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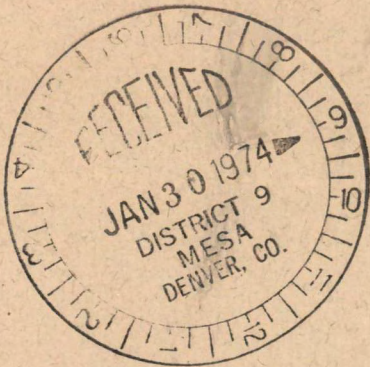
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**Analyses of Tipple and Delivered
Samples of Coal**

Collected During Fiscal Year 1973



UNITED STATES DEPARTMENT OF THE INTERIOR

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Report of Investigations 7848

**Analyses of Tipple and Delivered
Samples of Coal**

Collected During Fiscal Year 1973

By J. B. Janus and B. S. Shirley

Coal Sampling and Inspection, College Park, Md.



UNITED STATES DEPARTMENT OF THE INTERIOR
Rogers C. B. Morton, Secretary

BUREAU OF MINES
John D. Morgan, Jr., Acting Director

As the Nation's principal conservation agency, the Department of the Interior has basic responsibilities to protect and conserve our land and water, energy and minerals, fish and wildlife, and park and recreation areas, and for the wise use of all those resources. The Department also has a major responsibility for American Indian reservation communities and for the people who live in Island Territories under U.S. administration.

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ANALYSES OF TIPPLE AND DELIVERED SAMPLES OF COAL

Collected During Fiscal Year 1973

by

J. B. Janus¹ and B. S. Shirley²

ABSTRACT

In connection with the purchase of coal under specifications for Government use, the Bureau of Mines in this report has compiled data on 81 mines located in 15 States. This annual report lists analytical data on the composition and quality of tipple and delivered samples of coal collected during fiscal year 1973. Tipple samples were collected by Bureau of Mines engineers at tipples as coal was being loaded into railroad cars or trucks. Ultimate analyses are given for most of the coalbeds listed. The deliveries were sampled at destination in accordance with instructions issued by the Bureau of Mines. All samples were analyzed in the Bureau laboratory at Pittsburgh.

INTRODUCTION

The Bureau of Mines has long been active in promoting the purchase of coal for Government use under specifications that define the requirements in terms of heating value of the coal, expressed in British thermal units, and the composition as shown by proximate analyses. To these, when required, are added the ash-softening temperature, the free-swelling index, and the Hardgrove grindability index. Under most of these specification contracts, the bidders guarantee the quality of the coal, and that guaranteed by the successful bidder becomes the standard of his contract. The deliveries are sampled in accordance with instructions³ issued by the Bureau of Mines, and the samples are analyzed in the Bureau laboratory to determine whether the coal is of the quality guaranteed by the contractor; if it is not, a price adjustment is made.

The Government, with the exception of the Tennessee Valley Authority, purchased approximately 3.5 million tons of coal in fiscal year 1973. In connection with these purchases, the Bureau analyzed 2,757 samples. These are published (table 1) for the use of Government officials and the public. Such

¹Chief, Coal Sampling and Inspection.

²Secretary.

³Snyder, N. H. (rev. by S. J. Aresco). Coal Sampling (Revision of Technical Paper 133). BuMines Handbook, 1957, 16 pp.

analyses of delivered coal and tipple samples (samples collected at mine tipples as coal is being loaded into railroad cars or trucks) provide valuable data for use in evaluating future bids. In addition, the continuous sampling of coal as delivered is a check on the practical results obtained in burning the coal.

EXPLANATION OF TABLE OF ANALYSES

The analyses in table 1 are arranged alphabetically with respect to States, counties, towns, and mines, and are listed as follows:

1. Proximate analysis--moisture, volatile matter, fixed carbon, and ash.
2. Ultimate analysis--ash, sulfur, hydrogen, carbon, nitrogen, and oxygen.
3. Calorific value--the heat of combustion of a substance, expressed in British thermal units (Btu) per pound.
4. Softening temperature of ash, when such determinations were made. Numbers above 1 indicate the number of deliveries averaged.
5. Free-swelling index, when such tests were made. Numbers in parentheses indicate the number of determinations made.
6. Hardgrove grindability index, when such tests were made.
7. Numbers above 1 in column 18 indicate the number of deliveries averaged.

The analyses are given to the nearest 0.1 percent and the British thermal units to the nearest 10, although the laboratory determinations are recorded to the nearest 0.01 percent and nearest British thermal unit.

The tipple samples were taken by Bureau engineers at the mine tipple or breaker as the coal was loaded into railroad cars or trucks. These samples represent as nearly as possible the quality of the coal shipped. They are designated in column 5 as tipple; individual analyses are given for them.

The delivered samples were collected systematically throughout all deliveries by representatives of the Government Departments under directions supplied by the Bureau of Mines. Yearly average analyses are given for these samples.

FREE-SWELLING INDEX

The free-swelling index indicates fairly closely the coking characteristics of bituminous coal when burned in fuel beds.⁴

⁴Selvig, W. A., and W. H. Ode. An Investigation of a Laboratory Test for Determination of the Free-Swelling Index of Coal. BuMines RI 4238, 1948, 11 pp.

HARDGROVE GRINDABILITY INDEX

The grindability index indicates the relative grindability or ease of pulverizing coals in comparison with a coal chosen as having a grindability of 100.

EXPLANATION OF SYMBOLS USED IN TABLE OF ANALYSES

Kind of sample (column 5, table 1):	Preparation (column 6, table 1):
T--tipple or breaker sample.	W--washed.
D--delivered sample.	Q--partially washed.

ACKNOWLEDGMENTS

Samples were analyzed in the Coal Analysis Laboratory, Pittsburgh Energy Research Center, Bureau of Mines, Pittsburgh, Pa., under the supervision of Forrest E. Walker, chemist-in-charge.

Computerization of data was done by the Division of Automatic Data Processing, Denver, Colo.

