

**NORTH CAROLINA DIVISION OF
AIR QUALITY**

Air Permit Review

Region: Mooresville Regional Office
County: Union
NC Facility ID: 9000028
Inspector's Name: Melinda Wolanin
Date of Last Inspection: 05/28/2009
Compliance Code: 3 / Compliance - inspection

Permit Issue Date:

Facility Data			Permit Applicability (this application only)		
<p>Applicant (Facility's Name): Hanson Brick East, LLC, dba Hanson Brick-Monroe</p> <p>Facility Address: Hanson Brick East, LLC, dba Hanson Brick-Monroe 2304 Brickyard Road Monroe, NC 28111</p> <p>SIC: 3251 / Brick And Structural Clay Tile NAICS: 327121 / Brick and Structural Clay Tile Manufacturing</p> <p>Facility Classification: Before: Title V After: Title V Fee Classification: Before: Title V After: Title V</p>			<p>SIP: N/A NSPS: N/A NESHAP: N/A PSD: N/A PSD Avoidance: N/A NC Toxics: N/A 112(r): N/A Other: 15A NCAC 2D .1109 <i>[112(j) – Part 2 MACT Hammer for Brick Manufacturers]</i></p>		
Contact Data			Application Data		
Facility Contact	Authorized Contact	Technical Contact	<p>Application Number: 9000028.09A Date Received: 11/09/2009 Application Type: 112(j) Part II Application Schedule: TV-Significant</p> <p style="text-align: center;">Existing Permit Data</p> <p>Existing Permit Number: 03752/T30 Existing Permit Issue Date: 03/13/2008 Existing Permit Expiration Date: 04/30/2008</p>		
Jason Smith Plant Superintendent (704) 283-8158 P O Box 5012 Monroe, NC 28111	John Gargaro Regional Operations Manager (704) 283-8158 P. O. Box 5012 Monroe, NC 28111	Jack Garvey Environmental Manager (336) 398-1262 PO Box 368 Pleasant Garden, NC 27313			
<p>Review Engineer: Fern Paterson, P.E.</p> <p>Review Engineer's Signature: _____ Date: _____</p>			<p style="text-align: center;">Comments / Recommendations:</p> <p>Issue 03752/T31 Permit Issue Date: _____ Permit Expiration Date: 04/30/2011*</p> <p>* This permit shall expire on the earlier of April 30, 2011 or the date of the renewal of Permit No. 03752T30 has been issued or denied.</p>		

I. Purpose of Application

Hanson Brick East, LLC has a facility located in Monroe, Union County, North Carolina. Application No. 9000028.09A, received November 9, 2009, is a Part 2 MACT "Hammer" application for six natural gas, propane, and No. 2 fuel oil-fired tunnel kilns. Five of the kilns (**ID Nos. 1LK, 2LK, 1AK, 2AK, and 3AK**) have design capacities less than 10 tons per hour. The sixth kiln (**ID No. 3LK**) has a design capacity of 22.8 tons per hour and is equipped with a dry limestone adsorber (DLA) (**ID No. CD-8**). The application proposes a health-based compliance alternative (HBCA) to establish a facility-wide HCl-equivalent emission limitation using a facility-specific modeling analysis.

II. Permit Modifications/Changes

The following table describes the modifications to the current permit.

Page(s)	Section	Description of Change(s)
1	Permit Cover Page	Amend permit revision numbers and issuance/effective dates.
3	Section 1, Table	Add case-by-case MACT designations to affected tunnel kilns (ID Nos. 1AK, 2AK, 3AK, 1LK, 2LK, and 3LK).
5	Section 2.1.A., Table	Add case-by-case MACT to the table of applicable requirements.
8-11	Section 2.1.A.5.	Add Section to include applicable case-by-case MACT requirements for the affected tunnel kilns.
25-33	Section 3	Update General Provisions with the most recent revision (v. 3.1)

III. Regulatory Review

1. **15A NCAC 2D .1109 – CAA § 112(j); Case-by-Case MACT for Brick Manufacturers** – On March 13, 2007, the D.C. Circuit Court vacated the National Emission Standard for Hazardous Air Pollutants (NESHAP) for Brick & Structural Clay Products Manufacturing, which had been promulgated under 40 CFR 63, Subpart JJJJJ. The North Carolina Attorney General’s office has determined that the NESHAP vacatur equates to the failure of the U.S. EPA to promulgate a standard as required under Section 112(d) of the Clean Air Act (CAA). As a result, the site-specific Maximum Achievable Control Technology (MACT) standards required under CAA §112(j), commonly referred to as the MACT “hammer” provisions, have been triggered. North Carolina regulations implementing the MACT hammer are found at 15A NCAC 2D .1109.

