west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-3205
Plant ID No.:	009-00126
Applicant:	ECC Windsor Inc.
Facility Name:	Windsor Mine – West Liberty Gob well
Location:	North of West Liberty on State Route 88
NAICS Code:	213113
Application Type:	Construction
Received Date:	September 4, 2014
Engineer Assigned:	Edward S. Andrews, P.E.
Fee Amount:	$1000.00
Date Received:	September 5, 2014
Completeness Date:	October 1, 2014
Due Date:	December 30, 2014
Newspaper:	Intelligencer
Applicant Ad Date:	September 2, 2014
UTMs:	Easting: 535.8 km Northing: 4,447.6 km Zone: 17
Description:	This application is for the construction of a flare to control methane from a borehole of an inactive coalmine.

DESCRIPTION OF PROCESS

ECC Windsor Inc. (ECC) has elected to install an enclosed flare for the purposes of destroying the methane component of the gob gas. The Windsor Mine is an inactive underground coalmine, which is own by CONSOL Energy. CONSOL Energy will be leasing the West Liberty Portal Site to ECC to destroy the methane gas that is venting from the existing borehole.

ECC proposes to voluntarily install a flare to convert the methane, which is classified as a greenhouse gas, in the gas stream to carbon dioxide and water. The gas stream will be evacuated from the well using an induction fan (blower). The blower will create suction on the well, which will draw the gas to the surface. ECC is proposing to use an ABUTEC 200 flare to destroy the gas. This particular flare has eight - 2-inch diameter tips within the enclosure to promote complete destruction of the gas stream. This stack will confine the exhaust from the burner and extend upward with a total height above ground elevation of approximately 23 feet.

SITE INSPECTION

The site of this proposed flare is the existing West Liberty Mine Portal. Division of Mining had approved this portal, which included the associated drilling activities to construct the borehole to which the flare will be connected, as part of the CONSOL Energy mining permit. Thus, it is deemed that a site visit of this particular existing borehole is not necessary for this proposed flare.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

The emission estimates in the application were based on the methane content in the gas stream of 44% at maximum flow rate of 280 standard cubic feet per minute (scfm) from the borehole and emission factors from ABUTEC's Mass Balance Model Output. In these calculations, EPA Method 19 was used to determinate the mass rate from concentrations at measured oxygen levels. These emission estimates are presented in the following table.

Table #1 – Flare Emissions		
Pollutants	lb/hr	TPY
NO_x	0.75	3.28
CO	0.91	3.96
CO_2	991.9	4,344.7
Methane	0.22	0.98

The carbon dioxide equivalent (CO_2e) of this methane without the flare would be 34,238 tons per year. The proposed flare would reduce the CO_2e emissions down to 4,369 tons per year.

REGULATORY APPLICABILITY

45CSR6 - To Prevent and Control Air Pollution From Combustion of Refuse

The purpose of this rule is to prevent and control air pollution from combustion of refuse. The permittee has proposed to construct a flare to destroy the gas stream from the borehole. This rule defines incineration as the destruction of combustible refuse by burning in a furnace designed for that purpose. The purpose of this flare is to destroy the gob gas through incineration. Thus, it meets the definition.

Per section 4.1, this flare must meet the particulate matter limit by weight. The flare will have an allowable particulate matter emission rate of 0.85 pounds per hour (based on maximum mass flow rate of the methane in the gas stream is 312.7 lb/hr). The predicted particulate matter rate from the flare has been estimated to be 0 pounds per hour, which is significantly less than the allowable under this rule.

The flare is also subject to the 20% opacity limitation in section 4.3 of this rule. Typically, the incineration or burning of natural gas (methane) produces little to no visible emissions when combusted.

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 potential-to-emit from the proposed flare does not exceed the 6 pounds per hour and 10 tons per year for any regulated pollutant, which is the trigger level of a stationary source as defined in 45CSR§13-2.24. However, Rule 6 requires all incinerators to obtain a construction or

modification permit in accordance with Rule 13 regardless of size. ECC has proposed to install a flare, which is subject to Rule 6. Therefore, the facility is required to obtain a permit as required in 45CSR6-6.1.

The applicant has satisfied the applicable requirements of Rule 13 to obtain a construction permit by publishing a Class I Legal Advertisement in the on September 2, 2014, paid the $1000.00 application fee, and submitted a complete permit application.

The flare will not have a potential to exceed the major source trigger level under Title V. Thus, this flare will be subject to Rule 22 as a 9M source.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

Hazardous air pollutants (HAPs) from the flare will most likely be products of incomplete combustion, which is expected to be released in trace amounts. Due to the very low emission rate, there will be no toxicity discussion of these HAPs.

AIR QUALITY IMPACTS ANALYSIS

The writer deemed that an air dispersion modeling study or analysis was not necessary, because the proposed flare does not meet the definition of a major source as defined in 45CSR14.

MONITORING OF OPERATIONS

There is no state rule or federal regulation that requires ECC to destroy the methane (gob gas) before it is emitted to the atmosphere. ECC is doing this project on a voluntary basis. The real driving force for ECC is trading these CO_2e reductions on a carbon-offset market or exchange. These markets have specific protocols to be used when quantifying and validating the carbon reduction or offsets, which may differ by market or exchange.

Methane content in the gas stream will decrease over time to the point that the flare cannot be operated. This period is relativity short (two to three years). Natural gas is considered a clean burning fuel. Because natural gas is mainly composed of 80 to 90 percent methane, this gas stream should behave the same. Monitoring of natural gas combustion sources is usually focused on the amount of natural gas combusted in a given period and proper operation of the flare that could be indicated by combustion chamber temperature, which should not fall below $1{,}400^{0}$F. Considering everything, the writer recommends that the operator continuously monitor the combustion chamber and estimate the amount of methane flared.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates the proposed flare will meet all the requirements of the application rules and regulations when operated in accordance with the permit application. Therefore, the writer recommends granting ECC a Rule 13 construction permit for this flare associated with the Windsor Mine at the West Liberty Portal.

Edward S. Andrews, P.E.
Engineer

Date: October 20, 2014