ANALYSES OF TIPPLE AND DELIVERED SAMPLES

TABLE 1. - Analyses of tipples and delivered samples during the fiscal year 1973

County, town, and mine	Bed	Size of coal	Approximate tons sampled	Kind of sample	Preparation	Proximate, percent			Ultimate, percent						Calorific value, Btu		Ash-softening temperatures		Free-swelling index	Hardgrove grindability index	
						Moisture, as-received coal	Volatile matter	Fixed carbon	Dry coal						As received	Dry	Number of analyses	°F.			Number
									Ash	Sulfur	Hydrogen	Carbon	Nitrogen	Oxygen							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
ALABAMA																					
CULLMAN COUNTY																					
ARREMEN:																					
ARKADELPHIA.....	BLACK CREEK.....	RUN-OF-MINE.....	10,024	D		3.2	35.4	59.0	5.6	.9	-	-	-	-	13,740	14,190	11	2,560	1	4-1/2 (1)	-
DO.....	DO.....	1-1/4- BY 1/4-INCH.....	9,867	D		4.0	36.9	58.9	4.2	.7	-	-	-	-	13,810	14,390	13	-	-	5-1/2 (1)	-
WALKER COUNTY																					
SUNLIGHT:																					
SUNLIGHT.....	DO.....	DO.....	11,903	D	W	3.8	40.1	54.7	5.2	1.7	-	-	-	-	13,560	14,100	16	2,140	7	4-1/2 (3)	-
																					5 (2)
																					5-1/2 (1)
																					6-1/2 (1)
ALASKA																					
NENANA FIELD																					
HEALY FORK:																					
USIRELLI.....	VARIOUS.....	RUN-OF-MINE, CRUSHED.....	403,324	D		23.2	45.7	43.3	11.0	.2	-	-	-	-	8,690	11,310	426	-	-	-	-
COLORADO																					
FREMONT COUNTY																					
FLORENCE:																					
PIONEER CANON PREP. PLANT....	UNCORRELATED.....	1-1/4- BY 3/8-INCH.....	4,975	D	W	10.8	36.7	49.1	14.2	.5	-	-	-	-	10,310	11,560	14	-	-	-	-
ROUTT COUNTY																					
OAK CREEK:																					
EDNA.....	WADGE.....	1-1/4-INCH BY 0.....	7,432	D		9.9	40.9	48.4	10.7	.7	-	-	-	-	11,010	12,220	11	2,630	2	-	-
ILLINOIS																					
DOUGLAS COUNTY																					
MURDOCK:																					
MURDOCK.....	NO. 6.....	1-1/4-INCH BY 0.....	49,721	D	W	14.6	42.4	48.8	8.8	2.2	-	-	-	-	11,320	13,260	57	2,160	9	2-1/2 (1)	-
																					3 (1)
																					3-1/2 (5)
																					5 (1)
JEFFERSON COUNTY																					
WALTONVILLE:																					
ORIENT NO. 03.....	DO.....	1-1/2-INCH BY 28-MESH.....	2,604	D	W	10.8	36.8	52.1	11.1	1.2	-	-	-	-	11,420	12,800	9	2,490	2	3 (1)	-
																					4 (1)
KANKAKEE COUNTY																					
ESSEX:																					
NORTHERN ILLINOIS.....	VARIOUS.....	DO.....	13,570	D	W	13.9	44.0	47.8	8.2	3.1	-	-	-	-	11,300	13,130	14	2,010	4	2 (1)	-
																					2-1/2 (1)
																					3-1/2 (2)
KNOX COUNTY																					
VICTORIA:																					
MECCO.....	NO. 6.....	3/4-INCH BY 0.....	50,796	D	W	19.3	41.2	49.8	9.0	3.0	-	-	-	-	10,310	12,780	54	2,070	9	3 (1)	-
																					3-1/2 (5)
																					4-1/2 (3)
WILLIAMSON COUNTY																					
PITTSBURG:																					
ORIENT NO. 04.....	DO.....	3/4-INCH BY 28-MESH.....	915	D	W	7.6	37.4	53.7	8.9	1.9	-	-	-	-	12,230	13,240	1	-	-	-	-

TABLE 1. - Analyses of tippie and delivered samples during the fiscal year 1973 - Continued

County, town, and mine	Bed	Size of coal	Approximate tons sampled	Kind of sample	Preparation	Proximate, percent			Ultimate, percent						Colorific value, Btu			Ash-softening temperatures		Free swelling index	Hardgrove grindability index	
						Moisture, as-received coal	Volatile matter	Fixed carbon	Ash	Dry coal						As received	Dry	Number of analyses	°F			Number
										Sulfur	Hydrogen	Carbon	Nitrogen	Oxygen								
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
INDIANA																						
SPENCER COUNTY																						
CHRISNEY:																						
CHRISNEY STRIP.....	BUFFALOVILLE.....	1-1/2-INCH RY 10-MESH.....	9,698	D		10.8	45.3	44.8	9.9	5.9	-	-	-	-	11,600	13,010	14	2,050	6	2 (3) 2-1/2 (2) 3 (1)	-	
SULLIVAN COUNTY																						
DUGGER:																						
MINNEHAMA.....	VARIOUS.....	1- BY 1/4-INCH.....	20,848	D	W	12.9	42.1	47.7	10.2	2.3	-	-	-	-	11,310	12,990	27	2,320	6	3 (2) 3-1/2 (3) 4 (1)	-	
WARRICK COUNTY																						
LYNNVILLE:																						
LYNNVILLE.....	NO. VI.....	1-1/2-INCH RY 10-MESH.....	14,440	D	W	12.4	41.2	47.9	10.9	3.3	-	-	-	-	11,140	12,720	15	2,080	2	3 (1) 3-1/2 (1)	-	
KANSAS																						
CHEROKEE COUNTY																						
HALLOWELL:																						
P AND M NO. 19.....	VARIOUS.....	1-1/4-INCH RY 0.....	553	D	W	5.0	37.4	51.2	11.4	3.5	-	-	-	-	12,690	13,360	1	-	-	-	-	
KENTUCKY (EAST)																						
BELL COUNTY																						
FIELD:																						
ALAMO TIPPLE.....	VARIOUS.....	RUN-OF-MINE, CRUSHED.....	84,312	D		6.3	34.9	50.8	14.3	1.1	-	-	-	-	11,800	12,590	108	2,840	51	1 (6) 1-1/2 (2) 2 (5) 2-1/2 (11) 3 (3) 3-1/2 (10) 4 (9) 4-1/2 (4) 5 (1)	-	
KETTLE ISLAND:																						
ADVENTURE TIPPLE.....	DO.....	DO.....	3,542	D		8.2	32.4	45.9	21.7	1.7	-	-	-	-	10,250	11,170	8	2,510	4	1 (3) 1-1/2 (1)	-	
FLOYD COUNTY																						
MCDOWELL:																						
SIZEMORE TIPPLE.....	DO.....	3- BY 1-1/4-INCH.....	802	D	W	4.2	39.1	57.0	3.9	.8	-	-	-	-	13,790	14,390	4	2,460	1	4 (1)	-	
MARTIN:																						
SPURLOCK PREP. PLANT.....	ELKHORN NO. 2 AND HAZARD NO. 4	MODIFIED RUN-OF-MINE, CRUSHED TO 2-INCH (1-1/4- BY 3/8-INCH REMOVED)	500	T	W	5.9	39.1	55.5	5.4	.9	-	-	-	-	13,190	14,020	1	2,910+	1	-	-	
DO.....	DO.....	DO.....	747	D	W	4.8	40.3	54.5	5.2	1.0	-	-	-	-	13,430	14,110	1	-	-	-	-	
DO.....	DO.....	3- BY 2-INCH.....	15,198	D	W	3.6	40.4	54.8	4.8	.9	-	-	-	-	13,730	14,240	22	2,860	4	4 (1) 4-1/2 (1) 5 (1) 6 (1)	-	
DO.....	DO.....	1-1/4- BY 3/8-INCH.....	500	T	W	5.1	40.1	55.5	4.4	.9	5.4	79.7	1.6	8.0	13,510	14,240	1	2,910+	1	4 (1)	38	
HARLAN COUNTY																						
GRAYS KNOB:																						
GRAYS KNOB.....	VARIOUS.....	RUN-OF-MINE, CRUSHED.....	22,089	D	W	4.6	38.4	55.8	5.8	.8	-	-	-	-	13,390	14,040	24	2,800	8	4 (1) 4-1/2 (3) 5 (2) 5-1/2 (1) 6 (1)	-	

