	0.24	1.05
n-Butane	30.60	134.02	0.61	2.68
i-Pentane	11.42	50.01	0.23	1.00
n-Pentane	13.12	57.48	0.26	1.15
i-Hexanes	5.62	24.62	0.11	0.49
Heptanes	3.28	14.36	0.066	0.29
Octanes	1.11	4.85	0.022	0.10
Nonanes	0.19	0.81	0.0037	0.016
Decanes+	0.016	0.07	0.00032	0.0014
n-Hexane	3.60	15.76	0.072	0.32
Benzene	0.061	0.27	0.0012	0.0053
Toluene	0.12	0.54	0.0025	0.011
Ethylbenzene	0.044	0.19	0.00089	0.0039
Xylenes	0.11	0.47	0.0021	0.0094
Nitrogen	0.063	0.27	0.063	0.27
Carbon Dioxide	0.17	0.74	0.17	0.74
Water	1.59	6.95	1.59	6.95
VOC Subtotal	126.85	555.62	2.54	11.11
HAP Subtotal	3.93	17.23	0.079	0.34
CO₂e Subtotal	325.24	1424.53	6.67	29.22
Total	173.57	760.25	5.25	23.01

Notes:

1. Flashing emissions calculated by ProMax 3.2. Flashing only occurs in the settling tank as all pressurized fluids flow into the settling tank and then separate out at atmospheric conditions to the condensate and produced water tanks.
2. Tanks are controlled by a VRU with assumed 98% capture efficiency; but will likely be higher as vapors are recycled back into the system
3. VRU-100 is the primary VRU to collect storage tank vapors and VRU-200 is the backup VRU in times when the primary VRU is undergoing maintenance or shutdown.

Storage Tank Working and Breathing Emissions

Company:	Antero Midstream LLC
Facility Name:	Monroe Compressor Station
Facility Location:	Tyler County, West Virginia
Source Description:	Condensate, Settling, and Produced Water Tanks
Emission Unit ID:	TK-1500, TK-1501, TK-1502, TK-200, TK-201

TANK DESCRIPTION	Uncontrolled VOC Emissions ¹ (tons/yr)	Uncontrolled Benzene Emissions ¹ (tons/yr)	Uncontrolled Toluene Emissions ¹ (tons/yr)	Uncontrolled Ethylbenzene Emissions ¹ (tons/yr)	Uncontrolled Xylene Emissions ¹ (tons/yr)	Uncontrolled n-Hexane Emissions ¹ (tons/yr)	Uncontrolled CH ₄ Emissions ¹ (tons/yr)	Uncontrolled CO _{2e} Emissions (tons/yr)
400 bbl Hydrocarbon Storage Tank (TK-200)	8.03	2.50E-03	5.68E-03	2.15E-03	5.26E-03	2.35E-01	0.071	1.77
400 bbl Hydrocarbon Storage Tank (TK-201)	8.03	2.50E-03	5.68E-03	2.15E-03	5.26E-03	2.35E-01	0.071	1.77
400 bbl Settling Tank (TK-1502)	9.07	2.83E-03	6.42E-03	2.43E-03	5.94E-03	2.66E-01	0.080	2.00
400 bbl Produced Water Storage Tank (TK-1500)	0.00039	6.57E-07	3.20E-07	3.70E-08	7.43E-08	5.88E-08	0.00035	0.0089
400 bbl Produced Water Storage Tank (TK-1501)	0.00039	6.57E-07	3.20E-07	3.70E-08	7.43E-08	5.88E-08	0.00035	0.0089
TOTAL	25.13	0.0078	0.018	0.0067	0.016	0.74	0.22	5.57

