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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-3119A
Plant ID No.:	085-00031
Applicant:	Antero Resources Corporation
Facility Name:	Yolanda Pad
Location:	Pullman, Ritchie County
NAICS Code:	211111 (Natural Gas Extraction)
Application Type:	Modification
Received Date:	June 19, 2014
Engineer Assigned:	Jerry Williams, P.E.
Fee Amount:	$2,000.00
Date Received:	June 19, 2014
Complete Date:	August 1, 2014 (On hold from 8/28/2014 – 10/3/2014)
Due Date:	December 5, 2014
Applicant Ad Date	July 23, 2014
Newspaper:	*The Ritchie Gazette, Cairo Standard*
UTM's:	Easting: 509.981 km Northing: 4,338.469 km Zone: 17
Description:	Modification of a natural gas production facility to install and operate a production unit compressor, two (2) heater treaters, and increase in condensate production.

ID # 085 - 00031
Reg R13 - 3119A
Company ANTERO
Facility YOLANDA Initials JL

DESCRIPTION OF PROCESS

The following process description was taken from Permit Application R13-3119A:

The facility will be primarily responsible for natural gas production, but will also generate condensate and produced water. The condensate, gas, and water will flow from the wells to dedicated gas production units (GPUs). Each new GPU will have a 1.0 MMBTU/hr or 1.5 MMBTU/hr gas fired heater treater that will facilitate the separation of condensate and produced water from the gas. In the GPUs, the liquids and gases will be separated in a three

phase separator. After the initial separation the condensate will be processed in a low-pressure flash separator, where vapors entrained in the condensate will be separated and sent to a production unit compressor for recompression and delivery to the sales gas pipeline.

The product gas from the separator will continue on to metering and eventually the pipeline. A small quantity of product gas will be routed to the flare for the pilot light and to the compressor engine for fuel. From the GPU the remaining condensate and produced water will be sent to storage vessels. The working, breathing, and flashing losses from each storage vessel will be captured and then controlled by a flare. After storage, the condensate and produced water will be loaded onto trucks and hauled offsite for sale or disposal.

Fugitive emissions will be associated with components and piping used to convey liquid and gases through the natural gas production process.

This permit application requests the following modifications:

- Two (2) additional heaters (H005, H006) will be added, and one (1) of the existing heaters' heater capacity will be modified.
- Condensate throughput to the storage tanks will be increased. A new site-specific extended gas analysis was utilized to estimate condensate storage tank emissions.
- Installation of a natural gas fired production unit compressor.
- Flare calculations have been revised using a site-specific speciation analysis.
- Fugitive emissions have been updated to include new components associated with the new GPUs and production unit compressor. In addition, revisions have been made to existing equipment fugitives utilizing a new site-specific analysis.

