



**west virginia** department of environmental protection

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**ENGINEERING EVALUATION / FACT SHEET**

BACKGROUND INFORMATION

Application No.: R13-3118  
Plant ID No.: 085-00026  
Applicant: Antero Resources Corporation (Antero)  
Facility Name: John Campbell North Pad  
Location: Pullman, Ritchie County  
NAICS Code: 211111  
Application Type: Construction  
Received Date: August 29, 2013  
Engineer Assigned: Jill Harris  
Fee Amount: \$2,000.00  
Date Received: September 3, 2013  
Complete Date: October 2, 2013  
Due Date: December 31, 2013  
Applicant Ad Date: September 11, 2013  
Newspaper: *The Pennsboro News*  
UTM's: Easting: 506.099 km Northing: 4,336.743 km Zone: 17  
Description: After-the-fact construction permit for a natural gas production facility.

DESCRIPTION OF PROCESS

The facility is primarily responsible for natural gas production, but also generates condensate and produced water. The condensate, gas and water from the two wells flows from the well heads to dedicated gas production units (GPU). Each GPU has one heater treater that is used to facilitate the separation in a 3-Phase separator. After the initial separation, the condensate is process in a Low Pressure Flash Separator, where gas entrained in the condensate is separated and sent to the vapor combustor.

The product gas from the separator continues on to metering and eventually the pipeline. A small quantity of product gas is routed to the vapor combustor for pilot gas. From the GPU, the remaining condensate and produced water is sent to storage vessels. Each storage vessels' working, breathing and flashing losses are captured and then controlled by a vapor combustor. After storage, the condensate and produced water are loaded onto trucks and hauled offsite for sale or disposal.

**Promoting a healthy environment.**

## SITE INSPECTION

On October 9, 2013, Doug Hammell from DAQ's Enforcement Section conducted a site inspection of the John Campbell Pad. The wellpad is an "after-the-fact" construction, so all equipment was onsite at the time of inspection. The closest residence and building are located approximately 3,500 feet away. The site is appropriate for the location of the facility.



Directions to the Facility: 5.5 miles past Ellenboro / SR-16 south on SR-74 7.4 Pullman L, east on Main/Harrisville/Pullman R, south on CR-7/9 becomes CR-9/7 Slab Creek Rd ~1.2 miles.

## ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

The following indicates which methodology was used in the emissions determination for each proposed piece of processing equipment:

Natural Gas Heaters (H001 & H002):

There are two (2) Wenco Energy Corp. 0.5 MMBtu/hr (rated) heater treaters installed with the gas production unit to separate the condensate, water and gases. Emissions from the natural gas heaters occur from the combustion of natural gas within the heater treaters. Emissions from the heater treaters were calculated using AP-42, Chapter 1.4 Tables 1.4-1, 1.4-2, 1.4-3 and a heating value of natural gas of 1020 Btu/scf.

Fugitive Emissions:

Fugitive emission calculations were based on component counts at the facility. The potential emissions were estimated using the oil and gas production operations average emission factors in Table 2-4 of the Protocol for Equipment Leak Emission Estimates (EPA-453/R-95-017, November 1995). The composition of the materials in contact with these components was estimated using a sample of the separator liquids and gases. All the pneumatic valves are low bleed valves and each valve has a bleed rate less than 0.275 scf/hour.

**Storage Tanks (T001 – T008):**

Working, breathing and flashing emissions are produced from the condensate tanks. E&P TANKS computer software program was used to calculate the potential working, breathing and flashing losses from the condensate storage vessels (T001- T006). The chemical properties of the condensate are based on pressure, temperature and volume analysis of a representative well pad. The facility conservatively estimated an RVP of 15 psia and an API Gravity of 46 for bulk condensate liquids. The facility used a control efficiency of 98% to estimate controlled emissions from the vapor combustor.

EPA TANKS 4.09d computer software program was used to calculate the potential working and breathing losses from the produced water storage vessels located at the well pad. The chemical properties of the produced water are based on a ProMax analysis of a representative well pad. The following parameters shown in the table below were used to estimate emissions from the tanks.

**Table 1.0: Input Parameters for Tank Emissions**

<b>Emission Unit ID</b>	<b>Tank Name</b>	<b>Capacity (bbl)</b>	<b>Working Capacity (bbl)</b>	<b>Throughput (bbl/day)</b>
T001	Condensate Tank 1	400	364	5.7
T002	Condensate Tank 2	400	364	5.7
T003	Condensate Tank 3	400	364	5.7
T004	Condensate Tank 4	400	364	5.7
T005	Condensate Tank 5	400	364	5.7
T006	Condensate Tank 6	400	364	5.7
T007	Water Tank 1	400	364	400
T008	Water Tank 2	400	364	400

**Unpaved Roads:**

The trucks that will leave and enter the facility will do so on unpaved roads. The trucks entering and leaving the facility used calculate these emissions were based on trucks that will load condensate and produced water from the storage vessels. Particulate matter emissions will be generated from the truck travel. Emissions were estimated using AP-42 Section 13.2.2 was used to estimate fugitive particulate matter emissions. The follow parameters were used to estimate emissions.