TANK DESCRIPTION	Controlled VOC Emissions ^{1,2} (tons/yr)	Controlled Benzene Emissions ^{1,2} (tons/yr)	Controlled Toluene Emissions ^{1,3} (tons/yr)	Controlled Ethylbenzene Emissions ^{1,2} (tons/yr)	Controlled Xylene Emissions ^{1,2} (tons/yr)	Controlled n-Hexane Emissions ^{1,2} (tons/yr)	Controlled CH ₄ Emissions ^{1,2} (tons/yr)	Controlled CO _{2e} Emissions ^{1,2} (tons/yr)
400 bbl Hydrocarbon Storage Tank (TK-200)	0.16	5.01E-05	1.14E-04	4.31E-05	1.05E-04	4.71E-03	0.0014	0.043
400 bbl Hydrocarbon Storage Tank (TK-201)	0.16	5.01E-05	1.14E-04	4.31E-05	1.05E-04	4.71E-03	0.0014	0.043
400 bbl Settling Tank (TK-1502)	0.18	5.65E-05	1.28E-04	4.86E-05	1.19E-04	5.31E-03	0.0016	0.048
400 bbl Produced Water Storage Tank (TK-1500)	0.0000077	1.31E-08	6.39E-09	7.40E-10	1.49E-09	1.18E-09	7.04E-06	0.00032
400 bbl Produced Water Storage Tank (TK-1501)	0.0000077	1.31E-08	6.39E-09	7.40E-10	1.49E-09	1.18E-09	7.04E-06	0.00032
TOTAL	0.50	1.57E-04	3.56E-04	1.35E-04	3.29E-04	1.47E-02	0.0044	0.13

Notes:

1. ProMax 3.2 used to calculate standing, working, and breathing (S,W,B) emissions
2. Tanks are controlled by a VRU with assumed 98% capture efficiency; but will likely be higher as vapors are recycled back into the system.
3. VRU-100 is the primary VRU to collect storage tank vapors and VRU-200 is the backup VRU in times when the primary VRU is undergoing maintenance or shutdown.

Truck Loading Emissions

Company:	Antero Midstream LLC
Facility Name:	Monroe Compressor Station
Facility Location:	Tyler County, West Virginia
Source Description:	Production Liquids Truck Loadout
Emission Unit ID:	LDOUT1

AP - 42, Chapter 5.2 $L_L = 12.46 \times S \times P \times M / T$

L_L = Loading Loss Emission Factor (lbs VOC/1000 gal loaded)

S = Saturation Factor

P = True Vapor Pressure of the Loaded Liquid (psia)

M = Vapor Molecular Weight of the Loaded Liquid (lbs/lbmol)

T = Temperature of Loaded Liquid (°R)

VOC Emissions (tpy) = L_L (lbs VOC/1000 gal) * 42 gal/bbl * 365 days/year * production (bbl/day)

1000 gal * 2000 lbs/ton

Source	S ¹	P (psia) ²	M ²	T (°F) ³	T (°R)	L _L (lb/1000 gal)	Production (bbl/day)	Uncontrolled		
								VOC (tpy)	HAP ⁴ (tpy)	CO ₂ e ⁴ (tpy)
Condensate	0.6	12.1	41.1	65	524.75	7.09	150	8.15	0.25	1.80
Produced Water	0.6	0.35	18.5	65	524.75	0.093	45	0.0032	0.0000095	0.074

- Notes:
1. Saturation factor from AP-42, Table 5.2-1 (Submerged loading (bottom loading): dedicated normal service)
 2. True vapor pressure and molecular weight are estimated from tank-specific ProMax 3.2 simulations for both liquids.
 3. Temperature based on the annual average temperature of Charleston, WV retrieved from ProMax working and breathing report.
 4. HAP and CO₂e emissions calculated with weight percentages of the working and breathing vent gas from the ProMax 3.2 simulation

Assume 1 truck loaded per hour, 260 bbl truck, for short term emissions

Source	S ¹	P (psia) ²	M ²	T (°F) ³	T (°R)	L _L (lb/1000 gal)	Loading bbl/hr	Uncontrolled		
								VOC (lb/hr)	HAP ⁴ (lb/hr)	CO ₂ e ⁴ (lb/hr)
Condensate	0.6	12.1	41.1	65	524.75	7.09	260	77.44	2.42	17.1
Produced Water	0.6	0.35	18.5	65	524.75	0.093	260	0.10	0.00030	2.35