TABLE 1. - Analyses of tipple and delivered samples during the fiscal year 1973--Continued

County, town, and mine	Bed	Size of coal	Approximate tons sampled	Kind of sample	Preparation	Proximate, percent					Ultimate, percent					Colorific value, Btu		Number of analyses	Ash-softening temperatures		Free-swelling index	Handgrove grindability index
						Moisture, as-received coal	Dry coal				Sulfur	Hydrogen	Carbon	Nitrogen	Oxygen	As received	Dry		°F	Number		
							Volatiles matter	Fixed carbon	Ash													
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	

KENTUCKY--CONTINUED
(EAST)--CONTINUED

HARLAN COUNTY --CONTINUED																						
GRAYS KNOR: (CONTINUED)																						
GRAYS KNOR.....	VARIOUS.....	1-1/4- RY 1/4-INCH.....	14,550	D	W	5.3	38.5	55.3	6.2	1.0	-	-	-	-	13,240	13,980	16	2,810	4	4 (1)	-	
																			5	(2)		
																			6	(1)		
LETCHER COUNTY																						
CUMBERLAND (HARLAN COUNTY):																						
SCOTIA.....	IMRODEN.....	1-1/4-INCH RY 0.....	470	D	W	5.5	36.3	56.6	7.1	.9	-	-	-	-	13,280	14,050	1	-	-	-	-	
MCCREARY COUNTY																						
PINE KNOT:																						
RYANS CREEK TIPPLE.....	JELLICO.....	RUN-OF-MINE, CRUSHED.....	1,200	T		7.3	35.3	52.9	11.8	1.2	4.9	73.6	1.7	6.8	12,160	13,120	1	2,680	1	6-1/2(1)	45	
DO.....	DO.....	DO.....	5,483	D		5.4	35.3	53.0	11.7	1.2	-	-	-	-	12,420	13,130	7	2,630	6	5 (4)	-	
																					5-1/2(2)	
MARTIN COUNTY																						
DEVILLA:																						
PEVLER PREP. PLANT.....	VARIOUS.....	DO.....	1,760	T	W	6.5	38.2	53.6	8.2	.7	4.9	75.1	1.5	9.6	12,460	13,330	1	2,910+	1	2-1/2(1)	41	
DO.....	DO.....	DO.....	942	D	W	6.2	37.3	55.9	6.8	.7	-	-	-	-	12,830	13,680	1	2,910+	1	2-1/2(1)	-	
DO.....	DO.....	1-1/4- BY 1/4-INCH.....	3,523	D	W	5.7	38.7	55.0	6.3	.7	-	-	-	-	12,850	13,630	4	2,910+	2	2-1/2(1)	-	
																					4 (1)	
PERRY COUNTY																						
LEATHERWOOD:																						
LEATHERWOOD AUGER.....	LEATHERWOOD.....	RUN-OF-MINE, CRUSHED.....	22,255	D		7.0	37.5	53.5	9.0	.6	-	-	-	-	12,420	13,350	28	2,640	6	1-1/2(2)	-	
																					2 (1)	
																					3 (2)	
																					3-1/2(1)	
LEATHERWOOD NO. 01.....	DO.....	1-1/4- RY 1/4-INCH.....	17,656	D	W	3.4	39.8	55.2	5.0	.7	-	-	-	-	13,780	14,270	31	2,720	6	4 (2)	-	
																					4-1/2(2)	
DO.....	DO.....	1-1/4-INCH BY 0.....	4,051	D	W	4.8	38.8	55.3	5.9	.7	-	-	-	-	13,370	14,040	9	2,820	3	5 (2)	-	
																					3-1/2(1)	
																					4 (2)	
PIKE COUNTY																						
KIMPER:																						
GABRIEL TIPPLE.....	POND CREEK.....	RUN-OF-MINE, CRUSHED.....	1,617	D		3.9	32.9	56.2	10.9	.8	-	-	-	-	12,920	13,440	8	2,910+	8	7 (5)	-	
																					7-1/2(1)	
																					8 (1)	
VARNEY:																						
GUND PREP. PLANT.....	ELKHORN NO. 3.....	RUN-OF-MINE, CRUSHED (PLUS 1/4-INCH (W))	1,712	D	0	7.6	39.9	50.9	9.2	1.5	-	-	-	-	12,430	13,450	2	2,740	2	5-1/2(1)	-	
																					6 (1)	

KENTUCKY
(WEST)

HOPKINS COUNTY																						
MADISONVILLE:																						
FIES.....	NO. 11.....	7- RY 2-INCH.....	2,519	D	W	6.3	44.9	48.7	6.4	3.8	-	-	-	-	12,780	13,640	8	-	-	-	-	
MUHLENBERG COUNTY																						
GREENVILLE:																						
CANEY CREEK.....	DO.....	5- BY 2-INCH.....	1,402	D	W	8.0	42.9	49.7	7.4	2.9	-	-	-	-	12,260	13,330	4	-	-	-	-	
DO.....	DO.....	1-1/4- BY 1/4-INCH.....	20,810	D	W	9.3	42.3	50.4	7.3	2.9	-	-	-	-	12,060	13,300	28	2,140	7	2-1/2(1)	-	
																					3 (4)	
																					3-1/2(1)	
																					4 (1)	
MADISONVILLE (HOPKINS COUNTY):																						
VOGUE.....	DO.....	1-1/4-INCH RY 28-MESH.....	1,310	D	W	9.6	41.7	50.4	7.9	3.0	-	-	-	-	11,840	13,100	3	-	-	-	-	

TABLE 1. - Analyses of tipple and delivered samples during the fiscal year 1973--Continued

