UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

ANALYSES OF LIGNITES AND ASSOCIATED ROCKS FROM THE FORT UNION REGION, NORTH DAKOTA AND MONTANA

by

S.J. Tewalt, R.T. Hildebrand, R.B. Finkelman

Open-File Report 89-285
1989

ABSTRACT

Chemical and geologic data are presented for 383 lignite and 22 rock samples collected from the Fort Union Region in North Dakota and Montana. Chemical data include sample locations, sampling methods, stratigraphic information, air-drying loss, proximate and ultimate analyses, heat content, forms of sulfur, ash deformation temperatures, free-swelling index, and major-, minor-, and trace-element concentrations. Within the region, moisture contents range from 20 to 57 and average 38.8 per cent. Mean ash yield is about 9 per cent but ranges from 4 to 31 per cent. Heat content averages 6290 Btu/lb (3497 Kcal/kg) over the region.

Concentrations of trace elements of environmental concern are generally low. Average concentrations of arsenic and uranium are less than 6 ppm. Mean values of selenium and cadium are less than 1 ppm. Sodium and barium are two elements that can occur in high concentrations (mean values of 2200 and 389 ppm, respectively) in these lignites.

INTRODUCTION

Regional Setting

The Fort Union Region is in the Northern Great Plains Coal Province and covers parts of four States and three Canadian Provinces. Coals in this region are lignite in rank and Paleocene in age. Comparative stratigraphy and nomenclature within the region are indicated in figure 1. In North Dakota, the Fort Union Formation is classified as a group by the North Dakota Geological Survey.

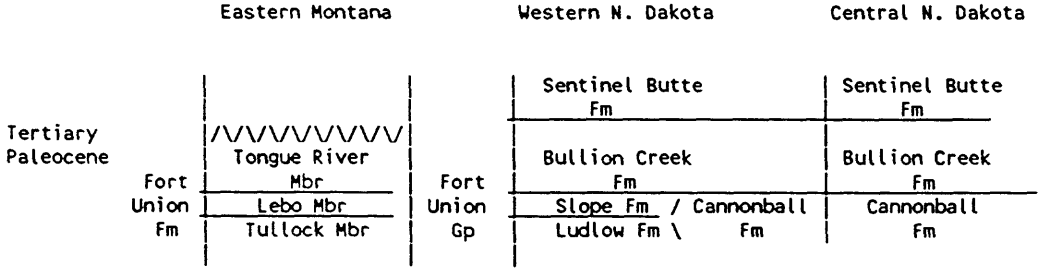

Figure 1. Comparative stratigraphy and nomenclature for the Fort Union Region (after Daly and others, 1985).

National Coal Resources Data System

The National Coal Resources Data System contains information on the stratigraphic occurrence and the chemical and physical characteristics of coals. The USCHEM database includes proximate and ultimate analyses, major-, minor-, and trace-element concentrations, forms-of-sulfur analyses, ash fusion temperatures, heat content, air-drying loss, and free swelling indices. Analyses of 383 lignite samples and 22 rock samples from North Dakota and Montana compose the available USCHEM database for the Fort Union Region. Collecting localities for these samples are shown in Figure 2.

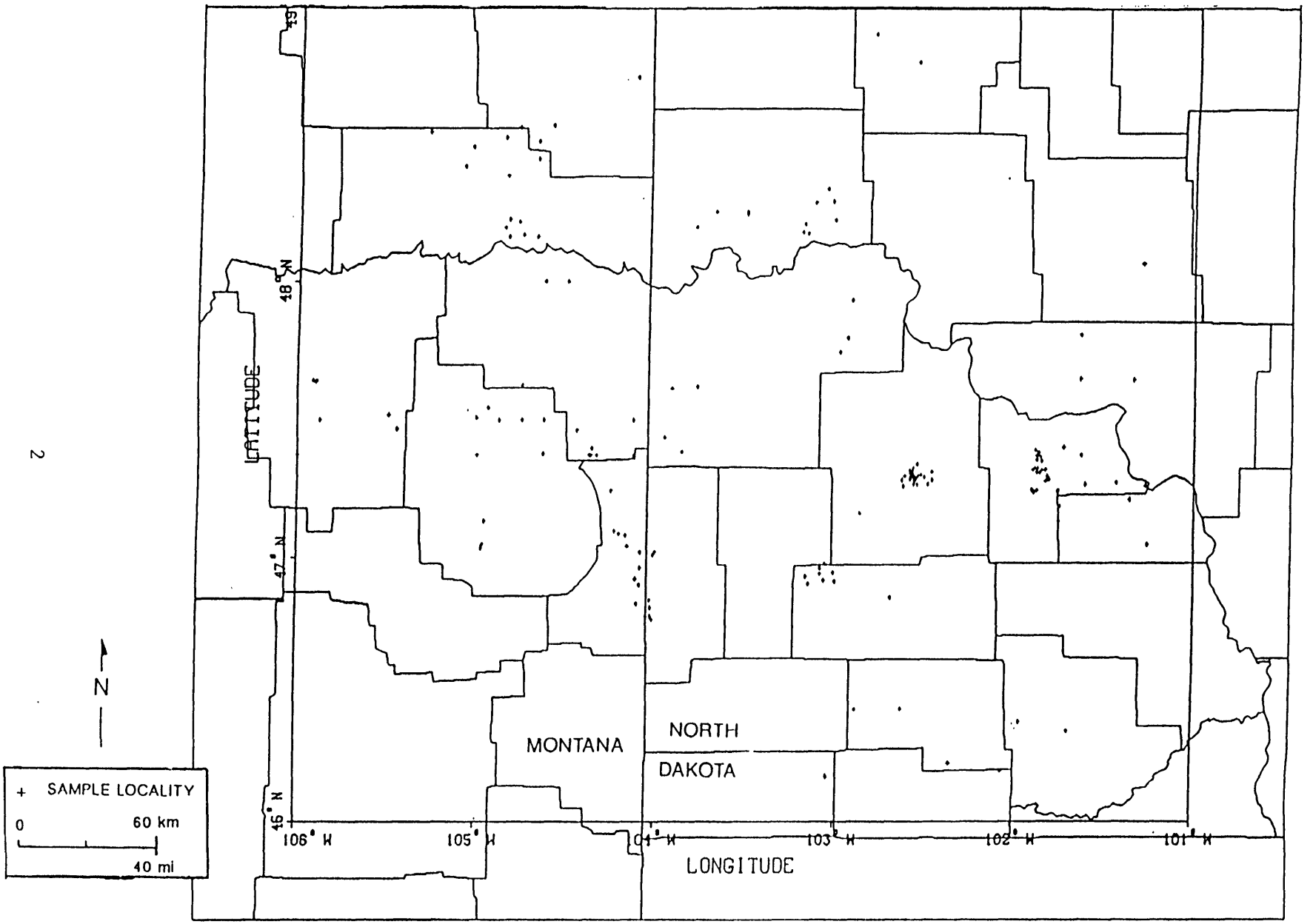

Figure 2. Collecting localities for USCHEM lignite samples in the Fort Union region-North Dakota and Montana.

SCOPE

The purpose of this report is to present available chemical data for lignites from the Fort Union region. No interpretations of the geological or technical significance of these data are attempted. Statistical summaries, contour mapping of some variables, and further discussion of the data will be presented in Tewalt and others, (in press).

Some data have been presented in other U.S. Geological Survey (USGS) open-file reports. These reports include: Swanson and others (1976,) USGS and others (1976,1977), Hatch and Affolter (1978), Affolter and Hatch (1980), and Affolter and Kirschbaum (1982).

METHODS

Most of the coal samples were collected and prepared according to procedures outlined in Swanson and Huffman (1976). Proximate and ultimate analyses have been done according to standard methods (ASTM, 1981) by several laboratories, including the U. S. Bureau of Mines, a commercial laboratory, and the Montana Bureau of Mines and Geology. Analyses performed at the U.S. Geological Survey use several analytical methods including wet chemical analysis, atomic absorption spectroscopy, X-ray fluorescence spectroscopy, and instrumental neutron activation analysis. Analytical methods have been modified through time, although the current analytical scheme is illustrated in Figure 3.

PRESENTATION OF DATA

Available data for lignites and non-coal material in the Fort Union Region are presented separately . Tables 1a through 1f contain the information for lignite samples. Location, geologic, and other sample information are presented in Tables 1a through 1c, respectively. Proximate and ultimate analyses, forms-of-sulfur, heat content, air-drying loss, free-swelling index, and ash fusion temperatures are in Table 1d. The U.S. Geological Survey makes no claims as to the accuracy of apparent rank calculated from parameters listed in Table 1d. Table 1e contains major oxides on an ash basis. Major-, minor-, and trace-element analyses on a whole-coal basis are presented in Table 1f.

Tables 2a through 2e present the data for non-coal samples; excluding, however, the table with ultimate and proximate analyses.

