



west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.: R13-0682A
Plant ID No.: 003-00002
Applicant: Continental Brick Company
Facility Name: Martinsburg Facility
Location: Martinsburg, Berkeley County
SIC Code: 3251
Application Type: Modification
Received Date: December 28, 2009
Engineer Assigned: Steven R. Pursley, PE
Fee Amount: \$1,000.00
Date Received: January 5, 2010
Complete Date: January 25, 2010
Due Date: April 25, 2010
Applicant Ad Date: January 8, 2010
Newspaper: *The Journal*
UTM's: Easting: 245.4 km Northing: 4,368.7 km Zone: 18
Description: Modification of a face brick manufacturing operation to add a periodic kiln and increase SO₂ and HF emission limits from the tunnel kilns.

DESCRIPTION OF PROCESS

The Martinsburg Facility is a face brick manufacturing operation which includes quarry to final brick production and storage. The weathered Martinsburg Shale is quarried by the use of pans, crushed, screened, wetted, mixed in a pug mill, vacuum extruded, trimmed and cut to form the final shape of the green face bricks. Green face bricks then pass through the warming room, drying room and kiln to remove the moisture in a controlled manner and then to fire the bricks. Fired bricks are sorted and packaged for sale. Bricks not meeting the specifications (waste bricks) are disposed of on property.

This application includes revising the tunnel kilns emissions (Tunnel Kiln No. 1 and No. 2) for sulfur dioxide and hydrogen fluoride to meet the stack testing conducted under the Title V permit and the addition of a proposed periodic kiln. In addition, the new permit will also include emission limits for all criteria and hazardous air pollutants.

The proposed periodic kiln will obtain the bricks from the same brick making equipment but will operate differently than the tunnel kilns. Within the tunnel kilns the brick cars are fed to one end of the kilns from the brick dryer and the cars actually advance by one of the cars being shoved in the end of the kilns and the last car at the end of the kiln is then removed. The periodic kiln will operate more like a bake oven. Up to two (2) tons of green face brick will be placed within the periodic kiln, the kiln will be closed and then the firing process will be initiated. The heating/firing process will last for two (2) days with the temperature being elevated in the chamber on a determined temperature gradient to properly dry and fire the brick. After the second day of firing the gas burners will be shut off and the brick will be allowed to cool down for the third day. After the third day the bricks will be cool enough to remove from the periodic kiln. Firing/heating of the periodic kiln will be supplied by two (2) 250,000 BTU/HR natural gas burners.

SITE INSPECTION

Since a full on site compliance inspection was performed less than one year ago, no site inspection of the facility was performed. On July 8, 2009 Joseph Kreger of DAQs Eastern Panhandle Regional Office performed an onsite compliance inspection of the facility and determined it to be in compliance. To get to the facility take Interstate 81 to exit 12. Then proceed east on State Route 9 approximately 1.5 miles. The facility is located on the right side of the road.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

The existing PTE of the facility is as follows:

	lb/hr	tpy
PM	57.81	188.64
PM ₁₀	34.56	129.10
PM _{2.5}	17.94	73.95
SO ₂	19.81	86.74
NO _x	9.57	39.21
CO	20.27	88.57
VOC	0.45	1.87
HF	2.80	12.28
HCl	2.80	12.28
VOC HAP	0.17	0.69
Metal HAP	0.01	0.01

Emissions from the new periodic kiln will be as follows:

	lb/hr	tpy
PM	1.92	0.03
PM ₁₀	1.74	0.03
PM _{2.5}	1.74	0.03
SO ₂	1.34	0.02
NO _x	0.70	0.01
CO	2.40	0.04
VOC	0.05	0.01
HF	3.62	0.07
HCl	0.34	0.01
Non HF/HCl HAPs	0.02	0.01

The requested increase in permitted emissions from the existing tunnel kilns is as follows:

	lb/hr	tpy
SO ₂	8.06	35.42
HF	27.06	118.52

The total increase in emissions will be as follows:

	lb/hr	tpy
PM	1.92	0.03
PM ₁₀	1.74	0.03
PM _{2.5}	1.74	0.03
SO ₂	9.40	35.44
NO _x	0.70	0.01
CO	2.40	0.04

VOC	0.05	0.01
HF	30.68	118.59
HCl	0.34	0.01
Non HF/HCl HAPs	0.02	0.01

The facility's new PTE will be as follows:

	lb/hr	tpy
PM	59.73	188.67
PM ₁₀	36.3	129.13
PM _{2.5}	19.68	73.98
SO ₂	29.21	122.18
NO _x	10.27	39.22
CO	22.67	88.61
VOC	0.50	1.88
HF	33.48	130.87
HCl	3.14	12.29
Non HF/HCl HAPs	0.21	0.70

Note that the above emissions (specifically particulate emissions) include both point sources and fugitive sources. For Title V purposes PM₁₀ emissions from point sources total 120.52 tons per year.

