Land Application Uses for Dry FGD By-Products

**Quarterly Report
July 1 - October 1, 1995**

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Work Performed Under Contract No.: DE-FC21-91MC28060

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

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MASTER

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1.0 PROJECT STATUS

1.1 Finances

Ohio State University and USGS are discussing with OCDO the potential for follow-up funding to continue monitoring the Fleming site for an additional three years.

From invoices sent to Dravo as of September the comparison of OSU expenses to OSU budget is attached and shows a balance of \$332,580. Some expenses will be shifted among the tasks to eliminate deficits.

2.0 REPORTS AND MEETINGS

2.1 The Ohio Mineland Partnership meeting was held October 16 and 17. Ohio State University presented a poster on use of FGD for improving soil and spoil properties.

2.2 The Fleming AML site comprised one of the major field tour stops for the Ohio Mineland Partnership meeting on October 16. Approximately 70 people heard presentations related to the development of the Fleming AML project, the construction and instrumentation of research plots, application of amendments, pre-reclamation surface and ground water quality, and first year results of plant growth response and water quality at the site following reclamation. A one-page Fact Sheet was prepared for distribution during the tour and is attached. A separate presentation and tour was held for the public at which members of our adversary, Club 3000, attended. A good discussion session from questions followed.

2.3 Drs. Lal, Sutton and Dick (Ohio State University) presented a paper at the American Society of Agronomy meetings (St. Louis, MO) on October 31. The abstract was published in the meeting abstracts notes prior to the meeting. One significance of this paper is that there is data on the agronomic response to the OSU spray dryer ash containing calcium sulfite versus calcium sulfate. Elsewhere, some caution has been expressed that CaSO_3 can be toxic under some soil conditions i.e. very low pH. This aspect has not been presented by OSU until now. A paper is not yet available for distribution.

3.0 DEMONSTRATION SITE PROJECT

3.1 Project Analytical Review

OCDO has taken the initiative, created as a result of the Fleming AML tour and the agronomic plot tour (see section 3.3 below), to begin the process of working with ODNR and OEPA to create beneficial reuse standards for coal ash and clean

coal technology by-products. Workshops and other types of information exchange are being planned.

3.2 Fleming AML Site

See 2.2 above. The USGS reports for September and October are attached. - As of October, the report states 65% of their task is complete.

3.3 Agronomic Plots

A tour of the agronomic plots in Wooster on October 17 concluded the Ohio Mineland Partnership meeting and approximately 40 people were in attendance.

3.4 Highway Reconstruction / Feedlot Construction

The Route 83 reconstruction site was finally paved with bituminous asphalt in mid-October. The Tidd PFBC base course was good enough to allow unrestricted traffic all year. Other ODOT priorities necessitated this paving to be held off. A presentation was made on the Route 83 project by Renee Payette of ODOT, who also is a graduate student of Prof. Bill Wolfe, at the University of Kentucky Ash Utilization Symposium, October 25, 1995. A copy is attached.

Another paper by Bill Wolfe and his student Xiyu Chen was given at the same above symposium on freeze thaw resistance of stabilized Conesville wet FGD solids used in the OSU feedlot project contracted in September, 1993. This paper is attached.

- 3.5 Dravo Lime Company sponsored a video filming of some of the demonstration sites that will be edited for a piece on Discovery Channel and other potential showing or use by other sponsors. About 90 minutes of film was shot. Other "raw footage" previously taken during the construction phases is available but needs editing.

4.0 **CONTRACT PROBLEMS**

None

5.0 **WORK PLANS**

- 5.1 Monitor Fleming AML Site.
- 5.2 Complete Phase 2 report and begin Phase 3 report.
- 5.3 Obtain funding to continue monitoring Fleming AML site. See 1.1.
- 5.4 OSU's Rick Stehouwer is preparing a paper on Fleming AML for the American Society Surface Mining and Reclamation International meeting next May 19-26, 1996.