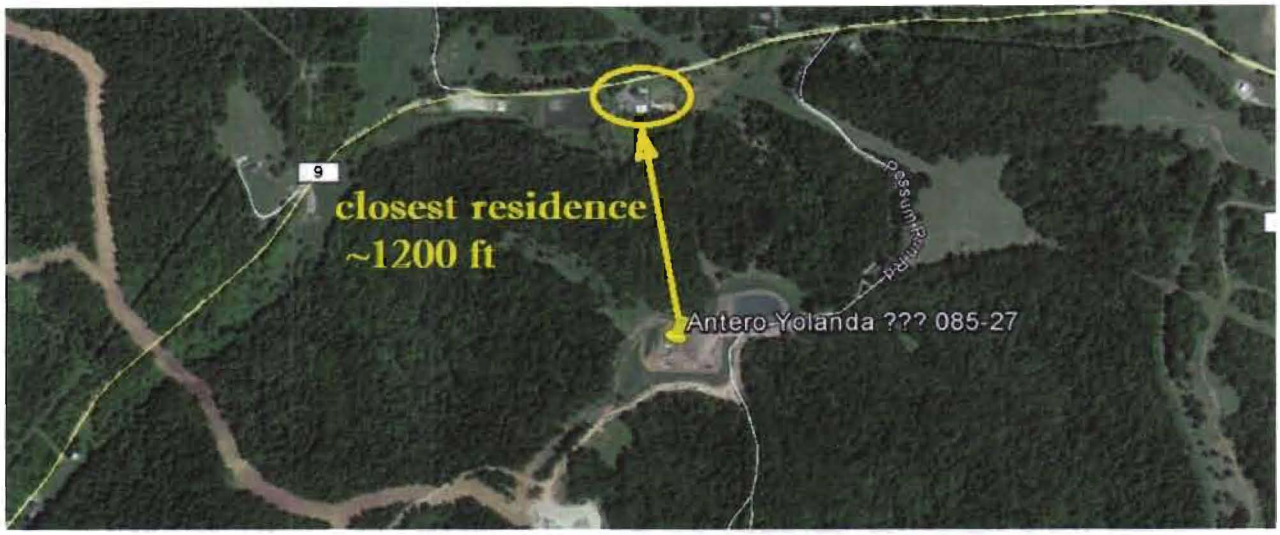
SITE INSPECTION

A site inspection was conducted on October 9, 2013 by Doug Hammell of the DAQ Enforcement Section. According to Mr. Hammell, the site location is appropriate for the proposed facility. The closest residence is approximately 1,200 feet from the proposed facility. The facility was in operation at the time of inspection.

Latitude: 39.1954
Longitude: -80.8844

Directions as given in the permit application are as follows:

From US Route 50, take County Route 50/30 for 1.9 miles and go left onto Oxford Road for 4.5 miles. Continue onto S Fork of Hughes River for 1.7 miles, and then County Road 9/Harrisville-Pullman Oxford for 0.8 miles. Possum Run Road will be on the left.



ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Maximum controlled point source emissions listed below were calculated by Antero and reviewed for accuracy by the writer. The following table indicates which methodology was used in the emissions determination:

Emission Unit ID#	Process Equipment	Calculation Methodology
T001 - T006	Six (6) 400 bbl (16,800 gal) Condensate Storage Tanks	E&P Tanks, EPA Tanks 4.09d
T007 – T008	Two (2) 400 bbl (16,800 gal) Produced Water Storage Tanks	E&P Tanks, EPA Tanks 4.09d
H001 - H006	Six (6) Heater Treaters (Three (3) 0.5 MMBTU/hr, One (1) 1.0 MMBTU/hr), two (2) 1.5 MMBTU/hr)	EPA AP-42 Emission Factors
L001	Condensate Truck Loading (4,599,000 gal/yr)	EPA AP-42 Emission Factors
L002	Produced Water Truck Loading (112,215,600 gal/yr)	EPA AP-42 Emission Factors
FL001	12 MMBTU/hr Flare	EPA AP-42 Emission Factors
E001	23.6 HP Kubota DG972-E2 Compressor Engine	Manufacturer's Data, 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
Six (6) Condensate Storage Tanks (T001 - T006)	Volatile Organic Compounds	Flare	98 %
	Total HAPs		98 %
Two (2) Produced Water Storage Tanks (T007 - T008)	Volatile Organic Compounds	Flare	98 %
	Total HAPs		98 %

The total facility potential to emit (PTE) for the Yolanda Pad after this proposed modification are shown in the following table:

Pollutant	Maximum Pre-Modification Annual Facility Wide Emissions (tons/year)	Maximum Post-Modification Annual Facility Wide Emissions (tons/year)	Net Facility Wide Emissions Changes (tons/year)
Nitrogen Oxides	2.84	5.57	2.73
Carbon Monoxide	11.50	42.73	31.23
Volatile Organic Compounds	18.50	21.25	2.75
Particulate Matter-10/2.5	1.80	0.56	-1.24
Sulfur Dioxide	0.01	0.01	0
Total HAPs	0.75	0.81	0.06
Carbon Dioxide Equivalent	6,109	6,482	373

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 Resources Corporation –Yolanda Pad (R13-3119A)