REGULATORY APPLICABILITY

The following state and federal regulations apply to the modification:

STATE RULES:

45CSR7 To Prevent and Control Particulate Air Pollution from Manufacturing Process Operations.

Fact Sheet R13-0682A
Continental Brick Company
Martinsburg Facility

The two tunnel kilns are defined as “Duplicate Source Operations”. Rule 7 limits opacity from the two stacks and the stack from the new periodic kiln to 20%. The combined process weight rate from the two tunnel kilns is 33,000 pounds per hour. This equates to a combined PM limit of 11.9 pounds per hour for each stack under table 45-7A and the formula in 45CSR7§7-4.8. The permitted PM emission rate for each tunnel kiln will be 9.5 pounds per hour.

The new periodic kiln has a process weight rate of 83.3 pounds per hour (2 tons per batch over a 48 hour firing time). Under table 45-7A this equates to a permitted PM emission rate of 0.1 pounds per hour. The applicant estimates that total PM emissions during the firing cycle will be 1.92 pounds or 0.04 pounds per hour. Note that in order to be conservative (and for simplicity) in the above “Estimate of Emissions” all emissions during a complete cycle were assumed to have been emitted in one hour. The permit will set the hourly limit at the rule 7 limit of 0.1 pounds per hour.

45CSR10 To Prevent and Control Air Pollution for the Emission of Sulfur Dioxide

Rule 10 limits SO₂ concentrations from each kiln to 2000 ppm by volume. Based on the allowable emission rate of 13.93 pounds per hour and a stack flow rate of 32,000 acfm at 330°F, the actual concentration should be about 66 ppm.

45CSR13 Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits, and Procedures for Evaluation.

The applicant was required to apply for the permit under consent order CO-R30-E-2009-14.

45CSR30 Requirements for Operating Permits.

The facility is a major source with an existing Title V permit.

FEDERAL REGULATIONS

40 CFR 60 Subpart OOO Standards of Performance for Nonmetallic Mineral Processing Plants.

Note that only one crusher in the entire facility is subject to OOO and that crusher is not addressed in this application.

40 CFR 63 Subpart B: Requirements for Control Technology Determinations for Major Sources in Accordance with Clean Air Act Sections 112(g) and 112(j).

The new kiln is subject to 112(g) because it is located at a major source of HAPs and is part of a source category for which USEPA has not promulgated emissions standards by the section 112(j) deadline. Section 112(g) requires a case by case MACT determination. In this case, emissions of HAPs from this particular kiln are so small (less than 0.09 tons per year) that no add on controls are deemed necessary. Instead, compliance with the permitted emission limits will be determined by monitoring kiln throughput and periodically testing the clay for Fluorides.

The existing kilns are subject to 112(j). However, the facilities existing Title V permit provides a time frame for Continental to submit their application for a 112(j) determination which lies outside of this permit (between June 1, 2010 and July 1, 2010). Therefore this permit does NOT address this requirement and does NOT constitute a 112(j) determination.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

As can be seen above, HF and HCl are the main Hazardous Air Pollutants emitted by the facility. The new kiln is subject to case by case MACT and will be addressed in the permit. The existing kilns have a separate time line to apply for case by case MACT and will be addressed outside of this permit.

AIR QUALITY IMPACT ANALYSIS

Because this is a minor modification no modeling analysis was performed.

MONITORING OF OPERATIONS

The permittee shall maintain records of the following:

- * Throughput through each of the 3 kilns
- * Fluoride content of the clay
- * Sulfur content of the coal being fired in the tunnel kilns.

CHANGES TO PERMIT R13-0682

Since the existing permit is an old "one page" permit, R13-0682A is essentially a brand new permit.

RECOMMENDATION TO DIRECTOR

Information supplied in the application indicates that compliance with all applicable regulations will be achieved. Therefore it is the recommendation of the writer that permit R13-0682A for the modification of a brick plant near Martinsburg be granted to Continental Brick Company.

Steven R. Pursley, PE
Engineer

Date