DOE/PC/7
PROJECT STATUS REPORT

DOE/PC/79997--T11

July 11, 1990

DE92 015521

Period Covered 4/9/90-7/8/90

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

CONTRACT NUMBER: DE-RP22-87PC79997

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

CONTRACT PERIOD: April 1988 to April 1991

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

Task 1-B: Storage of Coal Samples

Analysis of Headspace Oxygen in Primary Container

Headspace oxygen contents of designated drums containing -1" coal were measured in May. The results are shown in Table 1.

Effect of Container Type on Coal Sample Deterioration

In the Project Status Report for 7/9/89 - 10/8/89, results of a comparative study of coal sample deterioration in several container types were presented. In April 1990, one year after the initial analyses, the set of analyses was repeated on the most important container types. The new results are included in Table 2.

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Table 1. Headspace Oxygen Content of Primary (30-gal, -1") Containers Designated for Oxygen Monitoring (May, 1990).

PSOC #	Seam Name	Rank	Designated Drum	Oxygen Date '90	% Head Oxygen
1107	King Cannel	subA	1 of 2 -1"	5/7	20.5
1442	Darco	ligA	1 of 3 -1"	5/7	14.9
1443	unnamed	ligA	2 of 4 -1"	5/7	14.1
1444	unnamed	ligA	1 of 3 -1"	5/7	10.8
1445	Blue #1	hvCb	1 of 3 -1"	5/7	13.2
1446	New Mexico #8	hvCb	1 of 3 -1"	5/7	14.2
1447	Red	hvCb	1 of 3 -1"	5/7	13.4
1448	York Canyon	hvAb	1 of 3 -1"	5/7	18.7
1451	Pittsburgh	hvAb	2 of 3 -1"	5/7	16.9
1461	Mammoth	an	1 of 3 -1"	5/7	20.0
1468	Buck Mountain	an	2 of 3 -1"	5/7	19.1
1469	Mary Lee	hvBb	1 of 3 -1"	5/7	16.7
1470	Pratt	hvBb	1 of 2 -1"	5/9	11.2
1471	Pee Wee	hvAb	2 of 3 -1"	5/9	18.0
1474	Splashdam	mvb	1 of 3 -1"	5/9	15.9
1475	Elkhorn #3	hvAb	1 of 4 -1"	5/9	15.6
1482	Hagel	ligA	3 of 3 -1"	5/9	5.9
1485	Rosebud	subB	1 of 3 -1"	5/9	5.2
1486	Big Dirty	subB	2 of 3 -1"	5/9	8.8
1487	Adaville #1	subA	3 of 4 -1"	5/9	5.0
1488	Dietz	subB	2 of 4 -1"	5/9	10.1
1489	Pust	ligA	3 of 4 -1"	5/9	13.2
1490	Brazil Block	hvCb	2 of 3 -1"	5/9	15.9
1491	Indiana #6	hvCb	2 of 3 -1"	5/9	5.6
1492	Illinois #5	hvCb	3 of 3 -1"	5/9	10.2
1493	Illinois #6	hvCb	3 of 4 -1"	5/9	10.8
1494	Kentucky #9	hvBb	2 of 3 -1"	5/9	6.2
1495	Bevier-Wheeler	hvCb	3 of 3 -1"	5/10	3.7
1496	Tebo	hvCb	2 of 3 -1"	5/10	12.5
1497	Illinois #2	hvCb	3 of 3 -1"	5/10	7.8
1498	Wadge	hvCb	2 of 3 -1"	5/10	8.4
1499	Colorado B	hvBb	1 of 4 -1"	5/10	12.9
1500	Basin B	mvb	3 of 4 -1"	5/10	18.5
1501	Juanita C	hvBb	1 of 3 -1"	5/10	10.5
1502	Hiawatha	hvCb	3 of 4 -1"	5/10	14.2
1503	Blind Canyon	hvCb	1 of 4 -1"	5/10	12.3
1504	U. Sunnyside	hvBb	2 of 4 -1"	5/10	17.7
1506	Banner	hvAb	2 of 3 -1"	5/10	18.4
1507	Beulah	ligA	2 of 3 -1"	5/10	3.4
1508	Pocahontas #3	lvb	5 of 6 -1/4"	5/10	20.7
1515	Pa. Anthracite C	sa	3 of 4 -1"	5/10	19.7
1516	L. Kittanning	lvb	3 of 4 -1"	5/10	19.6
1517	L. Kittanning	hvBb	2 of 3 -1"	5/10	13.4
1518	M. Kittanning	hvBb	1 of 3 -1"	5/10	16.6
1519	Pittsburgh	hvBb	2 of 3 -1"	5/10	19.0
1520	Smith-Roland	subC	2 of 5 -1"	5/10	12.7
1521	L. Hartshorne	lvb	2 of 3 -1"	5/10	18.4
1522	Sewell	mvb	1 of 3 -1"	5/10	19.6
1523	#5 Block	hvBb	2 of 3 -1"	5/10	18.9
1524	U. Kittanning	hvAb	2 of 3 -1"	5/10	18.2
1532	#4 Usibelli	subB	1 of 2 -1"	5/10	7.9
1533	#3 Usibelli	ligA	1 of 2 -1"	5/10	11.5
1534	Waterfall	subC	1 of 2 -1"	5/10	10.9
1535	Deadfall Syncline #4	subA	1 of 2 -1/4"	5/10	19.2

