Task 5.8 - Development of a Coal By-Product Classification Protocol for Utilization

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**By
Bruce A. Dockter**

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For
U.S. Department of Energy
Office of Fossil Energy
Morgantown Energy Technology Center
P.O. Box 880
Morgantown, West Virginia 26507-0880

By
Energy and Environmental Research Center
University of North Dakota
P. O. Box 9018
Grand Forks, North Dakota 58202-9018

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TASK 5.8 – DEVELOPMENT OF A COAL BY-PRODUCT CLASSIFICATION PROTOCOL FOR UTILIZATION

1.0 INTRODUCTION

A large volume of fly ash is produced that does not meet current American Society for Testing and Materials (ASTM) specifications for use in the production of cement and concrete but could be used for other applications. In many cases, coal ash is required to meet ASTM specifications even when they are clearly inappropriate for the application (i.e., structural fill).

Creating a classification system for fly ash that facilitates the use of performance-based specifications for use applications will broaden the utilization options for coal ash, resulting in elimination of disposal costs and opportunities for industry to develop new products and expand the use of coal ash in existing products. The inadequacy of the current classification system is one of the major technical barriers to increased coal by-product utilization.

2.0 GOALS AND OBJECTIVES

The goal of this project at the Energy & Environmental Research Center (EERC) is to develop a classification system for fly ash based on parameters that relate to performance specification of engineering and construction applications. The new classification system will provide a means of evaluating the suitability of coal ash for use in certain products that currently have no reality-based standards or classifications.

3.0 ACCOMPLISHMENTS

Recent work by the ASTM Committee E50 on Pollution Prevention has proposed a standard practice for use of coal ash for structural fill. EERC coal ash researchers have worked on preparing this standard practice, and the development of criteria for the coal ash to be used in this application will facilitate the use of this standard once approved by ASTM. A preliminary flowchart for classification criteria was developed.

Two sources of regional coal fly ash were chosen for laboratory testing for appropriate test procedures. Both sources of fly ash were produced in North Dakota at electric power stations burning North Dakota lignite coal. The fly ash samples were obtained from a research project currently in progress at the EERC for the North Dakota Industrial Commission. Neither of the ash samples meet ASTM C618 specifications for use as a partial cement replacement in concrete so ultimately disposal would be the only alternative for both. Evaluation of the test results was performed using the classification flowchart. Additional test procedures are recommended for further evaluation for use in structural fill.

4.0 FUTURE WORK

Laboratory testing has been completed on the two selected North Dakota-produced fly ash samples. The final report is near completion and will be submitted in the next quarterly. In the final report, an evaluation of the test results will be performed and the flowchart will be used to recommend the appropriate use for the coal fly ash in structural fill applications.

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