



**west virginia department of environmental protection**

Division of Air Quality  
601 57<sup>th</sup> 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](http://www.dep.wv.gov)

**ENGINEERING EVALUATION / FACT SHEET**

**BACKGROUND INFORMATION**

Application No.: R13-3072A  
Plant ID No.: 051-00160  
Applicant: Williams Ohio Valley Midstream LLC  
Facility Name: Whipkey Station  
Location: near Moundsville, Marshall County  
NAICS Code: 213112  
Application Type: Class II Administrative Update  
Received Date: May 5, 2016  
Engineer Assigned: David Keatley  
Fee Amount: \$2,800 (\$2,500 NESHAP and \$300 Class II AU)  
Date Fee Received: May 5, 2016  
Complete Date: August 19, 2016  
Due Date: October 18, 2016  
Applicant Ad Date: May 5, 2016  
Newspaper: *Moundsville Daily Echo*  
UTM's: Easting: 536.629 km Northing: 4,414.030 km Zone: 17  
Description: Increase the MDHI to 0.5 mmBtu/hr for the TEG dehydrator reboiler, update TEG dehydrator emissions using updated information, and update fugitive emissions.

**DESCRIPTION OF PROCESS**

This facility is a gathering compressor dehydration station. This facility receives natural gas from local natural gas wells. The natural gas stream will be compressed to a higher pressure by one (1) natural gas compressor. The compressor will be powered by one (1) 203-bhp Caterpillar G3306TA (April 2008) four-stroke rich-burn natural gas fired engine CE-1. Emissions from CE-1 will be controlled with a Maxim three-way catalyst which will reduce the emissions of NO<sub>x</sub> by 88% and CO by 88%. The compressed natural gas will then be sent to a triethylene glycol (TEG) dehydration unit to reduce the water content of the natural gas. Natural gas will flow countercurrent to the natural gas in a contactor. The compressed dryer natural gas will exit the facility via the natural gas sales pipeline. The rich TEG from the contactor will be sent to the flash tank to remove

the lighter hydrocarbons. At least 50% of the flash tank vapors (9E) will be used as fuel in the reboiler RBV-1. The liquids from the flash tank will flow to the regenerator where water and hydrocarbons are heated by one (1) 0.5-MMBtu/hr reboiler (RBV-1) and where vapors will exit an uncontrolled still vent (3E).

**SITE INSPECTION**

Steven Sobotka from DAQ's Compliance and Enforcement Section performed a site visit on September 16, 2013. This location is at the bottom of a hill next to Whipkey Drilling Pad just off US 250 near Moundsville. The area is pretty remote and no houses seem to be within 500 ft. Most of the site is surrounded by woods.

Directions from Moundsville. Travel north on Jefferson Avenue for approximately 0.3 miles. Turn right onto 1st street. Travel on 1st street for approximately 0.8 miles and turn left onto Waynesburg Pike (US 250). Travel for approximately 13.8 miles on US 250 east and turn left onto Bane Lane. Take the access road on the left.

**ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER**

Emissions for the TEG dehydration unit were estimated with GRI-GLYCalc. Emissions for the reboiler were estimated with AP-42 emission factors.

Table 1: Modified Maximum Estimated PTE

Emission Point ID	Emission Source	Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (tpy)
3E	TEG Dehydrator Still Vent 17 MMscf/day	VOC	0.56	2.45
		Benzene	0.03	0.15
		n-Hexane	0.01	0.04
		Toluene	0.11	0.49
		Xylenes	0.06	0.26
		CO <sub>2</sub> e	2	8
2E	Reboiler 0.5 MMBTU/hr	NO <sub>x</sub>	0.05	0.22
		CO	0.04	0.18
		VOC	<0.01	0.01
		PM	<0.01	0.02
		PM <sub>10</sub>	<0.01	0.02
		CO <sub>2</sub> e	59	257
9E	TEG Dehydrator Flash Tank (50% used as fuel in reboiler) 17 MMscf/day	VOC	1.60	7.01
		Benzene	<0.01	0.02
		n-Hexane	0.03	0.13
		Toluene	0.01	0.04
		Xylenes	<0.01	0.01

		CO <sub>2</sub> e	136	594
SSM	Startup, Shutdown, and Maintenance	VOC	-	0.85
		n-Hexane	-	0.01
		Ethylbenzene	-	0.02
		Xylenes	-	0.02
		CO <sub>2</sub> e	-	106
FUG	Process Piping Fugitives	VOC	0.58	2.55
		Ethylbenzene	<0.01	0.04
		n-Hexane	<0.01	0.04
		Xylenes	<0.01	0.04
		CO <sub>2</sub> e	76	332

Table 2: Summarized Estimated Controlled Facility Wide PTE and Increase in PTE

Pollutant	Maximum Annual Facility Wide Emissions (tons/year)	Increase (tons/year)
Nitrogen Oxides	4.15	0.04
Carbon Monoxide	4.11	0.03
Volatile Organic Compounds	18.69	-34.57
Particulate Matter	0.17	0
PM <sub>10</sub>	0.17	0
Sulfur Dioxide	0.01	0
Formaldehyde	0.39	-
Benzene	0.70	-
n-Hexane	0.23	-
Toluene	0.53	-
Xylenes	0.33	-
Total HAPs	3.31	-8.99
Carbon Dioxide Equivalent	2,349	-101

## REGULATORY APPLICABILITY

The following rules and regulations apply to this 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 maximum design heat input of all of the proposed fuel burning unit RBV-1 is below 10 MMBTU/hr. Therefore, this unit are exempt from the aforementioned sections of 45CSR2. However, RBV-1 is subject to the opacity requirements in 45CSR2, which is 10% opacity based on a six minute block average.

