Energy & Environmental Research Center

UNIVERSITY OF NORTH DAKOTA

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May 1, 1996

Ms. Karlene Fine, Executive Director
North Dakota Industrial Commission
600 East Boulevard Avenue
Bismarck, ND 58505

Dear Ms. Fine:

Subject: EERC Proposal No. 96-6630

Enclosed please find a proposal entitled "Development of a Coal Combustion By-Products Utilization Workshop." The workshop that the Energy & Environmental Research Center (EERC) proposes to develop will facilitate the utilization of North Dakota lignite combustion by-products through an educational program for producers, marketers, regulators, practicing engineers and architects, and end users.

This transmittal letter represents a binding commitment by the EERC to complete the project described in Proposal No. 96-6630, submitted to the North Dakota Industrial Commission on May 1, 1996.

Enclosed is the $100 application fee.

If you have any questions regarding this proposal, please feel free to contact me at (701) 777-5261 at your convenience.

Sincerely,

Debra F. Pflughoeft-Hassett
Research Manager

Approved by:

Dr. Kenneth J. Dawes, Director
Office of Res. and Program Development

DFPH/csd

Enclosure

c/enc: John Hendrikson, EERC
Bruce Dockter, EERC

Energy & Environmental Research Center

DEVELOPMENT OF A COAL COMBUSTION BY-PRODUCTS UTILIZATION WORKSHOP

EERC Proposal No. 96-6630

Total Funds Requested: $10,000

Submitted to:

Ms. Karlene Fine, Executive Director

State of North Dakota
The Industrial Commission
Lignite Research Program
600 East Boulevard Avenue
Bismarck, ND 58505

Submitted by:

Debra F. Pflughoeft-Hassett
Bruce A. Dockter

Energy & Environmental Research Center
PO Box 9018
Grand Forks, North Dakota 58202

Debra F. Pflughoeft-Hassett, Project Manager

Dr. Kenneth J. Dawes, Director
Office of Research and Program Development

May 1996

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DEVELOPMENT OF A COAL COMBUSTION BY-PRODUCTS UTILIZATION WORKSHOP

ABSTRACT

Many coal combustion by-products (CCBs) are excellent engineering and construction materials, and using them in public works can result in reduced costs for projects such as road building, mine filling, and other applications. Several road-building applications were demonstrated in the Energy & Environmental Research Center (EERC) laboratory, and an environmental acceptability evaluation was performed. The results indicate that these materials should be used, but a regional CCB production and utilization survey indicated that currently in North Dakota, less than 5% of the coal combustion fly ash and bottom ash are utilized. In 1993, the U.S. Department of Energy submitted a report to Congress titled "Barriers to the Increased Utilization of Coal Combustion/Desulfurization By-Products by Governmental and Commercial Sectors." This report indicates that one factor limiting the use of CCBs is "inefficient technology/information transfer." The EERC proposes to develop a workshop titled "Coal Combustion By-Product Utilization," for technology and information generated by the North Dakota Industrial Commission-funded project, Survey and Demonstration of Utilization Potential of North Dakota Lignite Ash Resources. The workshop will provide an overview of information on CCBs produced from North Dakota lignite and on suitable applications for these materials. The audience for this workshop is anticipated to be engineers who specify materials, end users, regulators, producers, and marketers. A small-scale field demonstration will be included to allow some firsthand experience for workshop attendees and to spark interaction between attendees and presenters. The 1½-day workshop will be held in Bismarck, North Dakota, October 7–8, 1996. A sourcebook of information on CCB utilization will be prepared as a handout for workshop attendees.

DEVELOPMENT OF A COAL COMBUSTION BY-PRODUCTS UTILIZATION WORKSHOP

1.0 PROJECT SUMMARY

Development of a workshop is proposed to transfer information reported by the Energy & Environmental Research Center (EERC) on a project funded by the North Dakota Industrial Commission (NDIC) to develop a workshop titled "Coal Combustion By-Product Utilization." The workshop will be designed to provide an overview of information on coal combustion by-products (CCBs) produced from North Dakota lignite (NDL) and on suitable applications for these materials. The audience for this workshop is anticipated to be primarily engineers who specify materials, end users, regulators, producers, and marketers. The workshop will include classroom instruction and a small-scale field demonstration to allow firsthand experience for workshop attendees and to spark interaction between attendees and presenters. The 1½-day workshop will be held in Bismarck, North Dakota, October 7–8, 1996. A sourcebook of information on CCB utilization will be prepared as a handout for workshop attendees.