Tables 3 and 4 are statistical summaries of selected chemical parameters (from Tables 1d and 1f) for Fort Union lignites. Analytical results from partial bed samples were combined to one value by weight-averaging the data based on sample thicknesses listed in Table 1c. Therefore, statistics presented in Tables 3 and 4 represent the range in quality parameters for lignite beds, rather than individual samples.

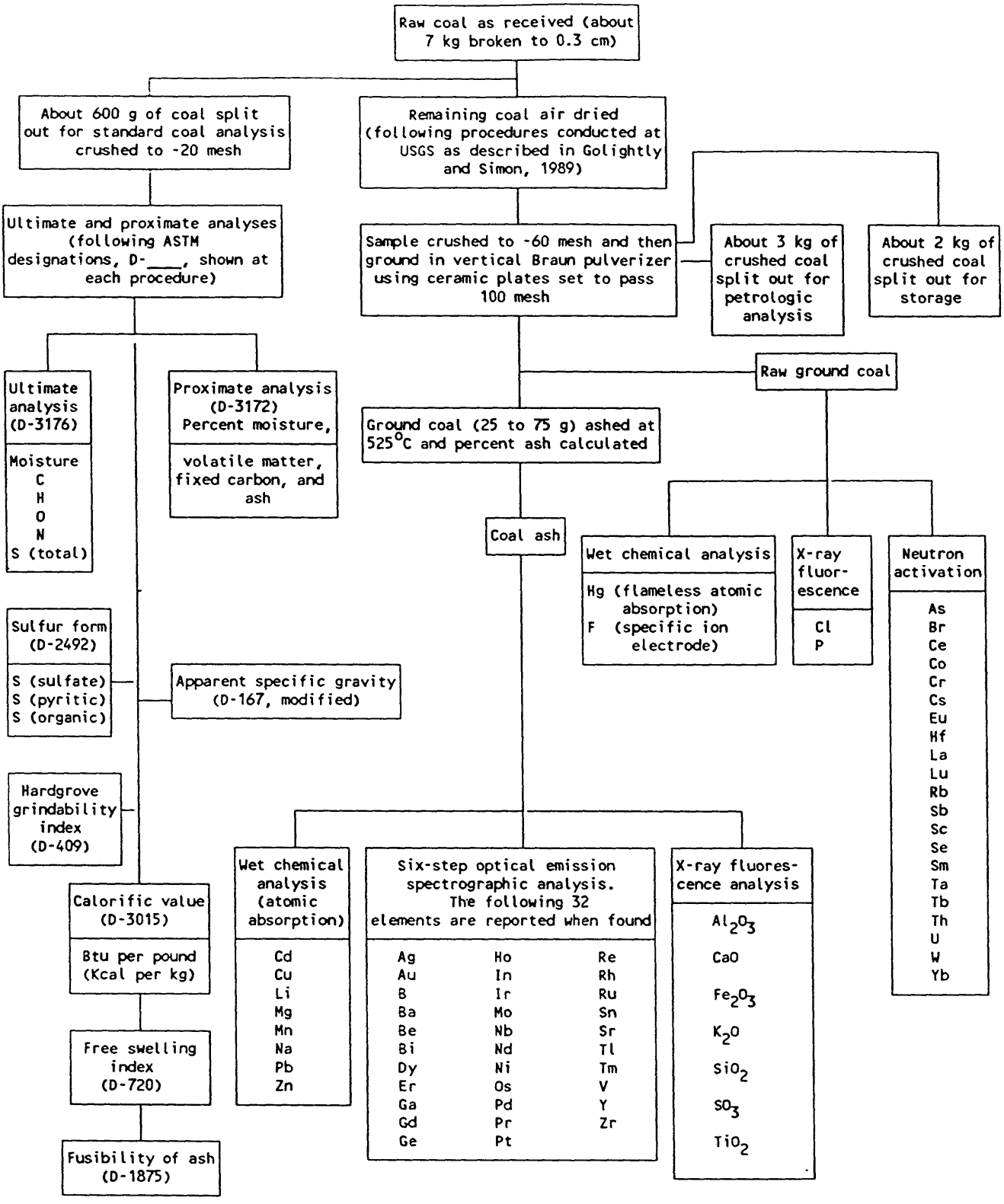

Figure 3. Flow diagram of procedures used for the analysis of coal samples. Methods standardized by American Society for Testing and Materials, ASTM.

Table 1a. Location information for 383 lignite samples from the Fort Union Region- North Dakota and Montana. NDE = no data entered.

SAMPLE NUMBER	STATE	COUNTY	QUADRANGLE	LATITUDE	LONGITUDE	LOCATION NAME
D165564	NORTH DAKOTA	MERCER	STANTON SE (7.5')	471600N	1011600W	GLENHAROLD MINE
D165565	NORTH DAKOTA	MERCER	STANTON SE (7.5')	471601N	1011600W	GLENHAROLD MINE
D165566	NORTH DAKOTA	MERCER	STANTON SE (7.5')	471602N	1011600W	GLENHAROLD MINE
D165567	NORTH DAKOTA	MERCER	STANTON SE (7.5')	471603N	1011600W	GLENHAROLD MINE
D165568	NORTH DAKOTA	OLIVER	CENTER (7.5')	470300N	1011510W	CENTER MINE
D165569	NORTH DAKOTA	OLIVER	CENTER (7.5')	470300N	1011510W	CENTER MINE
D165570	NORTH DAKOTA	OLIVER	CENTER (7.5')	470301N	1011510W	CENTER MINE
D165571	NORTH DAKOTA	OLIVER	CENTER (7.5')	470301N	1011510W	CENTER MINE
D165572	NORTH DAKOTA	MERCER	MEDICINE BUTTE NE (7.5')	470830N	1014501W	SOUTH BEULAH MINE
D165573	NORTH DAKOTA	MERCER	MEDICINE BUTTE NE (7.5')	470830N	1014502W	SOUTH BEULAH MINE
D165574	NORTH DAKOTA	MERCER	MEDICINE BUTTE NE (7.5')	470830N	1014503W	SOUTH BEULAH MINE
D165575	NORTH DAKOTA	MERCER	MEDICINE BUTTE NE (7.5')	470830N	1014504W	SOUTH BEULAH MINE
D165576	NORTH DAKOTA	MERCER	BEULAH (7.5')	471510N	1014510W	INDIAN HEAD MINE
D165577	NORTH DAKOTA	MERCER	BEULAH (7.5')	471510N	1014510W	INDIAN HEAD MINE
D165578	NORTH DAKOTA	MERCER	BEULAH (7.5')	471505N	1014510W	INDIAN HEAD MINE
D165579	NORTH DAKOTA	MERCER	BEULAH (7.5')	471505N	1014510W	INDIAN HEAD MINE
D165605	NORTH DAKOTA	WARD	VELVA (7.5')	475230N	1005730W	VELVA STRIP MINE
D165606	NORTH DAKOTA	WARD	VELVA (7.5')	475230N	1005730W	VELVA STRIP MINE
D165607	NORTH DAKOTA	WARD	VELVA (7.5')	475230N	1005730W	VELVA STRIP MINE
D165608	NORTH DAKOTA	WARD	VELVA (7.5')	475231N	1005731W	VELVA STRIP MINE
D165609	NORTH DAKOTA	WARD	VELVA (7.5')	475231N	1005731W	VELVA STRIP MINE
D165610	NORTH DAKOTA	WARD	VELVA (7.5')	475231N	1005731W	VELVA STRIP MINE
D165611	NORTH DAKOTA	WARD	VELVA (7.5')	475232N	1005732W	VELVA STRIP MINE
D165612	NORTH DAKOTA	WARD	VELVA (7.5')	475232N	1005732W	VELVA STRIP MINE
D165613	NORTH DAKOTA	WARD	VELVA (7.5')	475232N	1005732W	VELVA STRIP MINE
D165632	NORTH DAKOTA	BURKE	VELVA (7.5')	484500N	1025230W	NDE
D165974	NORTH DAKOTA	BOWMAN	SCRANTON NE (7.5')	461100N	1030200W	PEERLESS MINE
D165975	NORTH DAKOTA	BOWMAN	SCRANTON NE (7.5')	461101N	1030201W	PEERLESS MINE
D165976	NORTH DAKOTA	BOWMAN	SCRANTON NE (7.5')	461102N	1030201W	PEERLESS MINE
D165977	NORTH DAKOTA	BOWMAN	SCRANTON NE (7.5')	461100N	1030201W	PEERLESS MINE
D165978	NORTH DAKOTA	BOWMAN	SCRANTON NE (7.5')	461050N	1030202W	PEERLESS MINE
D165979	NORTH DAKOTA	BOWMAN	SCRANTON NE (7.5')	461051N	1030202W	PEERLESS MINE
D165980	NORTH DAKOTA	BOWMAN	SCRANTON NE (7.5')	461051N	1030201W	PEERLESS MINE
D165981	NORTH DAKOTA	BOWMAN	SCRANTON NE (7.5')	461051N	1030200W	PEERLESS MINE
D165982	NORTH DAKOTA	BOWMAN	SCRANTON NE (7.5')	461050N	1030203W	PEERLESS MINE
D165983	NORTH DAKOTA	BOWMAN	SCRANTON NE (7.5')	461050N	1030204W	PEERLESS MINE
D165984	NORTH DAKOTA	BOWMAN	SCRANTON NE (7.5')	461050N	1030205W	PEERLESS MINE
D165985	NORTH DAKOTA	BOWMAN	SCRANTON NE (7.5')	461049N	1030205W	PEERLESS MINE
D165986	NORTH DAKOTA	BOWMAN	SCRANTON NE (7.5')	461051N	1030205W	PEERLESS MINE
D165987	NORTH DAKOTA	BOWMAN	SCRANTON NE (7.5')	461051N	1030204W	PEERLESS MINE

Table 1a. (cont'd.) Location information for 383 lignite samples from the Fort Union Region- North Dakota and Montana.

