west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-3283
Plant ID No.:	003-00153
Applicant:	Brown Cremation Services, Inc.
Facility Name:	Inwood
Location:	Inwood, Berkley County, WV
NAICS Code:	812220
Application Type:	Construction
Received Date:	December 7, 2015
Engineer Assigned:	Caraline Griffith
Fee Amount:	$1000.00
Date Received:	December 8, 2015
Completeness Date:	January 4, 2016
Due Date:	April 4, 2016
Newspaper:	*The Journal Publishing Company*
Applicant Ad Date:	December 2, 2015
UTMs:	Easting: 755.58 km Northing: 4,361.61 km Zone: 17
Description:	This construction permit application is for the installation and operation of a human crematorium and animal crematorium at the Inwood facility.

DESCRIPTION OF PROCESS

Brown Cremation Services, Inc. proposes to install a new natural gas fired US Cremation Equipment Model Classic human crematory for use at their facility. The “CLASSIC” is a multi-chamber unit having an average 200 lbs/hr or 750 lbs/maximum load (approx. 1,000 BTU/lb). The primary chamber burner is rated at 500,000 BTU/hr/burner and the secondary chamber burner is rated at 1,500,000 BTU/hr, for a total of 2,000,000 BTU/hr (2.0 mmBTU/hr).

Control of air pollution is achieved through the design of the “CLASSIC” crematory, including its ability to operate the secondary chamber between 1600-1850 degrees Fahrenheit at a residence time in excess of 1.0 seconds. The design also includes fully automatic PLC based controls, independent fuel/air systems, preheated combustion air, secondary chamber

temperature monitor and recorder, primary burner temperature interlock (prevents primary burner from firing prior to the secondary chamber reaching its set point temperature), UV continuous scanning flame detectors on burners, and an opacity sensor (electronic exhaust gas scanner system) which can temporarily suspend operation of the primary chamber burner.

The US 75/300 is a multi-chamber unit having an average 75 lbs/hr capacity. The primary chamber burner is rated at 500,000 BTU/hr, and the secondary chamber burner is rated at 1,000,000 BTU/hr, for a total of 1,500,000 BTU/hr (1.5 mmBTU/hr). Control of air pollution is achieved through the design of the US 75/300 crematory, including its ability to operate the secondary chamber between 1600-1850 degrees Fahrenheit at a residence time in excess of 1.0 second. The design also includes fully automatic PLC based controls, independent fuel/air systems, preheated combustion air, secondary chamber temperature monitor and recorder, primary burner temperature interlock (prevents primary burner from firing prior to the secondary chamber reaching its set point temperature), UV continuous scanning flame detectors on burners, and an opacity sensor which can temporarily suspend operation of the primary chamber burner.

SITE INSPECTION

Directions to Facility:

From I-81 N toward Martinsburg, take Exit 5 for W. Va. 51 toward Inwood/Charles Town. Turn left onto WV-51 W. Go 0.2 miles and turn right onto Arden Nollville Road. The building will be 0.3 miles on the left.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

With the submitted application, Brown Cremation Services, Inc. included a complete compliance test report of a “Classic” Human Cremator and a US 75/300 animal cremator located in West Park, Florida and Lakeland, Florida, respectfully. The pollutants measured during the stack tests for the human cremator were filterable particulate matter, SO2, NOx, VOC, CO, and HCl. This particular demonstration was conducted using U.S. EPA Methods, 1-5, 9, 10 and 26A. Over a two-day period for the human cremator, March 3-4, 2010, three test runs were done to calculate emissions. Average measured particulate matter rate between the three runs was 0.12 pounds per hour at 7% O2. The average amount of HCl per run was 27.42 PPM at 7% O2.

The pollutants measured during the stack tests for the animal cremator were filterable particulate matter, SO2, NOx, VOC, and CO. This particular demonstration was conducted using U.S. EPA Methods, 1-5, 9, and 10. On February 25, 2011 for the animal cremator, three test runs were done to calculate emissions. Average measured particulate matter rate between the three runs was 0.03 pounds per hour at 12% CO2.

Table #1 Emission Units Estimated Potential to Emit				
Emission Unit ID	Emission Unit Description	Pollutant	lb/hr	TPY
001	US Cremation Equipment "Classic" Model Human Cremator	Particulate Matter (PM)	0.12	0.53
		Nitrogen Oxides (NO_x)	0.30	1.31
		Carbon Monoxide (CO)	<0.01	0.01
		Sulfur Dioxide (SO_2)	0.25	1.10
		Volatile Organic Compounds (VOC)	0.30	1.31
002	US Cremation Equipment US 75/300 Animal Cremator	Particulate Matter (PM)	0.03	0.13
		Nitrogen Oxides (NO_x)	0.11	0.49
		Carbon Monoxide (CO)	0.07	0.30
		Sulfur Dioxide (SO_2)	0.09	0.41
		Volatile Organic Compounds (VOC)	0.11	0.49

Table #2 Facility Potential to Emit (PTE)		
Pollutant	Emission Limitations lb/hr	Emission Limitations TPY
Particulate Matter (PM)	0.15	0.66
Nitrogen Oxides (NO_x)	0.41	1.80
Carbon Monoxide (CO)	0.07	0.31
Sulfur Dioxide (SO_2)	0.34	1.50
Volatile Organic Compounds (VOC)	0.41	1.80

REGULATORY APPLICABILITY

The following state regulations apply.