Table 2. Influence of Container Type on Coal Characteristics after Storage, PSOC-1536 (mbv, Lower Kittanning Seam), initially sealed in argon.

Storage Time	Mesh Size	Ash, dry %	Moisture %	Sulfur, % dry coal				% Oxygen in atmosphere		Alk. Extr. %	Gieseler Fluidity				
				Total	Pyr- itic	Org- anic	Sulf- ate	Sulf- % of Tot.	inner cont- bag ainer		Max. FI	T	T	T	Fluid Range
											ddpm	Init.	Max	F	Final
Foil laminate bags within polyethylene bucket with caulked lid, -1/4" coal															
original		21.37	1.34	5.88	4.54	1.28	0.06	1.0	-	100.0	1224	410	472	510	100
4 weeks	1/4"	21.30	1.30	5.50	4.64	0.82	0.04	0.7	0.28	99.9	1173	409	472	508	99
16 weeks	1/4"	21.00	1.41	5.42	5.06	0.34	0.01	0.2	0.17	97.8	1169	417	474	508	91
Foil laminate bags, -20 mesh coal															
original		21.37	1.34	5.88	4.54	1.28	0.06	1.0	-	100.0	1224	410	472	510	100
4 weeks	20M	20.50	1.43	5.31	4.45	0.79	0.06	1.1	0.29	100.0	968	417	472	508	92
16 weeks	20M	21.40	1.38	5.47	4.98	0.43	0.06	1.1	0.32	97.9	950	415	474	510	94
52 weeks	20M	21.22	1.29	5.69	4.35	1.31	0.04	0.7		65.4	1937	410	470	505	95
Steel can with inner polyethylene bag, -20 mesh coal															
original		21.37	1.34	5.88	4.54	1.28	0.06	1.0	-	100.0	1224	410	472	510	100
4 weeks	20M	21.20	1.03	5.23	4.36	0.80	0.07	1.3	1.20	99.2	816	412	470	508	96
16 weeks	20M	21.20	1.42	5.37	4.98	0.34	0.05	0.9	1.33	97.4	727	415	474	509	94
52 weeks	20M	21.35	1.63	5.71	4.23	1.19	0.20	3.5	0.60	94.9	205	417	471	500	83
Polyethylene bucket, -1/4" coal															
original		21.37	1.34	5.88	4.54	1.28	0.06	1.0	-	100.0	1224	410	472	510	100
4 weeks	1/4"	20.40	2.22	5.27	4.24	0.85	0.17	3.2	17.80	100.0	560	414	469	506	92
16 weeks	1/4"	20.50	2.13	5.23	4.37	0.39	0.47	9.0	16.20	97.4	1	458	466	480	22
52 weeks	1/4"	15.61	5.21	4.87	2.44	1.26	1.18	24.2	13.30	91	0				
Polyethylene bucket with caulked lid, -1/4" coal															
original		21.37	1.34	5.88	4.54	1.28	0.06	1.0	-	100.0	1224	410	472	510	100
20 weeks	1/4"	20.30	0.80	5.70	4.31	1.23	0.16	2.6	0.35	97.5	234	422	472	504	82
Exposed to atmosphere, -20 mesh coal															
original		21.37	1.34	5.88	4.54	1.28	0.06	1.0	-	100.0	1224	410	472	510	100
4 weeks	20M	22.60	0.54	5.34	4.25	1.06	0.03	0.6	(20.9)	99.6	568	414	472	504	89
16 weeks	20M	20.30	0.94	4.98	4.37	0.42	0.18	3.6	(20.9)	96.8	155	426	472	505	80
52 weeks	20M	21.89	0.66	5.99	4.18	1.43	0.39	6.5	(20.9)	94.2	2	447	466	489	42

