



west virginia department of environmental protection

Division of Air Quality
601 57th Street SE
Charleston, WV 25304
Phone (304) 926-0475 • FAX: (304) 926-0479

Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
www.dep.wv.gov

ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.: R13-3071
Plant ID No.: 051-00158
Applicant: Chesapeake Appalachia LLC
Facility Name: Gladys Briggs Pad
Location: near Cameron, Marshall County
NAICS Code: 211111
Application Type: Construction
Received Date: April 17, 2013
Engineer Assigned: David Keatley
Fee Amount: \$2,000
Date Fee Received: April 22, 2013
Complete Date: July 3, 2013
Due Date: October 7, 2013
Applicant Ad Date: April 16, 2013
Newspaper: *Moundsville Daily Echo*
UTM's: Easting: 532.881 km Northing: 4,401.972 km Zone: 17
Description: Installation of one (1) 1.00 MMBTU/hr GPU burner, one (1) 1.5 MMBTU/hr line heater, one (1) 0.5 MMBTU/hr heater treater, three (3) 400 bbl condensate tanks, and three (3) 400 bbl produced water tanks.

DESCRIPTION OF PROCESS

The facility is an oil and natural gas exploration and production facility, responsible for the production of natural gas and condensate. Condensate, gas, and water come from one (1) natural gas well to one (1) gas production unit (GPU), where the first state of separation occurs. The gas from the 1.0 MMBTU/hr GPU (EU-GPU1) will exit the facility via the gas sales pipeline. Liquids (condensate and produced water) from the GPU will be sent to one (1) 0.5 MMBTU/hr heater treater EU-HT1. The flash gas from the heater treater will be used as a fuel to help power the GPU. Produced water from the heater treater flows into three (3) 12,400 gallon produced water tanks EU-TANKS-PW. Condensate from the heater treater flows into three (3) 12,400 gallon condensate

tanks EP-TANKS-COND. Condensate and produced water are transported offsite via truck. A 1.5 MMBTU/hr line heater EU-LH1 may be used during the beginning phase of facility operations.

SITE INSPECTION

Steven J. Sobutka from the DAQ's Compliance and Enforcement Section performed a site visit on July 17, 2013. The site is remote, surrounded by woods on all sides. Former farm land, nearest residence about 0.1 of a mile northeast of well pad entrance.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

The GPU burner(s), Heater Treater(s), and Line Heater(s) use emission factors from AP-42. The emission factors in lb/MMscf are: NO_x, 100; CO, 84; SO₂, 0.6; PM, 7.6; and VOC, 5.5.

Emissions for EP-TANKS-COND working and breathing emissions were estimated using TANKS 4.0.9d and the flash emissions were estimated using ProMax. The representative sample for ProMax was taken at the Shawn Harlan Pad.

The emissions from the other tanks were considered negligible due to the combination of small tank size, low throughput, and low vapor pressure of tank contents.

The following table lists the estimated controlled emissions:

Source ID	Emission Source	Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (tpy)
EU-GPU1	GPU Burner 1.00 MMBTU/hr	NO _x	0.11	0.48
		CO	0.09	0.39
		VOC	0.01	0.03
		PM	0.01	0.04
		PM ₁₀	0.01	0.04
		CO ₂ e	117.00	512.48
EU-LH1	Line Heater 1.5 MMBTU/hr	NO _x	0.17	0.74
		CO	0.14	0.61
		VOC	0.01	0.04
		PM	0.01	0.06
		PM ₁₀	0.01	0.06
		CO ₂ e	175.51	767.96
EU-HT1	Heater Treater 0.5 MMBTU/hr	NO _x	0.06	0.26
		CO	0.05	0.22
		VOC	<0.01	0.01
		CO ₂ e	58.50	256.24
EP-TANKS-COND	Three (3) Condensate Tanks 400-bbl	VOC	3.41	14.92
		Benzene	<0.01	0.01

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		Ethylbenzene	0.03	0.13
		n-Hexane	0.10	0.45
		Toluene	0.02	0.10
		Xylenes	0.08	0.37
EP-TANKS-PW	Three (3) Produced Water Tanks 400-bbl	VOC	0.05	0.23
		n-Hexane	<0.01	0.01
		Xylenes	<0.01	0.01
EP-LOAD-COND	Condensate Truck Loading 153,300 gallons/year	VOC	0.10	0.43
		n-Hexane	<0.01	0.01
		Xylenes	<0.01	0.01
		CO ₂ e	0.05	0.21
EP-LOAD-PW	Produced Water Truck Loading 1,533,000 gallons/year	VOC	0.01	0.05
		CO ₂ e	0.49	2.14
EU-FUG	Fugitive Emissions	VOC	0.31	1.35
		CO ₂ e	5.46	23.53

The following table represents the total facility emissions:

Pollutant	Maximum Annual Facility Wide Emissions (tons/year)
Nitrogen Oxides	1.48
Carbon Monoxide	1.22
Volatile Organic Compounds	17.06
Particulate Matter	0.11
PM ₁₀	0.11
Sulfur Dioxide	0.01
Benzene	0.01
n-Hexane	0.53
Ethylbenzene	0.14
Toluene	0.11
Xylenes	0.42
Total HAPs	1.22
Carbon Dioxide Equivalent	1,563.30

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 heat input of all of the proposed fuel burning units (EU-GPU1, EU-HT1, and EU-LH1) are below 10 MMBTU/hr. Therefore, these units are exempt from the aforementioned sections of 45CSR2. However, CHK would be 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 heat input of all of the proposed fuel burning units (EU-GPU1, EU-LH1, and EU-HT1) 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 the changes proposed under this permitting action results in an emissions increase above permitting thresholds. Therefore, CHK is required to submit a construction application. CHK has published the required Class I legal advertisement notifying the public of their permit application.