SAMPLE NUMBER	STATE	COUNTY	QUADRANGLE	LATITUDE	LONGITUDE	LOCATION NAME
D165988	NORTH DAKOTA	BOWMAN	SCRANTON NE (7.5')	461103N	1030205W	PEERLESS MINE
D165989	NORTH DAKOTA	BOWMAN	SCRANTON NE (7.5')	461104N	1030205W	PEERLESS MINE
D165990	NORTH DAKOTA	BOWMAN	SCRANTON NE (7.5')	461100N	1030205W	PEERLESS MINE
D165991	NORTH DAKOTA	BOWMAN	SCRANTON NE (7.5')	461102N	1030205W	PEERLESS MINE
D173466	NORTH DAKOTA	STARK	LEHIGH (7.5')	465126N	1024125W	NDE
D173467	NORTH DAKOTA	STARK	LEHIGH (7.5')	465126N	1024125W	HUSKY INDUSTRIES MINE
D173468	NORTH DAKOTA	STARK	LEHIGH (7.5')	465126N	1024125W	NDE
D173469	NORTH DAKOTA	STARK	LEHIGH (7.5')	465126N	1024125W	NDE
D175930	NORTH DAKOTA	MERCER	ZAP (7.5')	471520N	1015422W	NDE
D175931	NORTH DAKOTA	MERCER	ZAP (7.5')	471520N	1015422W	NDE
D175932	NORTH DAKOTA	MERCER	ZAP (7.5')	471517N	1015412W	NDE
D175933	NORTH DAKOTA	MERCER	ZAP (7.5')	471517N	1015412W	NDE
D175934	NORTH DAKOTA	MERCER	MEDICINE BUTTE (7.5')	471439N	1015338W	NDE
D175935	NORTH DAKOTA	MERCER	MEDICINE BUTTE (7.5')	471439N	1015338W	NDE
D175936	NORTH DAKOTA	MERCER	MEDICINE BUTTE (7.5')	471455N	1015330W	NDE
D175937	NORTH DAKOTA	MERCER	MEDICINE BUTTE (7.5')	471455N	1015330W	NDE
D175938	NORTH DAKOTA	MERCER	BEULAH (7.5')	471450N	1014532W	NDE
D175939	NORTH DAKOTA	MERCER	BEULAH (7.5')	471450N	1014532W	NDE
D178143	NORTH DAKOTA	WILLIAMS	CUSSICKS SPRING (7.5')	481045N	1031210W	NDE
D178144	NORTH DAKOTA	WILLIAMS	CUSSICKS SPRING (7.5')	481045N	1031210W	NDE
D178145	NORTH DAKOTA	WILLIAMS	CUSSICKS SPRING (7.5')	481045N	1031210W	NDE
D178498	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471708N	1023311W	NDE
D178499	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471708N	1023311W	NDE
D178500	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471708N	1023311W	NDE
D178501	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471708N	1023311W	NDE
D178502	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471708N	1023311W	NDE
D178503	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471708N	1023311W	NDE
D178504	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471745N	1023403W	NDE
D178505	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471745N	1023403W	NDE
D178506	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471745N	1023403W	NDE
D178507	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471733N	1023454W	NDE
D178508	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471733N	1023454W	NDE
D178509	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471733N	1023454W	NDE
D178510	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471733N	1023454W	NDE
D178511	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471733N	1023454W	NDE
D178512	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471733N	1023454W	NDE
D179369	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471711N	1023400W	NDE
D179370	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471711N	1023400W	NDE
D179371	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471711N	1023400W	NDE
D179372	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471732N	1023302W	NDE

Table 1a. (cont'd.) Location information for 383 lignite samples from the Fort Union Region- North Dakota and Montana.

SAMPLE NUMBER	STATE	COUNTY	QUADRANGLE	LATITUDE	LONGITUDE	LOCATION NAME
D179373	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471732N	1023302W	NDE
D179374	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471800N	1023322W	NDE
D179375	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471800N	1023322W	NDE
D179376	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471800N	1023322W	NDE
D179377	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471803N	1023229W	NDE
D179378	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471803N	1023229W	NDE
D179379	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471800N	1023215W	NDE
D179380	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471800N	1023215W	NDE
D179381	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471800N	1023215W	NDE
D179382	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471800N	1023215W	NDE
D179383	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471750N	1023517W	NDE
D179384	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471813N	1023130W	NDE
D180007	NORTH DAKOTA	DUNN	WERNER (7.5')	471707N	1022744W	NDE
D180008	NORTH DAKOTA	DUNN	WERNER (7.5')	471613N	1022911W	NDE
D180009	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471706N	1023323W	NDE
D180010	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471745N	1023015W	NDE
D180011	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471707N	1023516W	NDE
D180012	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471758N	1023645W	NDE
D180013	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471707N	1023750W	NDE
D180014	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471615N	1023246W	NDE
D180015	NORTH DAKOTA	DUNN	WERNER (7.5')	471852N	1022743W	NDE
D180016	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471549N	1023713W	NDE
D180017	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471615N	1023400W	NDE
D180018	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	472034N	1023243W	NDE
D180019	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471944N	1023400W	NDE
D180075	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471822N	1023515W	NDE
D180076	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471852N	1023459W	NDE
D180077	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471852N	1023459W	NDE
D180078	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471826N	1023403W	NDE
D180079	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471813N	1023442W	NDE
D180080	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471913N	1023516W	NDE
D180081	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471913N	1023516W	NDE
D180082	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471859N	1023413W	NDE
D180083	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471859N	1023413W	NDE
D186051	NORTH DAKOTA	MERCER	ZAP (7.5')	471530N	1015345W	INDIAN HEAD MINE
D186052	NORTH DAKOTA	MERCER	HAZEN EAST (7.5')	471614N	1013601W	NDE
D186053	NORTH DAKOTA	OLIVER	RED BUTTE NW (7.5')	471142N	1014433W	NDE
D186054	NORTH DAKOTA	DUNN	MANNING (7.5')	471009N	1025145W	NDE
D186055	NORTH DAKOTA	DUNN	MANNING (7.5')	471009N	1025145W	NDE
D165992	NORTH DAKOTA	BOWMAN	SCOLE SCHOOL (7.5')	460000N	1030000W	NDE

Table 1a. (cont'd.) Location information for 383 lignite samples from the Fort Union Region- North Dakota and Montana.