Phase 3
OSU Budget / Expense Comparison
as of September 30, 1995

	<u>Budget</u>	<u>To Date Expense</u>	<u>Balance</u>
Task 3.1.1.1 Fleming AML	\$467,672.00	\$355,370.49	\$112,301.51
Task 3.1.1.2 groundwater	365,683.00	146,395.27	219,287.73
Task 3.1.2 aglime	176,634.00	181,182.31	-4,548.31
Task 3.1.3 feedlot	91,274.00	88,047.97	3,226.03
Task 3.1.4 coal refuse	91,995.00	172,484.74	-80,489.74
Task 3.2.1 leachate/solubility	117,847.00	123,401.54	-5,554.54
Task 3.2.2 road embankment	143,320.00	138,646.24	4,673.76
Task 3.2.3 economics	204,932.00	148,048.04	56,883.96
Task 3.3 final report	26,854.00	54.43	26,799.57
Total	\$1,686,211.00	\$1,353,631.03	\$332,579.97

OCDO MONTHLY PROJECT STATUS REPORT
LAND APPLICATION USES OF DRY FGD BY-PRODUCTS

OCDO GRANT AGREEMENT NO: CDO/D-89-35

STATUS REPORT

REPORTING PERIOD - AUGUST 1995

cc: H. Johnson - OCDO
J. Bird - OCDO
R. Forsythe - DLC
M. Babu - DLC
W. Dick - OSU
Steering Committee

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ACQUISITION SERVICES
95 DEC 15 AM 9:00

Joel H. Beeghly (412) 777-0711
Warren A. Dick (216) 263-3877

1.0 PROJECT STATUS

1.1 Finances

Projections of funds that potentially will remain after December 31, 1995 are currently being made. These funds would be used to continue monitoring of the Fleming AML site.

2.0 REPORTS AND MEETINGS

2.1 Joel Beeghly is supplying project information and photos to DOE for a presentation.

2.2 We are still working to obtain comments on the Phase 2 report prior to making the final revision.

3.0 DEMONSTRATION SITE PROJECT

3.1 Project Analytical Review

OSU (Wooster) has reviewed their log of samples collected and analyzed since the beginning of the project in 1990. Over 8,500 samples have been logged into the laboratories for ICP (i.e. metals analyses). the source of these samples is soil, FGD, water and plants. For each sample we measure the concentrations of 25 different elements. this is a total of more than 212,000 values related to metal analyses alone. A conservative estimate of an additional 40,000 to 50,000 values of pH, conductivity, lime test index, anions, ammonium, etc. have been measured on soil, FGD, water, and plant samples. Not included are the values measured by USGS, those prepared and analyzed in Columbus (i.e. not sent to Wooster for analyses) and engineering property measurements. this rough sketch or overview indicates the tremendous database that has been accumulated as a result of this project.

3.2 Fleming AML Site

Plans continue to be made for an Open House to take place at the Fleming site as part of the Ohio Mineland Partnership (OMP) annual meeting on October 16th and 17th. Two different tours will be presented. One will be in the morning as part of the OMP program and will require payment of a registration fee. The same tour will be repeated in the afternoon of October 16th and will be open to the public without a charge being imposed.

3.3 Agronomic Plots

A tour of the agronomic plots in Wooster is planned for the afternoon of October 17 and will be part of the OMP annual meeting.

4.0 **ECONOMIC PROGRESS**

- 4.1 Warren dick, Howard Johnson and the Ohio State University economics group met on August 30th to plan for the completion of the economics portion of the project. More precise data on potential sources and amounts of FGD, primarily wet FGD, will be obtained and models will be used to simulate potential impacts of various reuse strategies of these FGD materials.

5.0 **WORK PLANS**

- 5.1 Warren Dick is heading up an effort at Ohio State University to obtain an Ohio Board of Regents grant. Part of this grant will involve other educational institutions in the state of Ohio and will focus on continued development of beneficial uses of FGD and other industrial, agricultural and municipal by-products.
- 5.2 Prepare presentations for meetings to be held in Pittsburgh (September), Kentucky (October) and St. Louis (November).
- 5.3 Finalize Phase 2 report.
- 5.4 Project cash flow.
- 5.5 Fleming AML Open House.