Component Fugitive Emissions

Company:	Antero Midstream LLC
Facility Name:	Monroe Compressor Station
Facility Location:	Tyler County, West Virginia
Source Description:	Fugitive Emissions - Component Leaks

VOC Fugitive Emissions						
Equipment Type and Service	Number of Units ¹	Hours of Operation (hours/yr)	THC Emission Factor ² (kg/hr-unit)	VOC Weight Fraction ²	THC Emissions (tpy)	VOC Emissions (tpy)
Flanges - Gas Service	548	8,760	3.90E-04	0.20	2.07	0.42
Valves - Gas Service	773	8,760	4.50E-03	0.20	33.67	6.76
Compressor Seals Gas Service	39	8,760	8.80E-03	0.20	3.32	0.67
Total Emissions (tons/yr)					39.06	7.84

HAPs Fugitive Emissions								
Equipment Type and Service	Benzene Weight Fraction ³	Benzene Emissions (tpy)	Toluene Weight Fraction ²	Toluene Emissions (tpy)	Ethylbenzene Weight Fraction ²	Ethylbenzene Emissions (tpy)	Xylene Weight Fraction ²	Xylene Emissions (tpy)
Flanges - Gas Service	0.00018	0.00038	0.00022	0.00046	---	---	0.00010	0.00021
Valves - Gas Service	0.00018	0.0062	0.00022	0.0075	---	---	0.00010	0.0034
Compressor Seals Gas Service	0.00018	0.00061	0.00022	0.00074	---	---	0.00010	0.00034
Total Emissions (tons/yr)		0.0072		0.0086				0.0040

1) Component counts from Engineering Lists.

2) API average emission factors are for oil and gas production operations - Table 2.4, EPA Protocol for Equipment Leak Emission Estimates - 1995.

GHG Fugitive Emissions								
Equipment Type	Number of Units ¹	Hours of Operation (hours/yr)	Emission Factor ² (scf/hr-unit)	CH ₄ Concentration ³	CO ₂ Concentration ³	CH ₄ Emissions (tpy)	CO ₂ Emissions (tpy)	CO ₂ e Emissions (tpy)
Flanges	548	8,760	0.003	0.98	0.011	0.27	0.008	6.75
Valves	773	8,760	0.027	0.98	0.011	3.42	0.11	85.67
Compressor Seals	39	8,760	0.300	0.98	0.011	1.92	0.06	48.03
Total Emissions (tons/yr)						5.61	0.17	140.44

1) Component counts from Engineering Lists.

2) Emission factors from 40 CFR Part 98 Subpart W, Table W1-A; Gas service where available, else light crude service

3) CH₄ and CO₂ concentrations as defined in 40 CFR Part 98.233(r)

Fugitive Emissions From Venting Episodes

Company:	Antero Midstream LLC
Facility Name:	Monroe Compressor Station
Facility Location:	Tyler County, West Virginia
Source Description:	Fugitive Emissions-Venting Episodes

VOC Venting Emissions						
Type of Event ¹	Number Of Events (event/yr)	Amount Vented per Event (scf/event)	Molecular Weight of Vented Gas (lb/lb-mol)	Total Emissions (ton/yr)	VOC Weight Fraction ⁴	VOC Emissions (ton/yr)
Compressor Blowdown ²	156	10,000	21.32	43.82	0.20	8.58
Compressor Startup ³	156	1,050	21.32	4.60	0.20	0.90
Plant Shutdown	2	100,000	21.32	5.62	0.20	1.10
Pigging Venting	26	1,000	21.32	0.73	0.20	0.14
Total Emissions (tons/yr)						10.73