Emission	Source	NO_x		CO		VOC		PM-10		PM-2.5		SO_2		Total HAPs		CO_2e
Point ID#		lb/hr	ton/year	lb/hr	ton/year	lb/hr	ton/year	lb/hr	ton/year	lb/hr	ton/year	lb/hr	ton/year	lb/hr	ton/year	ton/year
H001 - H003	0.5 MMBTU/hr Heater Treaters	0.15	0.66	0.12	0.54	<0.01	0.03	<0.01	0.04	<0.01	0.04	<0.01	<0.01	<0.01	0.01	636
H004	1.0 MMBTU/hr Heater Treater	0.08	0.35	0.07	0.30	<0.01	0.02	<0.01	0.03	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	424
H005 - H006	1.5 MMBTU/hr Heater Treaters	0.25	1.10	0.20	0.89	0.02	0.06	0.02	0.08	0.02	0.08	<0.01	<0.01	<0.01	0.02	1272
F001	Flare	0.71	3.10	3.82	16.70	0.75	3.30	0.09	0.40	0.09	0.40	<0.01	<0.01	0.02	0.08	3931
L001 - L002	Condensate/PW Truck Loading	0.00	0.00	0.00	0.00	1.40	6.20	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.13	0
E001	23.6 hp Compresor Engine	0.08	0.36	5.54	24.30	0.17	0.74	<0.01	0.01	<0.01	0.01	<0.01	<0.01	0.01	0.04	123
Total Point Source Yolanda		**1.27**	**5.57**	**9.75**	**42.73**	**2.34**	**10.35**	**0.11**	**0.56**	**0.11**	**0.56**	**0.00**	**0.00**	**0.06**	**0.28**	**6386**
Total Fugitive Yolanda		**0.00**	**0.00**	**0.00**	**0.00**	**2.49**	**10.90**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.12**	**0.51**	**97**
Total Sitewide Yolanda PTE		**1.27**	**5.57**	**9.75**	**42.73**	**4.83**	**21.25**	**0.11**	**0.56**	**0.11**	**0.56**	**<0.01**	**0.01**	**0.18**	**0.81**	**6482**
Total Point Source Lockhart Heirs		**1.55**	**6.80**	**10.27**	**45.00**	**10.96**	**48.00**	**0.25**	**1.10**	**0.23**	**1.00**	**<0.01**	**0.02**	**0.29**	**1.26**	**7870**
Total Fugitive Lockhart Heirs		**0.00**	**0.00**	**0.00**	**0.00**	**2.51**	**11.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.15**	**0.64**	**145**
Total Sitewide Lockhart Heirs PTE		**1.55**	**6.80**	**10.27**	**45.00**	**13.47**	**59.00**	**0.25**	**1.10**	**0.23**	**1.00**	**0.00**	**0.02**	**0.44**	**1.90**	**8015**
Total Aggregated Source (excluding Fugitives)		**2.82**	**12.37**	**20.02**	**87.73**	**13.30**	**58.35**	**0.36**	**1.66**	**0.34**	**1.56**	**<0.01**	**0.03**	**0.35**	**1.54**	**14256**

REGULATORY APPLICABILITY

The following rules apply to the facility:

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

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

The individual heat input of the heater heaters (H001 – H006) are below 10 MMBTU/hr. Therefore, these units are exempt from the aforementioned sections of 45CSR2.

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

45CSR6 (To Prevent and Control Air Pollution from the Combustion of Refuse)

45CSR6 prohibits open burning, establishes emission limitations for particulate matter, and establishes opacity requirements. Sources subject to 45CSR6 include completion combustion devices, enclosed combustion devices, and flares.

The facility-wide requirements of the general permit include the open burning limitations §§45-6-3.1 and 3.2.

All completion combustion devices, enclosed combustion devices, and flares are subject to the particulate matter weight emission standard set forth in §45-6-4.1; the opacity requirements in §§45-6-4-3 and 4-4; the visible emission standard in §45-6-4.5; the odor standard in §45-6-4.6; and the testing standard in §§45-6-7.1 and 7.2.

Flares that are used to comply with emission standards of NSPS, Subpart OOOO are subject to design, operational, performance, recordkeeping and reporting requirements of the NSPS regulation that meet or exceed the requirements of 45CSR6.

Antero has one (1) flare at the Yolanda Pad. The flare has negligible particulate matter emissions. Therefore, the facility's flare should demonstrate compliance with this section. The facility will demonstrate compliance by maintaining records of the amount of natural gas consumed by the flare and the hours of operation. The facility will also monitor the flame of the flare and record any malfunctions that may cause no flame to be present during operation.

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

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

The individual heat input of the heater treaters (H001 – H006) are below 10 MMBTU/hr. Therefore, these units are exempt from the aforementioned sections of 45CSR10.