Table 2.0: Input Parameters for Haul Road Emissions

Emission Unit ID	Emission Unit Description	Frequency (vehicles/year)	Average Weight of Vehicles (tons)	Round Trip Distance (feet)	Road Surface Silt Loading (g/m <sup>2</sup> )	Precipitation (days/year)
HR001	Condensate Trucks	124	27	1,200	8.5	150
	Produced Water Trucks	2,920	29			

Vapor Combustor:

Condensate and produced water tank emissions are captured and routed to the vapor combustor for control. The vapor combustor has a control efficiency of 98% for the working, breathing and flashing emissions from the tanks. The vapor combustor utilizes an auxiliary pilot to combust the waste gases from the storage tanks. The potential emissions from the combustion of the waste gases include nitrogen dioxide, carbon monoxide and particulate matter, which were calculated using AP-42 section 13.5 and 1.4.

Bulk Liquid Transfer Operations:

Truck loading operations generate emissions from the displacement of VOCs while loading condensate or produced water. The emissions were calculated using AP-42 Section 5.2. Listed below are the parameters used to calculate emissions from the loading operations.

Table 3.0: Input Parameters for Bulk Liquid Transfer Operations

Emission Unit ID	Emission Unit Description	Saturation Factor	True Vapor Pressure (psia)	Molecular Weight (lb/lb-mole)	Temperature of Bulk Liquid Loaded (°R)
L001	Condensate Truck Loading	0.6	7.49	60	511.3
L002	Water Truck Loading	0.6	0.22	18	511.3

**Table 4.0: Antero Resources Appalachian Corporation – John Campbell North Pad (R13-3118)**

Pollutant	Heaters (H001 – H002)		Equipment Leaks (F001)		Tank Truck Loading Losses (L001-L002)		Vapor Combustor Operations (FL001)		Unpaved Roads (HR001)		Facility PTE	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Carbon Monoxide (CO)	0.08	0.36	-	-	-	-	2.46	10.8	-	-	2.54	11.2
Sulfur Dioxide (SO <sub>2</sub> )	5.9E-04	2.6E-03	-	-	-	-			-	-	5.9E-04	2.6E-03
Oxides of Nitrogen (NO <sub>x</sub> )	0.10	0.43	-	-	-	-	0.45	1.98	-	-	0.55	2.41
Particulate Matter (PM)	0.01	0.03	-	-	-	-	0.09	0.40	0.50	2.17	0.60	2.61
Particulate Matter less than 10 microns (PM <sub>10</sub> )	0.01	0.03	-	-	-	-	0.09	0.40	0.14	0.62	0.24	1.06
Particulate Matter less than 2.5 microns (PM <sub>2.5</sub> )	0.01	0.03	-	-	-	-	0.09	0.40	0.01	0.06	0.11	0.50
Volatile Organic Compounds (VOCs)	0.01	0.02	1.46	6.4	0.39	1.7	0.20	0.87	-	-	2.06	9.0
Carbon Dioxide Equivalent (CO <sub>2e</sub> )	118	518	9.3	41	-	-	1,139	4,991	-	-	1,266	5,550
Hazardous Air Pollutants (HAPs)	2.3E-03	0.01	0.07	0.31	4.6E-03	0.02	6.8E-03	0.03	-	-	0.08	0.38
Benzene	Neg.	Neg.	1.1E-02	5.0E-02	Neg.	Neg.	2.2E-03	9.5E-03	-	-	0.01	0.06
Ethylbenzene	-	-	1.5E-02	6.4E-02	Neg.	Neg.	2.4E-04	1.1E-03	-	-	0.02	0.07
n-Hexane	1.8E-03	0.01	2.7E-2	1.2E-01	3.5E-03	0.02	5.2E-03	0.02	-	-	0.04	0.17
Toluene	-	-	5.4E-03	2.3E-02	5.9E-05	2.6E-04	2.4E-04	1.1E-03	-	-	0.01	0.02
Xylene (mixed)	-	-	1.3E-02	5.7E-02	2.0E-05	8.6E-05	Neg.	Neg.	-	-	0.01	0.06

## 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 (Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers) is to establish emission limitations for smoke and particulate matter which are discharged from fuel burning units.

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

The individual heat input of the proposed fuel burning units (H001, H002) is below 10 MMBTU/hr. Therefore, these units are exempt from the aforementioned sections of 45CSR2. However, Antero would 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)

The purpose of this rule is to prevent and control air pollution from combustion of refuse.