HAPs Venting Emissions									
Type of Event ¹	Benzene Weight Fraction ⁴	Benzene Emissions (tpy)	Toluene Weight Fraction ⁴	Toluene Emissions (tpy)	Ethylbenzene Weight Fraction ⁴	Ethylbenzene Emissions (tpy)	Xylene Weight Fraction ⁴	Xylene Emissions (tpy)	Total Emissions (tons/yr)
Compressor Blowdown ²	0.00018	0.0080	0.00022	0.0095	---	---	0.00010	0.0044	0.00073
Compressor Startup ³	0.00018	0.0084	0.00022	0.010	---	---	0.00010	0.0046	0.00073
Plant Shutdown	0.00018	0.010	0.00022	0.012	---	---	0.00010	0.0056	0.00073
Pigging Venting	0.00018	0.0013	0.00022	0.0016	---	---	0.00010	0.00073	0.00073
Total Emissions (tons/yr)		0.010		0.012				0.0055	

GHG Venting Emissions						
Type of Event ¹	Number Of Events (event/yr)	Amount Vented per Event (scf/event)	Molecular Weight of Vented Gas (lb/lb-mol)	CH ₄ Weight Fraction ⁴	CH ₄ Emissions (ton/yr)	CO ₂ Emissions (ton/yr)
Compressor Blowdown ²	156	10,000	21.32	0.56	24.73	0.13
Compressor Startup ³	156	1,050	21.32	0.56	2.60	0.013
Plant Shutdown	2	100,000	21.32	0.56	3.17	0.016
Pigging Venting	26	1,000	21.32	0.56	0.41	0.0021
Total Emissions (tons/yr)					30.91	0.16

1) Estimated number of events and venting per event from engineering based on other facilities
 2) Total number of compressor blowdowns based on 12 blowdowns per compressor.
 3) Total number of compressor startups based on 12 starts per compressor.
 4) Weight Fraction is from a gas analysis that will be typical for the facility

Fugitive Dust Emissions

Company:	Antero Midstream LLC
Facility Name:	Monroe Compressor Station
Facility Location:	Tyler County, West Virginia
Source Description:	Fugitive Dust Emissions

Gravel Access Road	Loaded Truck Weight ¹	Trips per year ²	Trips per day ²	Distance per round trip (truck in and out) ³		VMT per year ⁴
	tons			feet	miles	
Condensate Tank Truck	40.00	365	1.0	2,746	0.52	190
Produced Water Tank Truck	40.00	365	1.0	2,746	0.52	190

Equation Parameter	PM-10/PM2.5	PM-Total
E, annual size-specific emission factor for PM ₁₀ & PM _{2.5} (upaved industrial roads) extrapolated for natural mitigation ⁶	see table below	see table below
k, Particle size multiplier for particle size range (PM ₁₀), (lb/VMT) (Source: AP-42 Table 13.2.2-2)	1.5	4.9
k, Particle size multiplier for particle size range (PM _{2.5}), (lb/VMT) (Source: AP-42 Table 13.2.2-2)	0.15	
s, surface material silt content, (%) (Source: AP-42 Table 13.2.2-1)	4.8	4.8
W, mean weight (tons) of the vehicles traveling the road	40.00	40.00
a, constant for PM ₁₀ and PM _{2.5} on industrial roads (Source: AP-42 Table 13.2.2-2)	0.9	0.7
b, constant for PM ₁₀ and PM _{2.5} on industrial roads (Source: AP-42 Table 13.2.2-2)	0.45	0.45
P, number of "wet" days with at least 0.254 mm (0.01 in) of precipitation during the averaging period, based on AP-42 Figure 13.2.2-1.	160	160

$$E = \left[k \left(\frac{s}{12} \right)^a \times \left(\frac{W}{3} \right)^b \right] \times (365 - P/365)$$

Source of Equation: AP-42 Section 13.2.2

PM₁₀ Emissions

Emission Factor (lb/VMT)	Vehicle miles traveled (VMT/yr) ⁴	Annual Uncontrolled PM ₁₀ Emissions (tpy)
1.18	379.60	0.22

