Prevention of Significant Air Quality Deterioration Review

Final Determination

December 2009

Facility Name: Carbo Ceramics, Inc. – Toomsboro Plant
City: Toomsboro
County: Wilkinson
AIRS Number: 04-13-319-00029
Application Number: 18293
Date Application Received: August 19, 2008

State of Georgia
Department of Natural Resources
Environmental Protection Division
Air Protection Branch

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BACKGROUND

On August 22, 2008, Carbo Ceramics, Inc. – Toomsboro Plant (hereafter "Carbo Ceramics") submitted the air permit application No. 18293 to propose BACT for CO, NO_x, PM/PM_{10} and SO_2 emissions from the two existing kaolin clay process lines. The implementation of the BACT is required because results of the 2006 emission testing revealed that the CO, NO_x and SO_2 emissions from the existing process line Nos. 1 and 2 exceeded the corresponding major source thresholds and significant increase levels under NSR/PSD regulations.

In the same application, Carbo Ceramics also proposed the construction and operation of two new kaolin clay process lines (Process Line Nos. 3 and 4) at the same plant. Consisting of mainly materials handling and storage, milling, slurry preparing, screening, spray drying, calcining, packaging and shipping operations, both new process lines will be almost identical to the two existing kaolin clay process lines (Process Line Nos. 1 and 2) in terms of process nature, production capacity, and configurations of process and pollution control equipment, as described in detail in the current Part 70 Operating Permit No. 3295-319-0029-V-02-0 issued to the facility. The same BACT for the existing process lines will also apply to the two new process lines.

On February 9 and August 17, 2009, Carbo Ceramics submitted revisions to the application because it was found that the plant-wide emissions of Hazardous Air Pollutants (HAPs) [methanol, hydrogen fluoride (HF) and hydrogen chloride (HCl)] exceeded the major source threshold under Section 112 of the Clean Air Act (CAA) of 1990 and Part 63 of 40 CFR. The HAP emissions from Carbo Ceramics would be subject to a Case-by-Case Maximum Achievable Control Technology (MACT) determination under Section 112(g) of CAA. A separate Section 112(g) Case-by-Case MACT determination prepared for the HAP emissions was included with the revised application.

On October 22, 2009, the Division issued a Preliminary Determination stating that the modifications described in Application No. 18293 should be approved. The Preliminary Determination contained a Case-by-Case MACT determination as required by Section 112(g) of CAA, and a draft Air Quality Permit for the operation of the existing process lines and the construction and operation of the new process lines.

The Division requested that Carbo Ceramics place a public notice in a newspaper of general circulation in the area of the existing facility notifying the public of the proposed construction and providing the opportunity for written public comment. Such public notice was placed in *The Wilkinson County Post* (legal organ for Wilkinson County) on October 29, 2009. The public comment period expired on November 28, 2009.

During the comment period, comments were received from Carbo Ceramics. There were no comments received from the general public or U.S. EPA region IV.

A copy of the final permit is included in Appendix A. A copy of written comments received during the public comment period is provided in Appendix B.

CARBO CERAMICS COMMENTS

Comments were received from Mr. Craig Wysong, EHS Manager of Carbo Ceramics via mail on November 24, 2009. The original comments are reproduced one by one below followed by EPD's responses, and also enclosed as Appendix B.

Comment 1 (on Updated Emission Units)

Table 3.1
Various Corresponding Permit Conditions Corrected – See attached red-strike permit.

EPD Response:
Necessary corrections and updates have been made to the table.

Comment 2 (on Condition 3.2.1):

Condition 3.2.1 was a PSD avoidance limit. Due to going through PSD in this permit this limit is no longer valid. This condition should be deleted and reserved.

EPD Response:
EPD agrees with the comment. Condition 3.2.1 has been deleted.

Comment 3 (on Condition 3.3.1)**:**

Condition 3.3.1 in existing TV-02-0 should be deleted and reserved. This is the previous NSPS OOO (prior to April 28, 2009 re-promulgation) is no longer relevant and is also superseded by Condition 3.3.9. Some of the conditions in 3.3.1 are no longer valid in the current NSPS OOO rule.