County, town, and mine	Bed	Size of coal	Approximate tons sampled	Kind of sample	Preparation	Proximate, percent					Ultimate, percent					Calorific value, Btu		Ash-softening temperatures		Free-swelling index	Hardgrove grindability index	
						Moisture, as-received coal	Dry coal				Sulfur	Hydrogen	Carbon	Nitrogen	Oxygen	As received	Dry	Number of analyses	°F			Number
							Volatile matter	Fixed carbon	Ash													
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
NORTH DAKOTA																						
WARD COUNTY																						
VELVA (MCCHERY COUNTY):																						
VELVA.....	UNCORRELATED.....	1-1/2- BY 1/4-INCH.....	43,079	D		37.6	43.1	48.0	8.9	.5	-	-	-	-	6,750	10,810	56	2,450	11	-	-	
OHIO																						
COSHOCKTON COUNTY																						
COSHOCKTON:																						
BROKEN RD.....	MIDDLE KITTANNING (NO. 6)	1-1/4- BY 1/4-INCH.....	4,165	D	W	6.2	47.6	46.6	5.8	4.0	-	-	-	-	12,790	13,640	15	2,040	5	3 (2) 3-1/2 (2) 4-1/2 (1)	-	
DO.....	DO.....	1-1/4-INCH BY 28-MESH.....	20,899	D	W	6.1	45.7	47.0	7.3	4.0	-	-	-	-	12,470	13,280	22	2,000	4	2 (1) 3 (1) 3-1/2 (2)	-	
PERRY COUNTY																						
CORNING:																						
CONGO.....	DO.....	RUN-OF-MINE, CRUSHED.....	1,000	T		8.8	36.9	46.3	16.8	.9	4.5	66.6	1.5	9.7	10,810	11,850	1	2,790	1	2 (1)	43	
NEW LEXINGTON:																						
SUNNYHILL PREP. PLANT.....	DO.....	1-1/4-INCH BY 0.....	36,525	D	W	8.0	41.3	45.9	12.8	2.7	-	-	-	-	11,440	12,440	39	2,360	9	3 (3) 3-1/2 (4) 4 (1) 4-1/2 (1)	-	
PENNSYLVANIA (ANTHRACITE)																						
LACKAWANNA COUNTY																						
OLYPHANT:																						
OLYPHANT.....	VARIOUS.....	BUCKWHEAT NO. 1.....	60	T	W	6.7	8.2	78.1	13.7	.9	-	-	-	-	11,830	12,680	1	2,910+	1	-	-	
DO.....	DO.....	RICE.....	50	T	W	5.6	7.9	79.7	12.4	.9	-	-	-	-	12,150	12,870	1	2,910+	1	-	-	
DO.....	DO.....	HARLEY.....	50	T	W	7.8	8.0	80.2	11.8	.9	-	-	-	-	11,970	12,980	1	2,910+	1	-	-	
DO.....	DO.....	BUCKWHEAT NOS. 4 AND 5.....	50	T	W	5.6	8.1	75.8	16.1	.9	-	-	-	-	11,550	12,240	1	2,910+	1	-	-	
TAYLOR:																						
TAYLOR.....	DO.....	PEA.....	1,722	D	W	4.5	6.4	81.3	12.3	.6	-	-	-	-	12,620	13,210	7	2,910+	3	-	-	
DO.....	DO.....	HARLEY.....	3,109	D	W	8.5	7.1	78.4	14.5	.6	-	-	-	-	11,680	12,760	6	2,910+	6	-	-	
LUZERNE COUNTY																						
ASHLEY:																						
HUBER.....	DO.....	DO.....	1,159	D	W	7.9	6.1	83.1	10.8	.7	-	-	-	-	12,180	13,220	9	2,910+	3	-	-	
ECKLEY:																						
HUCKLEY.....	DO.....	DO.....	11,618	D	W	9.5	4.8	83.5	11.7	.5	-	-	-	-	11,670	12,890	15	2,910+	15	-	-	
NORTHUMBERLAND COUNTY																						
ATLAS:																						
ATLAS.....	DO.....	DO.....	2,143	D	W	6.6	7.2	78.0	14.8	.6	-	-	-	-	11,660	12,480	13	2,910+	13	-	-	
SHAMOKIN:																						
GLEN BURN.....	DO.....	DO.....	8,998	D	W	7.1	7.2	80.6	12.2	.7	-	-	-	-	12,160	13,090	10	-	-	-	-	
SCHUYLKILL COUNTY																						
DUNCOTT:																						
NEW ST. NICHOLAS.....	DO.....	BUCKWHEAT NO. 1.....	2,922	D	W	4.3	5.1	85.5	9.4	.6	-	-	-	-	12,900	13,480	3	2,910+	2	-	-	
FORESTVILLE:																						
OLENICK.....	DO.....	PEA.....	60	T	W	6.5	5.1	83.0	11.9	.6	-	-	-	-	12,240	13,090	1	2,910+	1	-	-	
DO.....	DO.....	BUCKWHEAT NO. 1.....	60	T	W	9.2	5.4	79.7	14.9	.8	-	-	-	-	11,470	12,630	1	2,910+	1	-	-	
DO.....	DO.....	RICE.....	40	T	W	5.5	5.9	77.5	16.6	.7	-	-	-	-	11,630	12,310	1	2,910+	1	-	-	
DO.....	DO.....	HARLEY.....	60	T	W	2.5	5.6	80.6	13.8	.7	-	-	-	-	12,470	12,790	1	2,910+	1	-	-	
MAHANOH CITY:																						
HASCHAK.....	DO.....	BUCKWHEAT NO. 1.....	1,906	D	W	5.6	4.6	84.1	11.3	.6	-	-	-	-	12,330	13,060	2	2,910+	2	-	-	
SKYTOP.....	DO.....	HARLEY.....	2,785	D	W	9.5	5.3	78.9	15.8	.5	-	-	-	-	11,010	12,170	4	2,910+	4	-	-	
MINTERSVILLE:																						
DIRENZO.....	DO.....	DO.....	1,020	D	W	4.9	6.7	76.9	16.4	.6	-	-	-	-	11,750	12,360	5	2,910+	5	-	-	

TABLE 1. - Analyses of tippel and delivered samples during the fiscal year 1973-Continued

County, town, and mine	Bed	Size of coal	Approximate tons sampled	Kind of sample	Preparation	Proximate, percent					Ultimate, percent					Calorific value, Btu			Ash-softening temperatures		Free-swelling index	Hardgrove grindability index
						Moisture, as-received coal	Volatile matter	Fixed carbon	Ash	Dry coal					As received	Dry	Number of analyses	°F	Number			
										Sulfur	Hydrogen	Carbon	Nitrogen	Oxygen								
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	