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

45CSR13 applies to this source due to the fact that Antero exceeds the regulatory emission threshold for criteria pollutants of 6 lb/hr and 10 ton/year, and they are also subject to a substantive requirement of an emission control rule promulgated by the Secretary (40CFR60 Subparts JJJJ and OOOO, 40CFR63 Subpart ZZZZ).

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 Yolanda Well Pad 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.

40CFR60.4230 states that a source that commenced construction after June 12, 2006 whose SI ICE was less than 500 hp and was manufactured on or after July 1, 2008 is subject to this rule. Antero has proposed to install one (1) 23.6 HP SI ICE. Since the SI ICE that Antero will install was manufactured after the applicability date, Antero is subject to this rule. Antero submitted EPA Certificate of Conformity's for the engine.

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

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

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

The gas wells that currently exist at the Yolanda Pad were drilled principally for the production of natural gas and were done so after August 23, 2011. Therefore, these wells would be considered affected facilities under this subpart. The compliance date for these hydraulically fractured wells is October 15, 2012. Antero is required under §60.5410 to submit an initial notification, initial annual report, maintain a log of records for each well completion, and maintain records of location and method of compliance. §60.5420 requires Antero demonstrate continuous compliance by submitting reports and maintaining records for each completion operation.

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

There are no centrifugal compressors at the Yolanda Pad. Therefore, all requirements regarding centrifugal compressors under 40 CFR 60 Subpart OOOO would not apply.

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

There is an applicable reciprocating internal combustion engine located at the Yolanda Pad. The engine will be delivered after the effective date of this rule. However, §60.5365(c) states that 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. Therefore, all requirements regarding reciprocating compressors under 40 CFR 60 Subpart OOOO would not apply.

d. Pneumatic Controllers

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

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

There are no continuous bleed gas-driven pneumatic controllers at the Yolanda Pad. Therefore, there are no applicable requirements regarding pneumatic controllers under 40 CFR 60 Subpart OOOO that would apply.

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

40CFR60 Subpart 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 at the facility were constructed after August 23, 2011. The facility is considered to have Group 1 Storage Vessels. The facility has determined the potential emissions from the storage tanks and the uncontrolled emissions are greater than 6 tpy from each condensate vessel. The storage vessels located at the Yolanda Pad are controlled by a vapor combustor and as a result emit less than 6 tpy of VOC. Therefore, Antero is not required by this section to further reduce VOC emissions by 95%, since this subpart will take into account federal enforceable controls.

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

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

- Equipment associated with a compressor station, dehydration unit, sweetening unit, underground storage vessel, field gas gathering system, or liquefied natural gas unit is covered by §§60.5400, 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 Yolanda Pad is not a natural gas processing plant. Therefore, Leak Detection and Repair (LDAR) requirements for onshore natural gas processing plants would not apply.

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

- Each sweetening unit that processes natural gas is an affected facility; and
- Each sweetening unit that processes natural gas followed by a sulfur recovery unit is an affected facility.
- Facilities that have a design capacity less than 2 long tons per day (LT/D) of hydrogen sulfide (H_2S) in the acid gas (expressed as sulfur) are required to comply with recordkeeping and reporting requirements specified in §60.5423(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 Yolanda Pad. Therefore, all requirements regarding sweetening units under 40 CFR 60 Subpart OOOO would not apply.

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 at the Antero Well Pad 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.

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 Yolanda Pad is located in Ritchie County, which is an attainment county (unclassified) for all criteria pollutants, therefore the Yolanda Pad 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)	Yolanda Pad & Lockhart Heirs Pad PTE (tpy)	45CSR14 or 45CSR19 Review Required?
Carbon Monoxide	250	NA	87.73	No
Nitrogen Oxides	250	NA	12.37	No
Sulfur Dioxide	250	NA	0.03	No
Particulate Matter 2.5	250	NA	1.56	No
Ozone (VOC)	250	NA	58.35	No

45CSR30 (Requirements for Operating Permits)

Antero is not subject to 45CSR30. The Yolanda Pad 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. Please see Source Aggregation Section where emissions from Yolanda Pad and Lockhart Heirs Pad are listed and do not exceed 45CSR30 major source thresholds.