PM_{2.5} Emissions (tons/yr)

Emission Factor (lb/VMT)	Vehicle miles traveled (VMT/yr) ⁴	Annual Uncontrolled PM _{2.5} Emissions (tpy)
0.118	379.60	0.022

PM- Total Emissions (tons/yr)

Emission Factor (lb/VMT)	Vehicle miles traveled (VMT/yr) ⁴	Annual Uncontrolled PM-Total Emissions (tpy)
4.65	379.60	0.88

Table Notes:

1. Loaded truck weight is based on typical weight limit for highway vehicles.
2. Based on production, it's assumed a maximum of one condensate truck (200 bbl truck) and one produced water truck (200 bbl truck) will be onsite per day.
3. Distance per round trip is based on the proposed site layout. The one way distance is measured as 0.26 miles for the gravel access road.
4. VMT/yr = Trips/yr x Roundtrip Distance
5. Hourly emissions determined from tons per year calculation using 2,000 lb/ton and 8,760 hours per year.

Facility Gas Analysis

	Blanche 1H MOL %	MW	Component Weight lb/lb-mol	Wt. Fraction
Methane	75.007	16.04	12.03	0.564
Ethane	15.315	30.07	4.61	0.216
Propane	4.990	44.10	2.20	0.103
i-Butane	0.596	58.12	0.35	0.016
n-Butane	1.366	58.12	0.79	0.037
i-Pentane	0.342	72.15	0.25	0.012
n-Pentane	0.386	72.15	0.28	0.013
Hexanes +	0.201	106.72	0.21	0.010
n-Hexane	0.100	86.18	0.09	0.004
Benzene	0.005	78.11	0.00	0.0002
Toluene	0.005	92.14	0.00	0.0002
Ethylbenzene	---	106.17	---	---
Xylenes	0.002	106.16	0.00	0.0001
Nitrogen	1.273	28.01	0.36	0.017
Carbon Dioxide	0.138	44.01	0.06	0.003
Oxygen	0.274	32.00	0.09	0.004
Totals	100.00		21.32	1.00

Heating Value (Btu/scf) 1,149.46
Molecular weight 21.32

VOC weight fraction 0.1959
Methane weight fraction 0.5644
THC weight fraction 0.9763
VOC of THC wt fraction 0.2007
CH4 of THC wt fraction 0.5781
Benzene of THC wt fraction 0.0002
Toluene of THC wt fraction 0.0002
E-benzene of THC wt fraction ---
Xylene of THC wt fraction 0.0001
n-Hexane of THC wt fraction 0.0041

Attachment I

Emission Units Table

(includes all emission units and air pollution control devices
that will be part of this permit application review, regardless of permitting status)

