

**NORTH CAROLINA DIVISION OF  
AIR QUALITY**

**Air Permit Review**

Permit Issue Date: **PROPOSED**

**Region:** Winston-Salem Regional Office  
**County:** Guilford  
**NC Facility ID:** 4100854  
**Inspector's Name:** Ray Stewart  
**Date of Last Inspection:** 02/10/2009  
**Compliance Code:** 3 / Compliance - inspection

<p style="text-align: center;"><b>Facility Data</b></p> <p><b>Applicant (Facility's Name):</b> Marsh Furniture Company</p> <p><b>Facility Address:</b>  Marsh Furniture Company  1001 South Centennial Avenue  High Point, NC 27261</p> <p><b>SIC:</b> 2434 / Wood Kitchen Cabinets  <b>NAICS:</b> 33711 / Wood Kitchen Cabinet and Countertop Manufacturing</p> <p><b>Facility Classification: Before:</b> Title V <b>After:</b> Title V  <b>Fee Classification: Before:</b> Title V <b>After:</b> Title V</p>	<p style="text-align: center;"><b>Permit Applicability (this application only)</b></p> <p><b>SIP:</b>  <b>NSPS:</b>  <b>NESHAP:</b> 2D .1109 Case-by-Case MACT  <b>PSD:</b>  <b>PSD Avoidance:</b>  <b>NC Toxics:</b>  <b>112(r):</b>  <b>Other:</b></p>
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Contact Data			Application Data
<p style="text-align: center;"><b>Facility Contact</b></p> <p>Bruce Braswell  Regulatory Compliance  Manager  (336) 819-4035  1001 South Centennial  Avenue  High Point, NC 27261</p>	<p style="text-align: center;"><b>Authorized Contact</b></p> <p>Terry Dickey  President    Post Office Box 870  High Point, NC 27261</p>	<p style="text-align: center;"><b>Technical Contact</b></p> <p>Bruce Braswell  Regulatory Compliance  Manager  (336) 819-4035  1001 South Centennial  Avenue  High Point, NC 27261</p>	<p><b>Application Number:</b> 4100854.09A  <b>Date Received:</b> 09/14/2009  <b>Application Type:</b> 112(j) Part I  <b>Application Schedule:</b> TV-Significant  <p style="text-align: center;"><b>Existing Permit Data</b></p> <b>Existing Permit Number:</b> 03238/T19  <b>Existing Permit Issue Date:</b> 03/20/2008  <b>Existing Permit Expiration Date:</b> 02/28/2013</p>

<p><b>Review Engineer:</b> Jenny Kelvington</p> <p><b>Review Engineer's Signature:</b> _____ <b>Date:</b> _____</p>	<p style="text-align: center;"><b>Comments / Recommendations:</b></p> <p><b>Issue</b> 03238/T20  <b>Permit Issue Date:</b>  <b>Permit Expiration Date:</b></p>
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**I. Purpose of Applications**

Marsh Furniture Company is located in High Point, Guilford County, North Carolina. Application No. 4100854.09A, received September 14, 2009, is a Part 2 MACT "Hammer" application for one existing boiler:

**B1** –dry wood-fired with multiclone; 19.2 MMBtu/hr heat input capacity

**II. Permit Modifications/Changes**

The following table describes the modifications to the current permit.

Page(s)	Section	Description of Change(s)
Attachment	Insignificant Activities List	Amend permit revision number
Cover		Amend permit revision number and dates
2	Table of Contents	Remove Part I and Part II titles

Page(s)	Section	Description of Change(s)
All	Page Headers	Amend permit revision number
6	Section 1, List of Affected Sources	Add Case-by-Case MACT designation to the affected boiler
9, 11, 12, 16-19	Sections 2.1.A.2.b & c.ii; 2.1.B.2.b & c.ii; 2.1.C.1.c; 2.1.C.2.b & c.ii; 2.1.D.1.c; 2.1.D.2.b; and 2.1.D.3.b & c.ii	
17	Section 2.1.D	Add 15A NCAC 2D .1109; Case-by-Case MACT requirements to the table.
20-22	Section 2.1.D.4	Add 15A NCAC 2D .1109; Case-by-Case MACT requirements
31-42	Section 3	Update General Conditions to be consistent with the most recent version (v3.1)

### III. Regulatory Review – 15A NCAC 2D .1109 – CAA § 112(j); Case-by-Case MACT for Boilers & Process Heaters

1. Generally: On July 20, 2007, the D.C. Circuit Court vacated the National Emission Standard for Hazardous Air Pollutants (NESHAP) for Industrial, Commercial, and Institutional Boilers and Process Heaters, which had been promulgated under 40 CFR 63, Subpart DDDDD. 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 valid 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.