PENNSYLVANIA-CONTINUED
(ANTHRACITE)-CONTINUED

SCHUYLKILL COUNTY
--CONTINUED

NEW PHILADELPHIA:																					
SILVER CREEK.....	VARIOUS.....	PEA.....	45	T	W	10.4	4.7	84.6	10.7	.5	-	-	-	-	11,830	13,200	1	2,910+	1	-	-
DO.....	DO.....	RUCKWHEAT NO. 1.....	45	T	W	9.5	5.1	82.3	12.6	.5	-	-	-	-	11,620	12,840	1	2,900	1	-	-
DO.....	DO.....	RICE.....	45	T	W	5.8	6.1	81.1	12.8	.5	-	-	-	-	11,970	12,710	1	2,820	1	-	-
DO.....	DO.....	BARLEY.....	60	T	W	3.6	5.8	85.5	8.7	.5	-	-	-	-	12,900	13,380	1	2,750	1	-	-
PINE GROVE:																					
SCHNECK.....	DO.....	DO.....	5,021	D	W	5.7	6.8	75.9	17.3	.6	-	-	-	-	11,540	12,240	16	2,860	15	-	-
POTTSVILLE:																					
MARLIN.....	DO.....	DO.....	5,409	D	W	6.2	6.4	78.9	14.7	.5	-	-	-	-	11,650	12,420	8	2,910+	8	-	-
VALLEY VIEW:																					
KOCHER.....	DO.....	PEA.....	1,078	D	W	3.3	7.3	83.1	9.6	.8	-	-	-	-	13,290	13,740	4	2,630	2	-	-
ZERBE:																					
SWATARA:																					
DO.....	DO.....	STOVE.....	60	T	W	6.3	6.0	84.2	9.8	.6	-	-	-	-	12,660	13,510	1	2,910+	1	-	-
DO.....	DO.....	CHESTNUT.....	60	T	W	7.1	5.9	84.3	9.8	.6	-	-	-	-	12,470	13,420	1	2,910+	1	-	-
DO.....	DO.....	PEA.....	40	T	W	8.9	6.0	84.0	10.0	.7	-	-	-	-	12,160	13,350	1	2,910+	1	-	-
DO.....	DO.....	RUCKWHEAT NO. 1.....	40	T	W	9.3	6.5	83.2	10.3	.7	-	-	-	-	12,150	13,400	1	2,910+	1	-	-
DO.....	DO.....	DO.....	10,162	D	W	6.4	7.0	79.3	13.7	.6	-	-	-	-	11,820	12,630	13	2,830	5	-	-
DO.....	DO.....	RICE.....	32	T	W	2.7	7.0	81.1	11.9	.7	-	-	-	-	12,710	13,060	1	2,910+	1	-	-
DO.....	DO.....	DO.....	346	D	W	6.5	6.8	78.2	15.0	.5	-	-	-	-	11,590	12,400	2	2,890	1	-	-
DO.....	DO.....	BARLEY.....	60	T	W	2.9	6.8	82.7	10.5	.8	-	-	-	-	12,770	13,150	1	2,910+	1	-	-
DO.....	DO.....	DO.....	8,175	D	W	7.1	7.2	74.8	18.0	.6	-	-	-	-	11,030	11,870	32	2,840	32	-	-

PENNSYLVANIA
(BITUMINOUS)

ARMSTRONG COUNTY																					
WYOMORE (WESTMORELAND COUNTY):																					
DAVID.....	THICK FREEPORT.....	1-1/4- BY 1/4-INCH.....	8,049	D	W	2.9	34.2	56.0	9.8	1.4	-	-	-	-	13,350	13,750	9	2,740	3	8 (1) 8-1/2 (1) 9 (1)	-
CLEARFIELD COUNTY																					
RIGLER:																					
WILMO NO. 01 PREP. PLANT.....	VARIOUS.....	1-1/4- BY 3/8-INCH.....	841	D	W	1.5	23.7	66.4	9.9	2.1	-	-	-	-	13,670	13,880	2	2,560	1	9 (1)	-

TENNESSEE

CAMPBELL COUNTY																					
HIGHCLIFF:																					
APPALACHIAN TIPPLE.....	JELTICO.....	RUN-OF-MINE, CRUSHED.....	400	T		4.9	36.5	56.0	7.5	1.0	5.0	77.2	1.7	7.6	13,090	13,710	1	2,750	1	4 (1)	43
SCOTT COUNTY																					
NORMA:																					
DEAN.....	RED ASH.....	RUN-OF-MINE, CRUSHED.....	16,590	D		5.0	36.6	53.9	9.5	1.2	-	-	-	-	12,830	13,500	21	2,570	21	4 (2) 4-1/2 (6) 5 (4) 5-1/2 (6) 6 (3)	-

UTAH

CARBON COUNTY																					
HELPER:																					
CARRON FUEL.....	CASTLE GATE H.....	1-5/8-INCH BY 0.....	11,429	D		5.7	43.5	46.8	9.7	.5	-	-	-	-	12,330	13,070	16	2,320	6	-	-
HIAWATHA:																					
KING.....	HIAWATHA.....	DO.....	8,768	D	W	6.1	45.1	48.3	6.6	.8	-	-	-	-	12,700	13,520	15	2,340	7	-	-
WATTIS:																					
STAR POINT NO. 01.....	DO.....	1-1/4- BY 1/4-INCH.....	120	T		4.4	42.6	45.8	11.6	.5	5.3	70.3	1.6	10.7	12,070	12,630	1	2,830	1	1-1/2 (1)	-

TABLE 1. - Analyses of tipple and delivered samples during the fiscal year 1973--Continued

