

**NORTH CAROLINA DIVISION OF
AIR QUALITY**

Air Permit Review

Permit Issue Date:

Region: Winston-Salem Regional Office
County: Rockingham
NC Facility ID: 7900090
Inspector's Name: Ray Stewart
Date of Last Inspection: 04/21/2010
Compliance Code: 3 / Compliance - inspection

Facility Data

Applicant (Facility's Name): MillerCoors LLC

Facility Address:

MillerCoors LLC
 863 East Meadow Road
 Eden, NC 27288

SIC: 2082 / Malt Beverages

NAICS: 31212 / Breweries

Facility Classification: Before: Title V **After:** Title V

Fee Classification: Before: Title V **After:** Title V

Permit Applicability (this application only)

SIP:

NSPS:

NESHAP:

PSD:

PSD Avoidance:

NC Toxics:

112(r):

Other:

Contact Data

Facility Contact

Andrew Lucas
 EH&S Representative
 (336) 627-2592
 863 East Meadow Road
 Eden, NC 27288

Authorized Contact

James Smith
 Vice President and Plant
 Manager
 (336) 627-2204
 863 East Meadow Road
 Eden, NC 27288

Technical Contact

Michael Jones
 Vice President and
 Assistant Secretary
 (414) 931-3617
 3939 W. Highland Blvd.
 Milwaukee, WI 53201

Application Data

Application Number: 7900090.09A

Date Received: 09/14/2009

Application Type: 112(j) Part I

Application Schedule: TV-Significant

Existing Permit Data

Existing Permit Number: 03116/T19

Existing Permit Issue Date: 12/29/2010

Existing Permit Expiration Date: 11/30/2015

Review Engineer: Gautam Patnaik

Review Engineer's Signature:

Date:

Comments / Recommendations:

Issue 03116/T20

Permit Issue Date:

Permit Expiration Date:

1. Facility Description.

MillerCoors LLC operates a malt beverage manufacturing facility at this Eden site. Operations include grain drying, brewing, beer packaging, package labeling, and support facilities (i.e. boilers and waste water treatment).

2. Purpose of Application

On July 20, 2007, the D.C. Circuit Court vacated the boiler MACT 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 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.

This facility located in Rockingham County, North Carolina, has applied as part of this application to incorporate the CAA § 112(j), Part II MACT “Hammer” requirements. The facility has four boilers as listed below:

- Two coal/No. 2 fuel oil/No. 6 fuel oil-fired boilers (ID Nos. ES-1 and ES-2)
- One No. 2 fuel oil/No. 6 fuel oil-fired boiler (ID No. ES-3)
- One No. 2 fuel oil-fired boiler (ID No. ES-6)

None of these boilers are subject to any NSPS standards.

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

The application wants to incorporate the emissions standards CAA § 112(j), Part II MACT “Hammer” and demonstration of compliance. Based on the fuel type being burned and the rating of the above boilers the emissions limits are specified Section 2., of the “CAA § 112(j) – Part II MACT “Hammer” Application Guidance for North Carolina Boilers and Process Heaters.” On 2/9/2011 DAQ received another application where the applicant wanted to utilize the Health Based Compliance Alternative (HBCA) site specific compliance demonstration [Section 15 (c) of the guidance document] to demonstrate with emissions limit for Hydrogen Chloride (HCl), Chlorine (Cl₂), Mercury (Hg), Hydrogen Fluoride (HF), and Hydrogen Cyanide (HCN). The limits are as outlined below:

The following provides a summary of limits and/or standards for the emission source(s) described above.

