



**west virginia department of environmental protection**

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**ENGINEERING EVALUATION / FACT SHEET**

**BACKGROUND INFORMATION**

Application No.: G70-A011A  
Plant ID No.: 017-00083  
Applicant: Antero Resources Corporation  
Facility Name: Maxwell Horizontal  
Location: Doddridge County  
NAICS Code: 211111  
Application Type: Class II Administrative Update  
Received Date: February 9, 2015  
Engineer Assigned: Steven R. Pursley, PE  
Fee Amount: \$300  
Date Received: February 10, 2015  
Complete Date: March 2, 2015  
Due Date: April 16, 2015  
Applicant Ad Date: February 17, 2015  
Newspaper: *The Herald Record*  
UTM's: Easting: 526.54 km      Northing: 4,339.87 km      Zone: 17  
Description: Application to remove a flare due to insufficient emission flow rate due to low throughput.

**DESCRIPTION OF PROCESS**

A mixture of condensate and entrained gas from the wells enters the facility through a number of low pressure separators where the gas phase is separated from the liquid phase. Heater treaters (H001-H003) are used in conjunction with the separators to help separate the gas from the liquid phases. These heaters are fueled by a slip stream of the separated gas. The separated gas from the low pressure separators is then metered and sent to the sales gas pipeline. The separated condensate and water from the separators flow to their respective storage tanks (TANKCOND001-006 and TANKPW001-002).

The facility has six tanks (TANKCOND001-006) on site to store condensate and two tanks (TANKSPW001-002) to store produced water prior to removal from the site. Flashing, working, and breathing losses from the tanks were sent to the flare (FL001) to control emissions. With this application, those emissions will be vented to the atmosphere.

Condensate and produced water are transported off-site on an as-needed basis via tanker truck. Truck loading connections are in place to pump condensate (L001) and produced water (L002) from the storage tanks into tanker trucks. Emissions from the loading operations are vented to the atmosphere.

### SITE INSPECTION

A site inspection was conducted on January 16, 2014 by Douglas Hammel of the DAQ enforcement section.

*"Closest residence is the one WSW, ~2500 ft. Tanks were installed, drilling completed and all rig equip removed.*

*From New Milton, head southeast on C/R 25 / Meathouse Fork Road. Turn left to continue on C/R 25 / Meathouse Fork. Turn right at Brushy Fork, then turn right at second fork."*

### ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Maximum controlled point source emissions listed below were calculated by Antero and reviewed for accuracy by the writer. Storage tank and loading emissions were calculated using ProMax 3.2 Simulation Software. Note that truck loading emissions are included here even though no change in operation is occurring (the flare never controlled loading emissions). This is because the new application shows a very slight decrease in loading emissions. This is due to the calculations using a different gas analysis. The reason for this isn't addressed in the application but is possibly due to more recent or more representative gas sampling. Regardless, although the change in hourly emissions is notable, the annual decrease is trivial. The new analysis also obviously effects the calculated emissions from the tanks and accounts for the reason emissions are increasing less than might be expected from removing the flare.

Emissions the tanks (now uncontrolled) and truck loading will be as follows:

Emission Unit	Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (tpy)
TANKCOND001-006 (6) 400 bbl Condensate Tanks (Combined)	Volatile Organic Compounds	1.80	7.88
	Total HAPs	0.02	0.08
TANKPW001-002 (2) 400 bbl Produced Water Tanks (Combined)	Volatile Organic Compounds	0.01	0.04
	Total HAPs	<0.01	<0.01
L001 Cond. Loading	Volatile Organic Compounds	4.74	0.01
	Total HAPs	0.01	<0.01
L002 P.W. Loading	Volatile Organic Compounds	<0.01	<0.01
	Total HAPs	<0.01	<0.01

Existing emissions from the tanks, truck loading and flare are as follows (taken directly from permit application G70-A011).

TANKCOND001-006 (6) Condensate Tanks (Combined)	Volatile Organic Compounds	0.09	0.40
	Total HAPs	0.02	0.08
TANKPW001-002 (2) Water Tanks (Combined)	Volatile Organic Compounds	0.01	0.06
	Total HAPs	<0.01	<0.01
L001 Cond. Loading	Volatile Organic Compounds	7.06	0.01
	Total HAPs	1.29	<0.01
L002 P.W. Loading	Volatile Organic Compounds	<0.01	<0.01
	Total HAPs	<0.01	<0.01
Flare FL001	Nitrogen Oxides	0.01	0.03
	Carbon Monoxide	0.01	0.02

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The total change in annual emissions due to the removal of the flare is as follows:

Pollutant	TPY
NO <sub>x</sub>	-0.03
CO	-0.02
VOCs	+7.46
HAPS	--

## REGULATORY APPLICABILITY

The proposed modification is subject to the following state and federal rules:

### STATE RULES

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

The modification of the Maxwell Horizontal natural gas production facility has a potential to increase emissions of a regulated pollutant in excess of six (6) lbs/hour and ten (10) TPY. Pursuant to §45-13-2.24, the facility is defined as a "stationary source" under 45CSR13. Pursuant to §45-13-5.1, "[n]o person shall cause, suffer, allow or permit the ...modification . . . and operation of any stationary source to be commenced without . . . obtaining a permit to construct." Therefore, Antero is required to obtain a permit registration under 45CSR13 for the modification and operation of the natural gas production facility.