County, town, and mine	Bed	Size of coal	Approximate tons sampled	Kind of sample	Preparation	Proximate, percent			Ultimate, percent						Calorific value, Btu		Ash-softening temperatures		Free-swell index	Hardgrove grindability index	
						Moisture as-received coal	Volatile matter	Fixed carbon	Dry coal						As received	Dry	Number of analyses	°F			Number
									Ash	Sulfur	Hydrogen	Carbon	Nitrogen	Oxygen							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
UTAH--CONTINUED																					
CARBON COUNTY --CONTINUED																					
WATTIS:																					
STAR POINT NO. 01	(CONTINUED) HIAWATHA	1-1/4- BY 1/4-INCH	12,740	D		5.5	41.7	45.5	12.8	.6	-	-	-	-	11,730	12,410	58	2,820	10	-	-
DO	(CONTINUED) DO	1-1/4-INCH BY 0	3,613	D		6.6	42.0	46.0	12.0	.7	-	-	-	-	11,630	12,450	45	2,710	7	-	-
VIRGINIA																					
DICKENSON COUNTY																					
HAYSI:																					
LITTLE BYRD TIPPLE	SPLASH DAM	RUN-OF-MINE+ CRUSHED	240	T		3.4	28.5	54.2	17.3	.8	4.5	71.3	1.3	4.8	12,300	12,730	1	2,580	1	8 (1)	61
DO	DO	DO	56,236	D		5.8	27.2	56.1	16.7	.8	-	-	-	-	11,900	12,630	69	2,560	25	2-1/2 (2)	-
																				3 (1)	-
																				3-1/2 (1)	-
																				6-1/2 (2)	-
																				7 (5)	-
																				7-1/2 (6)	-
																				8 (8)	-
																				8-1/2 (2)	-
RUSSELL COUNTY																					
DANTE:																					
MOSS NO. 03-A	THICK TILLER	DO	119,493	D	W	2.7	30.0	62.5	7.5	.6	-	-	-	-	13,960	14,350	134	2,310	15	6-1/2 (1)	-
																				7 (8)	-
																				7-1/2 (6)	-
WISE COUNTY																					
APPALACHIA:																					
CROSSBROOK NO. 08 (PRESCOTT)	IMRODEN	1-1/4-INCH BY 0	69,828	D		3.2	31.7	52.6	15.7	.8	-	-	-	-	12,400	12,810	78	2,780	30	7-1/2 (5)	-
																				8 (13)	-
																				8-1/2 (11)	-
																				9 (1)	-
DUNBAR:																					
DUNBAR TIPPLE	VARIOUS	RUN-OF-MINE+ CRUSHED	17,825	D		6.3	34.4	58.1	7.5	.7	-	-	-	-	13,000	13,870	24	2,480	18	2 (1)	-
																				4 (1)	-
																				4-1/2 (2)	-
																				6 (3)	-
																				6-1/2 (3)	-
																				7 (2)	-
																				7-1/2 (5)	-
																				8 (1)	-
NORTON:																					
CUMBERLAND TIPPLE	KELLY	DO	400	T		2.8	34.3	61.0	4.7	.7	-	-	-	-	14,160	14,570	1	2,910+	1	7 (1)	50
NORTON TIPPLE	VARIOUS	DO	24,265	D		4.6	32.3	54.0	13.7	1.6	-	-	-	-	12,410	13,010	27	2,630	9	2 (1)	-
																				4 (1)	-
																				6-1/2 (1)	-
																				7 (1)	-
																				8 (2)	-
																				8-1/2 (1)	-
																				9 (2)	-
PARDEE:																					
PARDEE	HIGH SPLINT	3- BY 2-INCH	17,065	D		2.9	36.9	58.7	4.4	.6	-	-	-	-	13,960	14,380	25	2,890	4	4-1/2 (1)	-
																				5-1/2 (3)	-
DO	DO	2-INCH BY 0	74,149	D		5.2	34.2	54.8	11.0	.7	-	-	-	-	12,520	13,210	80	2,910	13	1-1/2 (1)	-
																				2-1/2 (2)	-
																				3 (1)	-
																				3-1/2 (2)	-
																				4-1/2 (2)	-
																				5 (2)	-
																				5-1/2 (1)	-
																				6 (1)	-
																				6-1/2 (1)	-

TABLE 1. - Analyses of tippie and delivered samples during the fiscal year 1973--Continued