Re: Kilns with a Capacity < 10 tph

On November 10, 2009, the NC DAQ received a Part 2 MACT “Hammer” application from this facility for six natural gas, propane, and No. 2 fuel oil-fired tunnel kilns. Five of the kilns (**ID Nos. 1LK, 2LK, 1AK, 2AK, and 3AK**) have design capacities less than 10 tons per hour. No control technologies for the control of filterable particulate matter (PM), HF, or HCl were identified for tunnel kilns in the state of North Carolina with a production capacity of less than 10 tons per hour (tph) on a 12-month rolling average basis.¹ The NC DAQ has determined that MACT is the use of best work practice standards for tunnel kilns rated at less than 10 tons/hr, consistent with the provisions in CAA § 112(d)(2)(D).

As described below, this facility has established an alternative, health-based facility-wide HCl-equivalent emission rate to limit HCl and HF emissions from all affected tunnel kilns, including these five, small tunnel kilns.

Re: Kilns with a Capacity =, < 10 tph

The November 10, 2009 application also identified a sixth kiln (**ID No. 3LK**) with a design capacity of 22.8 tons per hour that is equipped with a DLA (**ID No. CD-8**). The application proposes to accept NC DAQ’s recommended emission limitation for filterable PM and proposes a HBCA to establish to establish an HCl-equivalent emission limitation, limiting both HCl and HF emissions, using a facility-specific modeling analysis.

Filterable PM. The facility proposed a filterable PM emissions limitation of 0.17 pounds per ton of brick produced (lbs/ton) for the 22.8 tph kiln (**ID No. 3LK**), which is consistent with the NC DAQ application guidance.² NC DAQ developed this guidance to provide standards and compliance procedures that it has determined meet the requirements of CAA § 112(j).

HCl-Equivalent (HCl & HF). Both HF and HCl are respiratory irritants. Neither chemical has been classified for carcinogenicity. To establish an emissions limitation using a health-based approach pursuant

¹ The filterable PM standard is a surrogate for the regulated metal HAP, including antimony, arsenic, beryllium, cadmium, chromium, cobalt, mercury, manganese, nickel, lead, and selenium.

² <http://daq.state.nc.us/permits/112j/>

to CAA § 112(d)(4), the impacts of these two respiratory irritants must be summed and limited such that the combined effect does not exceed established reference concentrations (RfC's) available through U.S. EPA's Integrated Risk Information System (IRIS). The RfC (expressed in units of μg of substance/ m^3 air) is defined as an estimate of continuous inhalation exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime.³

The combined impact of HF and HCl from this facility was determined using the following procedure:

Step 1. Estimated Total HCl-Equivalent Emission Rate. Estimate the potential HCl and HF emission rates for each affected source. Then sum the total potential HCl emissions and HF emissions from all affected sources combined, and then calculating the facility-wide potential HCl-equivalent emission rate using the following equation:

Where:

- $E_{\text{HCl-equiv.}}$ = Toxicity-weighted HCl-equivalent emission rate from all affected sources (in lb/hr)
- E_{HCl} = Emission rate of HCl from all affected sources (in lb/hr)
- E_{HF} = Emission rate of HF from all affected sources (in lb/hr)
- RfC_{HCl} = Reference concentration of HCl, $20 \mu\text{g}/\text{m}^3$
- RfC_{HF} = Reference concentration of HF, $14 \mu\text{g}/\text{m}^3$

The facility-wide HCl-equivalent emission rate for this facility is estimated to be **18.9 lbs/hr** as demonstrated in the following table:

Kiln	Capacity (tons/hr)	HF Emission Factor (lbs/ton)	HF Emission Rate (lbs/hr)	HCl Emission Factor (lbs/ton)	HCl Emission Rate (lbs/hr)	HCl-Equivalent Emission Rate (lbs/hr)
1AK	4.68	0.39	1.83	0.036	0.17	
2AK	4.68	0.39	1.83	0.036	0.17	
3AK	6.69	0.39	2.61	0.036	0.24	
1LK	7.16	0.39	2.79	0.036	0.26	
2LK	7.16	0.39	2.79	0.036	0.26	
3LK	22.8	0.002	0.05	0.035	0.80	
Total			11.89		1.89	18.9