As required under §45-13-8.3 ("Notice Level A"), Antero placed a Class I legal advertisement in a "newspaper of general circulation in the area where the source is . . . located." The ad ran on February 17, 2015 in *The Herald Record* and the affidavit of publication was received on March 2, 2015.

### **45CSR22** *Air Quality Management Fee Program*

The Maxwell Horizontal Facility is not subject to 45CSR30. The facility is subject to 40CFR60 Subpart 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

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for a reason other than their status as an area source, therefore, the facility is not subject and will pay its annual fees through the Rule 22 program.

## FEDERAL RULES

### **40 CFR 60, Subpart OOOO Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution**

Subpart OOOO applies to facilities that commence construction, reconstruction, or modification after August 23, 2011 (October 15, 2012 for well completions). Since the Maxwell Horizontal pad began operation after August 23, 2011 it is subject to the requirements of Subpart OOOO. Even without a flare the 6 condensate and two produced water tanks at the Maxwell Horizontal facility will not have the potential to emit more than 6 tpy of VOC's each (total VOC emissions from all tanks total 7.92 tons per year), therefore the tanks will not be subject to the rule. The site also includes pneumatic controllers that were ordered and installed after August 23, 2011, therefore the controllers are subject to the applicable provisions of Subpart OOOO. The controllers have a bleed rate of 6.6 scf/day. The gas wells at the Maxwell Horizontal pad are also be affected facilities subject to Subpart OOOO.

## TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

This section provides an analysis for those regulated pollutants that may be emitted from the Maxwell Horizontal natural gas production facility and that are not classified as "criteria pollutants." 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 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) and 40 CFR 63 (MACT). Any potential applicability to these programs were discussed above under REGULATORY APPLICABILITY.

The majority of non-criteria regulated pollutants fall under the definition of HAPs which, with some revision since, were 188 compounds identified under Section 112(b) of the Clean Air Act (CAA) as pollutants or groups of pollutants that EPA knows or suspects may cause cancer or other serious human health effects. Antero included the following HAPs as emitted in substantive amounts in their emissions estimate: n-Hexane, Toluene, Ethylbenzene, and Xylene. The following table lists each HAP's carcinogenic risk (as based on analysis provided in the Integrated Risk Information System (IRIS)):

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HAPs	Type	Known/Suspected Carcinogen	Classification
n-Hexane	VOC	No	Inadequate Data
Toluene	VOC	No	Inadequate Data
Xylene	VOC	No	Inadequate Data
Ethylbenzene	VOC	No	Category D - Not Classifiable

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](http://www.epa.gov/iris).

#### AIR QUALITY IMPACT ANALYSIS

Because this is a class II administrative update to a minor stationary source, as defined in 45CSR14, no modeling was performed.

#### MONITORING OF OPERATIONS

No additional monitoring, beyond what is already required by G70-A011 is necessary.

#### CHANGES TO PERMIT REGISTRATION G70-A011

The following changes were made to G70-A011:

- \* Since the flare is being removed Section 14 of General Permit G70-A is no longer applicable. Therefore this section was unchecked on page 3 of the permit registration.
- \* Regarding the storage vessels being subject to Subpart OOOO, the engineering evaluation for G70-A011 states (seemingly correctly) that: "the tanks will not have the potential to emit more than 6 tpy of VOC's, therefore the tanks will not be subject to the rule. However, Section 12 of the Permit Section Applicability

was still checked. This will be corrected in G70-A011A and the section will be unchecked.

- \* Table 1.0 was updated to remove the control device and all references to it. Additionally, Section 14 from the Applicable Sections column was removed.
- \* The emission limitations and emission point ID's in Table 3.0 were updated.

### RECOMMENDATION TO DIRECTOR

Information supplied in the registration application indicates that compliance with all applicable regulations will be achieved. Therefore it is the recommendation of the writer that the class II administrative update general permit registration G70-A011A for a natural gas production facility near New Milton, Doddridge County, be granted to Antero Resources Corporation



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Steven R. Pursley, PE  
Engineer



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April 15, 2015