2.0 BACKGROUND

In a recent report to NDIC, the EERC indicated that NDL combustion by-products are valuable resources that are currently underutilized in North Dakota and the surrounding region (1). Currently in North Dakota, it is estimated that less than 5% of the coal combustion fly ash and bottom ash produced is utilized (2). Many of these materials are excellent engineering and construction materials, and utilizing them in public works may also result in reduced costs for projects such as road building, mine filling, and other applications. Several road-building applications were demonstrated in the laboratory at the EERC and an evaluation of the environmental acceptability of these

materials was performed. The results indicate that these materials should be used, but a regional CCB production and utilization survey indicated that the potential of these materials has not been realized (3). In 1993, the U.S. Department of Energy (DOE) submitted a report to Congress titled "Barriers to the Increased Utilization of Coal Combustion/Desulfurization By-Products by Governmental and Commercial Sectors." In this report DOE indicated that one factor limiting the utilization of CCBs was "inefficient technology/information transfer." The proposed workshop will be designed to transfer technology and information that were generated by the NDIC-funded project titled "Survey and Demonstration of Utilization Potential of North Dakota Lignite Ash Resources."

The EERC has developed other workshops on CCBs and other topics related primarily to energy production issues with excellent success. Technical research staff will work closely with support staff in developing the promotional and technical information for this workshop. Industrial sponsors of the Coal Ash Resources Research Consortium (CARRC), a key CCB utilization research program at the EERC, have expressed support for the development of this workshop for information transfer.

3.0 PROJECT DESCRIPTION

3.1 Introduction

The information generated in the project on the survey and demonstration of the utilization potential of NDL ash resources will be most valuable if potential and current specifiers and end users of CCBs can be made aware of it. Since the DOE indicated that one factor limiting the utilization of CCBs is inefficient technology and information transfer, EERC research staff surveyed participants of the first project to determine whether a workshop or short course would

be beneficial in reporting the information developed to key groups in the commercial and governmental sector. Industrial project participants supported the concept of a workshop focused on end users, specifiers, regulators, and other groups as a means of information transfer. A workshop format, including a small-scale field demonstration, classroom instruction, and invited speakers is proposed to provide the best combination of activities that will prompt participants to gain a level of comfort with these materials in commercial practice.

3.2 Goals and Objectives

The goal of the proposed work is to develop a workshop on CCB utilization designed to advance CCB use in North Dakota through education of potential specifiers, end users, and other key groups in the CCB industry. Supporting objectives of this program are 1) to prepare technical presentations for the classroom portion of the workshop; 2) to identify and coordinate a demonstration of one or more CCB utilization applications; 3) to prepare a sourcebook of information on CCB utilization.

3.3 Methodology

In order to achieve the goals and objectives for this project, the following tasks will be performed:

Task 1 – Development of Promotional and Background Information

The EERC will develop an agenda, arrange for workshop facilities, identify the application and location of the demonstration, and assemble technical information for the workshop. A mailing list for potential attendees will be developed, and promotional brochures will be prepared and mailed.

Task 2 – Development of the Classroom Materials

The EERC will develop an agenda for the overall workshop. EERC research staff will identify and invite expert speakers and will develop presentations based on the information from the previous NDIC project. A sourcebook of information on CCB utilization will be developed including information from the NDIC survey project, other key EERC CCB projects, other applicable research and demonstration information, and information on standards and specifications.

Task 3 – Development of the Demonstration

EERC research staff will coordinate with a local contractor to identify a site for a key utilization application to be demonstrated. Mix designs and key handling data will be developed and a demonstration summary will be prepared for inclusion in the sourcebook.

Task 4 – Reporting

A summary report and all workshop documentation, including the sourcebook, will be submitted to the NDIC project manager following the workshop.

