

DOE/PC/79997--T9

PROJECT STATUS REPORT

January 19, 1990

Period Covered 10/9/89-1/8/90

CONTRACT TITLE: Establishment and Maintenance of a Coal Sample Bank and Data Base

CONTRACT NUMBER: DE-RP22-87PC79997

DOE/PC/79997--T9

CONTRACTOR NAME: The Pennsylvania State University
517 Deike Building
University Park, PA 16802

DE92 015526

CONTRACT PERIOD: April 1988 to April 1991

1. Contract Objective: No change
2. Technical Approach Changes: None

W. McKinstry and M. Farcasiu of the Department of Energy visited Penn State on 11/17/89 to discuss work done under the contract. Methods of sample collection, storage and monitoring were discussed.

3. Contract Tasks:

Task 1-B: Storage of Coal Samples

Documentation of Sample Quality and Deterioration

Retrieval of 5-lb splits of -1/4 inch coal from designated 30-gallon drums was completed shortly after the beginning of the quarter. Preparation and analysis of these samples for the second yearly quality evaluation is still in progress at the end of the quarter.

Task 1-C: Collection of Samples, Sample Handling and Processing

After consultation with the DOE Project Manager, two replacement samples were collected. These are the first of the series which will be stored in foil laminate bags. DECS-1 (Department of Energy Coal Sample) was collected on December 11 from the Upper Wilcox Formation of Texas at the Big Brown mine; it will replace PSOC-1444. This seam has no accepted geological name. DECS-2 (Illinois #6 seam) was collected on December 13; it will replace PSOC-1493. We attempted to arrange for collection of this sample at the same mine (River King Underground #1) sampled by Argonne National Laboratory, but it was being permanently closed at the time of our trip. The sample was therefore collected at the River King #6 mine.

Both of these samples were placed in steel 30 gallon drums lined with polyethylene bags at the mine site. They were equipped with lid gaskets made from Tygon tubing, and 1/4" metal tubing fittings to purge and pressurize the drum with argon. One of these gaskets had been tested in

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the laboratory, where it had maintained positive gas pressure. However, none of the drums would maintain pressure during the sampling trip. To reduce the effect of leakage, the containers were purged with argon four times in the week between collection and processing. Solid rubber gaskets had been ordered but were not delivered in time for use on this trip. They are now in hand and will be used in the storage of future samples.

The samples were both crushed to minus 1/4 inch and sealed in large foil laminate bags. Part of each sample will be further processed to minus 20 mesh and sealed in small foil laminate bags.

The foil laminate (Tyvek/aluminum foil/polyethylene laminate) bags mentioned above were ordered and received during the quarter. One thousand 20 x 25 inch bags (30-lb capacity) and 2500 7½ x 9½ inch bags (0.7-lb capacity) were purchased. Along with one thousand 10 x 15 inch bags (5-lb capacity) already on hand, these bags will be used for long-term storage of all new DOE samples. A 24" wide bag sealer and an adjustable sealer stand were also purchased.

Investigations are being made into the possibility of housing DECS samples in a refrigerated storage facility at Penn State.

Task 1-D: Characterization of Coal Samples

Blocks of each sample had been collected from several levels in each seam. These blocks, along with splits of the minus 1/4 inch PSOC samples, were submitted for equilibrium moisture and total moisture analysis.

Task 1-E: Distribution of Samples to Users

During the current reporting period a total of 50 samples (38 DOE Sample Bank samples and 12 other Penn State samples) of various sizes were distributed. Twenty-nine of the samples were distributed to DOE or its contractors; 21 were distributed to other agencies.

The computerized coal sample container inventory system has been rewritten and expanded, and is now in operation on Penn State's IBM mainframe. The new program corrects several deficiencies of the previous program, includes information on distribution of individual containers (which can be summarized for reports), and allows more rapid searching, reporting, and data entry. The new program running on the mainframe performs most operations at least 100 times faster than the old system.

Task 2: Operation of the DOE Coal Data Base

- 1) During the current reporting period a total of 51 data printouts were distributed. In addition, six special data requests were fulfilled by either search/sort and printout or creation of a data disk, resulting in distribution of limited information on 385 samples. Several preliminary requests for Sample Bank and Data Base information and price quotations have also been handled.

The last six available copies of the 83-page booklet, "The Penn State Coal Sample Bank and Data Base" were distributed. A new edition including sections on new storage methods, selection of samples, and an updated sample list will be written and printed.

2) Agencies supplied with coal samples and/or data include:

Akita University (Japan)
Amoco Research Center
Buckeye Industrial Mining Co. (2)
Consortium for Fossil Fuel Liquefaction Science
Clark Atlanta University (2)
ENSR Consultants and Engineers
JK Research (2)
Jet Propulsion Laboratory
Michigan State University
Oak Ridge National Laboratory
Ohio University
Penn State University, Energy and Fuels Research Center
Penn State University, Fuel Science Dept. (2)
Penn State University, Geosciences Dept. (3)
Penn State University, Mineral Processing Dept.
Penn State University, Polymer Science Dept. (2)
Perfect View, Inc. (2)
Texaco Research Center
University of Kentucky, Dept. of Mechanical Engineering
U.S. Department of Energy, PETC
Viking Systems

The numbers in parentheses are multiple requests which were separately processed.

A paper titled "Operation and Composition of the Penn State Coal Sample Bank and Data Base" by David C. Glick and Alan Davis was presented at the Society for Organic Petrology annual meeting held at Urbana, Illinois on October 29-31, 1989.

Corrections and updates were made to the computer tape data set used for standard one- and five-page data printouts. This change also facilitates updating of the data set used for computer searches, and helps prepare for the revised edition of the "Penn State Coal Sample Bank and Data Base" booklet.

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8/20/92**