EPD Response:
Condition 3.3.1 in Part 70 operating permit 3295-319-0029-V-02-0 currently regulates existing process units along kaolin clay process lines No. 1 and 2 and associated control systems subject to NSPS Subpart OOO that were constructed, modified, or reconstructed after August 31, 1983 but before April 22, 2008. Condition 3.3.9 regulates affected facilities on new process lines No. 3 and 4 which will be constructed after April 22, 2008. Condition 3.3.1 has been revised as requested in the comment in accordance with the Subpart OOO as amended on April 28, 2009, and reproduced below:

"3.3.1 The Permittee shall comply with the provisions of 40 CFR, Part 60, Subpart OOO, *"Standards of Performance for Nonmetallic Mineral Processing Plants"* as amended on April 28, 2009 for all subject equipment {for reference, see listing in Section 3.1}. In particular, for affected facilities/sources subject to Subpart OOO that were constructed, modified, or reconstructed after August 31, 1983 but before April 22, 2008, the Permittee shall comply with the following emissions requirements for each crusher, grinding mill, screening operation, bucket elevator, belt conveyor, bagging operation, storage bin, silo, enclosed truck or railcar loading station or any other affected facilities as defined in 40 CFR 60.670 and 60.671:
[40 CFR 60.672 (a) thru (f)]

The Permittee shall not discharge or cause the discharge into the atmosphere, from each affected facility/source subject to 40 CFR 60 Subpart OOO, any

a. fugitive emissions (including those escaping capture systems) greater than 15 percent opacity.

b. stack emissions from capture systems feeding a dry control device which:

i. contain particulate matter in excess of 0.05 g/dscm (0.022 grains/dscf) except for individually enclosed storage bins.

ii. exhibit greater than 7 percent opacity.

For any transfer point on a conveyor belt or any other affected facility enclosed in a building, each enclosed affected facility shall comply with the emission limits in paragraphs (a) and (b) of this condition, or the building shall comply with the following emission limits:

c. Fugitive emissions from the building openings (except vents with mechanically induced air flow for exhausting PM emissions from the building) shall not exceed 7 percent opacity.

d. PM emissions from any aforementioned vent shall not:

i. contain particulate matter in excess of 0.05 g/dscm (0.022 grains/dscf).

ii. exhibit greater than 7 percent opacity.

Note:

- Truck dumping of nonmetallic minerals into any screening operation, feed hopper, or crusher is exempt from the requirements of this condition

- Any baghouse that controls emissions from only an individually enclosed storage bin is exempt from the stack PM concentration limit (and associated performance testing) in paragraph b.i but shall meet the stack opacity limit in paragraph b.ii.

- The emission limit in paragraph b.ii with associated opacity testing requirements do not apply for affected facilities using wet scrubbers)."

Comment 4 (on Condition 3.3.3)**:**

Table 3.3.3-1: BACT Emission Limits for Process Units

Sulfur dioxide BACT limit for each calciner/kiln should be 34.25 lb/hr.

****(Please note that this correction affects Conditions 6.2.17 as well)****

EPD Response:

Changes as requested have been made.

Comment 5 (on Condition 3.3.8)**:**

Table 3.3.8-1: Case-By-Case MACT Emission Limits

Methanol MACT emission limit for each Spray Dryer Nos. 1 through 8 should be 0.12 lbs/ton kiln feed based on 20 tph kiln feed and 10.04 tons per year methanol

****(Please note that this correction affects Conditions 6.1.7b.vi. and 6.2.5 as well)****

EPD Response:
Changes as requested have been made to relevant conditions after Carbo Ceramics corrected a discrepancy in the potential annual methanol emissions estimations included in the application No. 18293 revised on August 17, 2009.