County, town, and mine	Bed	Size of coal	Approximate tons sampled	Kind of sample	Preparation	Proximate, percent					Ultimate, percent					Calorific value, Btu		Ash-softening temperatures		Free-swelling index	Hardgrove grindability index	
						Moisture as received coal	Volatile matter	Fixed carbon	Ash	Dry coal					As received	Dry	Number of analyses	°F	Number			
										Sulfur	Hydrogen	Carbon	Nitrogen	Oxygen								
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
VIRGINIA--CONTINUED																						
WISE COUNTY --CONTINUED																						
RODA:																						
RODA TIPPLE.....	PARDEE.....	RUN-OF-MINE+ CRUSHED.....	507	D		3.1	31.8	51.3	16.9	.7	-	-	-	-	12,190	12,580	1	2,680	1	8	(1) -	
WEST VIRGINIA																						
BARBOUR COUNTY																						
PHILIPPI:																						
BADGER PREP. PLANT.....	MIDDLE KITTANNING.....	1-1/4- BY 1/4-INCH.....	15,459	D	W	1.8	33.6	58.1	8.3	1.2	-	-	-	-	13,870	14,120	18	2,880	6	6-1/2(1)	-	
DO.....	DO.....	1-1/4-INCH BY 0.....	668	D	W	1.7	33.3	58.6	8.1	1.4	-	-	-	-	13,930	14,170	2	2,910+	1	7-1/2(2)	-	
DO.....	DO.....	1-1/4-INCH BY 0.....																		8	(1)	-
ROONE COUNTY																						
COZY:																						
POND FORK.....	VARIOUS.....	1-1/4- BY 1/4-INCH.....	5,231	D	W	3.2	37.5	57.0	5.5	.8	-	-	-	-	13,900	14,360	7	2,910+	1	7-1/2(1)	-	
KANAWHA COUNTY																						
QUICK:																						
BLUE CREEK PREP. PLANT.....	NO. 5 BLOCK.....	DO.....	586	D	W	2.7	36.9	51.5	11.6	1.1	-	-	-	-	12,790	13,140	2	2,910+	2	4-1/2(1)	-	
DO.....	DO.....	1-1/4-INCH BY 0.....	6,947	D	W	2.8	37.3	51.9	10.8	1.1	-	-	-	-	12,920	13,290	8	2,880	6	5 (1)	-	
DO.....	DO.....	1-1/4-INCH BY 0.....																		4	(1)	-
DO.....	DO.....	1-1/4-INCH BY 0.....																		5	(2)	-
DO.....	DO.....	1-1/4-INCH BY 0.....																		5	(1)	-
DO.....	DO.....	1-1/4-INCH BY 0.....																		6	(1)	-
HELL CREEK NO. 05.....	DO.....	1-5/8- BY 1/4-INCH.....	1,810	D	W	5.3	38.2	52.9	8.9	1.3	-	-	-	-	12,730	13,440	2	2,730	1	2-1/2(1)	-	
DO.....	DO.....	1-1/4- BY 3/8-INCH.....	3,826	D	W	3.4	37.1	53.0	9.9	1.0	-	-	-	-	12,990	13,450	6	2,910+	3	5 (1)	-	
DO.....	DO.....	1-1/4- BY 3/8-INCH.....																		6	(1)	-
DO.....	DO.....	1-1/4- BY 3/8-INCH.....																		6	(1)	-
LOGAN COUNTY																						
AMHERSTDALE:																						
AMHERST NO. 01 PREP. PLANT...	VARIOUS.....	DO.....	140	T	W	4.7	36.0	59.5	4.5	.7	5.2	82.3	1.5	5.8	13,970	14,660	1	2,910+	1	7-1/2(1)	49	
GUYAN NO. 01.....	DO.....	1-1/4-INCH BY 1/4-INCH.....	1,000	T	W	4.2	35.1	55.3	9.6	1.0	5.0	77.2	1.4	5.8	13,200	13,780	1	2,910+	1	7 (1)	42	
DO.....	CEDAR GROVE.....	1-1/4- BY 1/4-INCH.....	10,810	D	W	2.4	35.1	55.1	9.8	1.0	-	-	-	-	13,360	13,690	17	2,910+	7	7 (1)	-	
DO.....	DO.....	1-1/4- BY 1/4-INCH.....	2,693	D	W	3.9	33.7	57.2	9.1	.9	-	-	-	-	13,260	13,800	5	-	-	9 (1)	-	
DO.....	DO.....	1-1/2-INCH BY 28-MESH.....	14,627	D	W	4.3	34.8	55.3	9.9	.8	-	-	-	-	13,020	13,600	19	2,910+	5	6-1/2(1)	-	
DO.....	DO.....	1-1/2-INCH BY 28-MESH.....																		7	(3)	-
DO.....	DO.....	1-1/2-INCH BY 28-MESH.....																		8	(1)	-
EARLING:																						
ELKAY.....	DO.....	1-1/4- BY 1/4-INCH.....	371	D	W	1.6	36.3	57.8	5.9	1.3	-	-	-	-	14,020	14,250	1	-	-	-	-	
DO.....	DO.....	2-INCH BY 0 (2- BY 1/4-INCH (W))..	3,267	D	Q	2.3	37.9	55.4	6.7	1.3	-	-	-	-	13,900	14,230	5	2,730	3	7 (1)	-	
DO.....	DO.....	1-1/4-INCH BY 0 (1-1/4- BY 1/4-INCH (W))	66,744	D	Q	3.0	37.2	55.8	7.0	1.3	-	-	-	-	13,750	14,180	78	2,630	15	7-1/2(2)	-	
DO.....	DO.....	1-1/4-INCH BY 0 (1-1/4- BY 1/4-INCH (W))																		7	(4)	-
DO.....	DO.....	1-1/4-INCH BY 0 (1-1/4- BY 1/4-INCH (W))																		7	(6)	-
DO.....	DO.....	1-1/4-INCH BY 0 (1-1/4- BY 1/4-INCH (W))																		8	(4)	-
KELLY:																						
GUYAN NO. 05.....	DO.....	1-1/4- BY 1/4-INCH.....	2,170	D	W	2.3	35.4	56.0	8.6	.9	-	-	-	-	13,460	13,780	5	2,910+	1	7-1/2(1)	-	
DO.....	DO.....	1- BY 1/4-INCH.....	596	D	W	3.5	35.7	55.8	8.5	1.0	-	-	-	-	13,320	13,800	1	2,880	1	7-1/2(1)	-	
DO.....	DO.....	1-1/2-INCH BY 0.....	811	D	W	2.1	36.2	55.7	8.1	1.1	-	-	-	-	13,640	13,930	1	2,760	1	7-1/2(1)	-	
LORDO:																						
LORADO NO. 05 PREP. PLANT....	VARIOUS.....	1-1/4-INCH BY 0.....	13,373	D	W	4.2	35.3	57.2	7.5	.9	-	-	-	-	13,550	14,140	17	2,850	4	6-1/2(1)	-	
DO.....	DO.....	1-1/4-INCH BY 0.....																		7	(3)	-
MAN:																						
SNAP CREEK NO. 06.....	CEDAR GROVE.....	2-INCH BY 0 (2- BY 1/4-INCH (W))..	1,806	D	Q	2.1	37.3	55.2	7.5	1.6	-	-	-	-	13,800	14,100	3	-	-	-	-	
DO.....	DO.....	1-1/4-INCH BY 0 (1-1/4- BY 1/4-INCH (W))	17,322	D	Q	2.9	37.0	55.5	7.5	1.4	-	-	-	-	13,700	14,110	26	2,520	7	7 (1)	-	
DO.....	DO.....	1-1/4-INCH BY 0 (1-1/4- BY 1/4-INCH (W))																		7	(4)	-
DO.....	DO.....	1-1/4-INCH BY 0 (1-1/4- BY 1/4-INCH (W))																		8	(3)	-
SLAGLE:																						
MCSREGOR PREP. PLANT.....	CEDAR GROVE AND WINIFREDE	1-1/4- BY 3/8-INCH.....	1,800	T	W	3.4	36.8	57.0	6.2	.9	5.3	80.5	1.5	5.6	13,860	14,350	1	2,910+	1	7-1/2(1)	41	

TABLE 1. - Analyses of tippie and delivered samples during the fiscal year 1973-Continued