45CSR4 – To Prevent and Control the Discharge of Air Pollutants Into the Open Air Which Causes or Contributes to an Objectionable Odor or Odors

The purpose of this rule is to prevent and control any discharge that may cause or contribute to objectionable odors. The Brown Cremation Services, Inc. Inwood Facility will not be emitting any objectionable odors now or in the future.

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 install and operate one human crematory. This rule defines incineration as the destruction of combustible refuse by burning in a furnace designed for that purpose. The proposed cremators are designed to destroy human and animal remains and associated containers through incineration. Thus, it meets this definition.

Per section 4.1, these crematories must meet the particulate matter limit by weight. The human crematory will have an allowable particulate matter emission rate of 0.543 pounds per hour (based on maximum design-incineration rate of 200 lb/hr). This allowable rate is higher than the estimated hourly potential of 0.12 lb/hr. Thus, the unit should be more than capable of meeting this PM standard.

The animal crematory will have an allowable particulate matter emission rate of 0.20 pounds per hour (based on maximum design-incineration rate of 75 lb/hr). This allowable rate is

higher than the estimated hourly potential of 0.03 lb/hr. Thus, the unit should be more than capable of meeting this PM standard.

The crematory is subject to the 20% opacity (visible emission) limitation in section 4.3 of this rule. The opacity and the allowable limits should be met since the crematory is equipped with a secondary chamber with the afterburner, which is designed to reduce the particulate matter and other pollutants entrained in the exhaust stream into products of complete combustion. It is estimated that at any given time during the incineration process the minimum retention time will be 2.0 seconds. The rule of thumb for nearly complete combustion is 1.0-second retention time in the secondary chamber. Thus, this particular crematory should be capable of meeting the applicable limitations of this rule.

45CSR13 - Permits for Modification, 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 crematories are below 6 pounds per hour and 10 tons per year for all of the criteria pollutants, which is less than the permit trigger level as defined in 45CSR§13-2.24.b. However, Rule 6 requires all incinerators be required to obtain a construction or modification permit regardless of size. Brown Cremation Services, Inc. has proposed to install two cremators, which are subject to Rule 6. Therefore, the facility is required to obtain a permit as required in 45CSR§6-6.1. and 45CSR§13-2.24.a. The facility has met the applicable requirements of this rule by publishing a Class I Legal Advertisement in *The Journal Publishing Company* on December 2, 2015, paid the $1,000.00 application fee, and submitted a complete permit application.

As a result of this Construction, the Inwood facility will not be classified as a major source of hazardous air pollutants or major source under Title V. In addition, the emission unit is not subject to a New Source Performance Standard. Thus, the facility is not subject to Title V and will not be required to obtain an operating permit under 45CSR30. Therefore, the Seventh Street Parkersburg facility will remain classified as a "9B - Crematory Incinerator" source as defined in 45CSR22.

45CSR22 Air Quality Management Fee Program

This facility is a minor source and not subject to 45CSR30. Brown Cremation Services, Inc. is required to keep their Certificate to Operate current. They paid the $1000 fee associated with a Rule 13 permit application.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

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*. The file contains summaries of the IRIS database information on hydrogen chloride and mercury. For a complete discussion of the known health effects, refer to the IRIS database located at *www.epa.gov/iris*.

AIR QUALITY IMPACTS ANALYSIS

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

MONITORING OF OPERATIONS

Brown cremation services must monitor both the primary and secondary chamber temperatures. The temperature of the secondary chamber must be recorded. Other monitoring that is needed for this type of unit is the weight of each cremation.

Monitoring the secondary chamber temperature is an indicator that the temperature in the secondary chamber is sufficient to ensure complete combustion of the products of incomplete combustion such as particulate matter, carbon monoxide, and volatile organic compounds. The secondary chamber must be operated at a minimum temperature of $1{,}600^0$F, but no more than $1{,}800^0$F, which is suggested by the manufacturer.

To ensure compliance with the visible emission standard of Rule 6, the writer proposes requiring visible emission checks to be conducted once every quarter.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application and the conditions set forth in the permit indicates the US Cremation Equipment "Classic" human cremator and the US Cremation Equipment 75/300 animal cremator should meet all applicable state rules and federal regulations when operated. Therefore, this writer recommends that a Rule 13 Construction Permit should be granted to Brown Cremation Services, Inc. for their proposed crematory at the Inwood facility.

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Caraline Griffith
Permit Engineer

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Date