Emission Unit ID ¹	Emission Point ID ²	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type ³ and Date of Change	Control Device ⁴
C-100	1E	Compressor Engine #1	2014	1,680 hp	Modified	NSCR (1C)
C-200	2E	Compressor Engine #2	2014	1,680 hp	Modified	NSCR (2C)
C-300	3E	Compressor Engine #3	2014	1,680 hp	Modified	NSCR (3C)
C-400	4E	Compressor Engine #4	2014	1,680 hp	Modified	NSCR (4C)
C-500	5E	Compressor Engine #5	2014	1,680 hp	Modified	NSCR (5C)
C-600	6E	Compressor Engine #6	2014	1,680 hp	Modified	NSCR (6C)
C-700	7E	Compressor Engine #7	2014	1,680 hp	Modified	NSCR (7C)
C-800	8E	Compressor Engine #8	2014	1,680 hp	Modified	NSCR (8C)
C-900	9E	Compressor Engine #9	2014	1,680 hp	Modified	NSCR (9C)
C-1000	10E	Compressor Engine #10	2014	1,680 hp	Modified	NSCR(10C)
C-1100	11E	Compressor Engine #11	2014	1,680 hp	Modified	NSCR(11C)
GEN1	12E	Microturbine Generator #1	2014	600 kWe	NA	None
GEN2	13E	Microturbine Generator #2	2014	600 kWe	NA	None
DEHY1	14E	Dehydrator Still Vent #1	2014	72.5 MMscfd	Modified	FLARE1 (12C)
DFLSH1	15E	Dehydrator Flash Tank #1	2014	72.5 MMscfd	Modified	98% control
DREB1	16E	Dehydrator Reboiler #1	2014	1.5 mmbtu/hr	Modified	None
DEHY2	17E	Dehydrator Still Vent #2	2014	72.5 MMscfd	Modified	FLARE1 (12C)
DFLSH2	18E	Dehydrator Flash Tank #2	2014	72.5 MMscfd	Modified	98% control
DREB2	19E	Dehydrator Reboiler #2	2014	1.5 mmbtu/hr	Modified	None
TK-1502	20E	Settling Tank 1	2014	400 barrel	NA	VRU-100 & 200 (13C & 14C)
TK-200	21E	Condensate Tank 1	2014	400 barrel	NA	VRU-100 & 200 (13C & 14C)
TK-201	22E	Condensate Tank 2	2014	400 barrel	NA	VRU-100 & 200 (13C & 14C)
TK-1500	23E	Produced Water Tank 1	2014	400 barrel	NA	VRU-100 & 200 (13C & 14C)

TK-1501	24E	Produced Water Tank 2	2014	400 barrel	NA	VRU-100 & 200 (13C & 14C)
CATHT1	27E	Catalytic Heater for Generator Fuel	2014	0.024 MMBtu/hr	NA	None
----	----	NSCR Catalyst for Compressor #1	2014	----	Modified	1C
----	----	NSCR Catalyst for Compressor #2	2014	----	Modified	2C
----	----	NSCR Catalyst for Compressor #3	2014	----	Modified	3C
----	----	NSCR Catalyst for Compressor #4	2014	----	Modified	4C
----	----	NSCR Catalyst for Compressor #5	2014	----	Modified	5C
----	----	NSCR Catalyst for Compressor #6	2014	----	Modified	6C
----	----	NSCR Catalyst for Compressor #7	2014	----	Modified	7C
----	----	NSCR Catalyst for Compressor #8	2014	----	Modified	8C
----	----	NSCR Catalyst for Compressor #9	2014	----	Modified	9C
----	----	NSCR Catalyst for Compressor #10	2014	----	Modified	10C
----	----	NSCR Catalyst for Compressor #11	2014	----	Modified	11C
FLARE1	26E	Flare Combustion Device 1	2014	4.8 MMBtu/hr	NA	12C
VRU-100	----	Vapor Recovery Unit 1	2014	----	NA	13C
VRU-200	----	Vapor Recovery Unit 2	2014	----	NA	14C
C-1200	28E	Compressor Engine #12	2016	1,680 hp	New	NSCR (15C)
C-1300	29E	Compressor Engine #13	2016	1,680 hp	New	NSCR (16C)
----	----	NSCR Catalyst for Compressor #12	2016	----	New	15C
----	----	NSCR Catalyst for Compressor #13	2016	----	New	16C
LDOUT1	30E	Truck Loadout	2014	195 bbl/day	NA	None

¹ For Emission Units (or Sources) use the following numbering system: 1S, 2S, 3S,... or other appropriate designation.

² For Emission Points use the following numbering system: 1E, 2E, 3E, ... or other appropriate designation.

³ New, modification, removal

⁴ For Control Devices use the following numbering system: 1C, 2C, 3C,... or other appropriate designation.