On September 14, 2009, the NC DAQ received a Part 2 MACT “Hammer” application from this facility asking that the NC DAQ establish 112(j) emissions limitations. The application contained Mr. W. Terry Dickey, President/CEO certification that the facility is in compliance with all applicable requirements.

DAQ has developed 112j permit application guidance including a “model rule” for the industrial, commercial and institutional boilers, and process heaters, which is available at <http://www.daq.state.nc.us/permits/112j/>. This guidance provides standards and compliance procedures that meet the requirements of § 112(j).

2. Case-By-Case MACT Determinations: The affected source (**ID No. B1**) is a dry-wood-fired boiler with flyash reinjection equipped with a multiclone.

The facility proposed to comply with mercury (Hg) and carbon monoxide (CO) emission limitations that are consistent with the NC DAQ application guidelines <http://www.daq.state.nc.us/permits/112j/>. The facility has chosen to comply with a Health-Based Compliance Alternative (HBCA) for both manganese (Mn) and hydrogen chloride (HCl). A discussion of each proposed standard, proposed pursuant to 15A NCAC 2D .1109 is provided below:

**a. Mercury (Hg)**

The facility has proposed a mercury limit of 5.0E-06 lbs/MMBtu, which is consistent with the NC DAQ application guidance.

**b. Carbon Monoxide (CO)**

The facility has proposed a carbon monoxide limit of 269 ppmvd, corrected to 7% oxygen, which is consistent with the NC DAQ application guidance.

**c. Total Selected Metals (TSM), including HBCA for Manganese (Mn)**

In accordance with the 112(j) application guidance provided by NCDAQ, affected facilities may propose either a total selected metal (TSM) limit or a filter PM limit. NC DAQ guidance sets the filterable PM limit at 0.19 MMBtu/hr for dry wood-fired boilers with heat input capacities less than 30 MMBtu/hr. Stack tests previously performed by the facility indicate the boiler could not meet the NC DAQ guidance filterable PM limit as shown below:

Pollutant	Test Date	Test Results
Filterable PM	February 10, 2009	0.43 lb/mmBtu
Filterable PM	September 17, 2002	0.364 lb/mmBtu
Condensable PM	September 17, 2002	0.032 lb/mmBtu

This facility has chosen to comply with the TSM limit. In general, TSM includes arsenic, beryllium, cadmium, chromium, lead, manganese, nickel, and selenium. However, by showing it is eligible for the HBCA for manganese, the facility may comply with the TSM emission limitation proposed in the NC DAQ application guidance without including manganese in the compliance demonstration.

The look-up table approach in Section 15 of the NC DAQ application guidance, which is identical in substance to Appendix A of the vacated 112(d) standard, is used. This approach to the HBCA requires the facility to determine the allowable manganese emission rate in HCl-equivalent according to the following steps:

- Calculate the weighted average stack height in meters. *One 43 foot stack equates to 13.1 meters.*
- Determine the shortest distance to the property from the affected source: *268 feet or 87.1 meters*
- Use the look-up table to determine the maximum allowable manganese emission rate: *0.47 lbs/hr*

**Allowable Manganese Emission Rate (lbs/hr)**

Stack Ht. (m)	Distance to Property Boundary (m)											
	0	50	100	150	200	250	500	1000	1500	2000	3000	5000
5	0.29	0.29	0.29	0.29	0.29	0.29	0.36	0.72	0.93	0.93	0.93	0.94
10	0.47	0.47	0.47	0.47	0.47	0.47	0.49	0.82	1.08	1.08	1.08	1.08
20	0.97	0.97	0.97	0.97	0.97	0.97	0.97	1.06	1.45	1.51	1.51	1.51
30	0.99	0.99	0.99	0.99	0.99	0.99	0.99	1.09	1.49	1.72	2.02	2.04
40	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.12	1.53	1.79	2.08	2.42
50	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.15	1.58	1.87	2.15	2.51
60	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.18	1.62	1.95	2.21	2.61
70	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.22	1.67	2.03	2.28	2.72
80	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.25	1.71	2.12	2.35	2.84

- Determine the worst-case manganese emission rate from the affected boiler (in lbs/hr). *NCASI TB858 Appendix A-19b summarizes manganese test data for nine wood-fired boilers. Potential Mn emissions are based on the emission rate of 0.010 lbs/MMBtu, which is the highest Mn emission rate listed in Appendix A-19b. Using this factor, potential manganese emissions from the boiler are 0.19 lbs/hr.*
- Compare the allowable manganese emission rate to the maximum manganese emission rate. If the maximum rate is less than the allowable, the facility is eligible for the HBCA. *The maximum manganese emission rate is less than half of the allowable; therefore, the facility may use the HBCA of 0.010 lbs Mn/MMBtu.*

**d. Hydrogen Chloride (HCl)**

In the 112(j) application guidance, NC DAQ provided for a risk-based HBCA that is consistent with the approach provided by U.S. EPA in Appendix A of the vacated 112(d) standard. This facility proposed to establish a facility-specific HCl-equivalent emission rate using this HBCA approach. A summary of the HBCA eligibility demonstration and resulting emissions limitations is provided below.

