



COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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July 21, 2009

Attn: Kyle E. Crake
PMI Ash Technologies, LLC
14001 Weston Parkway, Suite 112
Cary, NC 27513

Re: 310 CMR 7.00 Appendix B(7)
Transmittal # X227555, X227556
Final Approval of BWP AQ 27 and
AQ 28 Applications Certification and
Verification of GHG Credits at Chesapeake,
Virginia Carbon Burn-Out Plant

Dear Mr. Crake:

The Massachusetts Department of Environmental Protection (MassDEP) hereby approves your Application for Certification of GHG (Greenhouse Gas) Credits (BWP AQ27), dated March 30, 2009. The Department also approves your Application for Verification of GHG Credits (BWP AQ 28), dated March 30, 2009. In accordance with the requirements of 310 CMR 7.00: Appendix B(7)(f), the Department conducted a 30-day public comment period on the proposed approval and considered all comments received. The public comment period ended on July 20, 2009.

The Final Approval of your Application for Certification of GHG Credits (BWP AQ 27), combined with the Final Approval of your Application for Verification of GHG Credits (BWP AQ 28) creates 137,884 verified GHG Credits for emission reductions that occurred between January 1, 2007 and December 31, 2008. These credits have been deposited into MA GHG Credit account MAGHG-N-10011; the GHG Credit Account Representative for this account is Kyle Crake. Verified GHG Credits from this project can only be used by affected facilities for compliance with the CO₂ emissions standards of 310 CMR 7.29.

Included as part of this Final Approval of your Applications for Certification and Verification of GHG Credits are the following:

- (1) A description of the project.
- (2) A table showing the number of Certified and Verified GHG Credits.
- (3) A list of relevant determinations that the Department has made in accordance with the requirements of 310 CMR 7.00: Appendix B(7).
- (4) An explanation of how the number of GHG Credits was calculated.

Note that your applications are also incorporated, by reference, into this approval.

(1) Description of the Project

GHG Credits are awarded to the applicant, PMI Ash Technologies, LLC (PMI), for a project which processes coal ash at the Chesapeake Virginia Carbon Burn-Out (CBO) Plant for use in place of Portland cement in concrete manufacture. The number of GHG Credits is based on an estimate of the emissions that would have occurred if Portland cement were used instead of processed coal ash to manufacture concrete. The applicant has described the project as follows:

PMI Ash Technologies, LLC (PMI) has developed and installed a Carbon Burn Out (CBO) facility... The CBO facility is located at the Chesapeake Energy Center in Chesapeake, Virginia and went into commercial operation on November 1, 2006... The end product from... the CBO is a Coal Combustion Product (CCP) that is a low carbon fly ash used as a partial replacement for Portland cement in the production of concrete. The CBO in Virginia consists of one fluidized bed combustion system with a maximum heat input rating of 76.7 MMBtu/hr and is capable of processing up to 223,000 tons of fly ash per year. At this maximum production rate, approximately 204,000 tons of low carbon fly ash would be generated annually for use as a partial replacement to Portland cement in the production of concrete.

(2) Table showing the number of Certified and Verified GHG Credits.

	Time period	Number of Credits
Certified GHG Credits	January 1, 2007 through December 31, 2008	137,884
Verified GHG Credits	January 1, 2007 through December 31, 2008	137,884

(3) A list of relevant determinations that the Department has made in accordance with the requirements of 310 CMR 7.00: Appendix B(7). (Defined terms and language that is directly excerpted from regulations appear in italics.)

The Department has made the following determinations:

- The emission reductions are *Real*, in that, when coal ash is used in place of cement, emissions that would have occurred during the manufacture of cement do not occur.
- The emission reductions are *Additional*, in that there is no legal requirement to process coal ash for use as a replacement for Portland cement, or to use processed coal ash as a replacement for Portland cement.
- The emission reductions are *Verifiable*, in that the applicant will provide documents showing the transfer of processed coal ash to Boral Material Technologies, Inc. (BMTI), an ash marketer with which the applicant has established a contractual relationship.