4.0 STANDARDS OF SUCCESS

The standards of success for this project include 1) development of a sourcebook for CCB utilization; 2) identification and performance of a demonstration of a CCB utilization applications; and 3) preparation and presentation of technical information for the classroom portion of the workshop. These standards will be addressed by providing all workshop materials to the NDIC and a summary report detailing governmental and industrial participation in the workshop.

5.0 QUALIFICATIONS

Project Manager

Ms. Debra Pflughoeft-Hassett, Research Manager

Principal Investigator

Mr. Bruce Dockter, Manager, Materials Properties Research Laboratories

Additional Research Staff

Mr. David Hassett, Senior Research Advisor

Mr. Kurt Eylands, Research Associate

Ms. Dee Kraft, Outreach Assistant

Resumes for key participants in this project are included in Appendix A.

6.0 VALUE TO NORTH DAKOTA

The primary benefit to North Dakota is the economic benefit that can be realized by utilities when the disposal of a high-volume by-product can be minimized. The proposed workshop will provide information to the government and commercial groups that will specify and utilize these materials, leading toward less disposal and increased utilization of a valuable resource.

7.0 MANAGEMENT

The proposed project will be managed and coordinated by Ms. Debra Pflughoeft-Hassett. (See resume, Appendix A).

8.0 TIMETABLE

The timetable for the proposed project is as follows:

	Task Initiation	Task Completion
Task 1 - Develop Promotional and Background Information	June 1, 1996	August 1, 1996
Task 2 - Develop Classroom Materials	July 1, 1996	September 1, 1996
Task 3 - Develop Demonstration	August 1, 1996	October 8, 1996
Task 4 - Reporting		
Workshop		October 7-8, 1996
Report to NDIC		December 1, 1996

The scheduled date for this workshop is October 7-8, 1996. The preparation phase of the workshop will begin June 1, 1996. The workshop documentation and summary report will be submitted by December 1, 1996.

9.0 BUDGET

A budget detailing the costs for the proposed workshop is attached. The total project cost is estimated to be $30,250. Funds in the amount of $2000 have been obtained from the North Dakota Office of Intergovernmental Assistance. Additional industrial cash contributions totaling $6750 are expected. This includes registration fees of $100/person paid by attendees, with an anticipated 50 attendees, totaling $5000. Matching contributions of $9000 will be provided by DOE through a jointly sponsored research project. In-kind costs in the amount of $1500 will be provided by a local contractor for performance of the demonstration. Additional in-kind consts totaling $200 will be provided by Cooperative Power for documentation to be distributed at the workshop. An additional $800 in-kind contribution is also anticipated from another North Dakota

Utility to defray costs for an invited speaker. The EERC is requesting $10,000 from the NDIC to match these government and industrial contributions.

10.0 REFERENCES

1. Pflughoeft-Hassett, D.F.; Dockter, B.A.; Eylands, K.E.; and Hassett, D.J.; "Survey and Demonstration of Utilization Potential of North Dakota Lignite Ash Resources," EERC Report 96-EERC-04-01 to the Industrial Commission of North Dakota; April 1996.

2. Bryggman, T.; Nallick, J. "Use of Coal Combustion By-Products - Status and Opportunities in Region 8," Associated Western Universities Fellowship; U.S. Department of Energy, Region 8: Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming, 1993.

3. U.S. Department of Energy. "Barriers to the Increased Utilization of Coal Combustion/Desulfurization By-Products by Governmental and Commercial Sectors," Report to Congress; July 1994.

Development of a Coal Combustion By-Products Workshop
Period of Perfromance 6/1/96-11/30/96
01-May-96 EERC PROPOSAL #96-6630