County, town, and mine	Bed	Size of coal	Approximate tons sampled	Kind of sample	Preparation	Proximate, percent						Ultimate, percent					Calorific value, Btu			Ash-softening temperatures		Free-swelling index	Hardgrove grindability index		
						Moisture, as-received coal	Volatile matter		Fixed carbon	Ash	Dry coal			Sulfur	Hydrogen	Carbon	Nitrogen	Oxygen	As received	Dry	Number of analyses			° F.	Number
							8	9			10	11	12												
WEST VIRGINIA-CONTINUED																									
LOGAN COUNTY --CONTINUED																									
STOWE:																									
GUYAN NO. 04	CEDAR GROVE	1-1/4- HY 1/4-INCH	2,841	D	W	2.7	34.8	55.5	9.7	.8	-	-	-	-	-	13,340	13,710	3	2,910+	2	7 (1)	-			
DO	DO	1- BY 1/4-INCH	334	D	W	4.8	34.8	55.5	9.7	.7	-	-	-	-	-	12,850	13,500	3	2,910+	2	2 (1)	-			
DO	DO	1-1/4-INCH BY 0	32,930	D	W	4.2	34.7	55.1	10.2	.8	-	-	-	-	-	12,960	13,530	41	2,910+	7	5 (2)	-			
DO	CEDAR GROVE AND WINIFREDE	1-1/4- HY 1/4-INCH	250	T	W	4.8	35.9	55.6	8.5	.8	5.1	78.4	1.4	5.8	13,160	13,820	1	2,910+	1	7-1/2 (1)	43				
NICHOLAS COUNTY																									
SUMMERSVILLE:																									
GAULEY EARLE NO. 04 PREP. PLANT	VARIOUS	RUN-OF-MINE, CRUSHED	1,865	D	W	3.5	35.9	57.3	6.8	.9	-	-	-	-	-	13,640	14,130	2	2,850	2	7-1/2 (2)	-			
DO	DO	MODIFIED RUN-OF-MINE, CRUSHED TO 1-1/4-INCH (PORTION OF 1-1/4- BY 3/8-INCH REMOVED)	2,000	T	W	3.3	36.1	55.8	8.1	1.1	-	-	-	-	-	13,510	13,970	1	2,910+	1	7-1/2 (1)	45			
DO	DO	1-1/4- HY 3/8-INCH	250	T	W	5.3	36.1	56.0	7.9	1.0	5.2	78.5	1.6	5.8	13,180	13,920	1	2,910+	1	7 (1)	-				
TIoga:																									
TIoga NO. 01	TIoga	1-1/2-INCH BY 0	1,661	D	W	2.6	36.3	53.6	10.1	.8	-	-	-	-	-	13,260	13,610	2	2,910+	2	6-1/2 (1)	-			
WAYNE COUNTY																									
CRUM:																									
MARK	ALMA	RUN-OF-MINE, CRUSHED TO 1-1/4-INCH (PLUS 1/4-INCH (W))	5,787	D	Q	4.4	38.3	55.5	6.2	.7	-	-	-	-	-	13,360	13,980	6	2,720	5	4 (3)	-			
DO	DO	1-1/4- BY 1/4-INCH	5,953	D	W	4.6	40.2	55.5	4.3	.7	-	-	-	-	-	13,660	14,320	7	2,830	2	5-1/2 (1)	-			
WYOMING COUNTY																									
ROLT (RALEIGH COUNTY):																									
ROLT NO. 40	VARIOUS	1-1/2-INCH BY 0	171,358	D	W	3.3	28.1	65.3	6.6	1.2	-	-	-	-	-	14,030	14,510	180	2,720	24	6 (1)	82			
COAL MOUNTAIN:																									
COAL MOUNTAIN NO. 12	DOROTHY	2- BY 1/4-INCH	16,765	D	W	3.6	34.3	58.0	7.7	.8	-	-	-	-	-	13,570	14,080	18	2,910+	5	7-1/2 (2)	-			
DO	DO	1-1/4- BY 1/4-INCH	8,356	D	W	2.7	34.4	58.2	7.4	.7	-	-	-	-	-	13,760	14,140	11	2,910+	5	8 (3)	-			
DO	DO	1-1/2-INCH BY 0 (1-1/2- BY 1/4-INCH (W))	975	D	Q	3.9	34.3	58.4	7.3	.7	-	-	-	-	-	13,520	14,070	1	2,910+	1	7-1/2 (1)	-			
DO	DO	1-1/4-INCH BY 0 (1-1/4- BY 1/4-INCH (W))	4,436	D	Q	2.8	34.5	57.0	8.5	.7	-	-	-	-	-	13,610	14,000	5	2,910+	5	7-1/2 (2)	-			
KOPPERSTON:																									
KOPPERSTON PREP. PLANT	VARIOUS	1-1/4-INCH BY 0	6,707	D	W	2.9	30.7	62.9	6.4	.6	-	-	-	-	-	14,100	14,520	8	2,910+	1	7 (1)	-			
WYOMING																									
SHERIDAN COUNTY																									
SHERIDAN:																									
HIS HORN	MONARCH	1-1/4- BY 1/4-INCH	6,320	D		20.9	43.4	49.2	7.4	.9	-	-	-	-	-	9,800	12,330	25	2,120	2	-	-			
DO	DO	1-1/2-INCH BY 0	4,495	D		21.9	41.9	51.5	6.6	.7	-	-	-	-	-	9,570	12,250	10	2,100	1	-	-			

APPENDIX

Previous publications in this series are--

- Snyder, N. H., and S. J. Aresco. Analyses of Tipple and Delivered Samples of Coal (Collected During the Fiscal Years 1948 to 1950, Inclusive). BuMines Bull. 516, 1953, 133 pp.
- Aresco, S. J., and C. P. Haller. Analyses of Tipple and Delivered Samples of Coal (Collected During the Fiscal Year 1951). BuMines RI 4934, 1953, 93 pp.
- _____. Analyses of Tipple and Delivered Samples of Coal (Collected During the Fiscal Year 1952). BuMines RI 4972, 1953, 84 pp.
- Aresco, S. J., C. P. Haller, and R. F. Abernethy. Analyses of Tipple and Delivered Samples of Coal (Collected During the Fiscal Year 1953). BuMines RI 5085, 1955, 82 pp.
- _____. Analyses of Tipple and Delivered Samples of Coal (Collected During the Fiscal Year 1954). BuMines RI 5221, 1956, 77 pp.
- _____. Analyses of Tipple and Delivered Samples of Coal (Collected During the Fiscal Year 1955). BuMines RI 5270, 1956, 67 pp.
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- _____. Analyses of Tipple and Delivered Samples of Coal (Collected During the Fiscal Year 1959). BuMines RI 5615, 1960, 59 pp.
- _____. Analyses of Tipple and Delivered Samples of Coal (Collected During the Fiscal Year 1960). BuMines RI 5792, 1961, 44 pp.
- _____. Analyses of Tipple and Delivered Samples of Coal (Collected During the Fiscal Year 1961). BuMines RI 6086, 1962, 41 pp.
- Aresco, S. J., J. B. Janus, and F. E. Walker. Analyses of Tipple and Delivered Samples of Coal (Collected During the Fiscal Year 1962). BuMines RI 6300, 1963, 46 pp.
- _____. Analyses of Tipple and Delivered Samples of Coal (Collected During the Fiscal Year 1963). BuMines RI 6461, 1964, 38 pp.
- _____. Analyses of Tipple and Delivered Samples of Coal (Collected During the Fiscal Year 1964). BuMines RI 6622, 1965, 38 pp.

- _____. Analyses of Tipple and Delivered Samples of Coal (Collected During the Fiscal Year 1965). BuMines RI 6792, 1966, 49 pp.
- Aresco, S. J., and J. B. Janus. Analyses of Tipple and Delivered Samples of Coal (Collected During Fiscal Year 1966). BuMines RI 6904, 1967, 43 pp.
- _____. Analyses of Tipple and Delivered Samples of Coal (Collected During Fiscal Year 1967). BuMines RI 7104, 1968, 43 pp.
- _____. Analyses of Tipple and Delivered Samples of Coal (Collected During Fiscal Year 1968). BuMines RI 7219, 1969, 31 pp.
- Staff, Coal Sampling and Inspection. Analyses of Tipple and Delivered Samples of Coal (Collected During Fiscal Year 1969). BuMines RI 7346, 1970, 29 pp.
- _____. Analyses of Tipple and Delivered Samples of Coal (Collected During Fiscal Year 1970). BuMines RI 7490, 1971, 20 pp.
- _____. Analyses of Tipple and Delivered Samples of Coal (Collected During Fiscal Year 1971). BuMines RI 7588, 1972, 20 pp.
- Janus, J. B., and B. S. Shirley. Analyses of Tipple and Delivered Samples of Coal (Collected During Fiscal Year 1972). BuMines RI 7712, 1973, 17 pp.

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