### **45CSR4 (To Prevent and Control the Discharge of Air Pollutants into the Open Air which Causes or Contributes to an Objectionable Odor or Odors)**

This facility shall not cause the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public. 45CSR4 states that an objectionable odor is an odor that is deemed objectionable when in the opinion of a duly authorized representative of the Air Pollution Control Commission (Division of Air Quality), based upon their investigations and complaints, such odor is objectionable.

### **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 maximum design heat input of all of the proposed fuel burning unit RBV-1 are below 10 MMBTU/hr. Therefore, this unit 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)

As can be seen in Table 2 the increase in emissions is less than regulatory thresholds for modification and this facility is therefore eligible for a Class II Administrative Update.

**45CSR16** - (Standards of Performance for New Stationary Sources Pursuant to 40CFR60)

45CSR16 incorporates by reference the standards of performance for new stationary sources (40CFR60). This facility is subject to 40CFR60 Subpart OOOO, and is therefore this facility is subject to 45CSR16.

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

This facility is a minor source, not subject to 45CSR30, and the NSPS are Title V exempt. Since this facility has a total reciprocating engine capacity of less than 1,000 hp (203 hp) this facility is subject to 9M with an annual fee of \$200. This facility is required to keep their Certificate to Operate current.

**40 CFR 63 Subpart HH** (*National Emission Standards for Hazardous Air Pollutants From Oil and Natural Gas Production Facilities*)

On June 1, 2013 the DAQ took delegation of the area source provisions of 40 CFR 63, Subpart HH. Whipkey Station is a natural gas production facility that processes, upgrades, or stores natural gas prior to transmission. Whipkey Station is an area source of HAPs refer to the previous facility wide emissions table.

Pursuant to §63.760(b)(2), each glycol dehydration unit (GDU) located at an area source that meets the requirements under §63.760(a)(3) is defined as an affected facility under Subpart HH. The requirements for affected sources at area sources are given under §63.764(d). However, for a GDU, exemptions to these requirements are given under §63.764(e)(2) “actual average emissions of benzene from the glycol dehydration unit process vent to the atmosphere are less than 0.90 megagram [1 TPY] per year.”

As shown above, the maximum PTE of benzene emissions from the GDU process vent is 0.17 TPY. Therefore, the GDU is exempt from the Subpart HH requirements given under §63.764(d).

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

EPA issued its new source performance standards (NSPS) and air toxics rules for the oil and gas sector on April 17, 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 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 will be (1) reciprocating compressor associated with CE-1 at this facility. This compressor will be delivered after to the effective date of this regulation. However this compressor was installed at a different facility prior to August 23, 2011 and this therefore this section of the regulation does not apply.*

- b.
  1. 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.
  2. 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.

*The pneumatic controllers at this facility will be intermittent or will vent less than 6 scf/hr and therefore this facility is not subject to this section of this regulation.*

- c. 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:

1. 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.

2. Process vessels such as surge control vessels, bottoms receivers or knockout vessels.

3. 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.

*Both tanks T01 and T02 will be constructed after August 23, 2011, however will emit less than 6 tpy each and this facility is not subject to this section of this regulation.*

## 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. Antero included the following HAPs as emitted in substantive amounts (0.01 tons/year) in their emissions estimate: Benzene, n-Hexane, Toluene, and Xylenes. The following table lists each HAP's carcinogenic risk (as based on analysis provided in the Integrated Risk Information System (IRIS)):

**Table 3: Potential HAPs - Carcinogenic Risk**

HAPs	Type	Known/Suspected Carcinogen	Classification
n-Hexane	VOC/HAP	No	Inadequate Data
Benzene	VOC/HAP	Yes	Category A - Known Human Carcinogen
Ethylbenzene	VOC/HAP	No	Category D - Not classifiable as to human carcinogenicity
Toluene	VOC/HAP	No	Inadequate Data
Xylenes	VOC/HAP	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*. This facility is a minor source of HAPs as can be seen in Table 2. 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

Modeling was not performed for 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) based on the annual emission rates as can be seen in Table 2.

### RECOMMENDATION TO DIRECTOR

The information provided in this facility's permit application indicates that compliance with all state and federal air quality requirements will be achieved. It is recommended that Williams should be granted a 45CSR13 Class I Administrative Update Permit for their Whipkey Station.



---

David Keatley  
Permit Writer - NSR Permitting

August 24, 2016

---

Date