Williams, Jerry

From: Ward, Beth A
Sent: Thursday, January 28, 2016 11:54 AM
To: Williams, Jerry
Subject: ANTERO RESOURCES CORP & ANTERO MIDSTREAM LLC PERMIT APPLICATION FEE

This is the receipt for payment received from:

ANTERO RESOURCES CORP, MONROE STATION, CHECK NUMBER 1412, CHECK DATE 01/20/2016, \$4,500.00
R13-3184C ID# 095-00037

ANTERO MIDSTREAM LLC, NICHOLS STATION, CHECK NUMBER 1413, CHECK DATE 01/20/2016, \$4,500.00
R13-3201B ID#017-00114

OASIS Deposit CR 1600081107

Thank You!

Beth Ward

**WV DEPARTMENT OF ENVIRONMENTAL PROTECTION
BTO FISCAL
601 57TH STREET SE
CHARLESTON, WV 25304
(304) 926-0499 EXT 1846
beth.a.ward@wv.gov**

NON-CONFIDENTIAL

Adkins, Sandra K

From: Adkins, Sandra K
Sent: Wednesday, January 27, 2016 4:29 PM
To: 'wmcneilly@anteroresources.com'; 'bschatz@anteroresources.com';
'msteyskal@kleinfelder.com'
Cc: McKeone, Beverly D; Williams, Jerry
Subject: WV DAQ Permit Application Status for Antero Resources Corporation; Monroe Station

**RE: Application Status
Antero Resources Corporation
Monroe Station
Plant ID No. 095-00037
Application No. R13-3184C**

Mr. McNeilly,

Your application for a modification permit for the Monroe Compressor Station was received by this Division on January 27, 2016, and was assigned to Jerry Williams. The following item was not included in the initial application submittal:

Original affidavit for Class I legal advertisement not submitted.

This item is necessary for the assigned permit writer to continue the 30-day completeness review.

Within 30 days, you should receive a letter from Jerry stating the status of the permit application and, if complete, given an estimated time frame for the agency's final action on the permit.

Any determination of completeness shall not relieve the permit applicant of the requirement to subsequently submit, in a timely manner, any additional or corrected information deemed necessary for a final permit decision.

Should you have any questions, please contact the assigned engineer, Jerry Williams, at 304-926-0499, extension 1223.

NON-CONFIDENTIAL

3184C

R13-3184B

July
modification

095-00037

**45CSR13 Administrative Update, Construction, Modification, Relocation,
Temporary Permit or General Permit Registration Incomplete Application**

A complete application is demonstrated when all of the information required below is properly prepared, completed and attached. The items listed below are required information which must be submitted with a 45CSR13 permit application. Any submittal will be considered incomplete if the required information is not included. The applicant must submit a complete application in order to receive a 45CSR13 permit.

- Class I legal advertisement not published in a newspaper certified to accept legal advertisements and original affidavit submitted.
- Application fee AND/OR additional application fees not included:
 - \$250 Class I General Permit
 - \$300 Class II Administrative Update
 - \$1,000 Construction, Modification, Relocation or Temporary Permit
 - \$500 Class II General Permit
 - \$1,000 NSPS
 - \$2,500 NESHAP
 - \$2,500 45CSR27 Pollutant
 - \$5,000 Major Modification
 - \$10,000 Major Construction
- Original and two (2) copies of the application not submitted.
- File organization – application pages are not numbered or in correct order, application is not bound in some way, etc.
- Confidential Business Information is not properly identified.
- General application forms not completed and signed by a responsible official.
- Authority of Corporation form not included – required if application is signed by someone other than a responsible official.
- Applicant is not registered with the West Virginia Secretary of State's Office.
- Copy of current Business Registration Certificate not included.
- Process description, including equipment and emission point identification numbers, not submitted.
- Process flow diagram, including equipment and emission point identification numbers, not submitted.
- Plot plan, including equipment and emission point identification numbers, not submitted.
- Applicable technical forms not completed and submitted:
 - Emission Point Data Summary Sheets
 - Air Pollution Control Device Sheets
 - Emission Unit Data Sheets
 - Equipment List Form
- Emission calculations not included – emission factors, references, source identification numbers, etc.
- Electronic submittal diskette not included.