SAMPLE NUMBER	STATE	COUNTY	QUADRANGLE	LATITUDE	LONGITUDE	LOCATION NAME
D165993	NORTH DAKOTA	BOWMAN	SCOLE SCHOOL (7.5')	460000N	1030000W	NDE
D196052	NORTH DAKOTA	MERCER	ZAP (7.5')	471850N	1015234W	NDE
D196053	NORTH DAKOTA	MERCER	ZAP (7.5')	471850N	1015234W	NDE
D196054	NORTH DAKOTA	MERCER	BEULAH (7.5')	471848N	1015137W	NDE
D196055	NORTH DAKOTA	MERCER	BEULAH (7.5')	471848N	1015137W	NDE
D196056	NORTH DAKOTA	MERCER	BEULAH (7.5')	471848N	1015137W	NDE
D196057	NORTH DAKOTA	MERCER	BEULAH (7.5')	471914N	1015045W	NDE
D196058	NORTH DAKOTA	MERCER	BEULAH (7.5')	471914N	1015045W	NDE
D196059	NORTH DAKOTA	MERCER	BEULAH (7.5')	471924N	1014940W	NDE
D196060	NORTH DAKOTA	MERCER	BEULAH (7.5')	471924N	1014940W	NDE
D196061	NORTH DAKOTA	MERCER	BEULAH (7.5')	471924N	1014940W	NDE
D196062	NORTH DAKOTA	MERCER	ZAP (7.5')	472216N	1015232W	NDE
D196075	NORTH DAKOTA	MERCER	BEULAH NW (7.5')	472338N	1015306W	NDE
D196076	NORTH DAKOTA	MERCER	BEULAH (7.5')	471940N	1015259W	NDE
D196077	NORTH DAKOTA	HETTINGER	LONG BUTTE (7.5')	461405N	1022100W	NDE
D196078	NORTH DAKOTA	HETTINGER	LONG BUTTE (7.5')	461405N	1022100W	NDE
D196079	NORTH DAKOTA	ADAMS	PLUM BUTTE NE (7.5')	461206N	1020337W	NDE
D196080	NORTH DAKOTA	GRANT	LEITH (7.5')	462124N	1014143W	NDE
D196081	NORTH DAKOTA	GRANT	NEW LEIPZIG N (7.5')	462337N	1015749W	NDE
D194858	NORTH DAKOTA	MERCER	BEULAH NE (7.5')	472309N	1015145W	NDE
D194859	NORTH DAKOTA	MERCER	BEULAH NE (7.5')	472309N	1015145W	NDE
D194860	NORTH DAKOTA	MERCER	BEULAH NE (7.5')	472309N	1015145W	NDE
D194861	NORTH DAKOTA	MERCER	BEULAH (7.5')	472215N	1015115W	NDE
D194862	NORTH DAKOTA	MERCER	BEULAH (7.5')	472126N	1015225W	NDE
D194863	NORTH DAKOTA	MERCER	BEULAH (7.5')	472115N	1015052W	NDE
D194864	NORTH DAKOTA	MERCER	BEULAH (7.5')	472115N	1015052W	NDE
D194865	NORTH DAKOTA	MERCER	BEULAH (7.5')	472115N	1015052W	NDE
D194866	NORTH DAKOTA	MERCER	BEULAH (7.5')	471940N	1015214W	NDE
D194867	NORTH DAKOTA	MERCER	BEULAH (7.5')	471940N	1015214W	NDE
D194868	NORTH DAKOTA	MERCER	BEULAH (7.5')	471940N	1015214W	NDE
D194869	NORTH DAKOTA	MERCER	ZAP (7.5')	471920N	101540DW	NDE
D194870	NORTH DAKOTA	MERCER	ZAP (7.5')	471920N	1015400W	NDE
D194029	NORTH DAKOTA	MERCER	STANTON (7.5')	471640N	1012538W	NDE
D194030	NORTH DAKOTA	MERCER	STANTON (7.5')	471640N	1012538W	NDE
D194031	NORTH DAKOTA	MERCER	STANTON (7.5')	471640N	1012538W	NDE
D194032	NORTH DAKOTA	MERCER	HAZEN NW (7.5')	472423N	1014335W	NDE
D194033	NORTH DAKOTA	MERCER	HAZEN NW (7.5')	472423N	1014335W	NDE
D194034	NORTH DAKOTA	OLIVER	HANNOVER NE (7.5')	471306N	1012109W	NDE
D194035	NORTH DAKOTA	OLIVER	HANNOVER NE (7.5')	471306N	1012109W	NDE
D194036	NORTH DAKOTA	OLIVER	HANNOVER NE (7.5')	471306N	1012109W	NDE

Table 1a. (cont'd.) Location information for 383 lignite samples from the Fort Union Region- North Dakota and Montana.

SAMPLE NUMBER	STATE	COUNTY	QUADRANGLE	LATITUDE	LONGITUDE	LOCATION NAME
D196624	NORTH DAKOTA	GOLDEN VALLEY	DUCK CREEK (7.5')	464632N	1040050W	NDE
D196625	NORTH DAKOTA	GOLDEN VALLEY	DUCK CREEK (7.5')	464632N	1040050W	NDE
D196626	NORTH DAKOTA	GOLDEN VALLEY	DUCK CREEK (7.5')	464632N	1040050W	NDE
D196627	NORTH DAKOTA	GOLDEN VALLEY	DUCK CREEK (7.5')	464713N	1040120W	NDE
D196628	NORTH DAKOTA	GOLDEN VALLEY	DUCK CREEK (7.5')	464713N	1040120W	NDE
D196629	NORTH DAKOTA	GOLDEN VALLEY	ODLAND DAM NE (7.5')	470118N	1040015W	NDE
D196630	NORTH DAKOTA	GOLDEN VALLEY	ODLAND DAM NE (7.5')	470118N	1040015W	NDE
D196631	NORTH DAKOTA	GOLDEN VALLEY	ODLAND DAM NE (7.5')	470118N	1040015W	NDE
D196632	NORTH DAKOTA	GOLDEN VALLEY	ODLAND DAM NE (7.5')	470118N	1040015W	NDE
D196633	NORTH DAKOTA	GOLDEN VALLEY	ODLAND DAM NE (7.5')	470118N	1040015W	NDE
D196634	NORTH DAKOTA	GOLDEN VALLEY	ODLAND DAM NE (7.5')	470118N	1040015W	NDE
D196635	NORTH DAKOTA	GOLDEN VALLEY	ODLAND DAM (7.5')	470041N	1040100W	NDE
D196636	NORTH DAKOTA	GOLDEN VALLEY	ODLAND DAM (7.5')	470041N	1040100W	NDE
D196637	NORTH DAKOTA	GOLDEN VALLEY	DUCK CREEK (7.5')	464907N	1040130W	NDE
D196638	NORTH DAKOTA	GOLDEN VALLEY	DUCK CREEK (7.5')	464907N	1040130W	NDE
D196639	NORTH DAKOTA	GOLDEN VALLEY	DUCK CREEK (7.5')	464907N	1040130W	NDE
D196640	NORTH DAKOTA	GOLDEN VALLEY	DUCK CREEK (7.5')	465045N	1040145W	NDE
D221097	NORTH DAKOTA	MERCER	BEULAH (7.5')	471657N	1014938W	NDE
D221098	NORTH DAKOTA	MERCER	BEULAH (7.5')	471657N	1014938W	NDE
D221099	NORTH DAKOTA	MERCER	BEULAH (7.5')	471657N	1014938W	NDE
D221100	NORTH DAKOTA	MERCER	BEULAH (7.5')	471657N	1014938W	NDE
D221101	NORTH DAKOTA	MERCER	BEULAH (7.5')	471759N	1014856W	NDE
D221102	NORTH DAKOTA	MERCER	BEULAH (7.5')	471759N	1014856W	NDE
D221103	NORTH DAKOTA	MERCER	BEULAH (7.5')	471759N	1014856W	NDE
D221104	NORTH DAKOTA	MERCER	BEULAH (7.5')	471718N	1014822W	NDE
D221105	NORTH DAKOTA	MERCER	BEULAH (7.5')	471718N	1014822W	NDE
D221106	NORTH DAKOTA	MERCER	BEULAH (7.5')	471718N	1014822W	NDE
D213983	NORTH DAKOTA	STARK	BELFIELD NE (7.5')	465749N	1030502W	NDE
D213984	NORTH DAKOTA	STARK	BELFIELD NE (7.5')	465749N	1030502W	NDE
D213985	NORTH DAKOTA	STARK	BELFIELD NE (7.5')	465849N	1030318W	NDE
D213986	NORTH DAKOTA	STARK	BELFIELD NE (7.5')	465849N	1030318W	NDE
D213987	NORTH DAKOTA	STARK	BELFIELD NE (7.5')	465849N	1030318W	NDE
D213988	NORTH DAKOTA	STARK	BELFIELD NE (7.5')	465634N	1030504W	NDE
D213989	NORTH DAKOTA	STARK	BELFIELD NE (7.5')	465634N	1030504W	NDE
D213990	NORTH DAKOTA	STARK	BELFIELD NE (7.5')	465634N	1030504W	NDE
D213991	NORTH DAKOTA	STARK	BELFIELD NE (7.5')	465655N	1030031W	NDE
D213992	NORTH DAKOTA	STARK	BELFIELD NE (7.5')	465655N	1030031W	NDE
D213993	NORTH DAKOTA	STARK	BELFIELD NE (7.5')	465655N	1030031W	NDE
D213994	NORTH DAKOTA	STARK	BELFIELD NE (7.5')	465512N	1030345W	NDE
D213995	NORTH DAKOTA	STARK	BELFIELD NE (7.5')	465512N	1030345W	NDE

Table 1a. (cont'd.) Location information for 383 lignite samples from the Fort Union Region- North Dakota and Montana.