Antero has one (1) vapor combustor at the John Campbell North well pad. The vapor combustor is subject to section 4, emission standards for incinerators.

Emissions (lb/hr) = F x Incinerator Capacity (tons/hr)

Where, the factor, F, is as indicated in Table I below:

Table I: Factor, F, for Determining Maximum Allowable Particulate Emissions.

Incinerator Capacity	Factor F
A. Less than 15,000 lbs/hr	5.43
B. 15,000 lbs/hr or greater	2.72

The estimated total flow rate to the vapor combustor is 528.3 lb/hr or 0.26 tons/hr.

Allowable Emissions PM (lb/hr) = 5.43 x 0.26 tons/hr = 1.41 lb/hr

The vapor combustor has an hourly particulate matter emissions rate of 0.09 lb/hr. Therefore, the facility's vapor combustor should demonstrate compliance with this section. The facility will demonstrate compliance by maintaining records of the amount of natural gas consumed by the vapor combustor and the hours of operation. The facility

will also monitor the flame of the vapor combustor and record any malfunctions that may cause no flame to be present during operation.

**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 is defined as a “stationary source” under 45CSR13 Section 2.24.b, which states that an owner or operator discharges or has the potential to discharge more than six (6) pounds per hour and ten (10) tons per year, or has the potential to discharge more than 144 pounds per calendar day of any regulated air pollutant. Antero’s uncontrolled volatile organic compounds (VOC) emissions exceed 45CSR13 permit thresholds. In addition, the facility is proposing to install a vapor combustor at the facility, which is subject to a substantive requirement (45CSR6). Antero has published the required Class I legal advertisement notifying the public of their permit application, and paid the appropriate application fee (construction). The Class I Legal Advertisement was published on September 11, 2013 in *The Pennsboro News*.

**45CSR22** (Air Quality Management Fee Program)

The facility is required to submit a permit application fee of \$1,000 for a construction permit. In addition, the facility is subject to a New Source Performance Requirement, 40 CFR 60 Subpart OOOO, therefore, the facility has submitted an NSPS fee of \$1,000. This facility is a minor source and not subject to 45CSR30. Antero is required to keep their Certificate to Operate current.

**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<sub>2</sub>) 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:

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

*There are two (2) gas wells that currently exist at the John Campbell North Pad. The wells were drilled after August 23, 2011. Therefore, these wells are considered affected facilities under this subpart.*

*The facility is subject is to the standards in section §60.5375 and the notification, reporting and recordkeeping requirements of section §60.5420. See permit, R13-3118, for all requirements.*

- 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 John Campbell North 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 are no reciprocating compressors at the John Campbell North Pad. 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 John Campbell North 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 nonearthen 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. The storage vessels located at the John Campbell North Well 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 John Campbell North Well 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<sub>2</sub>S) 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 John Campbell North Well Pad. Therefore, all requirements regarding sweetening units under 40 CFR 60 Subpart OOOO would not apply.*

The following rules do not apply to the facility:

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

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 all of the proposed fuel burning units (H001, H002) is below 10 MMBTU/hr. Therefore, these units are exempt from the aforementioned sections of 45CSR10.

**40CFR60 Subpart 60.18** (General Control Device and Work Practice Requirements)

40CFR60 Subpart 60.18 contains requirements for control devices when they are used to comply with applicable subparts of 40CFR60 and 40CFR61. The Yolanda Pad currently operates a Cimarron 48" HV ECD at their site. This is an enclosed combustor unit that has a guaranteed destruction efficiency of 98%. Enclosed combustion devices used for compliance with NSPS Subpart OOOO do not meet the definition of a vapor combustor, as it is defined in that subpart. Therefore, the facility's enclosed combustion device is not subject to the requirements of this regulation.

**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 (19,812.9 gallons). The tanks that Antero has proposed to install are 16,800 gallons each (400 bbl condensate and produced water tanks). 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 John Campbell North Well Pad was constructed after August 23, 2011 and is not a natural gas processing plant, therefore, Antero would not be subject to this rule.

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

There are no SI ICEs at the John Campbell North Well Pad. Therefore, Antero would not be subject to this rule.

**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 John Campbell North Well Pad is located in Richie County which is an attainment county for all pollutants.

As shown in the table below, Antero is not subject to 45CSR14 or 45CSR19 review.

