

FY04-L(50)-127

“Alternative Cover Demonstration Project at Coal Creek Station”

Contractor: Great River Energy

Principal Investigator: Ron Jorgenson (Golder Associates Inc)

PARTICIPANTS

<u>Sponsor</u>	<u>Cost Share</u>
Great River Energy	\$ 250,000
NDIC	\$ 250,000
Total Cost	\$ 500,000

Project Schedule - 36 Months

Contract Date – 2/4/04

Start Date – 2/4/04

Completion Date – 1/1/07

Project Deliverables

Contract Signed: 2/4/04 (✓)

Semi-Annual Reports:

7/1/04 (✓); 12/31/04 (✓);

7/1/05 (✓); 12/31/05 (✓);

7/1/06 (✓)

Final Report: 1/1/07 (✓)

OBJECTIVE / STATEMENT OF WORK:

A field demonstration to evaluate and demonstrate the performance of alternative earth landfill cover designs while maintaining equal or a better level of environmental performance for long-term storage of coal combustion byproducts.

STATUS:

Progress Report 1 (Feb 16 – June 30, 2004). Golder Associates completed the engineering design for the alternative cover test plots (three), including developing a Construction Work Plan, a Construction Quality Assurance Protocol, including a Health and Safety Plan. Computer modeling was performed to predict percolation through the proposed cover(s) to confirm thickness, revegetation design and preparation of a draft irrigation plan to help establish vegetation. Construction of the test plots was completed in June, 2004.

Progress Report 2 (July – December 31, 2004). The activities accomplished this period include: development of a final irrigation plan and irrigation of the test plots; reseeding of test plots; development of soil-water curves; completion of water content reflectometer calibrations, development of data monitoring protocols, monitoring of climate and water balance data, implementation of web-based database and query tool; and diagnostics and repair or replacement of damaged or malfunctioning equipment.

Progress Report 3 (Jan – June, 2005). Engineering design, site preparation and test plot construction and instrumentation installation has been completed. Nearly 13 months of climate and water balance data have been collected and reduced. Interpretations of the data are on-going. During the spring and summer of 2005, vegetation on the test plots has been established and thrived.

Progress Report 4 (July – December, 2005). The following activities occurred during this period: Monitoring of climate and water balance data to help ensure satisfactory performance of the sensors; Data reduction and interpretation, including two quarterly quality assurance reports; routine visual inspections of lysimeters and piping to help ensure adequate performance; and a meeting in December to review progress. Performance to date indicates the alternative covers are exceeding the minimum regulatory requirements for cover efficiency.

Progress Report 5 (January – June 2006). The major activity completed during this period included monitoring and interpretation of water balance data related to the hydraulic performance of the test plots. More specifically, the activities included: monitoring of climate and water balance data to help ensure satisfactory performance of the sensors; diagnostics and repair of damaged or malfunctioning equipment; and routine visual inspections of the lysimeters and associated piping to help ensure adequate performance.

Final Report (July – December, 2006). The activities conducted during this reporting period included: monitoring of climate and water balance data to help ensure satisfactory performance of the sensors; diagnostics and repair of damaged or malfunctioning equipment; data reduction and interpretation; routine visual inspections of the lysimeters and associated piping to help ensure adequate performance; and development of proposed rule change language to allow installation of alternative covers demonstrated by the project to be equivalent to the prescriptive cover. Based on the performance of the alternative covers (three-foot municipal waste cover and three-foot evapotranspiration cover), the report recommends that the earthen cover prescribed by North Dakota Department of Health rules could be reduced from five feet to three feet. This would result in: more efficient use of soil resources; lower cost of construction and operation of landfill facilities; reduced greenhouse gas emissions during placement of soil cover; more efficient and cost-effective use of existing landfill facility footprints; and, a reduction in the number of acres disturbed to provide soil cover for landfill closure.