



# UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 7  
901 N. 5<sup>th</sup> STREET  
KANSAS CITY, KANSAS 66101

AIR PERMITTING AND  
COMPLIANCE BRANCH

March 15, 2006

Mindy Bowman  
Kansas Department of Health & Environment  
Bureau of Air and Radiation  
1000 S.W. Jackson Street, Suite 310  
Topeka, KS 66612-1366

Dear Ms. Bowman,

On February 23, 2006, the Kansas Department of Health and Environment provided a copy of a draft Prevention of Significant Deterioration (PSD) permit for Ash Grove Chanute. Ash Grove proposes to expand its fuel options to include petroleum coke during all modes of operation, including those when the kiln is not combusting hazardous waste. We appreciate the opportunity to evaluate the project and provide the comments in Attachment A.

If you have any questions, please contact Jon Knodel at [Knodel.jon@epa.gov](mailto:Knodel.jon@epa.gov) or (913) 551-7622.

Sincerely,

JoAnn Heiman, Chief  
Air Permitting and Compliance Branch

## **Attachment A.**

### **EPA Region 7 Comments on Draft PSD Permit for Ash Grove Chanute's Petroleum Coke Project**

#### **CO BACT**

The current PSD project allows Ash Grove Chanute flexibility to burn petroleum coke during all periods of operation, including those when not burning hazardous waste. Ash Grove contends that any increase in project emissions will be accommodated within the existing plant-wide caps established for SO<sub>2</sub> and NO<sub>x</sub> in the original 1999 PSD project for the pre-heater, pre-calciner kiln replacement project. Ash Grove also notes that CO emissions, while expected to increase when burning pet coke, will remain within the original BACT limits set in 1999. These limits were 1409 tons per year, 12-month rolling sum and 5,000 pounds per hour, 8-hour block average. These limits were also reaffirmed in the December, 2004, PSD permit authorizing the use of tire derived fuel.

The primary reason PSD review is triggered for CO for this project is that the existing emissions baseline for the two years preceding the project are substantially less than the potential to emit for the kiln. As a consequence, the operational change to include coke as an authorized fuel results in greater than "significant" emissions and therefore triggers PSD review for CO.

Ash Grove's PSD application evaluates potential add-on control technologies and makes a persuasive argument that the cost of such control may be unreasonable from a cost point of view. In the original 1999 PSD application, Ash Grove estimated a total cost effectiveness for CO removal at approximately \$3,600 per ton removed. KDHE found the cost unreasonable and did not require the use of the regenerative thermal oxidizer at that time. Because of much higher natural gas prices today, the cost has soared to over \$16,300 per ton removed. As a result, Ash Grove contends that "good combustion practices", using combustion optimization control and operator training, is BACT. Ash Grove seeks reaffirmation from KDHE that its original 1999 CO BACT limits are appropriate for the petroleum coke project.

While we don't take issue with the "good combustion practice" finding in the permit, we believe the original CO BACT limit established in 1999, and carried over to the current permit, may be too high based on continuous emissions monitor data showing much lower emissions. Ash Grove's data, summarized in Appendix B in the application, indicates that annual CO emissions range from 319 to 540 tons per year from the period 1997 through 2004. The proposed 1,409 tons per year limit provides a compliance margin of 260 to 414% and seems excessive. Also, it's not clear from the permit record whether the higher limit provides adequate incentive for Ash Grove to optimize the combustion process during all periods of time or only those times when the CO emissions are at or near the BACT limit. The application discusses the importance of minimizing

fuel costs relative to the cost of cement production and the relationship between fuel conversion efficiency and CO emissions, but it isn't clear that the combustion optimization system seeks to minimize CO.

In a December 27, 2004, memorandum from Trinity Consultants to KDHE, Ash Grove explains that under certain raw material and fuel scenarios, a higher CO BACT limit may be necessary. In particular, Trinity identifies limestone with petroleum hydrocarbons and solid hazardous waste derived fuels as causing increased CO emissions. But, the memorandum also notes that these operating conditions do not occur all the time. Ash Grove practices raw material blending or substitution to avoid use of higher petroleum-laden limestone. In addition, while Ash Grove expresses an interest in burning more solid waste fuels, they note that supplies are not always available.

These highly variable raw material and fuel feed scenarios seem to argue for an adjustable CO BACT limit; each designed for the specific firing conditions at the time. This situation is somewhat analogous to the new coal-fired utility boilers being permitted across the U.S. Many of these projects seek to maximize their SO<sub>2</sub> BACT limit by applying BACT level of control to a worst-case design fuel. In many instances though, this design fuel is used only 2-3 % of the operating time. During the other 97-98% of the operating time, the utility may use very low sulfur fuel and can turn down the scrubber to meet its BACT limit. This can result in significant under performance of the scrubber and calls into question whether the level of control represents the maximum level of control anticipated under BACT.

In the utility example described above, a properly designed BACT limit would minimize emissions during all periods of operation. For example, when the utility is burning very low sulfur coal, the corresponding limit would assure that the scrubber operates at or near the same efficiency as it does with higher sulfur coal. This is sometimes accomplished using a percent removal requirement in the permit. While an explicit percent removal requirement is not feasible for Ash Grove, because there are no add-on controls, the use of multiple BACT limits for CO may be appropriate. For example, under the raw material and fuel conditions under which Ash Grove has been operating since construction of the new kiln, it appears the CO limit should be no more than 540 tons per years, with any appropriate adjustment for compliance margin. In circumstances where Ash Grove burns significant quantities of petroleum hydrocarbon limestone or solid waste fuels, a higher limit may be appropriate. Other scenarios in between may be appropriate as well.

To help sort out the appropriate CO BACT limits for Ash Grove, we recommend that KDHE seek the hourly CO-CEMS data collected for the past several years, along with raw material and fuel data for these times to determine if there are operating scenarios under which a lower BACT limit is appropriate. By correlating emissions to various feed conditions, KDHE may be able to determine one or more CO limits for these conditions. As an alternative, KDHE may want Ash Grove to perform this analysis and submit a comprehensive reporting, including the data and methodologies used. Since we don't have the data before us, it is difficult to make specific recommendations for how

best to set the limits. But, it's possible that the four operating modes identified in the permit may be the appropriate breakouts for individual CO BACT limits. If the data indicate that the majority of kiln operation is based on lower CO producing fuel and feed materials, the PSD permit should specify a lower CO limit and the conditions under which it applies. Likewise, in an effort not meant to limit fuel flexibility or use of less desirable raw materials, the permit should include the conditions under which a higher CO limit is appropriate. The limits should reflect a reasonable margin for compliance and should be accompanied by the appropriate monitoring, recordkeeping, and excess emission reporting requirements. The conditions should also assure that the combustion optimization system is utilized to its fullest extent, over all modes of operation, to minimize CO emissions. This approach would have the side benefit of minimizing the disconnect between actual and potential emissions which continue to trip the PSD thresholds anytime Ash Grove investigates the use of a new fuel.

[ End of Comments ]