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.:	R13-3287
Plant ID No.:	103-00111
Applicant:	Ascent Resources – Marcellus, LLC (Ascent)
Facility Name:	Mason Hill
Location:	Reader, Wetzel County
NAICS Code:	211111 (Crude Petroleum and Natural Gas Extraction)
Application Type:	Construction
Received Date:	December 23, 2015
Engineer Assigned:	Jerry Williams, P.E.
Fee Amount:	$1,000.00
Date Received:	December 23, 2015
Complete Date:	January 8, 2016
Due Date:	April 7, 2016
Applicant Ad Date	December 30, 2015
Newspaper:	*Wetzel Chronicle*
UTM's:	Easting: 524.839 km Northing: 4,380.436 km Zone: 17
Description:	Installation and operation of a natural gas pigging facility.

DESCRIPTION OF PROCESS

The following process description was taken from Permit Application R13-3287:

The process begins when wet production gas flows through a 16" pipeline to Mason Hill. It passes through a pig receiver and then into a slug catcher. Most free flowing pipeline liquids fall out in the slug catcher due to velocity reduction. The gas stream then passes through a filter separator where solid particles are removed and any remaining free liquid is removed in a coalescing filter. The fluids collected in the slug catcher and coalescing filter are periodically dumped into atmospheric stock tanks (2 –210 barrel (bbl) and 1 - 100 bbl tank). The fluid drains from the slug catcher at 450 psi to the atmospheric tanks over a period of 12 hours following each pig run.

NON-CONFIDENTIAL

Vapors are released by this pressure reduction and these vapors are consumed by the combustor. The enclosed combustor only operates during pigging events. The typical pigging frequency results in the use of the enclosed combustor approximately one day a week in the summer and three days a week in the winter.

SITE INSPECTION

A site inspection was conducted on January 13, 2016 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 1,400 feet from the proposed facility.

Latitude: 39.5732
Longitude: -80.7108

Directions to the facility are as follows:

From Reader, WV: Go east 0.3 miles on WV-20 S. Go northeast 2.8 miles on McKimmie Ridge Road. Go south 0.5 miles on lease road to facility.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions associated with this construction application consist of the combustion emissions from one (1) vapor combustor that controls three (3) tanks, condensate loading, maintenance/startup/shutdown (MSS) pigging activities, fugitive emissions and haul road emissions. The following table indicates which methodology was used in the emissions determination:

Emission Unit ID#	Process Equipment	Calculation Methodology
COMB-1	8 MMBTU/hr MRW Vapor Combustor	E&P Tanks, EPA AP-42 Emission Factors
FUG	Site-wide Fugitive Emissions (flanges, valves, relief valves, pump seals)	TCEQ oil and gas production operation emission factors
C LOAD	Condensate Loading (358,722 gal/yr)	EPA AP-42 Emission Factors
MSS	MSS Activities/Pigging Operations	Engineering Estimate
HR	Unpaved Haul Road Emissions	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
Product Storage Tanks (Tank 1, 2, 3)	Volatile Organic Compounds	MRW Vapor Combustor (COMB 1)	98 %
	Hazardous Air Pollutants		98 %

The total facility PTE for the Mason Hill is shown in the following table:

Pollutant	Facility Wide PTE (tons/year)
Nitrogen Oxides	2.38
Carbon Monoxide	10.86
Volatile Organic Compounds	5.27
Particulate Matter-10/2.5	0.27
Sulfur Dioxide	<0.01
Total HAPs	0.18
Carbon Dioxide Equivalent	12,122

Maximum detailed controlled point source emissions were calculated by Ascent and checked for accuracy by the writer and are summarized in the table on the next page.

Ascent Resources – Marcellus, LLC – Mason Hill (R13-3287)

Emission	Source	NO_x		CO		VOC		PM-10/2.5		SO_2		Total HAPs		CO2e
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	ton/year
COMB 1	Vapor Combustor (Tanks 1-3)	0.54	2.38	2.48	10.86	0.33	1.42	0.06	0.26	<0.01	<0.01	0.01	0.05	12095
C LOAD	Condensate Loading	0	0	0	0	46.56	0.84	0	0	0	0	4.88	0.09	1
MSS	MSS Activities/Pigging Operation	0	0	0	0	2.84	0.14	0	0	0	0	0.04	<0.01	1
Total Point Source		**0.54**	**2.38**	**2.48**	**10.86**	**49.73**	**2.40**	**0.06**	**0.26**	**<0.01**	**<0.01**	**4.93**	**0.14**	**12097**
FUG	Site-wide Fugitives	0	0	0	0	0.66	2.87	0	0	0	0	0.01	0.04	25
HR	Haul Road Fugitives	0	0	0	0	0	0	<0.01	0.01	0	0	0	0	0
Total Fugitive		**0.00**	**0.00**	**0.00**	**0.00**	**0.66**	**2.87**	**0.00**	**0.01**	**0.00**	**0.00**	**0.01**	**0.04**	**25**
Total Sitewide		**0.54**	**2.38**	**2.48**	**10.86**	**50.39**	**5.27**	**0.06**	**0.27**	**<0.01**	**<0.01**	**4.94**	**0.18**	**12122**

REGULATORY APPLICABILITY

The following rules apply to the facility:

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.