Regulated Pollutant	Limits/Standards	Applicable Regulation
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Regulated Pollutant	Limits/Standards	Applicable Regulation
HAPs	<p>From firing coal in boilers (ES-1 and ES-2): Filterable PM: 0.08 lb/MMBtu Total Selected Metals*: 0.0004 lb/MMBtu Carbon Monoxide: 30 ppmvd, 7% O₂ Hydrogen Chloride (HCl): 0.1254 lb/MMBtu Chlorine (Cl₂): 0.01304 lb/MMBtu Mercury (Hg): 7.6932e-4 lb/MMBtu Hydrogen Fluoride (HF): 0.00577 lb/MMBtu Hydrogen Cyanide (HCN): 0.00018 lb/MMBtu</p> <p>From firing fuel oil No. 6 in boilers (ES-1, ES-2, ES-3, and ES-6): Filterable PM: 0.45 lb/MMBtu Total Selected Metals*: 0.002 lb/MMBtu Carbon Monoxide: 28 ppmvd, 7% O₂ Hydrogen Chloride (HCl): 0.00238 lb/MMBtu Chlorine (Cl₂): 0.00231 lb/MMBtu Mercury (Hg): 7.5367e-7 lb/MMBtu Hydrogen Fluoride (HF): 2.6176e-4 lb/MMBtu Hydrogen Cyanide (HCN): 1.786e-4 lb/MMBtu</p> <p>From firing fuel oil No. 2 in boilers (ES-1, ES-2, ES-3, and ES-6): Work Practice Standards.</p>	15A NCAC 2D .1109 [CAA § 112(j)]

* Facilities may choose to comply with the Total Selected Metals (TSM) standard *in lieu* of the particulate matter (PM) standard. Facilities are not required to comply with both the PM and TSM standards.

Operating Limits

The operating limits as specified in the table above are also specified in Section 2.2 B. 1. b., of the modified permit

Control Device and Continuous System Monitoring Requirements

The applicant shall install operate the electrostatic precipitators (ID Nos. CD-1 and CD-2) and maintain continuous monitoring systems (CMS) for the coal-fired boilers (ID Nos. ES-1 and ES-2). These electrostatic precipitators are not required while these boiler are solely burning fuel oil. The applicant shall maintain the total ESP power (kW) on each of the electrostatic precipitators based on a 12-hour block average. The applicant/ shall also perform a monthly external inspection and an

internal inspection and perform maintenance on the electrostatic precipitators as recommended by the manufacturer

Carbon Monoxide CEMS

The applicant must install, operate, and maintain an emission monitoring system (CEMS) for carbon monoxide and oxygen for boilers (ID Nos. ES-1 and ES-2). The carbon monoxide and oxygen shall be monitored at the same location at the outlet of each of the boiler.

Site Specific Monitoring Plan

Must develop a site-specific monitoring plan for each required continuous monitoring system (CMS). The plan shall be submitted to the DAQ Stationary Source Compliance Branch (SSCB) at least 60 days before the initial performance evaluation of the CMS.

Boiler Inspection and Maintenance

The applicant shall perform an annual boiler inspection and maintenance as recommended by the manufacturer for each boiler (ID Nos. ES-1, ES-2, ES-3, and ES-6)

Performance Testing

Performance testing shall be conducted in accordance with Section 2.2 B. 1. aa., of the modified permit. No performance testing is required if the facility can demonstrate compliance with any applicable emission limit using fuel analysis according to the procedures approved by DAQ. The facility demonstrates compliance with the CO limit using CO CEMS. Performance testing for HCL must be conducted by fuel analysis. No performance testing or fuel analysis is required for HCl, Cl₂, Hg, HF, and HCN ems, since the applicant will demonstrate compliance by modeling.

Fuel Analyses Plan

To demonstrate compliance the applicant shall conduct the analyses according to DAQ approved site-specific fuel analysis plans.

Initial Compliance Requirements

To demonstrate initial compliance with each emission limit the applicant shall conduct initial performance tests and establishing required operating limits within 180 days of the initial compliance date or while firing only distillate fuel oil and retain records demonstrating that the source only fires these fuels.

Periodic Testing/Fuel Analysis Requirements

If the applicant uses performance testing to demonstrate compliance with the standard, the tests shall be conducted on an annual basis. These tests may be conducted less often for a given pollutant if the performance tests for at least 3 consecutive years show **the emission rate is less than or equal to 80 percent of the allowable limit**. The applicant need not conduct a performance test for that pollutant

for the next 2 years, but must conduct a performance test during the each third year and no more than 36 months after the previous performance test.