SAMPLE NUMBER	STATE	COUNTY	QUADRANGLE	LATITUDE	LONGITUDE	LOCATION NAME
D213996	NORTH DAKOTA	STARK	BELFIELD (7.5')	465602N	1030956W	NDE
D213997	NORTH DAKOTA	STARK	BELFIELD NE (7.5')	465457N	1030000W	NDE
D213998	NORTH DAKOTA	STARK	BELFIELD NE (7.5')	465457N	1030000W	NDE
D213999	NORTH DAKOTA	STARK	BELFIELD NE (7.5')	465417N	1030900W	NDE
D214000	NORTH DAKOTA	STARK	BELFIELD (7.5')	465417N	1030900W	NDE
D214001	NORTH DAKOTA	STARK	BELFIELD (7.5')	465417N	1030900W	NDE
D196399	NORTH DAKOTA	MCKENZIE	SHEEP CREEK (7.5')	473705N	1034640W	NDE
D196400	NORTH DAKOTA	MCKENZIE	SQUAW GAP (7.5')	472620N	1035730W	NDE
D196401	NORTH DAKOTA	MCKENZIE	FLAT ROCK BUTTE (7.5')	472315N	1035145W	NDE
D196402	NORTH DAKOTA	MCKENZIE	PHILLIP SPRING (7.5')	473645N	1035505W	NDE
D196403	NORTH DAKOTA	MCKENZIE	PHILLIP SPRING (7.5')	473645N	1035505W	NDE
D196404	NORTH DAKOTA	MCKENZIE	JOHNSONS CORNER (7.5')	474745N	1025630W	NDE
D196405	NORTH DAKOTA	MCKENZIE	CROFF (7.5')	474450N	1025900W	NDE
D196406	NORTH DAKOTA	MCKENZIE	KEENE (7.5')	475602N	1025510W	NDE
D196407	NORTH DAKOTA	MCKENZIE	KEENE (7.5')	475602N	1025510W	NDE
D210365	NORTH DAKOTA	BURKE	RENNIE LAKE (7.5')	484825N	1023401W	NDE
D210368	NORTH DAKOTA	MCLEAN	EMMET (7.5')	473853N	1013757W	NDE
D210369	NORTH DAKOTA	MCLEAN	BLUE HILL (7.5')	474830N	1013805W	NDE
D210371	NORTH DAKOTA	HETTINGER	REGENT (7.5')	462633N	1023723W	NDE
D210372	NORTH DAKOTA	HETTINGER	EAST RAINY BUTTE (7.5')	462630N	1025256W	NDE
D218907	NORTH DAKOTA	WARD	MINOT (15')	480355N	1011710W	NDE
D210366	NORTH DAKOTA	BURKE	COLUMBUS (7.5')	485431N	1024825W	NDE
D210370	NORTH DAKOTA	HETTINGER	REGENT (7.5')	462633N	1023723W	NDE
D196593	NORTH DAKOTA	GOLDEN VALLEY	DUCK CREEK (7.5')	464632N	1040100W	TWIN TO HOLE WB-3
D196594	NORTH DAKOTA	GOLDEN VALLEY	DUCK CREEK (7.5')	464714N	1040135W	TWIN TO HOLE WB-104
D196595	NORTH DAKOTA	GOLDEN VALLEY	DUCK CREEK (7.5')	464907N	1040140W	TWIN TO HOLE WB-14
D196596	NORTH DAKOTA	GOLDEN VALLEY	HOOT OWL CREEK (7.5')	470037N	1035958W	TWIN TO HOLE WB-107
D196597	NORTH DAKOTA	GOLDEN VALLEY	ODLAND DAM (7.5')	470108N	1040015W	TWIN TO HOLE WB-53
D240973	NORTH DAKOTA	WILLIAMS	RAY SE (7.5')	482031N	1030356W	NDE
D240974	NORTH DAKOTA	WILLIAMS	RAY SE (7.5')	481743N	1030156W	NDE
D240975	NORTH DAKOTA	WILLIAMS	RAY SE (7.5')	481743N	1030156W	NDE
D240976	NORTH DAKOTA	WILLIAMS	RAY (7.5')	481730N	1030750W	NDE
D240977	NORTH DAKOTA	WILLIAMS	RAY (7.5')	481730N	1030750W	NDE
D240978	NORTH DAKOTA	WILLIAMS	CUSSICKS SPRING (7.5')	481032N	1031022W	NDE
D240979	NORTH DAKOTA	WILLIAMS	CUSSICKS SPRING (7.5')	481032N	1031022W	NDE
D240980	NORTH DAKOTA	WILLIAMS	CUSSICKS SPRING (7.5')	481233N	1031135W	NDE
D240981	NORTH DAKOTA	WILLIAMS	CUSSICKS SPRING (7.5')	481233N	1031135W	NDE
D240982	NORTH DAKOTA	WILLIAMS	RED MIKE HILL (7.5')	481335N	1030118W	NDE
D240983	NORTH DAKOTA	WILLIAMS	BLACKTAIL LAKE SE (7.5')	481525N	1033059W	NDE
D240984	NORTH DAKOTA	WILLIAMS	BLACKTAIL LAKE SE (7.5')	481525N	1033059W	NDE

Table 1a. (cont'd.) Location information for 383 lignite samples from the Fort Union Region- North Dakota and Montana.

SAMPLE NUMBER	STATE	COUNTY	QUADRANGLE	LATITUDE	LONGITUDE	LOCATION NAME
D240985	NORTH DAKOTA	WILLIAMS	BLACKTAIL LAKE SE (7.5')	481525N	1033059W	NDE
D240986	NORTH DAKOTA	WILLIAMS	WILLISTON EAST (7.5')	481454N	1033103W	NDE
D240987	NORTH DAKOTA	WILLIAMS	WILLISTON EAST (7.5')	481454N	1033103W	NDE
D240988	NORTH DAKOTA	WILLIAMS	WILLISTON EAST (7.5')	481454N	1033103W	NDE
D240989	NORTH DAKOTA	WILLIAMS	OTTER TAIL CREEK (7.5')	481521N	1034124W	NDE
D240990	NORTH DAKOTA	WILLIAMS	OTTER TAIL CREEK (7.5')	481521N	1034124W	NDE
D240991	NORTH DAKOTA	WILLIAMS	TRENTON NE (7.5')	481153N	1034754W	NDE
D240992	NORTH DAKOTA	WILLIAMS	TRENTON NE (7.5')	481153N	1034754W	NDE
D210367	NORTH DAKOTA	MCLEAN	GARRISON NE (7.5')	473847N	1012000W	NDE
D175972	NORTH DAKOTA	MERCER	BEULAH NE (7.5')	472231N	1015230W	NDE
D175973	NORTH DAKOTA	MERCER	BEULAH (7.5')	471501N	1015230W	NDE
D175974	NORTH DAKOTA	MERCER	HAZEN NE (7.5')	472231N	1013730W	NDE
D175975	NORTH DAKOTA	MERCER	HAZEN NE (7.5')	472232N	1013730W	NDE
D165751	MONTANA	RICHLAND	SAVAGE (7.5')	472232N	1042230W	NDE
D165752	MONTANA	RICHLAND	SAVAGE (7.5')	472232N	1042230W	NDE
D165753	MONTANA	RICHLAND	SAVAGE (7.5')	472232N	1042230W	NDE
D165754	MONTANA	RICHLAND	SAVAGE (7.5')	472232N	1042230W	NDE
D165755	MONTANA	RICHLAND	SAVAGE (7.5')	472232N	1042230W	NDE
D165756	MONTANA	RICHLAND	SAVAGE (7.5')	472232N	1042230W	NDE
D165757	MONTANA	RICHLAND	SAVAGE (7.5')	472230N	1042150W	NDE
D165758	MONTANA	RICHLAND	SAVAGE (7.5')	472230N	1042150W	NDE
D165759	MONTANA	RICHLAND	SAVAGE (7.5')	472230N	1042150W	NDE
D165760	MONTANA	RICHLAND	SAVAGE (7.5')	472230N	1042000W	NDE
D165761	MONTANA	RICHLAND	SAVAGE (7.5')	472230N	1042000W	NDE
D165762	MONTANA	RICHLAND	SAVAGE (7.5')	472230N	1042000W	NDE
D165763	MONTANA	RICHLAND	SAVAGE (7.5')	472400N	1042130W	NDE
D165764	MONTANA	RICHLAND	SAVAGE (7.5')	472400N	1042130W	NDE
D165765	MONTANA	RICHLAND	SAVAGE (7.5')	472230N	1042150W	NDE
D165766	MONTANA	RICHLAND	SAVAGE (7.5')	472230N	1042150W	NDE
D178086	MONTANA	RICHLAND	DUGOUT CREEK (7.5')	480000N	1043730W	NDE
D178087	MONTANA	RICHLAND	THREE BUTTES (7.5')	480000N	1043000W	NDE
D178088	MONTANA	RICHLAND	THREE BUTTES (7.5')	480000N	1043000W	NDE
D188118	MONTANA	MCCONE	BROCKWAY NE (7.5')	473000N	1055230W	NDE
D188119	MONTANA	MCCONE	BROCKWAY NE (7.5')	473000N	1055230W	NDE
D188120	MONTANA	MCCONE	BROCKWAY NE (7.5')	473000N	1055230W	NDE
D188121	MONTANA	MCCONE	BROCKWAY NE (7.5')	473000N	1055235W	NDE
D188122	MONTANA	MCCONE	BROCKWAY NE (7.5')	473000N	1055235W	NDE
D188123	MONTANA	MCCONE	BEAUTY CREEK (7.5')	472230N	1060000W	NDE
D188124	MONTANA	MCCONE	BEAUTY CREEK (7.5')	472230N	1060000W	NDE
D188125	MONTANA	MCCONE	BEAUTY CREEK (7.5')	472229N	1060005W	NDE

Table 1a. (cont'd.) Location information for 383 lignite samples from the Fort Union Region- North Dakota and Montana.