Table 5.0: PSD & NANSR Threshold Limits

<b>Pollutant</b>	<b>PSD (45CSR14) Threshold (tpy)</b>	<b>NANSR (45CSR19) Threshold (tpy)</b>	<b>John Campbell North Pad PTE (tpy)</b>	<b>45CSR14 or 45CSR19 Review Required?</b>
Carbon Monoxide	250	NA	11.1	No
Nitrogen Oxides	250	NA	2.41	No
Sulfur Dioxide	250	NA	2.6E-03	No
Particulate Matter 2.5	250	NA	0.50	No
Ozone (VOC)	250	NA	9.0	No
Greenhouse Gas (CO <sub>2</sub> e)	100,000	NA	5,550	No

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

There will be small amounts of various non-criteria regulated pollutants emitted from the combustion of natural gas. Criteria pollutants are defined as Carbon Monoxide (CO), Lead (Pb), Oxides of Nitrogen (NO<sub>x</sub>), Ozone, Particulate Matter (PM), Particulate Matter less than 10 microns (PM<sub>10</sub>), Particulate Matter less than 2.5 microns (PM<sub>2.5</sub>), and Sulfur Dioxide (SO<sub>2</sub>). These pollutants have National Ambient Air Quality Standards (NAAQs) set forth for each that are designed to protect the public health and welfare. Other pollutants of concern, although designated as non-criteria and without national concentration standards, are regulated through various federal programs designed to limit their emissions and public exposure. These programs include federal source-specific Hazardous Air Pollutants (HAPs) standards promulgated under 40 CFR 61 (NESHAPs – National Emission Standards for Hazardous Air Pollutants) and 40 CFR 63 (MACT – Maximum Available Control Technology). Any potential applicability to these programs was discussed above in the Regulatory Applicability section.

There are trace amounts of the non-criteria pollutants emitted by Antero’s John Campbell North Pad fall under the definition of Hazardous Air Pollutants (HAPs). HAPs are 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 following HAPs listed below are HAPs that are emitted from the John Campbell North Pad in quantifiable amounts (≥ 0.01 tpy). This table describes the individual HAP’s carcinogenic risk as listed in the Integrated Risk Information System (IRIS), which is maintained and updated by EPA.

Table 6.0: John Campbell North Pad HAPs and Carcinogenic Risk

<b>HAPs</b>	<b>Type</b>	<b>Known/Suspected Carcinogen</b>	<b>Classification</b>
<i>n-Hexane</i>	VOC	No	Inadequate Data
<i>Benzene</i>	VOC	Yes	Category A - Known Human Carcinogen
<i>Toluene</i>	VOC	No	Inadequate Data
<i>Xylenes</i>	VOC	No	Inadequate Data
<i>Ethylbenzene</i>	VOC	No	Classification D – Not Classifiable as a Human Carcinogen

## 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 John Campbell North Pad is located in Ritchie County and will be operated by Antero, who is the owner and operator. Several different entities are involved in the production, gathering, and transmission of gas. The Operators are the parties who drill and operate the wells. The Shippers are the owners of the gas who may or may not be the same entity as the Operator. There are also parties who own and operate the gathering system pipelines and compression station, called Gatherers. In addition, there are parties that own and operate the gas processing plants.

1. The John Campbell North Pad will operate under SIC code 1311 (Crude Petroleum and Natural Gas Extraction). There are surrounding wells and compressor stations operated by Antero that share the same two-digit major SIC code of 13 for oil and gas exploration and production. Therefore, the John Campbell North Pad does share the same SIC code as other related sources.
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.

Based on the common sense notion of a plant and the fact that facility boundary of the closest Antero facility operating under SIC code 1311 is the Yolanda Pad which is 2.5 miles away from the John Campbell North Pad facility boundary, the John Campbell North Pad is not considered to be contiguous or adjacent to other Antero operations.

3. According to Antero, no functional dependency exists in that the operation of one (1) well is not dependent on the operation of any other Antero well. Once gas enters the gathering line downstream from Antero’s well pad and metering devices, control of the gas and any associated facilities is beyond Antero’s ownership and control because the gathering lines, compression facilities, and processing plants are owned and operated by separate legal entities.

Because the facilities are not considered to be on contiguous or adjacent properties and are not fully under control of the same person, the emissions from the John Campbell North Pad 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 associated with this permit application:

1. Monitor and record quantity of natural gas consumed for all combustion sources.
2. Monitor the presence of the pilot flame with a thermocouple or equivalent.
3. Monitor opacity from all fuel burning units.
4. Monitor the tanks to ensure that all vapors are sent to the vapor combustor.
5. Monitor the condensate and produced water truck loading to ensure that all vapors are routed to the vapor combustor.

Antero will be required to perform the following recordkeeping associated with this modification application:

1. Maintain records of the amount of natural gas consumed in each combustion source.
2. 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
3. Maintain the corresponding records specified by the on-going monitoring requirements of and testing requirements of the permit.
4. Maintain records of the visible emission opacity tests conducted per the permit.
5. 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.
6. The records shall be maintained on site or in a readily available off-site location maintained by for a period of five (5) years.

## RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates Antero's John Campbell North Well Pad meets all the requirements of applicable regulations. Therefore, impact on the surrounding area should be minimized and it is recommended that this location should be granted a 45CSR13 construction permit for this proposed permitting action.

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Jill Harris, P.E.  
Engineer

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Date