If the source continues to meet the emission limit, the applicant may conduct performance tests every third year, but each such performance test must be conducted no more than 36 months after the previous performance test. If a performance test shows noncompliance with an emission limits, the annual performance tests must be conducted for that pollutant until all performance tests over a consecutive 3-year period show **the emission rate is less than or equal to 80 percent of the allowable limit.**

If fuel analysis is used to demonstrate compliance the applicant must conduct the fuel analysis on an annual basis. Each fuel analysis shall be conducted between 11 and 13 months after the previous analysis. If a fuel analysis shows a potential exceedance of an emission limit then the applicant shall conduct a follow-up stack test of the affected source within 90 days.

Recordkeeping Requirements

The applicant shall maintain copies of performance tests, fuel analyses, monthly fuel use, other compliance demonstrations, and CMS performance evaluations.

Performance Testing Notification and Reporting Requirements

If emissions testing is required the applicant must submits emissions testing to the DAQ and follow procedures as outlined in Section 2.2 B. 1. aa, of the modified permit.

Notification of Compliance Status

The applicant must submit a Notification of Compliance Status that meets the requirements as outlined in Section 2.2 B. 1. bb, of the modified permit.

Health-Based Compliance Alternative (HBCA)

This application demonstrates that the facility meets the requirements of the Health-Based Compliance Alternative (HBCA) for hydrogen chloride (HCl), chlorine (Cl₂), and mercury (Hg) emissions, based on a site-specific assessment, using the standard risk assessment format tailored to the site-specific assessment approach of Section 15 of the CAA § 112(j) Part II MACT “Hammer” Application Guidance for North Carolina Boilers and Process Heaters. This demonstration also includes dispersion modeling results for the emissions of hydrogen cyanide and hydrogen fluoride.

Under the HBCA provisions, the applicant demonstrated acceptable risk by conducting a site-specific risk assessment including a refined air dispersion modeling analysis and consideration of site-specific risk factors as outlined in Risk Assessment Guidance¹ as an acceptable approach to completing a site-specific health risk assessment. The Risk Assessment Guidance recommends a three-tiered approach to predict impacts and assess risk:

(1) Screening level Gaussian dispersion model (i.e., SCREEN3)

¹ Air Toxics Risk Assessment Reference Library, Volume 2 Facility Specific Assessment, U.S. EPA, EPA-453-K-04-001B, April 2004.

- (2) Refined dispersion model (i.e., AERMOD)² along with population data
 (3) Refined dispersion model along with simulations of human activity patterns

The approach used in this analysis uses a refined dispersion model as in Tier 2, and conservatively estimated the risks associated with the maximum off-site impacts, regardless of location and population exposure. A facility is eligible for the HBCA for HCl, Cl₂, and Hg emissions if the site-specific risk assessment shows that the maximum hazard index (HI) for HCl, Cl₂, and Hg is less than or equal to one.

The table below presents the stack parameters for each of the boilers included in the HBCA demonstration. There are only three stacks at the facility. ES-3 and ES-6 have dedicated stacks (BUSTK and WWSTK, respectively) and ES-1 and ES-2 exhaust through a common stack

Source	UTM East ¹ (m)	UTM North ¹ (m)	Stack Base Elevation (m)	Stack Release Height (m)	Stack Diameter (m)	Stack Gas Temp. (°K)	Stack Vertical Velocity (m/s)
MNSTK	614,913.9	4,042,293.8	191.67	41.45	2.44	440.37	11.08
BUSTK	614,937.3	4,042,302.8	191.67	30.48	0.61	440.37	0.01
WWSTK	614,570.6	4,042,821.9	193.06	9.08	0.15	440.37	0.01

For ES-1 and ES-2, the applicant calculated HCl and Cl₂ emissions based on source testing results while burning bituminous coal and firing rates that approached their capacity using typically fired coal. Based on these source tests applicant was able to determine a ratio of Cl₂ to HCl emissions. For Hg emissions, the applicant assumed all Hg in the coal was emitted. For these two boilers the applicant determined that coal with a chloride content of 1,800 ppm by weight (ppmw) and Hg content of 10 ppmw at maximum firing rates would result in a modeled HI less than 1.0. For the remaining HBCA eligible boilers, the applicant calculated emissions based on latest AP-42 emissions factors.