Comment 6 (on Condition 3.3.9)**:**

Condition 3.3.9 NSPS Subpart OOO
The particulate matter standards in Conditions 3.3.9a., b., c., and d., are in reference to NSPS Subpart OOO affected facilities that commenced construction, modification, or reconstruction after April 22, 2008. We are requesting that Condition 3.3.9 be modified to reflect the applicability date. We are also requesting that 3.3.9 c. be updated to the current language in the rule which allows fugitive emissions from applicable buildings to not exceed 7% opacity instead of any visible emissions. (Please refer to 60.672(e)(1))

EPD Response:
Condition 3.3.9 contains emissions limitations applicable to the affected facilities constructed, modified, or reconstructed on or after April 22, 2008. This condition has been revised based on the comment and reproduced below:

3.3.9 The Permittee shall comply with the provisions of 40 CFR, Part 60, Subpart OOO, *"Standards of Performance for Nonmetallic Mineral Processing Plants"* as amended on April 28, 2009 for all subject equipment {for reference, see listing in Section 3.1}. In particular, for sources subject to Subpart OOO that were constructed, modified, or reconstructed on or after April 22, 2008, the Permittee shall comply with the following for each crusher, grinding mill, screening operation, bucket elevator, belt conveyor, bagging operation, storage bin, silo, enclosed truck or railcar loading station or any other affected facilities as defined in 40 CFR 60.670 and 60.671: [40 CFR 60.672 (a) thru (f)]

The Permittee shall not discharge or cause the discharge into the atmosphere, from each affected facility/source subject to 40 CFR 60 Subpart OOO, any

a. fugitive emissions (including those escaping capture systems) exhibiting greater than 7 percent opacity except for any crusher that does not use a capture system, which shall not exhibit fugitive emissions greater than 12 percent opacity.

b. stack emissions from capture systems feeding a dry control device which contain particulate matter in excess of 0.032 g/dscm (0.014 grains/dscf) except for individually enclosed storage bins.

For any transfer point on a conveyor belt or any other affected facility enclosed in a building, each enclosed affected facility shall comply with the emission limits in paragraphs (a) and (b) of this condition, or the building shall comply with the following emission limits:

c. Fugitive emissions from the building openings (except vents with mechanically induced air flow for exhausting PM emissions from the building) shall not exceed 7 percent opacity.

d. PM emissions from any building vent with mechanically induced air flow for exhausting PM emissions shall not contain particulate matter in excess of 0.032 g/dscm (0.014 grains/dscf).

Note:

- Truck dumping of nonmetallic minerals into any screening operation, feed hopper, or crusher is exempt from the requirements of this condition

- Any dry control device that controls emissions from an individually enclosed storage bin is exempt from the stack PM concentration limit (and associated performance testing) in paragraph (b) but shall not exhibit greater than 7 percent stack opacity.

- The emission limit in paragraph b.ii with associated opacity testing requirements do not apply for affected facilities using wet scrubbers).

Comment 7 (on Condition 4.2.2)**:**

Conditions 4.2.2c.i. and ii. Initial BACT & Case-By-Case MACT Performance Test Requirements for Existing Plant/Process Line Nos. 1 and 2.

Method 9 test duration reduction reflects language similar to that of the previous NSPS Subpart OOO 60.675(c)(3). Conditions 4.2.2c.i. and ii. have been modified to reflect the current NSPS Subpart OOO test methods and procedures. Please refer to 60.675(c)(2).

EPD Response:

Condition 4.2.2. has been updated per comments to incorporate the current Method 9 testing requirements of NSPS Subpart OOO as amended on April 28, 2009. In addition, Condition 4.2.4 has been revised to incorporate the fugitive emissions testing requirements under the same rule. The revised provisions of Conditions 4.2.2 and 4.2.4 are reproduced below:

"4.2.2 Within 180 days after the issuance of this permit amendment, the Permittee shall conduct performance tests as specified in the following table:

……

c. The duration of the Method 9 test shall be 3 hours (thirty 6-minute averages), except that the duration of the test for sources subject to 40 CFR Part 60, Subpart OOO as amended on April 28, 2009:

i. shall be 1 hour (ten 6-minute averages) for stack visible emissions from any baghouse that controls PM emissions only from an individual enclosed storage bin per 40 CFR 60.675((c)(2)(i).

ii. may be reduced to the duration the affected facilities operates (but no less than 30 minutes) for baghouses controlling storage bins or enclosed truck or railcar loading stations that operate for less than 1 hour at a time per 40 CFR 60.675((c)(2)(ii).

iii. shall be 30 minutes (five 6-minute averages) for fugitive PM emissions from any affected facilities subject to the opacity limit(s) of 40 CFR Part 60, Subpart OOO as amended on April 28, 2009.

