

**Air Permit Review**

**Permit Issue Date:** November ??, 2010

**Region:** Raleigh Regional Office  
**County:** Durham  
**NC Facility ID:** 3200017  
**Inspector's Name:** Brian Bland  
**Date of Last Inspection:** 09/09/2009  
**Compliance Code:** 3 / Compliance - inspection

<p style="text-align: center;"><b>Facility Data</b></p> <p><b>Applicant (Facility's Name):</b> GlaxoSmithKline</p> <p><b>Facility Address:</b>          GlaxoSmithKline          Five Moore Drive          Research Triangle Park, NC 27709</p> <p><b>SIC:</b> 2834 / Pharmaceutical Preparations  <b>NAICS:</b> 325412 / Pharmaceutical Preparation 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> N/A  <b>NSPS:</b> N/A  <b>NESHAP:</b> N/A  <b>PSD:</b> N/A  <b>PSD Avoidance:</b> N/A  <b>NC Toxics:</b> N/A  <b>112(r):</b> N/A  <b>Other:</b> 15A NCAC 2D .1109  <i>[112(j) – Part 2 MACT Hammer for Boilers &amp; Process Heaters]</i></p>
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<b>Contact Data</b>			<b>Application Data</b>
<p style="text-align: center;"><b>Facility Contact</b></p> <p>Lindsey Walata          Environmental Engineer          (919) 483-4640          P. O. Box 13398          Research Triangle Park,          NC 27709</p>	<p style="text-align: center;"><b>Authorized Contact</b></p> <p>Earl Guill          VP-US Site Operations          (919) 483-7301          P. O. Box 13398          Research Triangle Park,          NC 27709</p>	<p style="text-align: center;"><b>Technical Contact</b></p> <p>Lindsey Walata          Environmental Engineer          (919) 483-4640          P. O. Box 13398          Research Triangle Park,          NC 27709</p>	<p><b>Application Number:</b> 3200017.09B  <b>Date Received:</b> 08/20/2009  <b>Application Type:</b> 112(j) Part I  <b>Application Schedule:</b> TV-Significant</p> <p style="text-align: center;"><b>Existing Permit Data</b></p> <p><b>Existing Permit Number:</b> 04612/T30  <b>Existing Permit Issue Date:</b> 06/01/2010  <b>Existing Permit Expiration Date:</b> 11/30/2013</p>

<p><b>Review Engineer:</b> Brian Bland</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> 04612/T31  <b>Permit Issue Date:</b> 11/??/ 2010  <b>Permit Expiration Date:</b> 11/30/2013</p>
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**I. Purpose of Application**

GlaxoSmithKline is located in Research Triangle Park, North Carolina in Durham County. Application No. 3200017.09B, received August 20, 2009, is a Part 2 MACT "Hammer" application for twelve No. 2 fuel oil / natural gas-fired boilers (each rated at between 10.5 and 51.0 million British thermal units per hour (MMBtu/hr)) and seventeen natural gas-fired boilers (each rated at 5.0 million British thermal units per hour (MMBtu/hr) or less).

**II. Permit Modifications/Changes**

The following table describes the modifications to the current permit.

Page(s)	Section	Description of Change(s)
1	Cover Page	- Updated permit revision number and permit issuance date.
3 - 65	All, Header	- Updated permit revision number.
3 - 7	Section 1	- Added "2D .1100 Case-by-Case MACT" designation to applicable boilers and added "MACT-ZZZZ" designation to applicable RICE sources.
3 - 7	Section 1	- Removed NSPS, MACT labels from Emission Source Description column
3 - 7	Section 1	- Removed "*"s (that indentified them as insignificant for Title V purposes) from "2D .1100 Case-by-Case MACT" boilers and applicable "MACT ZZZZ" RICE sources.