The table below presents these worst-case emissions for hydrogen chloride, chlorine, and mercury from these boilers:

Pollutant	Emission Point	Emission Estimation Method	Maximum Rated Capacity (MMBtu/hr)	Maximum Emission Rate (g/sec)
HCl	MNSTK	Source Testing/Mass Balance	476	7.522E+00
		BUSTK	AP-42	136
	WWSTK	AP-42	5.6	1.679E-03
Cl ₂	MNSTK	Source Testing/Mass Balance	476	7.823E-01
		BUSTK	AP-42	136
	WWSTK	AP-42	5.6	1.633E-03
Hg	MNSTK	Source Testing/Mass Balance	476	4.613E-02
		BUSTK	AP-42	136
	WWSTK	AP-42	5.6	5.315E-07

² Note that the Risk Assessment Guidance was developed prior to the promulgation of AERMOD as EPA's preferred refined dispersion model. Due to the recent change in guidance, modeling is conducted using AERMOD.

The intent of the HBCA analysis to show that the long term inhalation risks (non carcinogenic and carcinogenic) associated with the inhalation of the HAPs at the modeled emission rates is considered low. This is shown by the calculation of the hazard index (HI) and hazard quotients (HQ). The calculated HI or HQ must be less than or equal to 1.0 at a location where people live in order for a facility to utilize the HBCA.

The Hazard Quotient (HQ) is the ratio of the potential exposure to the substance and the level at which no adverse effects are expected. If the Hazard Quotient is calculated to be less than 1, then no adverse health effects are expected as a result of exposure. If the Hazard Quotient is greater than 1, then adverse health effects are possible.

The Reference Concentration (RfC) is a long-term threshold, defined as an estimate of a daily inhalation exposure that, over a lifetime, that would not likely result in the occurrence of non-cancer health effects in humans.

The Hazard index (HI) is the sum of hazard quotients for substances that affect the same target organ or organ system. The HQ, the maximum predicted impact (g/m³) divided by Reference Concentration (RfC), the dose-response value. EPA's current chronic inhalation RfC for chlorine, hydrogen chloride, and mercury is given in *Prioritized Dose-Response Values*³ and mentioned in the table below. Because different pollutants may cause similar adverse health effects, it is often appropriate to combine hazard quotients associated with different substances.

Dose-Response Values used for HBCA Demonstration

HAP	Chronic RfC (g/m ³) ¹
HCl	20
Cl ₂	0.2
Hg	0.3

To evaluate whether predicted HCl, Cl₂, and Hg impacts are “low risk” for the Boiler MACT, a HI was calculated, using the site-specific analysis and in accordance with the procedures established by the Air Toxics Risk Assessment Reference Library, Volume 2: Facility-Specific Assessment and U.S. EPA's Appendix W to 40 CFR §51 Guideline on Air Quality Models (Guideline).^{4,5,6}

Site-specific dispersion models require an hourly record of dispersion meteorology representative of the region within which the source is located. In the absence of site-specific measurements, EPA recommends the use of readily available data from the closest and most representative National Weather Service (NWS) stations. As per DAQ Air Quality Modeling Guidelines⁷, the Greensboro International

³ U.S. EPA's table of HAP risk assessments located at <http://www.epa.gov/ttn/atw/toxsource/summary.html>.