LABOR	LABOR CATEGORY	HOURLY RATE	TOTAL PROJECT HOURS	TOTAL PROJECT $ COST	NDIC HOURS	NDIC $ COST	OTHER COMM. HOURS	OTHER COMM. $ COST	DOE-JSRP HOURS	DOE-JSRP $ COST	COMPLIMENTARY FUNDING OIA HOURS	COMPLIMENTARY FUNDING OIA $ COST	PROJECT TOTAL HOURS	PROJECT TOTAL $ COST
D. P-HASSETT	RES. SCIENTIST II	$21.82	60	$1,309	30	$655	8	$175	22	$479	0	$0	60	$1,309
B. DOCKTER	RES. SCIENTIST II	$19.21	80	$1,537	36	$692	10	$192	34	$653	0	$0	80	$1,537
K. EYLANDS	RES. SCIENTIST II	$19.77	48	$949	25	$494	6	$119	17	$336	0	$0	48	$949
D. HASSETT	RES. SCIENTIST III	$26.46	48	$1,270	25	$662	6	$159	17	$449	0	$0	48	$1,270
J. RISKE	EDITOR	$20.24	5	$101	2	$40	1	$20	2	$41	0	$0	5	$101
S. MORENO	OFFICE SERVICES	$7.75	8	$62	3	$23	1	$8	4	$31	0	$0	8	$62
D. KRAFT	OFFICE SERVICES	$9.02	120	$1,082	60	$541	16	$144	44	$397	0	$0	120	$1,082
			369	$6,310	181	$3,107	48	$817	140	$2,386	0	$0	369	$6,310
ESCALATION ABOVE CURRENT BASE			4%	$252	4%	$124	4%	$33	4%	$95	4%	$0	4%	$252
TOTAL DIRECT LABOR				$6,562		$3,231		$850		$2,481		$0		$6,562
FRINGE BENEFITS - % OF DIRECT LABOR														
PERMANENT		47%		$3,084		$1,519		$400		$1,165		$0		$3,084
TOTAL FRINGE BENEFITS				$3,084		$1,519		$400		$1,165		$0		$3,084
TOTAL LABOR				$9,646		$4,750		$1,250		$3,646		$0		$9,646
OTHER DIRECT COSTS:														
TRAVEL				$645		$275		$0		$370		$0		$645
GENERAL SUPPLIES AND EQUIPMENT <$750				$794		$250		$50		$494		$0		$794
OTHER:														
COMMUNICATIONS - Phones and Postage				$600		$200		$20		$360		$20		$600
PROJECT OFFICE SUPPLIES				$60		$10		$25		$15		$10		$60
DATA PROCESSING (computer software)				$25		$10		$0		$15		$0		$25
RENTS & LEASES				$65		$26		$5		$34		$0		$65
WORKSHOP				$4,325		$328		$2,458		$239		$1,300		$4,325
GENERAL (shipping)				$100		$30		$25		$45		$0		$100
FEES:														
GRAPHICS @ $35/HR			60	$2,100		$602		$550		$908		$40		$2,100
TECHNICAL TOUR				$50		$12		$0		$38		$0		$50
TOTAL OTHER				$7,325		$1,218		$3,083		$1,654		$1,370		$7,325
TOTAL OTHER DIRECT COST				$8,764		$1,743		$3,133		$2,518		$1,370		$8,764
TOTAL DIRECT COST				$18,410		$6,493		$4,383		$6,164		$1,370		$18,410
INDIRECT COST - % OF MTDC					54%	$3,507	54%	$2,367	46%	$2,836	46%	$630	VAR.	$9,340
TOTAL ESTIMATED COST						$10,000		$6,750		$9,000		$2,000		$27,750
IN-KIND: Cooperative Power						$0		$200		$0		$0		$200
Unspecified						$0		$2,300		$0		$0		$2,300
TOTAL IN-KIND						$0		$2,500		$0		$0		$2,500
TOTAL PROJECT COSTS						$10,000		$9,250		$9,000		$2,000		$30,250

SUMMARY OF TRAVEL

Rates Used to Calculate Estimated Travel Expenses

Destination	Airfare	Lodging	Per Diem	Ground Transptn.	Miles
Bismarck	$0	$38	$20	$0.32	$300

Destination	Number of Trips	Number of People	Number of Days	Airfare	Lodging	Per Diem	Ground Trans/Day	Misc.	Total
Bismarck	1	4	2	$0	$152	$136 *	$96	$20	$404
Bismarck	1	1	3	$0	$76	$54 *	$96	$15	$241
Total Estimated Travel									$645

* Lunch will be provided the day of the workshop.

