



west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.: R13-3319
Plant ID No.: 097-00071
Applicant: Perennial CMM West Virginia, LLC
Facility Name: Big Bend Ridge Utility Flare
Location: Upshur County
NAICS Code: 333999
Application Type: Construction
Received Date: May 12, 2016
Engineer Assigned: Joe Kessler
Fee Amount: \$1,000
Date Received: May 13, 2016
Complete Date: June 11, 2016
Due Date: September 26, 2016
Applicant Ad Date: May 18, 2016
Newspaper: *The Record Delta*
UTM's: 565.814 km Easting • 4,305.999 km Northing • Zone 17
Latitude/Longitude: 38.90042/-80.24101
Description: Construction of a Perennial Energy Model CSF6-750 750 ft²/minute (scfm) coal mine-methane utility flare.

DESCRIPTION OF PROCESS

Perennial CMM West Virginia, LLC (PCMMWV), a subsidiary of Perennial CMM, LLC, has submitted a permit application for the construction of a Perennial Energy Model CSF6-750 750 scfm (or alternatively, up to 18 mmBtu/hr) coal mine-methane utility flare. An electrically driven centrifugal blower, powered by the local electrical utility, will provide the methane gas to the flare from the closed Grand Badger Mine. The flare will utilize a 45,000 Btu/hr propane-fired pilot light and compressed nitrogen shall be used to operate a pneumatic safety shutdown valve on the flare. The flare will be designed to operate 8,760 hours per year. PCMMWV plans to sell carbon credits (gained by destroying methane, designated as a greenhouse gas) generated at the site into the California carbon trading market.

SITE INSPECTION

On July 13, 2016, the writer conducted an inspection of the proposed location of the Big Bend Ridge Utility Flare. The proposed site is located in a rural area of Upshur County approximately 1.9 miles east of Adrian, WV just north of State Route (SR) 30 (Gould Road). The writer was accompanied on the inspection by Mr. Edward Boys, the Engineering Manager of PCMMWV. Observations from the inspection include:

- The proposed facility will be in a heavily wooded area approximately 1.9 miles east of Adrian, WV just north of State Route (SR) 30 (Gould Road). The area is hilly and rural in nature with scattered homes and farms within several miles of the proposed location. Even with the required fifty foot setback of the flare, the size of the trees surrounding the flare (the flare will be approximately ~25 feet high) should mitigate any site pollution from the flare;
- At the time of the inspection, a drill rig was on site. The well will be capped and the flare, according to Mr. Boys, will not be erected until after the permit is issued; and
- The occupied dwelling located nearest to the proposed site is approximately 200 yards east of the proposed along Gould Road. According to Mr. Boys, (and confirmed at the site), the occupant of the dwelling is leasing the land to PCMMWV for operation of the flare.

The following is a picture of the proposed site of the Big Bend Ridge Utility Flare:



Directions: [Latitude: 38.90042, Longitude: -80.24101] From the junction of WV State Route (SR) 20 and County Route 30 (Gould Road) in Adrian, travel east on CR 30 for approximately 2.2 miles to the site access road on the left.

AIR EMISSIONS AND CALCULATION METHODOLOGIES

PCMMWV included in Attachment N of the permit application an emission estimate for the proposed flaring of coal mine-methane gas. Emissions of CO, NO_x, and VOCs were based on emission factors as given in AP-42 (AP-42 is a database of emission factors maintained by USEPA) Section 13.5. - “Industrial Flares.” Emissions of particulate matter and SO₂ are expected to be negligible. Hourly emissions from the flare were based on the MDHI of the unit (18.00 mmBtu/hr). Annual emissions were based on operating 8,760 at MDHI. Pilot light emissions were considered negligible (annual use of the pilot light is estimated at 1.7 hours/yr). The following table details the calculated emissions from the proposed flare:

Table 1: Perennial Energy Model CSF6-750 Flare PTE

Pollutant	Emission Factor	Source	Hourly (lb/hr)	Annual (ton/yr)
CO	0.31 lb/mmBtu	AP-41, Table 13.5-2	5.58	24.44
NO _x	0.068 lb/mmBtu	AP-41, Table 13.5-1	1.22	5.36
VOCs	0.57 lb/mmBtu	AP-41, Table 13.5-2	10.26	44.94

REGULATORY APPLICABILITY

This section will address the potential regulatory applicability/non-applicability of substantive state and federal air quality rules relevant to the Dewhurst Dehydration Station.

45CSR6: To Prevent and Control Particulate Air Pollution from Combustion of Refuse

PCMMWV has proposed use of a flare for combusting coal mine methane to generate carbon credits. This flare will meet the definition of an “incinerator” under 45CSR6 and is, therefore, subject to the requirements therein. The substantive requirements applicable to the unit is discussed below.