OCDO MONTHLY PROJECT STATUS REPORT
LAND APPLICATION USES OF DRY FGD BY-PRODUCTS

OCDO GRANT AGREEMENT NO: CDO/D-89-35

STATUS REPORT

REPORTING PERIOD - JULY 1995

RECEIVED
ACQUISITION SERVICES
95 DEC 18 AM 10:15

cc: H. Johnson - OCDO
J. Bird - OCDO
R. Forsythe - DLC
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W. Dick - OSU
Steering Committee

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1.0 PROJECT STATUS

1.1 Finances

All tasks except the continued monitoring of the Fleming Site and writing of the Phase 3 and Final Report are on target to be completed at the end of 1995.

- 1.2 The May, 1995 OSU invoice (#73) was processed by DLC and submitted for payment to OCDO. The February and March OSU invoices were paid to OSU as was the first installment of a USGS - OSU Phase 2 invoice from May, 1993. The second installment of the USGS - OSU Phase 2 invoice and April, 1993 OSU invoice were scheduled for payment in early August.

- 1.3 OCDO stated that the 90% level of their contribution has been reached as of receiving our invoice #72 in July. According to the contract, they will make no further payments until the final report is received. This Phase 3 report is bound to be more than 6 months away. Work at the Fleming AML site will not be complete until late 1996. A meeting to discuss the remaining cash flow and availability is needed soon. This projection promised last month is not done yet.

2.0 REPORTS AND MEETINGS

- 2.1 Only a few comments have been received concerning the Phase 2 report. We will become more active in obtaining feedback before finalizing the report.
- 2.2 At least one report is being prepared for the American Society of Agronomy meetings in St. Louis in November 1995, and an abstract has been submitted for presentation consideration at the 1996 ASSMR meeting in Knoxville, Tennessee on the Fleming project.
- 2.3 Warren Dick presented a talk at a local Ruritans Club on beneficial reuses of FGD by-products and has been asked to speak at the Wooster Lions Club meeting in October on the same theme.
- 2.4 J. Bigham and R. Fowler submitted the final draft of a paper on mineralogy of Tidd PFBC by-products that has been hydrated and weathered for the Pittsburgh Coal Conference, September 12-15, 1995.

3.0 DEMONSTRATION SITE PROJECT

3.1 Fleming AML Site

All rainulator runs were completed and water and sediment samples collected. Harvest yields on the different watersheds were made prior to mowing of the plots.

Groundwater samples from each of the wells put into place by the USGS were obtained and submitted to OSU for analyses. The USGS report is attached.

3.2 Acid/Base Accounting of Various Active Mine Spoils or Coal Wash Refuse

Nothing new to report.

3.3 Agronomic Plots

Alfalfa growth and yields have been better this year than any other year. The quality of the alfalfa has been excellent. Early corn growth has also been excellent. The plots have served as a good tour of the benefits of FGD by-products for agriculture. Warren Dick has given several visitors a tour of these plots including candidates for the OARDC Directorship.

- 3.4 Randy Fowler has essentially completed his Ph.D. degree. He has completed studies of the expected long-term water quality when soil and spoil are amended with FGD. He has also conducted chemical speciation models to improve our understanding of the impact of FGD on soil, water and plant quality.

4.0 **ECONOMIC PROGRESS**

- 4.1 A meeting has been planned, to discuss the economics portion of the project, for the end of August. The topics to be considered at this meeting are potential end-of-project problems and opportunities. This meeting is also being held to ensure that all parts of the economic work are completed by the end of the year.

5.0 **ENGINEERING PROGRESS**

Nothing new to report.

6.0 **WORK PLANS**

- 6.1 Finalize plans for the Ohio Mining Partnership field tour and public meeting at the Fleming AML site, scheduled for October 16-17, 1995.
- 6.2 Complete analyses of samples collected this summer from the Fleming site. This will consume a major part of the time for the next few months as we have collected hundreds of soil (spoil) and water samples.
- 6.3 Complete the experiment involving study of FGD benefits for neutralizing acid mine spoil or coal refuse.
- 6.4 Make cash flow projection for monitoring Fleming AML.

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