Page(s)	Section	Description of Change(s)
4	Section 1	- Corrected size description for ID No. M-EG-3
5	Section 1	- Corrected ID No. for "EG8.4"
14	Section 2.1.B, Table	- Added 15A NCAC 2D .1109 to list of applicable regulations
15	Section 2.1 B 4	- Added section to include 112(j) MACT Hammer requirements applicable to the affected boilers.
16	Section 2.1.C, Table	- Added 15A NCAC 2D .1109 to list of applicable regulations
17	Section 2.1 C 4	- Added section to include 112(j) MACT Hammer requirements applicable to the affected boilers.
18	Section 2.1.D, Table	- Added 15A NCAC 2D .1109 to list of applicable regulations
19-20	Section 2.1 D 5	- Added section to include 112(j) MACT Hammer requirements applicable to the affected boilers.
20	Section 2.1 E	- Added emergency generators (ID Nos. EGD.03 and EGE.01) and fire pumps (ID Nos. N-F1-1 and 8.9) to list of emission sources
20	Section 2.1 E, Table	- Added MACT Subpart ZZZZ to list of applicable regulations
21	Section 2.1 E 3	- Added MACT Subpart ZZZZ paragraph.
22	Section 2.1 G, Table	- Added 15A NCAC 2D .1109 to list of applicable regulations
24-25	Section 2.1 G 6	- Added section to include 112(j) MACT Hammer requirements applicable to the affected boilers.
N/A	Section 2.1 K 3 c	- Removed initial notification requirement for (ID No. M-EG-3), as this has been completed.
46-48	Section 2.1 L	- Added .0503, .0516 and .0521 language for these small natural gas-fired boilers. - Added section to include 112(j) MACT Hammer requirements applicable to the affected boilers.
56-64	Section 3	- Updated General Conditions

### III. Regulatory Review

#### *All permanent boilers*

**15A NCAC 2D .1109 –Case-by-Case MACT** – 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 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 in accordance with NC DAQ’s recommendations.

No control technologies for the control of CO, metals, Hg, or HCl were identified for natural gas or No. 2 fuel oil-fired boilers in the state of North Carolina, nor were any such technologies identified in a North Carolina query using U.S. EPA’s AirControlNet software (v4.1). The NC DAQ has determined that MACT is the use of best work practice standards for natural gas combustion sources of this size, consistent with the provisions in CAA § 112(d)(2)(D). Best work practice standards in this case shall include the annual inspection and maintenance of the boiler as follows:

*To assure compliance, the Permittee shall perform an annual boiler inspection and maintenance as recommended by the manufacturer, or as a minimum, the inspection and maintenance requirement shall include the following:*

- i. *Inspect the burner, and clean or replace any components of the burner as necessary;*
  - ii. *Inspect the flame pattern and make any adjustments to the burner necessary to optimize the flame pattern; and,*
  - iii. *Inspect the system controlling the air-to-fuel ratio, and ensure that it is correctly calibrated and functioning properly.*
- The Permittee shall conduct at least one tune-up per calendar year to demonstrate compliance with this requirement. The Permittee shall be deemed in noncompliance with 15A NCAC 2D .1109 if the affected boilers are not inspected and maintained as required above.*

In addition, the Permittee will be required to record the results of the annual inspection in a logbook (written or electronic format), which shall be retained on-site and made available to an authorized representative upon request.

### *Boilers included in “North Campus Combustion Sources” and “South Campus Combustion Sources”*

Although not previously included in section 2.1 of the permit, these small natural gas-fired boilers were/are subject to the requirements of 2D .0503, .0516 and .0521. These requirements were included in section 2.1 as a part of this revision.

#### 15A NCAC 2D .0503 "Particulates From Fuel Burning Indirect Heat Exchangers"

This regulation applies to particulate matter (PM) emissions from indirect heat exchangers, except the PM emissions from electric steam generating units are subject to 2D .0536.

Emissions of PM from combustion of natural gas that is discharged from each boiler into the atmosphere shall not exceed PM emission rate as derived using 2D .0503(c).

Accordingly, allowable emissions of particulate matter (PM) from burning of natural gas in each boiler shall be calculated as follows:

$$E = 1.090 \times Q^{-0.2594} \quad \text{Where: } E = \text{allowable PM emission rate in lbs/million Btu heat input}$$

$$Q = \text{maximum heat input rate in million Btu per hour at the facility}$$

For this regulation, maximum heat input rates of all fuel burning indirect heat exchangers at a plant site which are in operation, under construction, or permitted shall be considered as total heat input rate for determining allowable PM limit for each indirect heat exchanger.