BUDGET NOTES

ENERGY & ENVIRONMENTAL RESEARCH CENTER (EERC)

Background

The EERC is an independently organized multidisciplinary research center within the University of North Dakota. The EERC receives no appropriated funding from the state of North Dakota and is funded through federal and nonfederal grants, contracts, or other agreements. Although the EERC is not affiliated with any one academic department, university academic faculty may participate in a project based on the scope of work and expertise required to perform the project.

The proposed work will be done on a fixed-price basis. The budget for this proposal has been prepared based on a specific start date; this start date is indicated at the top of the EERC detail budget or identified in the body of the proposal. Please be aware that any delay in the start of this project may result in an increase in the budget.

Salaries and Fringe Benefits

As an interdisciplinary, multiprogram, and multiproject research center, the EERC employs an administrative staff to provide required services for various direct and indirect support functions. Direct project salaries are estimated based on the scope of work and prior experience on projects of similar scope. Technical and administrative salaries are charged based on direct hourly effort on the project. Costs for general support services, such as grants and contracts administration, accounting, personnel, purchasing and receiving, as well as clerical support of these functions, are included in the indirect cost of the EERC.

Fringe benefits are estimated based on historical data. The fringe benefits actually charged consist of two components. The first component covers average vacation, holiday, and sick leave (VSL) for the EERC. This component is approved by the UND cognizant audit agency and charged as a percentage of direct labor on permanent staff employees eligible for VSL benefits. The second component covers actual expenses for items such as health, life, and unemployment insurance; social security matching; worker's compensation; and UND retirement contributions.

Travel

Travel is estimated based on UND travel policies, which include estimated GSA daily meal rates. Travel includes scheduled meetings and conference participation as indicated in the scope of work.

Communications

Monthly telephone services and fax telephone lines are included in indirect cost. Direct project cost includes long-distance telephone including fax-related long-distance calls; postage for regular, air, and express mail; and other data or document transportation costs.

Project Office Supplies

General purpose office supplies (pencils, pens, paper clips, staples, Post-it notes, etc.) are provided through a central storeroom at no cost to individual projects. Budgeted project office supplies include items specifically related to the project: special research notebooks, binders, and other project organizational

materials; duplicating, printing, special covers or paper, and binding of reports; project data forms, transparencies or other presentation materials; literature searches and technical information procurement, including subscriptions; manuals, computer diskettes, memory chips, laser printer paper, and toner cartridges; and other miscellaneous supplies required to complete the project.

Data Processing

Data processing includes items such as computer use charges and computer software.

Supplies

Supplies in this category include scientific supply items such as chemicals, gases, and glassware supplies and/or nuts, bolts, and piping necessary for pilot plant operations.

Fees

Laboratory and analytical fees are established and approved at the beginning of each fiscal year and are charged based on a per sample or hourly charge depending on the analytical services performed.

Engineering support fees are based on an established per hour rate for drafting services related to the production of drawings as part of EERC's quality assurance/quality control program for complying with piping and pressure vessel codes.

Graphic services fees are based on an established per hour rate for overall graphics production such as report figures, poster sessions, standard word or table slides, simple maps, schematic slides, desktop publishing, photographs, and printing or copying.

Shop and operation fees are for expenses directly associated with the operation of the pilot plant facility. These fees cover such items as training, safety (protective eye glasses, boots, gloves), and physicals for pilot plant and shop personnel.

General

Membership fees (if included) are for memberships in technical areas directly related to work on this project. Technical journals and newsletters received as a result of a membership are used throughout development and execution of the project as well as by the research team directly involved in project activity.

General expenditures for workshops and conferences may include such items as food (some of which may exceed the institutional established limits), room amenities (e.g., place cards, music, banners, floral arrangements), speaker gifts, security, interpreters, technical tour transportation, and room and equipment rental necessary to conduct workshops and conferences.

Indirect Cost

The indirect cost rate included in this proposal is the rate which became effective July 1, 1995. Indirect cost is calculated on modified total direct costs (MTDC). MTDC is defined as total direct costs less individual items of equipment in excess of $750 and subcontracts/subgrants in excess of the first $25,000 of each award.