Ascent has proposed one (1) vapor combustor at the facility. The vapor combustor is subject to section 4, emission standards for incinerators. The vapor combustor has negligible hourly particulate matter emissions. 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 Ascent 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 (45CSR6, 40CFR60 Subpart OOOO).

Ascent 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, Subpart OOOO. These requirements are discussed under that rule below.

45CSR22 (Air Quality Management Fee Program)

Ascent is not subject to 45CSR30. The Mason Hill pigging 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 for a reason other than their status as an area source.

Ascent is required to pay the appropriate annual fees and 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_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.

There are no gas wells at this facility. Therefore, all requirements regarding gas well affected facilities under 40 CFR 60 Subpart OOOO would not apply.

a. 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 Mason Hill pigging facility. Therefore, all requirements regarding centrifugal compressors under 40 CFR 60 Subpart OOOO would not apply.

b. 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 Mason Hill pigging facility. Therefore, all requirements regarding reciprocating compressors under 40 CFR 60 Subpart OOOO would not apply.

c. 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 applicable pneumatic controllers which commenced construction after August 23, 2011. Therefore, all requirements regarding pneumatic controllers under 40 CFR 60 Subpart OOOO would not apply.

d. 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 located at the Mason Hill pigging facility will be controlled by a vapor combustor which will reduce the potential to emit to less than 6 tpy of VOC. Therefore, Ascent is not required by this section to further reduce VOC emissions by 95%. Ascent is claiming a control efficiency of 98% for the vapor combustor.

e. 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 Mason Hill pigging facility not a natural gas processing plant. Therefore, Leak Detection and Repair (LDAR) requirements for onshore natural gas processing plants would not apply.

f. 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 Mason Hill pigging facility. Therefore, all requirements regarding sweetening units under 40 CFR 60 Subpart OOOO would not apply.

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 Mason Hill pigging facility is located in Wetzel County, which is an unclassified county for all criteria pollutants, therefore the Mason Hill pigging facility is not applicable to 45CSR19.

As shown in the following table, Ascent 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)**	**Mason Hill PTE (tpy)**	**45CSR14 or 45CSR19 Review Required?**
Carbon Monoxide	250	NA	10.86	No
Nitrogen Oxides	250	NA	2.38	No
Sulfur Dioxide	250	NA	<0.01	No
Particulate Matter 2.5	250	NA	0.26	No
Ozone (VOC)	250	NA	2.40	No

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. All tanks at this facility are smaller than 75 cubic meters. The largest storage tank proposed at this facility is 33.39 cubic meters. Therefore, Ascent 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. The following HAPs are common to this industry. 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
Formaldehyde	VOC	Yes	Category B1 - Probable Human Carcinogen
Benzene	VOC	Yes	Category A - Known Human Carcinogen
Ethylbenzene	VOC	No	Inadequate Data
Toluene	VOC	No	Inadequate Data
Xylenes	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

"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 Mason Hill pigging facility is located in Wetzel County and will be operated by Ascent. Because there are no other facilities that are considered to be on contiguous or adjacent properties, the emissions from the Mason Hill pigging facility should not be aggregated with other facilities in determining major source or PSD status.

MONITORING OF OPERATIONS

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

- Monitor and record quantity of condensate throughput for all storage tanks and loadout.
- Monitor all applicable requirements of 40CFR60 Subpart OOOO.
- Monitor the presence of the vapor combustor pilot flame with a thermocouple or equivalent.
- Monitor LDAR in accordance with permit conditions.
- 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 engines and ancillary equipment.
- Maintain records of the vapor combustor design evaluation.
- The records shall be maintained on site or in a readily available off-site location maintained by Ascent for a period of five (5) years.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates that Ascent meets all the requirements of applicable regulations. Therefore, impact on the surrounding area should be minimized and it is recommended that the Mason Hill facility should be granted a 45CSR13 construction permit for their facility.

Jerry Williams, P.E.
Engineer

FEB 1, 2016
Date