SAMPLE NUMBER	STATE	COUNTY	QUADRANGLE	LATITUDE	LONGITUDE	LOCATION NAME
D188126	MONTANA	MCCONE	BEAUTY CREEK (7.5')	472229N	1060005W	NDE
D188127	MONTANA	SHERIDAN	TADPOLE LAKE (7.5')	484500N	1040730W	NDE
D188128	MONTANA	DAWSON	RED TOP (7.5')	473000N	104523DW	NDE
D188129	MONTANA	DAWSON	STINKING COULEE (7.5')	472230N	1050000W	NDE
D188130	MONTANA	DAWSON	STINKING COULEE (7.5')	472230N	1050000W	NDE
D188131	MONTANA	DAWSON	INTAKE NW (7.5')	473000N	1044500W	NDE
D188132	MONTANA	DAWSON	INTAKE NW (7.5')	473000N	10445D0W	NDE
D188133	MONTANA	DAWSON	INTAKE NW (7.5')	473000N	1044500W	NDE
D188134	MONTANA	DAWSON	INTAKE NW (7.5')	473000N	1044500W	NDE
D188135	MONTANA	DAWSON	ALLARD RANCH (7.5')	473000N	1043730W	NDE
D188136	MONTANA	RICHLAND	BUTLER TABLE (7.5')	473730N	1044500W	NDE
D188137	MONTANA	RICHLAND	BUTLER TABLE (7.5')	473730N	104450DW	NDE
D188138	MONTANA	RICHLAND	SKAAR (7.5')	472230N	1040730W	NDE
D188140	MONTANA	RICHLAND	SKAAR NE (7.5')	473000N	1040730W	NDE
D188141	MONTANA	RICHLAND	SKAAR NE (7.5')	473000N	1040730W	NDE
D188142	MONTANA	RICHLAND	SKAAR NE (7.5')	473000N	1040730W	NDE
D188143	MONTANA	RICHLAND	SKAAR NE (7.5')	473000N	1040730W	NDE
D188144	MONTANA	WIBAUX	PARSON CREEK (7.5')	471500N	1041500W	NDE
D188145	MONTANA	WIBAUX	PARSON CREEK (7.5')	471500N	1041500W	NDE
D189256	MONTANA	RICHLAND	KNIFE RIVER MINE (7.5')	472748N	1042630W	NDE
D189257	MONTANA	RICHLAND	KNIFE RIVER MINE (7.5')	472748N	1042630W	NDE
D189258	MONTANA	RICHLAND	KNIFE RIVER MINE (7.5')	472748N	1042630W	NDE
D189259	MONTANA	RICHLAND	KNIFE RIVER MINE (7.5')	472748N	1042630W	NDE
D189260	MONTANA	DAWSON	POVERTY FLAT WEST (7.5')	470822N	1045717W	NDE
D189261	MONTANA	DAWSON	POVERTY FLAT WEST (7.5')	470822N	1045717W	NDE
D189262	MONTANA	DAWSON	POVERTY FLAT WEST (7.5')	470822N	1045717W	NDE
D189263	MONTANA	DAWSON	POVERTY FLAT WEST (7.5')	470822N	1045717W	NDE
D196643	MONTANA	WIBAUX	ODLAND DAM SW (7.5')	470525N	1041210W	NDE
D196644	MONTANA	WIBAUX	ODLAND DAM SW (7.5')	470525N	1041210W	NDE
D196645	MONTANA	WIBAUX	BEACH WEST (7.5')	465755N	1040455W	NDE
D196646	MONTANA	WIBAUX	BEACH WEST (7.5')	465755N	1040455W	NDE
D196647	MONTANA	WIBAUX	BEACH WEST (7.5')	465755N	1040455W	NDE
D196648	MONTANA	WIBAUX	BEACH WEST (7.5')	465755N	1040455W	NDE
D196649	MONTANA	WIBAUX	BEACH WEST (7.5')	465755N	1040455W	NDE
D196650	MONTANA	WIBAUX	BEACH WEST (7.5')	465408N	1040512W	NDE
D196651	MONTANA	WIBAUX	BEACH WEST (7.5')	465408N	1040512W	NDE
D196652	MONTANA	WIBAUX	ODLAND DAM SW (7.5')	470605N	1041340W	NDE
D196653	MONTANA	WIBAUX	BEACH WEST (7.5')	465534N	1040620W	NDE
D196654	MONTANA	WIBAUX	BEACH WEST (7.5')	465534N	1040620W	NDE
D196655	MONTANA	WIBAUX	ODLAND DAM (7.5')	470118N	1040512W	NDE

Table 1a. (cont'd.) Location information for 383 lignite samples from the Fort Union Region- North Dakota and Montana.

SAMPLE NUMBER	STATE	COUNTY	QUADRANGLE	LATITUDE	LONGITUDE	LOCATION NAME
D196656	MONTANA	WIBAUX	ODLAND DAM (7.5')	470118N	1040512W	NDE
D196657	MONTANA	WIBAUX	ODLAND DAM (7.5')	470118N	1040512W	NDE
D196658	MONTANA	WIBAUX	DUCK CREEK (7.5')	464710N	1040250W	NDE
D196659	MONTANA	WIBAUX	DUCK CREEK (7.5')	464710N	1040250W	NDE
D196660	MONTANA	WIBAUX	DUCK CREEK (7.5')	464710N	1040250W	NDE
D196661	MONTANA	WIBAUX	ODLAND DAM SW (7.5')	470236N	1040915W	NDE
D196662	MONTANA	WIBAUX	ODLAND DAM SW (7.5')	470502N	1041000W	NDE
D196641	MONTANA	WIBAUX	ODLAND DAM SW (7.5')	470525N	1041210W	NDE
D196642	MONTANA	WIBAUX	ODLAND DAM SW (7.5')	470525N	1041210W	NDE
D221125	MONTANA	ROOSEVELT	HAY CREEK (15')	482945N	1050240W	NDE
D221126	MONTANA	ROOSEVELT	HAY CREEK (15')	482945N	1050240W	NDE
D221127	MONTANA	ROOSEVELT	HAY CREEK (15')	482945N	1050240W	NDE
D221128	MONTANA	ROOSEVELT	HAY CREEK (15')	482945N	1050240W	NDE
D221129	MONTANA	ROOSEVELT	HAY CREEK (15')	482945N	1050240W	NDE
D221130	MONTANA	ROOSEVELT	HOMESTEAD (15')	482710N	1044030W	NDE
D221131	MONTANA	ROOSEVELT	HAY CREEK (15')	482530N	1050510W	NDE
D221132	MONTANA	ROOSEVELT	BREDETTE (7.5')	483300N	1051650W	NDE
D221133	MONTANA	ROOSEVELT	BREDETTE (7.5')	483300N	1051650W	NDE
D221134	MONTANA	ROOSEVELT	BREDETTE (7.5')	483300N	1051650W	NDE
D221135	MONTANA	ROOSEVELT	BREDETTE (7.5')	483300N	1051650W	NDE
D221136	MONTANA	ROOSEVELT	SOO (15')	483145N	1045130W	NDE
D221137	MONTANA	ROOSEVELT	SOO (15')	483145N	1045130W	NDE
D221138	MONTANA	ROOSEVELT	SMOKE CREEK (15')	482320N	1045055W	NDE
D221139	MONTANA	SHERIDAN	ALKALI COULEE (7.5')	483425N	1043545W	NDE
D221140	MONTANA	SHERIDAN	ALKALI COULEE (7.5')	483425N	1043545W	NDE
D221141	MONTANA	SHERIDAN	ALKALI COULEE (7.5')	483425N	1043545W	NDE
D221142	MONTANA	SHERIDAN	SOO (15')	483400N	1044650W	NDE
D221143	MONTANA	SHERIDAN	SOO (15')	483400N	1044650W	NDE
D221145	MONTANA	SHERIDAN	OTTER CREEK (15')	483100N	1044030W	NDE
D196598	MONTANA	WIBAUX	BEACH WEST (7.5')	465525N	1040620W	NDE
D196599	MONTANA	WIBAUX	ODLAND DAM (7.5')	470120N	1040457W	NDE
D209953	MONTANA	ROOSEVELT	CALAIS (7.5')	480950N	1045010W	NDE
D209954	MONTANA	ROOSEVELT	CALAIS (7.5')	480950N	1045010W	NDE
D209955	MONTANA	ROOSEVELT	CALAIS (7.5')	480950N	1045010W	NDE
D209956	MONTANA	ROOSEVELT	CALAIS (7.5')	480950N	1045010W	NDE
D209957	MONTANA	ROOSEVELT	CALAIS (7.5')	481010N	1044525W	NDE
D209958	MONTANA	ROOSEVELT	CALAIS (7.5')	481010N	1044525W	NDE
D209959	MONTANA	ROOSEVELT	FORT KIPP (7.5')	480950N	1044045W	NDE
D209960	MONTANA	ROOSEVELT	FORT KIPP (7.5')	480950N	1044045W	NDE

Table 1a. (cont'd.) Location information for 383 lignite samples from the Fort Union Region- North Dakota and Montana.