⁴ Section 7 of Appendix A of Subpart DDDDD cites this document, which can be obtained from the U.S. EPA website: http://www.epa.gov/ttn/fera/risk_atoxic.html

⁵ Appendix W to 40 CFR 51

⁶ Regulation 61-62.5 Air Pollution Control Standards 62.5 St. 7 (l)

⁷ <http://daq.state.nc.us/permits/mets/metdata.shtml>

Airport serves as the source of meteorological data for a facility in Rockingham County. DAQ has developed official meteorological datasets spanning 1988 through 1992 for use in modeling analyses.⁸

Since there are building downwash effects, the look-up table analysis is not applicable to this facility per Appendix A of the vacated boiler MACT Subpart DDDDD.⁹ The applicant modeled each of three pollutants (HCl, Cl₂, and Hg) worst-case emissions rates, to evaluate long-term non-carcinogenic impacts, the annual average concentration for each of five years of meteorological data was determined. The results were used to estimate the maximum annual HCl, Cl₂, or Hg concentrations at each receptor. For example the HQ for HCL for 1988 is calculated as mentioned below:

$$HQ = \frac{\text{Modeled Concentration}}{\text{RfC}} = \frac{1.084\mu\text{g}/\text{m}^3}{20.00\mu\text{g}/\text{m}^3} = 0.054$$

Using the RfCs and the maximum calculated annual impacts, the maximum HQ for each model year is included in a table below HCl, Cl₂, and Hg:

Pollutant	Averaging Period	RfC		1988	1989	1990	1991	1992
HCl	Annual	20.00	(highest)	1.084	1.161	1.134	1.171	1.208
		HQHCl =		0.054	0.058	0.057	0.059	0.060
Chlorine	Annual	0.20	(highest)	0.162	0.174	0.165	0.167	0.171
		HQCl ₂ =		0.812	0.872	0.824	0.836	0.853
Mercury	Annual	0.30	(highest)	6.34E-03	6.76E-03	6.64E-03	6.88E-03	7.11E-03
		HQHg =		0.021	0.023	0.022	0.023	0.024

Calculating the Hazard Index based on the highest HQ for that above range of years

$$\text{Hazard Index} = \text{HQHCL} + \text{HQCL}_2 + \text{HQHg} = 0.060 + 0.872 + 0.024 = 0.956$$

Emissions Impact Assessment For HCN and HF

Emissions of HCN and HF were calculated using the latest AP-42 factors, and a DOE Study¹⁰ and maximum heat input to the boilers for one hour and modeled this emission rate for both the 1-hr and 24-hr standards for HCN and HF. The maximum emission rates of HCN and HF result in impacts **much** lower than the established Acceptable Ambient Levels (AALs) listed in 15A NCAC 2D .1104 Toxic Air Pollutant Guidelines.

These modeling results for HCl, Cl₂, Hg, HCN and HF emissions are yet to be verified by NC DAQ.

⁸ <http://daq.state.nc.us/permits/mets/metdata.shtml>

⁹ Section 6 of Appendix A of Subpart DDDDD states that look-up table analyses are not valid if site-specific variations, such as complex terrain, rain caps or building downwash effects, are present at a facility.

¹⁰ Energy & Environmental Research Center, *A Comprehensive Assessment of Toxic Emissions from Coal-Fired Power Plants: Phase I Results from The U.S. Department of Energy Study Final Report*, September 1996.

4. Recommendations

This permit modification application for this facility has been reviewed by NC DAQ to determine compliance with all procedures and requirements.

The facility was inspected last on April 21, 2010, by Mr. Ray Ray Stewart of the Regional Office, and the facility was found to be in compliance with its Title V Air Permit and all applicable DAQ regulations. The permit for this facility was recently renewed and all the General Conditions have been updated.

5. Table of Changes

Page(s)	Section	Description of Change(s)
3	Source Table	Added 112(j) designations to all boilers.
16	2.2 B. 1. b.	Emissions limits for boilers as per 112(j) standards.
18 to 23	2.2 B. 1.	Permit requirements to demonstrate compliance with 112(j).
24 to 34	Section 3	Upgrade General Conditions