The total maximum heat input rate of all permitted indirect heat exchangers at the facility is 444.2 million Btu/hr.

Hence, the total maximum heat input rate considered for setting PM emission limit for each new boiler is

$$E = 1.090 \times (444.2)^{-0.2594} = 0.2242 \text{ lbs PM/million Btu heat input}$$

Say 0.22 lb PM/million Btu for each boiler.

Calculations for 5.0 mmBtu boiler:

The above allowable emission rate of 0.22 lb/million Btu for PM can also be written as 1.1 lbs/hr (0.22 lb PM/million Btu x 5 million Btu/hr).

Using the AP-42 emission factor (Table 1.4-2), the PM emission rate for the boiler can be estimated as

$$(0.0075 \text{ lb/mmscf natural gas}) \times (5 \text{ million Btu/hr}) = 0.038 \text{ PM/hr}$$

Compliance with the PM emission standard of 2D .0503 is expected, as the potential emission rate (0.038 lb/hr) of PM is less than the allowable emission rate (1.1 lb/hr). Because the potential emission rate is significantly lower than the allowable emission rate, no monitoring / record keeping / reporting will be required for particulate emissions from these boilers due to firing of natural gas.

#### 15A NCAC 2D .0516 “Sulfur Dioxide Emissions from Combustion Sources”

Emission of sulfur dioxide from any source of combustion that is discharged from any vent, stack, or chimney shall not exceed 2.3 pounds of sulfur dioxide per million BTU input. Sulfur dioxide formed by the combustion of sulfur in fuels, wastes, ores, and other substances shall be included when determining compliance with this standard.

These emission sources are expected to comply with the above standard due to low sulfur content of natural gas. Because the worst-case potential emission rate is significantly lower than the allowable emission rate, no monitoring / record keeping / reporting will be required for SO<sub>2</sub> emissions from these boilers while firing natural gas.

#### 15A NCAC 2D .0521 "Control of Visible Emissions"

The intent of this Rule is to prevent, abate and control emissions generated from fuel burning operations and industrial processes where visible emissions can be reasonably expected to occur, except during startup, shutdowns, and malfunctions approved as such according to procedures approved under 15A NCAC 2D .0535.

For sources manufactured after July 1, 1971, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period. Compliance with the 20 percent opacity limit shall be determined as follows:

- i. No six-minute period exceeds 87 percent opacity;
- ii. No more than one six-minute period exceeds 20 percent opacity in any hour; and
- iii. No more than four six-minute periods exceed 20 percent opacity in any 24-hour period.

Compliance is expected due to the low visible emissions associated with the burning of natural gas.

### *Existing RICE*

**40 CFR Part 63, MACT Subpart ZZZZ**— U.S. EPA promulgated the revised NESHAP for CI RICE on March 3, 2010 (with an effective date of May 3, 2010). As a result of this revision, numerous RICE located at GSK became subject to Subpart ZZZZ. Since GSK is a major source of HAPS, existing (construction/reconstruction before June 12, 2006) stationary CI RICE having a site rating of less than or equal to 500 brake horsepower are subject to Subpart ZZZZ with a compliance date of May 3, 2013.

As a part of this permit revision, these RICE, that were not previously subject to Subpart ZZZZ, were identified as being subject: ID Nos. M-EG-1, M-EG-2, N-EG-1, N-F1-1, EGB.01, EGD.01, EGD.02, EG8.1, EG8.2, EG8.3, EG8.4, EG8.5, 8.9, EGD.03 and EGE.01. Considering the compliance of date of May 2013, the facility's desire to issue the permit quickly (due to the 112(j) modification) as well as the possibility of changes in requirements before the compliance date for some of these generators (elimination of non-emergency use, etc.) all the specific requirements for this group will not be included in this permit revision.

#### **IV. Draft Permit Review Summary**

Charles McEachern of the Raleigh Regional Office was provided a draft permit and draft permit review document on October 8, 2010.

Lindsey Walata of GlaxoSmithKline was provided a draft permit for review on October 8, 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 GlaxoSmithKline is located in Research Triangle Park, 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. 04612/T31