……"; and

"4.2.4 Within 60 days after achieving the maximum production rate at which Process Line Nos. 3 and 4 will be operated, but no later than 180 days of the initial startup of the affected source(s), the Permittee shall conduct performance tests as required below: [40 CFR 60.675(a), (b), (c), (d) and (e)]

a. Determining compliance with the NSPS Subpart OOO visible emission standards in Condition 3.3.9 using Method 9 and the procedures 40 CFR 60.11, with the following additions:

……

vi. The duration of the Method 9 observations must be 30 minutes (five 6-minute averages) for fugitive PM emissions from any affected facilities subject to the opacity limit(s) of 40 CFR Part 60, Subpart OOO as amended on April 28, 2009.

……"

Comment 8 (on Condition 5.2.6)**:**

Condition 5.2.6 Fugitive Dust Control Monitoring.

Requesting deletion of the requirement to include a description of inspection, maintenance, malfunction, and corrective actions taken in reference to daily operation records of the control equipment used to remove kaolin dust from roads. This requirement is unduly burdensome to the facility.

EPD Response:

Condition 5.2.6 has been revised to require Carbo Ceramics to keep operation records of the fugitive control equipment per event rather than per day.

Comment 9(on Condition 5.2.9c.)**:**

Condition 5.2.9c. Determination of Weekly NOx Emission Rate from Calciners/Kilns. Requesting that the determination of standard hourly flow rate, Q_{std}, for the purpose of determining NOx emissions from each calciner/kiln include the option of to determine Q_{std} using an exhaust flow monitor calibrated in accordance with Method 2 of Appendix A to 40 CFR Part 60.

EPD Response:

Condition 5.2.9c has been revised to allow the use of the exhaust flow monitor as an alternative to Method 2. Condition 5.2.10 has been added to establish the operational requirements for the exhaust flow monitor. Both changes are reproduced below:

"5.2.9 The Permittee shall monitor emissions of nitrogen oxides from the exhaust gases from each kiln stack for each week or portion of week of operation of each calciner/kiln using the following procedures:

……

c. NO_x emissions rate (pounds per hour) for all emissions units shall be determined using the following equation;

where:

$$E = K \times C_d \times Q_{std} \times \left(\frac{20.9}{20.9 - O_2} \right)$$

E = Mass emissions of nitrogen oxides (lb/hr);

K = Conversion factor for NO_x = 1.194 x 10^{-7} ([lb/scf]/ppm)

C_d = Concentration of NO_x (ppm by volume, dry basis)

Q_{std} = Standard hourly flow rate from kiln exhaust as measured by Method 2, dscfh

(Note: In lieu of a standard hourly flow rate from the kiln exhaust measured by Method 2, data from a continuous flow monitor, installed as per Condition 5.2.10 of this permit, taken concurrently with the NO_x measurements can be used.)

O_2 = Exhaust Gas Oxygen Concentration (percent by volume, dry basis)

……"

"5.2.10 In lieu of the exhaust flow rate measured by Method 2 for each kiln as per Condition 5.2.9, the Permittee may install, calibrate, maintain, and operate according to all applicable performance specifications a flow monitor to continuously measure the exhaust from each kiln."

Comment 10 (on Condition 5.2.9h)**:**

Condition 5.2.9h. NOx Emissions Notification.

Requesting that we be given 30 days, in lieu of only 5 days, to submit reports relating weekly NOx emissions measurements from each calciner/kiln in excess of 121 lb/hr.

EPD Response:

The condition has been revised to allow 15 days for reporting the exceedance.