45CSR6 Emission Standards for Incinerators - Section 4.1

Section 4.1 limits PM emissions from incinerators to a value determined by the following formula:

$$\text{Emissions (lb/hr)} = F \times \text{Incinerator Capacity (tons/hr)}$$

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

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

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

Based on the maximum capacity of the proposed flare of 750 scfm (45,000 ft²/hour), and using the density of methane (0.0422 lb/scf), the capacity of the flare in lbs/hr would be approximately 1,900 lbs/hour (0.95 tons/hr). Using this value in the above equation produces a PM emission limit of 5.16 lb/hr. When operating correctly, there is expected to be only trace amounts of particulate matter from the flare and, therefore, the flare shall easily meet this limit.

45CSR6 Opacity Limits for - Section 4.3, 4.4

Pursuant to Section 4.3, and subject to the exemptions under 4.4, the flare has a 20% limit on opacity during operation. As a primary constituent in the vapors combusted in the unit shall be clean burning methane, particulate matter emissions from the unit is expected to be nominal. Therefore, the unit should easily meet this requirement.

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 Big Bend Ridge Utility Flare has a maximum emission rate of a regulated pollutant in excess of six (6) lbs/hour and ten (10) TPY (see Table 1 above) and, therefore, 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 construction . . . and operation of any stationary source to be commenced without . . . obtaining a permit to construct.” Therefore, PCMMWV is required to obtain a permit under 45CSR13 for the construction and operation of the Big Bend Ridge Utility Flare.

As required under §45-13-8.3 (“Notice Level A”), PCMMWV placed a Class I legal advertisement in a “newspaper of *general circulation* in the area where the source is . . . located.” The ad ran on May 18, 2016 in *The Record Delta* and the affidavit of publication for this legal advertisement was submitted on June 16, 2016.

45CSR14 (NON APPLICABILITY)

The facility-wide PTE of the Big Bend Ridge Utility Flare (see Table 1 above) is below the levels that would define the source as “major” under 45CSR14 and, therefore, the construction evaluated herein is not subject to the provisions of 45CSR14.

45CSR30: Requirements for Operating Permits - (NON APPLICABILITY)

45CSR30 provides for the establishment of a comprehensive air quality permitting system consistent with the requirements of Title V of the Clean Air Act. The facility does not meet the

definition of a "major source under § 112 of the Clean Air Act" as outlined under §45-30-2.26 and clarified (fugitive policy) under 45CSR30b. Therefore, the Big Bend Ridge Utility Flare is not subject to 45CSR30.

TOXICITY ANALYSIS OF NON-CRITERIA REGULATED POLLUTANTS

This section provides an analysis for those regulated pollutants that may be emitted from the Big Bend Ridge Utility Flare and that are not classified as "criteria pollutants." Criteria pollutants are defined as Carbon Monoxide (CO), Lead (Pb), Oxides of Nitrogen (NO_x), Ozone, Particulate Matter (PM), Particulate Matter less than 10 microns (PM₁₀), Particulate Matter less than 2.5 microns (PM_{2.5}), and Sulfur Dioxide (SO₂). These pollutants (with the exception of PM) 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 and programs designed to limit their emissions and public exposure. These programs include federal source-specific Hazardous Air Pollutants (HAPs) limits 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. The Big Bend Ridge Utility Flare will not produce any substantive amount of non-criteria regulated pollutants.

AIR QUALITY IMPACT ANALYSIS

The proposed construction does not meet the definition of a "major stationary source" pursuant to 45CSR14 and, therefore, an air quality impact (computer modeling) analysis was not required. Additionally, based on the nature of the construction, modeling was not required under 45CSR13, Section 7.

MONITORING, COMPLIANCE DEMONSTRATIONS, RECORD-KEEPING, AND REPORTING REQUIREMENTS

The following substantive monitoring, compliance demonstration, reporting, and record-keeping requirements (MRR) shall be required:

- To demonstrate compliance with flow and heat input limits given under 4.1.2(a) of the draft permit, the permittee shall be required to install instrumentation to monitor and record, at a minimum of fifteen (15) minute intervals, the flow of vapors to the flare and BTU content of the vapors sent to the flare;

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- Pilot flame compliance demonstration, monitoring and record-keeping is extensive and shall be required as given under 4.2.1(b) through (e) of the draft permit and may be reviewed there; and
- Recording and reporting for visible emissions testing shall be required as given under 4.4.4. and 4.5.1 of the draft permit and may be reviewed there.

PERFORMANCE TESTING OF OPERATIONS

The following substantive performance testing requirements shall be required:

- Visible emissions testing to show compliance with 45CSR6 shall be required initially within 180 days of start-up and thereafter at a minimum of at least once per each period of 12 months. Additionally, a visible emission check shall be conducted each time the flare is manually started. Specific visible emissions testing requirements shall be as given under 4.3.1. of the draft permit and may be reviewed there.

RECOMMENDATION TO DIRECTOR

The information provided in permit application R13-3319 indicates that compliance with all applicable state and federal air quality regulations will be achieved. Therefore, I recommend to the Director the issuance of Permit Number R13-3319 to Perennial CMM West Virginia, LLC for the construction and operation of the Big Bend Ridge Utility Flare located on Big Bend Ridge, Upshur County, WV.

Joe Kessler, PE
Engineer

Date

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