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 has one (1) natural gas well subject to 40CFR60 Subpart OOOO, and is therefore 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. CHK is required to keep their Certificate to Operate current. CHK paid a \$1,000 construction application fee and \$1,000 NSPS fee.

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 (SO₂) emissions from affected facilities that commence construction, modification or reconstruction after August 23, 2011. The following affected sources which commence construction, modification or reconstruction after August 23, 2011 are subject to the applicable provisions of this subpart:

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

The one (1) gas well that currently exists at the Gladys Briggs Pad was drilled principally for the production of natural gas and was done so after August 23, 2011. Therefore, this natural gas well would be considered an affected facility under this subpart.

- 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 Gladys Briggs Pad. Therefore, this section 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 located at Gladys Briggs Pad. Therefore, this section would not apply.

- d. 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 and therefore this section of this regulation does not 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:

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.

All three (3) EP-TANKS-COND tanks located at the Gladys Briggs Pad emit less than 6 tpy of VOC without controls (4.98 tpy each). Therefore this section does not apply to this facility

- f. The group of all equipment, except compressors, within a process unit is an affected facility.
 1. 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.
 2. 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.
 3. 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 Gladys Briggs Pad is not a natural gas processing plant. Therefore, LDAR 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.
 - 1. Each sweetening unit that processes natural gas is an affected facility; and
 - 2. Each sweetening unit that processes natural gas followed by a sulfur recovery unit is an affected facility.
 - 3. Facilities that have a design capacity less than 2 long tons per day (LT/D) of hydrogen sulfide (H₂S) in the acid gas (expressed as sulfur) are required to comply with recordkeeping and reporting requirements specified in §60.5423(c) but are not required to comply with §§60.5405 through 60.5407 and paragraphs 60.5410(g) and 60.5415(g) of this subpart.
 - 4. 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 Gladys Briggs Pad. Therefore, this section would not apply.

The following rules and regulations do not apply to the facility:

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 vapor combustor that CHK has proposed is not used to comply with one of these rules. The purpose of the vapor combustor is to control emissions from the tanks that are routed to it. However, these tanks are not subject to 40CFR60 Subpart Kb due to their size. In addition 40CFR60.18 refers to flares but makes no mention of vapor combustor, which are essentially enclosed combustion devices. Therefore, CHK is not subject to this standard.

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 tanks that CHK has proposed to install are 63.60 cubic meters each. Therefore, CHK would not be subject to this regulation.

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. The Gladys Briggs Pad is not a natural gas processing plant, therefore, CHK would not be subject to this regulation.

45CSR14 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollutants)

This facility does not meet or exceed the thresholds of this rule.

45CSR19 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution which Cause or Contribute to Nonattainment)

The Gladys Briggs Pad is located in Marshall County which is a non-attainment county for Particulate Matter 2.5, however this rule does not apply. This facility does not meet or exceed the thresholds of this rule.

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

Pollutant	PSD (45CSR14) Threshold (tpy)	NANSR (45CSR19) Threshold (tpy)	PTE (tpy)	45CSR14 or 45CSR19 Review Required?
Carbon Monoxide	250	NA	1.22	No
Nitrogen Oxides	250	100	1.48	No
Sulfur Dioxide	250	100	0.01	No
Particulate Matter 2.5	250	100	0.11	No
Ozone (VOC)	250	NA	17.06	No
Greenhouse Gas (CO ₂ e)	100,000	NA	1,563.30	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. However, due to the concentrations emitted, detailed toxicological information is not included in this evaluation.

AIR QUALITY IMPACT ANALYSIS

Based on the annual emission rates this facility will not be a major source as defined by 45CSR14, so air quality modeling was not performed.

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 Gladys Briggs Pad is located in Marshall County and will be operated by CHK, who is partial 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 Gladys Briggs Pad will operate under SIC code 1311 (Crude Petroleum and Natural Gas Extraction). There are surrounding wells and compressor stations operated by CHK that share the same two-digit major SIC code of 13 for oil and gas exploration and production. Therefore the Gladys Briggs Pad does share the same SIC code as the wells and surrounding compressor stations.

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.

The closest well to the Gladys Briggs Pad is over one quarter (1/4) mile away. Operations separated by these distances do not meet the common sense notion of a plant. Therefore, the properties in question are not considered to be on contiguous or adjacent property.

3. According to CHK, none of the wells in the area are under common control with the Gladys Briggs Pad. The Gladys Briggs Pad is operated by CHK but is owned and controlled by a group of non-affiliated companies. Through proprietary agreements, CHK’s operation of the Gladys Briggs Pad is controlled by the system owners. The ownership and control of the wells in the area may be distinct for each well and is not necessarily known by CHK. The owners and operators of the wells each may take their gas in kind and consequently affect the operation of the wells in which they have an ownership interest. Furthermore, no well is dependent on the operation of the Gladys Briggs Pad to function, nor is the Gladys Briggs Pad dependent on any

specific well to operate. From this analysis, CHK is not under common control with other wells in the area.

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 Gladys Briggs Pad should not be aggregated with other facilities in determining major source or PSD status.

MONITORING OF OPERATIONS

CHK 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 opacity from all fuel burning units.

CHK 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 all equipment.
6. The records shall be maintained on site or in a readily available off-site location maintained by CHK for a period of five (5) years.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates Chesapeake Appalachia LLC's natural gas well pad site should meet the applicable requirements. It is recommended that Chesapeake Appalachia's proposed Gladys Briggs Pad should be granted a 45CSR13 construction permit for their facility.

David Keatley
Permit Writer

Date