Comment 11 (on Condition 6.1.7b.vi)**:**

Condition 6.1.7b.vi Definition of Exceedance for Methanol Emissions from Spray Dryers for Semi-annual Reporting.

Please correct to 0.12 pounds of methanol per ton of kiln feed. Please refer to comment on Table 3.3.8-1.

EPD Response:

The condition has been revised per comment (See also EPD response to Comment 5).

Comment 12 (on Condition 6.1.7d.i)**:**

Condition 6.1.7d. i Requirement to Submit All NOx Measurements for Calciners/Kilns.

Requesting that we be required to submit only a summary of the monitoring notifications required by Condition 5.2.9h for each semi-annual reporting period. This would be more in line with what is required of reporting under Condition 6.1.4.

EPD Response:

The monitoring results shall be submitted in accordance with the condition. No change has been made to the Permit as a result of the comment.

Comment 13 (on Condition 6.2.4c)**:**

Condition 6.2.4c. Requirement to Maintain Monthly Fuel Usage Rate Record for Each Process Line.

The monthly fuel usage rate for each processing line is not required to demonstrate compliance with any limitation specified in the draft permit. Recommending deletion of this requirement since it is arbitrary.

EPD Response:

The requested change has been made.

Comment 14 (on Condition 6.2.5)**:**

Condition 6.2.5. Monthly Notification for Monthly Average Methanol Emission Rates from Spray Dryers.

Please correct to 0.12 pounds of methanol per ton of kiln feed. Please refer to comment on Table 3.3.8-1.

EPD Response:

The condition has been revised according to the comment (See also EPD response to Comment 5).

Comment 15 (on Conditions 6.2.6, 6.2.6, 6.2.7, 6.2.8, 6.2.12, 6.2.17, 6.2.18 and 6.2.19)**:**

Conditions 6.2.5, 6.2.6, 6.2.7, 6.2.8, 6.2.12, 6.2.17., 6.2.18, and 6.2.19. Notification Postmark Dates.

Requesting that we be given until the 30th day of the following calendar month to submit the required notifications.

EPD Response:

The current notification deadline is a standard reporting requirement. No changes have been made to these conditions as a result of the comment.

Comment 16 (on Condition 6.2.7)**:**

Condition 6.2.7 Monthly VOC Records Notification.

The notification condition of the permit term should reflect a monthly total VOC emissions, not a 12-month rolling total. We are requesting that this typo be corrected.

EPD Response:

Corrections as requested have been made.

Comment 17 (on Condition 6.2.16)**:**

Condition 6.2.16 Records of Kiln Feed for Calculation of SO2 Emissions for Calciners/Kilns.

Record keeping of kiln feed for $E_{SO2,\,i}$ in Condition 6.2.17 should reflect the averaging period (daily average) of $M_{kf,\,i}$ (tons/day). We respectfully request that "hourly" input rate be changed to "daily".

EPD Response:

Requested change has been made to the condition.

Comment 18 (on Condition 6.2.17)**:**

Condition 6.2.17 Calculation of SO2 Emissions from Calciners/Kilns.

Please correct to "34.2 pounds per calendar day" to "34.25 pounds per hour for any calendar day". Please refer to comment on Table 3.3.3-1. Additionally we respectfully request that the 34.25 pounds per hour for any calendar day be "as averaged over a 7-day period". We believe this is reasonable and consistent with averaging time specified in Table 3.3.3-1 (e.g. daily average).

EPD Response:
The hourly SO_2 emission limit has been revised to 34.25 pounds as requested. The average period remains as daily/24 hours.

Comment 19 (on Condition 7.7.1)**:**

7.7 Compliance Schedule/Progress Reports Associated with this Amendment

This requirement is no longer applicable after issuance of this amendment. Please add Condition 7.7.1 to reflect "Deleted (Reserved)" as follows:

Condition 7.7.1 Deleted (Reserved).

EPD Response:
The condition has been deleted.

Carbo Ceramics also made following comments at the same time on the Preliminary Determination (see Attachment). Comments noted by EPD.