SAMPLE NUMBER	STATE	COUNTY	QUADRANGLE	LATITUDE	LONGITUDE	LOCATION NAME
D209961	MONTANA	ROOSEVELT	FORT KIPP (7.5')	480950N	1044045W	NDE
D209962	MONTANA	ROOSEVELT	CALAIS (7.5')	481310N	1044700W	NDE
D209963	MONTANA	ROOSEVELT	CALAIS (7.5')	48131DN	1044700W	NDE
D209964	MONTANA	ROOSEVELT	CALAIS (7.5')	481310N	1044700W	NDE
D209965	MONTANA	ROOSEVELT	CALAIS (7.5')	481145N	1045145W	NDE
D209966	MONTANA	ROOSEVELT	CALAIS (7.5')	481145N	1045145W	NDE
D209967	MONTANA	ROOSEVELT	CALAIS (7.5')	481340N	1045010W	NDE
D209968	MONTANA	ROOSEVELT	CALAIS (7.5')	481340N	1045D10W	NDE
D240927	MONTANA	DAWSON	NDE	NDE	NDE	NDE
D240928	MONTANA	DAWSON	NDE	NDE	NDE	NDE
D240929	MONTANA	DAWSON	INTAKE NW (7.5')	472243N	1043750W	NDE
D240930	MONTANA	DAWSON	INTAKE NW (7.5')	472243N	1043750W	NDE
D240931	MONTANA	DAWSON	INTAKE NW (7.5')	472243N	1043750W	NDE
D240932	MONTANA	DAWSON	INTAKE NW (7.5')	472311N	1043903W	NDE
D240933	MONTANA	DAWSON	INTAKE NW (7.5')	472311N	1043903W	NDE
D240934	MONTANA	DAWSON	CLAY BUTTE (7.5')	473237N	1045620W	NDE
D240935	MONTANA	DAWSON	RICHEY SE (7.5')	473029N	1050008W	NDE
D240936	MONTANA	DAWSON	RICHEY SE (7.5')	473029N	1050008W	NDE
D240937	MONTANA	DAWSON	PLEASANT VIEW (7.5')	470302N	1045746W	NDE
D240938	MONTANA	DAWSON	PLEASANT VIEW (7.5')	470208N	1045816W	NDE
D240939	MONTANA	MCCONE	WOODWORTH HILL (7.5')	472808N	1052632W	NDE
D240940	MONTANA	MCCONE	WOODWORTH HILL (7.5')	472808N	1052632W	NDE
D240941	MONTANA	MCCONE	BUFFALO CREEK (7.5')	473101N	1052929W	NDE

Table 1b. Geologic information for 383 lignite samples from the Fort Union Region- North Dakota and Montana. NDE = no data entered.

SAMPLE NUMBER	GROUP/FORMATION	BED NAME	ESTIMATED RANK	FIELD ID NO.	COLLECTOR
D165564	FORT UNION GP	NDE	LIGNITE	CG-1-73	USGD-SWANSON V E
D165565	FORT UNION GP	HAGEL	LIGNITE	CG-2-73	USGD-SWANSON V E
D165566	FORT UNION GP	NDE	LIGNITE	CG-3-73	USGD-SWANSON V E
D165567	FORT UNION GP	HAGEL	LIGNITE	CG-4-73	USGD-SWANSON V E
D165568	FORT UNION GP	HAGEL	LIGNITE	BN-5-73	USGD-SWANSON V E
D165569	FORT UNION GP	HAGEL	LIGNITE	BN-6-73	USGD-SWANSON V E
D165570	FORT UNION GP	HAGEL	LIGNITE	BN-7-73	USGD-SWANSON V E
D165571	FORT UNION GP	HAGEL	LIGNITE	BN-8-73	USGD-SWANSON V E
D165572	FORT UNION GP	BEULAH-ZAP	LIGNITE	KR-9-73	USGD-SWANSON V E
D165573	FORT UNION GP	BEULAH-ZAP	LIGNITE	KR-10-73	USGD-SWANSON V E
D165574	FORT UNION GP	BEULAH-ZAP	LIGNITE	KR-11-73	USGD-SWANSON V E
D165575	FORT UNION GP	BEULAH-ZAP	LIGNITE	KR-12-73	USGD-SWANSON V E
D165576	FORT UNION GP	BEULAH-ZAP	LIGNITE	NA-13-73	USGD-SWANSON V E
D165577	FORT UNION GP	BEULAH-ZAP	LIGNITE	NA-14-73	USGD-SWANSON V E
D165578	FORT UNION GP	BEULAH-ZAP	LIGNITE	NA-15-73	USGD-SWANSON V E
D165579	FORT UNION GP	BEULAH-ZAP	LIGNITE	NA-16-73	USGD-SWANSON V E
D165605	BULLION CREEK	COTEAU	LIGNITE	V-1	USGD-SWANSON V E
D165606	BULLION CREEK	COTEAU	LIGNITE	V-2	USGD-SWANSON V E
D165607	BULLION CREEK	COTEAU	LIGNITE	V-3	USGD-SWANSON V E
D165608	BULLION CREEK	COTEAU	LIGNITE	V-4	USGD-SWANSON V E
D165609	BULLION CREEK	COTEAU	LIGNITE	V-5	USGD-SWANSON V E
D165610	BULLION CREEK	COTEAU	LIGNITE	V-6	USGD-SWANSON V E
D165611	BULLION CREEK	COTEAU	LIGNITE	V-7	USGD-SWANSON V E
D165612	BULLION CREEK	COTEAU	LIGNITE	V-8	USGD-SWANSON V E
D165613	BULLION CREEK	COTEAU	LIGNITE	V-9	USGD-SWANSON V E
D165632	FORT UNION GP	NOONAN	LIGNITE	B-N-1	USGD-SWANSON V E
D165974	FORT UNION GP	NDE	LIGNITE	LJ-1-74	USGD-SWANSON V E
D165975	FORT UNION GP	NDE	LIGNITE	LJ-2-74	USGD-SWANSON V E
D165976	FORT UNION GP	NDE	LIGNITE	LJ-3-74	USGD-SWANSON V E
D165977	FORT UNION GP	NDE	LIGNITE	LJ-4-74	USGD-SWANSON V E
D165978	FORT UNION GP	NDE	LIGNITE	LJ-5-74	USGD-SWANSON V E
D165979	FORT UNION GP	NDE	LIGNITE	LJ-6-74	USGD-SWANSON V E
D165980	FORT UNION GP	NDE	LIGNITE	LJ-7-74	USGD-SWANSON V E
D165981	FORT UNION GP	NDE	LIGNITE	LJ-8-74	USGD-SWANSON V E
D165982	FORT UNION GP	NDE	LIGNITE	LJ-9-74	USGD-SWANSON V E
D165983	FORT UNION GP	NDE	LIGNITE	LJ-10-74	USGD-SWANSON V E
D165984	FORT UNION GP	NDE	LIGNITE	LJ-11-74	USGD-SWANSON V E
D165985	FORT UNION GP	NDE	LIGNITE	LJ-12-74	USGD-SWANSON V E
D165986	FORT UNION GP	NDE	LIGNITE	LJ-13-74	USGD-SWANSON V E
D165987	FORT UNION GP	NDE	LIGNITE	LJ-14-74	USGD-SWANSON V E

Table 1b. (cont'd.) Geologic information for 383 lignite samples from the Fort Union Region- North Dakota and Montana.