Step 2. Estimate Worst-Case Annual Impacts. Using the AERMOD model, the total HCl-equivalent emissions from the facility are modeled through the actual "worst-case" stack using five-years of meteorological data.⁴

Based on an HCl-equivalent emission rate of 18.9 lbs/hr, the AERMOD model for this facility predicted the modeled HCl-equivalent impact from the facility to be **13.866 $\mu\text{g}/\text{m}^3$** .

Step 3. Determine the Hazard Quotient (HQ). The HQ is the ratio of the predicted pollutant concentration in ambient air to the RfC, or concentration at which no adverse effects are expected as a result of inhalation exposures. The RfC for HCl is $20 \mu\text{g}/\text{m}^3$. If the HQ is less than 1.0, the facility may establish a health-based emissions limitation for HCl-equivalent as an alternative to

³ http://www.epa.gov/iris/help_ques.htm#rfd

⁴ The "worst-case" stack is determined by running different scenarios of the model, with the total emissions being released from a different stack in each scenario. The scenario resulting in the highest off-site impacts identifies the "worst-case" stack.

established a technology-based emission limitation for HCl and HF. This health-based approach is consistent with CAA § 112(d)(4).

Based on an HCl-equivalent emission rate of 18.9 lbs/hr, the HQ for this facility is **0.6933**.

Step 3. Determine the Allowable HCl-Equivalent Emission Rate. The allowable HCl-equivalent emission rate is equivalent to the emission rate that may be modeled from the worst-case stack that results in a HQ < 1.0. The NC DAQ determined the allowable HCl-equivalent emission rate by scaling the modeled emission rate up to where it would result in HQ = 0.99, as follows:

The allowable HCl-equivalent emission rate for this facility is **27.0 lbs/hr**. The total HCl-equivalent emission rate from all six affected tunnel kilns shall be less than the allowable HCl-equivalent emission rate established above.

Compliance with the Toxicity-Weighted Emission Rate

The facility must demonstrate, through testing, monitoring, and recordkeeping, that the total toxicity-weighted HCl-equivalent emission rate from all of the affected sources is less than the established allowable emission rate. Initial compliance shall be demonstrated using initial performance testing for both HCl or HF. Testing is required for all six tunnel kilns unless an alternative approach (e.g., fuel analysis or other approach for estimating worst-case emissions from the small, uncontrolled tunnel kilns) is approved by the NCDAQ-SSCB through the test protocol.

During the performance test, the Permittee shall establish the following operating parameters for the DLS ((ID No. CD-8):

- The limestone feeder setting at the DLA; and,
- The source and grade of limestone used at the DLA.

In addition to monitoring compliance with these operating parameters, the Permittee shall check and record the pressure drop across the DLA once per day to ensure the control device is not being by-passed, conduct a daily check the amount of limestone in the hopper, storage bin, and DLA, and conduct periodic visible emissions observations at the DLA to ensure there are no visible emissions from the control device.

Limestone may be recycled through the DLA. However, at least once per calendar month, the Permittee is required to ensure that the limestone feed system replaces the limestone at least as frequently as the schedule set during the performance test.

The small tunnel kilns shall demonstrate on-going compliance with the HCl-equivalent emission rate by conducting an annual inspection of the system ductwork, the kiln burners, and the air-to-fuel ration control system.

IV. Draft Permit Review Summary

Melinda Wolanin and Denise Hayes of the Fayetteville Regional Office were provided a draft permit and draft permit review document on June 22, 2010.

Jack Garvey of Hanson Brick was provided a draft permit for review on May 18, 2010.

Ms. Katy Forney and Ms. Gracy DeNois (U.S. EPA, Region IV) were provided a draft permit for review on <DATE>. <SUMMARY OF COMMENTS>.

V. Recommendations

This permit modification application for the Hanson Brick East, LLC facility located in Monroe, Union County, North Carolina has been reviewed by NC DAQ to determine compliance with all procedures and requirements. NC DAQ has determined that this facility appears to be complying with all applicable requirements.

Issue Permit No. 03752T31