1.0 Introduction – Facility Information and Emissions Data

Table 1-3: Emissions Increases from the Project.

Table 1-3 in the PSD PD is inconsistent with the data provided in Table 2-5b of the February 9, 2009 application. We are requesting that the following changes be made:

- *Title for table should read "Table 1-3: Emissions Increases from the Project (Processing Lines 3 and 4);*

2.0 Process Description

3rd Paragraph, Page 3: Monitoring of Volumetric Flow Rate from Calciners/Kilns

The draft PSD permit does not requires continuous monitoring a volumetric flow rate as part of demonstrating compliance with any emission limit specified. We are requesting the option to determine volumetric flow rate from each calciner/kiln using a flow monitor calibrated according to Method 2 of Appendix A to 40 CFR Part 60 as part of draft Condition 5.2.9c. It should be noted that volumetric flow is only required to be determined on a weekly basis when determining NOx emissions from each calciner/kiln. We are respectfully requesting that the 2nd sentence in the 3rd paragraph on page 3 be deleted.

4.1 Fugitive PM Emissions

1st Paragraph, Page 8: Determining PSD Applicability

The first paragraph/sentence under Section 4.1 is incorrect. CARBO Ceramics Toomsboro is not one of the listed source categories required to calculate quantifiable fugitive emissions as part of determining PSD applicability. Please delete or update this paragraph/sentence accordingly.

4.4 CO Emissions from Rotary Calciners/Kilns

2nd Paragraph, Page 11: Determining PSD Applicability

We are respectfully requesting that the 2nd and 3rd sentences in the 2nd paragraph under Section 4.4 be deleted.

5.0 Testing and Monitoring Requirements

8th Paragraph, Page 22: PSD/NSR/BACT.

Determination of the "fuel/air ratio", temperature "profile", and "burner settings" are not required as part of determining compliance with any draft permit condition nor is this data required as part of reporting excess emissions, exceedances, or excursions. We are respectfully requesting that these parameters be deleted.

6.0 Ambient Air Quality Review

1st Paragraph, Page 31, under Table 6-8e: Class I Area Analysis.

We have a minor correction to 2nd sentence of the listed paragraph.

7.0 Additional Impacts Analysis

Table 7-1: Soils and Vegetation.

Fluorine is not a pollutant for which an ambient screening concentration or significant emission rate is listed in Table 5.3 or 5.6 of EPA 450/2-81-078, respectively. Non-HF fluorides (PSD fluorides) are less than the "PSD" Significant Emission Rate (<3 tpy) but still greater than the Significant Emission Rate for fluoride in Table 5.6 of EPA 450/2-81-078 (<0.23 tpy). We performed this analysis in the August 15, 2009 update to the February 9, 2009 application. We have updated Table 7-1 with our results and add footnote 4 under the table. The footnote references the EPD review of our August 15, 2008 submittal as represented in an October 15, 2009 modeling memorandum from Yan Huang through Jim Boylan to Hamid Yavari and Wei-Wei Qiu. We are respectfully requesting that Table 7-1 and the footnotes be updated accordingly.

Table 7-2: Projected Impacts – Air Toxics.

We are respectfully requesting that it be acknowledged that the annual HF AAC is an alternative standard approved by the division. The footnote added under Table 7-2 is consistent with the modeling memorandum reference in comment to Table 7-1 above.

NOTICE OF MACT APPROVAL (APPENDIX A)

Table 5-7.1: Section 112(g) Case-by-Case MACT Determinations

Please correct the lbs Methanol/ ton of kiln feed to 0.12. Please refer to our comment above on Permit Table 3.3.8-1.

EPD CHANGES

For easy reference. conditions or portions of conditions changed by EPD based on Carbo Ceramics' comments are included with EPD responses to the relevant comments.

APPENDIX A

AIR QUALITY PERMIT AMENDMENT
No. 3295-319-0029-V-02-1

APPENDIX B

WRITTEN COMMENTS
RECEIVED DURING
COMMENT PERIOD