The look-up table approach to the HBCA requires the facility to determine the Allowable Toxicity Weighted Emission Rate in HCl-equivalent according to the following steps:

- Determine the worst-case HCl and Cl<sub>2</sub> emission rates (in lbs/hr)  
*NCASI TB858 Appendix A-19 provides a summary of HCl emissions from stack tests performed on five wood-fired boilers. The highest HCl emission rate occurred from a conventional wood-fired boiler (630 mmBtu/hr) controlled by a dry scrubber and fabric filter where HCl emissions averaged 1.6E-03 lbs/MMBtu. At the highest emission rate, HCl emissions from boiler B1 are 0.031 lbs/hr. The potential Cl<sub>2</sub> emission rate for the boiler is 1.5E-02 lbs/hr, based on the AP-42 emission factor of 7.9 E-04 lbs/MMBtu for wood residue combustion.*
- Calculate the toxicity-weighted emission rate in HCl-equivalents (in lbs/hr)  
*Using the following equation:*

$$TW = E_{HCl} + E_{Cl_2} \left( \frac{RV_{HCl}}{RV_{Cl_2}} \right)$$

*Where “RV” denotes the reference values. The reference value of HCl is 20 µg/m<sup>3</sup>. The reference value for Cl<sub>2</sub> is 0.2 µg/m<sup>3</sup>.*

$$TW = 0.031 + 0.015 (20/0.2) = 1.53 \text{ lbs HCl-equivalent/hr}$$

- Calculated the weighted average stack height (in meters, m) *13.1 m*
- Determine the distance to property boundary (in m) *81.7 m*
- Use the look-up table provided in the NC DAQ application guidance, which is identical to the look-up table provided in the vacated 112(d) standard, to determine the Allowable Toxicity Weighted Emission Rate in HCl-equivalent (in lbs/hr) *188.5 lbs/hr*

Stack Ht. (m)	Distance to Property Boundary (m)											
	0	50	100	150	200	250	500	1000	1500	2000	3000	5000
5	114.9	114.9	114.9	114.9	114.9	114.9	144.3	287.3	373.0	373.0	373.0	373.0
10	188.5	<b>188.5</b>	188.5	188.5	188.5	188.5	195.3	328.0	432.5	432.5	432.5	432.5
20	386.1	386.1	386.1	386.1	386.1	386.1	386.1	425.4	580.0	602.7	602.7	602.7
30	396.1	396.1	396.1	396.1	396.1	396.1	396.1	436.3	596.2	690.6	807.8	816.5
40	408.1	408.1	408.1	408.1	408.1	408.1	408.1	448.2	613.3	715.5	832.2	966.0
50	421.4	421.4	421.4	421.4	421.4	421.4	421.4	460.6	631.0	746.3	858.2	1002.8
60	435.5	435.5	435.5	435.5	435.5	435.5	435.5	473.4	649.0	778.6	885.0	1043.4

<b>70</b>	450.2	450.2	450.2	450.2	450.2	450.2	450.2	486.6	667.4	813.8	912.4	1087.4
<b>80</b>	465.5	465.5	465.5	465.5	465.5	465.5	465.5	500.0	685.9	849.8	940.9	1134.8
<b>100</b>	497.5	497.5	497.5	497.5	497.5	497.5	497.5	527.4	723.6	917.1	1001.2	1241.3
<b>200</b>	677.3	677.3	677.3	677.3	677.3	677.3	677.3	682.3	919.8	1167.1	1390.4	1924.6

- Compare the Allowable Toxicity Weighted Emission Rate in HCl-equivalent to the maximum toxicity-weighted emission rate to determine eligibility. *The maximum HCl-equivalent emission rate (1.53 lbs/hr) is less than 1% of the allowable toxicity-weighted emission rate determined using the look-up table approach. Based on this large compliance margin, NC DAQ has determined that the facility is eligible to use the HBCA compliance option for HCl for its wood-fired boiler.*

#### **IV. Recommendations**

This permit modification application for the Marsh Furniture Company located in High Point, Guilford 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. 03238T20**