- The emission reductions are *Permanent*, in that once concrete has been manufactured using coal ash, the same concrete will never be manufactured using Portland cement.
- The emission reductions are *Enforceable*, in that, pursuant to 310 CMR 7.00: Appendix B(7)(g)8., violations of the requirements of 310 CMR 7.00: Appendix B(7) may be enforced against any person who applied for certification or verification of GHG Credits, an affected facility that purchases GHG Credits created by this project, or any combination thereof.
- The project commenced *on or after January 1, 2006*, in accordance with 310 CMR 7.00: Appendix B(7)(d)9, in that the ash processing facility commenced operation in November of 2006.
- The project is expected to *generate an annual average over the period applied for of 5,000 or more tons CO_{2e}*, in accordance with 310 CMR 7.00: Appendix B(7)(e)3, in that the project is expected to generate approximately 66,000 tons of CO_{2e} reductions annually.
- The application includes *a proposed method for determining, monitoring and assuring compliance*, in accordance with 310 CMR 7.00: Appendix B(7)(e)4.b, as described in section (4) of this document.
- The application specifies *the best management practice used to determine an emissions baseline*, in accordance with 310 CMR 7.00 B(7)(e)4.b, in that the project achieves greenhouse gas emissions reductions beyond those that would be achieved if current best management practice was employed. Supplemental application materials state:

Installation and operation of a Carbon Burn Out process is not common practice at small power plant's which have installed pollution control devices that render the fly ash unsuitable for re-sale as a partial replacement for Portland cement. Because CBO is not required nor is it common practice at utilities, the BMP scenario allows Dominion Virginia Power at its Chesapeake Energy Station to have a consistent LOI <loss-on-ignition> and no ammonia from pollution controls it installed to reduce nitrogen oxides. The majority of utilities who have installed similar pollution control equipment or have altered operations to reduce nitrogen oxides do not employ active beneficiation CBO systems.

Note: Based on the conclusion that the project goes beyond current best management practice for processing and using fly ash to avoid greenhouse gas emissions from cement production, the department will allow the use of an emissions baseline based on historical practice at this facility to calculate avoided emissions.

- The project does not present any potential project leakage.

(4) Explanation of how the number of GHG Credits for Certification and Verification was calculated

The number of GHG Credits was calculated using the following equation:

$$\text{GHG Credits} = N_{\text{baseline}} - N_{\text{project}}$$

Where $N_{\text{baseline}} - N_{\text{project}}$ = the difference between the number of tons of CO_{2e} emitted without the project and the number of tons of CO_{2e} emitted by the project, calculated thus:

$$N_{\text{baseline}} - N_{\text{project}} = A \times 0.71$$

Where:

A = the number of tons of ash processed for use in place of Portland cement during the certification and verification period;

0.71 = an estimate of the number of tons of CO_{2e} emissions that are avoided when one ton of fly ash is used as a cement replacement, as proposed by the applicant. This estimate was derived by the United States Environmental Protection Agency (EPA) using the Building Environmental and Economic and Sustainability (BEES) methodology. The BEES methodology was used by EPA as the primary tool for calculating CO_{2e} emissions impacts in two reports that were published in 2008. (*See Waste and Materials-Flow Benchmark Sector Report: Beneficial Use of Secondary Materials – Coal Combustion Products* and *Study on Increasing the Usage of Recovered Mineral Components in Federally Funded Projects Involving Procurement of Cement or Concrete to Address the Safe, Accountable, Efficient Transportation Equity Act: A Legacy for Users*. In particular, Table D-13 in the latter source includes the numerical estimate used in this application. The document is available at <http://www.epa.gov/epawaste/consERVE/tools/cpg/pdf/rtc/report4-08.pdf> and the table is on page D-41.)¹

¹ MassDEP is using the BEES model in order ensure that the number of GHG Credits created represents a conservative estimate of the actual reductions that occurred. The BEES model is not the only model that could be used to estimate number of tons of CO_{2e} emissions that are avoided when one ton of fly ash is used as a cement replacement. However, MassDEP has concluded that the difference between the available estimates is associated with uncertainty, and therefore does not imply that one estimate is more correct than another. Using the more conservative of these estimates (i.e., the lower of the estimates, which is associated with the BEES model) provides greater certainty that all estimated avoided emissions have actually occurred. Further information regarding MassDEP's decision to use the BEES model for this purpose is contained in MassDEP's Conditional Approval of a similar certification application that was submitted by Dominion Energy Brayton Point, and in the associated Response to Public Comment. These documents are available at <http://www.mass.gov/dep/air/climate/ghgcred.htm>.

Data and calculations for this application are summarized in the following table:

A	194,203
Certified and Verified GHG Credits	137,884

Should you have any questions concerning this FINAL APPROVAL, please contact Stacy DeGabriele at stacy.h.degabriele@state.ma.us or (617) 292-5864.

Very truly yours,

Nancy L. Seidman
Deputy Assistant Commissioner
Climate Strategies
Bureau of Waste Prevention

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