

FY00-XXXIV-96
DEMONSTRATION OF UTILITY AND INDUSTRIAL
BYPRODUCTS FOR FEEDLOT SURFACES

CONTRACTOR: Energy & Environmental Research Center

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PARTICIPANTS

<u>Sponsor</u>	<u>Cost Share</u>
Industry Participants	
Great River Energy	\$43,200
American Crystal Sugar	\$43,200
Otter Tail Power Company	\$43,200
U.S. Department of Energy (JSRP)	\$242,290
State Board of Agricultural Research and Education	\$43,200
ND Industrial Commission	<u>\$116,160</u>
Total Project Costs	\$531,360

Project Schedule - 36 Months

Contract Date – 2/09/00
Start Date – 2/09/00
Completion Date – 2/01/03

Project Deliverables

Contract Award ✓
Annual Report – 2/01/01 ✓
Annual Report – 2/01/02 ✓
Final Report – 10/31/03 ✓

OBJECTIVE / STATEMENT OF WORK

The objective of this project is to demonstrate the placement, engineering performance, and environmental performance of lignite ash for feedlot surfaces. The goal of this project is to demonstrate and evaluate six different surface types at the North Dakota State University (NDSU) Carrington Research Extension Center (CREC) bison research facility. The agriculture economic objective of this project is to provide livestock producers in North Dakota a low-cost alternative to placing concrete in feedlots.

STATUS

During the first year of the project, laboratory and field activities were initiated to develop composition and leaching profiles of the various bottom and fly ash materials proposed for

demonstration at CREC. Composite samples of bottom and fly ash samples were obtained from Great River Energy's Coal Creek Station and Stanton Station, and from Otter Tail Power Company's Coyote Station and Hoot Lake Station. Bulk and trace chemical compositions were determined, as well as leaching characteristics (20:1 distilled water to solid ratio sampled at 18 hours, 30 days and 60 days). Leachate concentrations consistently fell below the Resource Conservation and Recovery Act (RCRA) and Universal Treatment Standard (UTS) levels.

Prior to placement of the coal combustion by-products (CCB)¹ at the CREC site, tests wells were installed to monitor ground water and collection stations established to monitor and collect surface water. Multi-sets of feeding pens were constructed employing different compositions of CCB, construction techniques and control areas. The environmental aspects of the test pens and the performance of the animals (Bison) are being monitored during this initial year.

During the April through June quarter, 2002, a runoff system was constructed and leaching and groundwater testing was conducted. Technology transfer activities consist of submitting a paper to be published in the 2002 CREC Field Day report, and an abstract submitted for consideration to the American Coal Ash Association Coal Ash Symposium scheduled for January 2003. Future activities will include additional demonstrations at commercial feedlot sites in addition to continued monitoring of the existing CREC site.

Summary

Studies on fly ash & fly ash-soil mixtures has produced a preponderance of evidence that the mixture utilized in feedlot surfacing has numerous characteristics that make it an environmentally benign material that will not contaminate water or form a contaminated leachate, and can be utilized by farmers and ranchers in North Dakota. Use of fly ash from the sources studied in the feedlot surfaces are approved by the North Dakota Department of Health.

¹ Coal combustion by-products are commonly called fly ash or bottom ash.