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 is not 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 Yolanda Pad is not a natural gas processing facility, therefore, Antero is not subject to this rule.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

The majority of non-criteria regulated pollutants fall under the definition of HAPs which, with some revision since, were 188 compounds identified under Section 112(b) of the Clean Air Act (CAA) as pollutants or groups of pollutants that EPA knows or suspects may cause cancer or other serious human health effects. HAPs are those pollutants that are specifically identified in section 112(b) of the Clean Air Act. To be listed as a HAP, EPA must find that the chemical in question may present a threat to human health and cause adverse environmental effects. If the facility has the potential to emit 10 tons per year of any pollutant on the HAP list, or any combination of pollutants on that list for a total of 25 tons per year, the facility is considered a major source of HAPs. Otherwise, it is considered an area source.

The following table lists each HAP's carcinogenic risk (as based on analysis provided in the Integrated Risk Information System (IRIS)):

HAPs	Type	Known/Suspected Carcinogen	Classification
n-Hexane	VOC	No	Inadequate Data
Benzene	VOC	Yes	Category A - Known Human Carcinogen
Toluene	VOC	No	Inadequate Data
Xylene	VOC	No	Inadequate Data
Ethylbenzene	VOC	No	Inadequate Data

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) or 45CSR19 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution which Cause or Contribute to Nonattainment) as shown in the table listed in the Regulatory Discussion section under 45CSR14/45CSR19.

SOURCE AGGREGATION

Classifying multiple facilities as one "stationary source" under 45CSR13, 45CSR14, and 45CSR19 is based on the definition of "Building, structure, facility, or installation" as given in §45-14-2.13 and §45-19-2.12. The definition states:

"Building, Structure, Facility, or Installation" means all of the pollutant-emitting activities which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, and are under the control of the same person (or persons under common control). Pollutant-emitting activities are a part of the same industrial grouping if they belong to the same "Major Group" (i.e., which have the same two (2)-digit code) as described in the Standard Industrial Classification Manual, 1987 (United States Government Printing Office stock number GPO 1987 0-185-718:QL 3).

The Yolanda Pad shares the same SIC code as several other well pads owned by Antero in the area. Therefore, the potential classification of the Yolanda Pad as one stationary source with any other facility depends on the determination if these stations are considered "contiguous or adjacent properties." "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. 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; or having a common endpoint or border. The Yolanda Pad and Lockhart Heirs Pad are located approximately 0.35 miles from each other. Antero has cut an access road that leads from the Yolanda Pad to the Lockhart Heirs Pad. There is no other way to access the Lockhart Heirs Pad without the access road that was non-existent prior to this development. There is no other development or housing associated with this access road. It is the opinion of the writer that these facilities are located on 'adjacent' properties.

There is also a compressor station (White Oak Compressor Station) that is owned by Antero and located on this same access road. However, the White Oak Compressor Station operates under the two digit SIC code of 49 and the wellpads operate under the two digit SIC code of 13. The White Oak Compressor Station has the ability to accept gas from several other wellpads in the area.

Upon review of these three facilities, the Yolanda Pad and Lockhart Heirs Pad meet all three (3) prongs to be considered the same "Building, structure, facility, or installation". Therefore, the emissions from these facilities have been aggregated in determining major source and/or PSD status.

The total facility PTE for the Yolanda Pad and Lockhart Heirs Pad (excluding fugitives) is shown in the following table:

Pollutant	**Facility Wide PTE (tons/year)**
Nitrogen Oxides	12.37
Carbon Monoxide	87.73
Volatile Organic Compounds	58.35
Particulate Matter-10	1.66
Sulfur Dioxide	0.03
Total HAPs	1.54
Carbon Dioxide Equivalent	14,256

MONITORING OF OPERATIONS

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

- Monitor and record quantity of natural gas consumed and hours of operation for all combustion sources.
- Monitor opacity from all fuel burning units.
- Monitor the condensate tanks to ensure that all vapors are sent to the flare.
- 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 engine and ancillary equipment.
- Maintain records of all applicable requirements of 40CFR60 Subpart JJJJ, and 40CFR63 Subpart ZZZZ.
- 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.

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 Yolanda Pad should be granted a 45CSR13 modification permit for their facility.

Jerry Williams, P.E.
Engineer

OCT 8, 2014
Date