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

Nine new samples were collected during a 21-day sampling trip though the Rocky Mountain and Northern Great Plains coal provinces in May and June. The samples are:

Sample No.	Seam	State	County	Rank	Sample Type
DECS-3	Dutch Creek (H)	CO	Pitkin	mvb	whole seam channel
DECS-4	Blue	NM	McKinley	hvCb	whole seam channel
DECS-5	Hiawatha	UT	Sevier	hvCb	working section channel
DECS-6	Blind Canyon	UT	Emery	hvCb	working section channel
DECS-7	Adaville #1	WY	Lincoln	subA	whole seam channel
DECS-8	Smith-Roland	WY	Campbell	subC	run-of-mine
DECS-9	Dietz	MT	Bighorn	subB	whole seam drill hole
DECS-10	Rosebud	MT	Rosebud	subB	whole seam channel
DECS-11	Beulah	ND	Mercer	lig	whole seam channel

These samples were placed in 30-gallon steel barrels with high-density lid gaskets and purged with argon at the mines.

Separate samples of blocks to be analyzed for moisture were collected when feasible.

At the end of the quarter, crushing (half to -1/4" and half to -20 mesh) has been completed on three samples, and work continues on the others. The remainder are stored in the original containers, with the argon being replenished as needed.

Task 1-E: Distribution of Samples to Users

During the period 4/9/90-7/8/90 a total of 25 samples (14 DOE Sample Bank samples and 11 other Penn State samples) of various sizes were distributed.

Task 2: Operation of the DOE Coal Data Base

- 1) During the current reporting period a total of 42 data printouts were distributed. In addition, 7 special data requests were fulfilled by either search/sort and printout or creation of a data disk, resulting in distribution of limited information on 2,083 samples. Several preliminary requests for Sample Bank and Data Base information and price quotations have also been handled.

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

Borden Chemical Co.
Brookhaven National Laboratory
CANMET Energy Mines & Resources (Canada)
Grambling State Univ., Chemistry Dept.
Indianapolis Power & Light
Institute of Gas Technology
Ohio State Univ., Chemistry Dept.
Penn State University, Fuel Science Dept. (2)
Penn State University, Geosciences Dept. (2)
Penn State University, Polymer Science Dept.
Rochester and Pittsburgh Coal Co.
University of California at Davis, Chemical Engineering Dept.
University of Utah, Fuels Engineering Dept.
University of Utah, Metallurgical Engineering Dept.
UNOCAL Science and Technology Division
U.S. Department of Energy, METC
West Virginia University, Physics Dept.

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

A paper titled "The Function and Operation of the Penn State Coal Sample Bank and Data Bases" by David C. Glick and Alan Davis was presented at the ASTM D05.29 Seminar on Certified Reference Materials, Calibration and Standardization held at Lexington, Kentucky on May 7, 1990.

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