SAMPLE NUMBER	GROUP/FORMATION	BED NAME	ESTIMATED RANK	FIELD ID NO.	COLLECTOR
D165988	FORT UNION GP	NDE	LIGNITE	LJ-15-74	USGD-SWANSON V E
D165989	FORT UNION GP	NDE	LIGNITE	LJ-16-74	USGD-SWANSON V E
D165990	FORT UNION GP	NDE	LIGNITE	LJ-17-74	USGD-SWANSON V E
D165991	FORT UNION GP	NDE	LIGNITE	LJ-18-74	USGD-SWANSON V E
D173466	SENTINEL BUTTE	LEHIGH	LIGNITE	ST-1-75	NDGS-CARLSON C G
D173467	SENTINEL BUTTE	NDE	LIGNITE	ST-2-75	NDGS-CARLSON C G
D173468	SENTINEL BUTTE	NDE	LIGNITE	ST-3-75	NDGS-CARLSON C G
D173469	SENTINEL BUTTE	NDE	LIGNITE	ST-4-75	NDGS-CARLSON C G
D175930	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	MER-1-75	NDGS
D175931	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	MER-2-75	NDGS
D175932	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	MER-3-75	NDGS
D175933	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	MER-4-75	NDGS
D175934	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	MER-5-75	NDGS
D175935	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	MER-6-75	NDGS
D175936	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	MER-7-75	NDGS
D175937	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	MER-8-75	NDGS
D175938	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	MER-9-75	NDGS
D175939	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	MER-10-75	NDGS
D178143	FORT UNION GP	UNCORRELATED	LIGNITE	C-169-5-1	USGD-SWANSON V E
D178144	FORT UNION GP	UNCORRELATED	LIGNITE	C-169-5-2	USGD-SWANSON V E
D178145	FORT UNION GP	UNCORRELATED	LIGNITE	C-169-5-3	USGD-SWANSON V E
D178498	FORT UNION GP	NDE	LIGNITE	DH-75-101-1	USGD-SWANSON V E
D178499	FORT UNION GP	NDE	LIGNITE	DH-75-101-2	USGD-SWANSON V E
D178500	FORT UNION GP	NDE	LIGNITE	DH-75-101-3	USGD-SWANSON V E
D178501	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	DH-75-101-4	USGD-SWANSON V E
D178502	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	DH-75-101-5	USGD-SWANSON V E
D178503	FORT UNION GP	NDE	LIGNITE	DH-75-101-6	USGD-SWANSON V E
D178504	FORT UNION GP	NDE	LIGNITE	DH-75-104-1	USGD-SWANSON V E
D178505	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	DH-75-104-2	USGD-SWANSON V E
D178506	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	DH-75-104-3	USGD-SWANSON V E
D178507	FORT UNION GP	NDE	LIGNITE	DH-75-102-1	USGD-SWANSON V E
D178508	FORT UNION GP	NDE	LIGNITE	DH-75-102-2	USGD-SWANSON V E
D178509	FORT UNION GP	NDE	LIGNITE	DH-75-102-3	USGD-SWANSON V E
D178510	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	DH-75-102-4	USGD-SWANSON V E
D178511	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	DH-75-102-5	USGD-SWANSON V E
D178512	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	DH-75-102-6	USGD-SWANSON V E
D179369	FORT UNION GP	NDE	LIGNITE	DH75-103-1	USGD-SWANSON V E
D179370	FORT UNION GP	NDE	LIGNITE	DH75-103-2	USGD-SWANSON V E
D179371	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	DH75-103-3	USGD-SWANSON V E
D179372	FORT UNION GP	NDE	LIGNITE	DH75-105-1	USGD-SWANSON V E

Table 1b. (cont'd.) Geologic information for 383 lignite samples from the Fort Union Region- North Dakota and Montana.

SAMPLE NUMBER	GROUP/FORMATION	BED NAME	ESTIMATED RANK	FIELD ID NO.	COLLECTOR
D179373	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	DH75-105-2	USGD-SWANSON V E
D179374	FORT UNION GP	NDE	LIGNITE	DH75-106-1	USGD-SWANSON V E
D179375	FORT UNION GP	NDE	LIGNITE	DH75-106-2	USGD-SWANSON V E
D179376	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	DH75-106-3	USGD-SWANSON V E
D179377	FORT UNION GP	NDE	LIGNITE	DH75-107-1	USGD-SWANSON V E
D179378	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	DH75-107-2	USGD-SWANSON V E
D179379	FORT UNION GP	NDE	LIGNITE	DH75-108-1	USGD-SWANSON V E
D179380	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	DH75-108-2	USGD-SWANSON V E
D179381	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	DH75-108-3	USGD-SWANSON V E
D179382	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	DH75-108-4	USGD-SWANSON V E
D179383	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	DH75-109-1	USGD-SWANSON V E
D179384	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	DH75-113-1	USGD-SWANSON V E
D180007	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	SD-1	USGD-SWANSON V E
D180008	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	SD-2	USGD-SWANSON V E
D180009	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	SD-3	USGD-SWANSON V E
D180010	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	SD-4	USGD-SWANSON V E
D180011	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	SD-5	USGD-SWANSON V E
D180012	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	SD-6	USGD-SWANSON V E
D180013	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	SD-7	USGD-SWANSON V E
D180014	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	SD-8	USGD-SWANSON V E
D180015	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	SD-9	USGD-SWANSON V E
D180016	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	SD-10	USGD-SWANSON V E
D180017	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	SD-11	USGD-SWANSON V E
D180018	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	SD-12	USGD-SWANSON V E
D180019	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	SD-13	USGD-SWANSON V E
D180075	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	DH-110-1	USGD-SWANSON V E
D180076	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	DH-111-1	USGD-SWANSON V E
D180077	FORT UNION GP	NDE	LIGNITE	DH-111-2	USGD-SWANSON V E
D180078	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	DH-114-1	USGD-SWANSON V E
D180079	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	DH-116-1	USGD-SWANSON V E
D180080	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	DH-117-1	USGD-SWANSON V E
D180081	FORT UNION GP	NDE	LIGNITE	DH-117-2	USGD-SWANSON V E
D180082	FORT UNION GP	NDE	LIGNITE	DH-118-1	USGD-SWANSON V E
D180083	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	DH-118-2	USGD-SWANSON V E
D186051	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	BZ-123	NDGS-CARLSON C G
D186052	SENTINEL BUTTE	SCHOOLHOUSE	LIGNITE	L-9	NDGS-CARLSON C G
D186053	FORT UNION GP	NDE	LIGNITE	L-10	NDGS-CARLSON C G
D186054	FORT UNION GP	NDE	LIGNITE	M-16-1	NDGS-CARLSON C G
D186055	FORT UNION GP	NDE	LIGNITE	M-16-2	NDGS-CARLSON C G
D165992	BULLION CREEK	HARMON	LIGNITE	LJ-19-74	USGD-SWANSON V E

Table 1b. (cont'd.) Geologic information for 383 lignite samples from the Fort Union Region- North Dakota and Montana.

SAMPLE NUMBER	GROUP/FORMATION	BED NAME	ESTIMATED RANK	FIELD ID NO.	COLLECTOR
D165993	BULLION CREEK	HARMON	LIGNITE	LJ-20-74	USGD-SWANSON V E
D196052	FORT UNION GP	NDE	LIGNITE	77-108-1	USGD-SWANSON V E
D196053	FORT UNION GP	NDE	LIGNITE	77-108-2	USGD-SWANSON V E
D196054	FORT UNION GP	NDE	LIGNITE	77-109-1	USGD-SWANSON V E
D196055	FORT UNION GP	NDE	LIGNITE	77-109-2	USGD-SWANSON V E
D196056	FORT UNION GP	NDE	LIGNITE	77-109-3	USGD-SWANSON V E
D196057	FORT UNION GP	NDE	LIGNITE	77-110-1	USGD-SWANSON V E
D196058	FORT UNION GP	NDE	LIGNITE	77-110-2	USGD-SWANSON V E
D196059	FORT UNION GP	NDE	LIGNITE	77-111-1	USGD-SWANSON V E
D196060	FORT UNION GP	NDE	LIGNITE	77-111-2	USGD-SWANSON V E
D196061	FORT UNION GP	NDE	LIGNITE	77-111-3	USGD-SWANSON V E
D196062	FORT UNION GP	NDE	LIGNITE	77-112-1	USGD-SWANSON V E
D196075	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	P-6A-1	NDGS-CARLSON C G
D196076	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	P-3A-1	NDGS-CARLSON C G
D196077	FORT UNION GP	NDE	LIGNITE	H-33C-1	NDGS-CARLSON C G
D196078	FORT UNION GP	NDE	LIGNITE	H-33C-2	NDGS-CARLSON C G
D196079	FORT UNION GP	NDE	LIGNITE	H-30C-1	NDGS-CARLSON C G
D196080	FORT UNION GP	NDE	LIGNITE	H-16C-1	NDGS-CARLSON C G
D196081	FORT UNION GP	NDE	LIGNITE	H-43-1	NDGS-CARLSON C G
D194858	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	77-101-1	USGD-SCHNEIDER G B
D194859	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	77-101-2	USGD-SCHNEIDER G B
D194860	FORT UNION GP	NDE	LIGNITE	77-101-3	USGD-SCHNEIDER G B
D194861	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	77-102	USGD-SCHNEIDER G B
D194862	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	77-103	USGD-SCHNEIDER G B
D194863	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	77-104	USGD-SCHNEIDER G B
D194864	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	77-105-1	USGD-SCHNEIDER G B
D194865	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	77-105-2	USGD-SCHNEIDER G B
D194866	FORT UNION GP	NDE	LIGNITE	77-106-1	USGD-SCHNEIDER G B
D194867	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	77-106-2	USGD-SCHNEIDER G B
D194868	FORT UNION GP	NDE	LIGNITE	77-106-3	USGD-SCHNEIDER G B
D194869	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	77-107-1	USGD-SCHNEIDER G B
D194870	FORT UNION GP	NDE	LIGNITE	77-107-2	USGD-SCHNEIDER G B
D194029	FORT UNION GP	NDE	LIGNITE	P-3G-1	NDGS-CARLSON C G
D194030	FORT UNION GP	NDE	LIGNITE	P-3G-2	NDGS-CARLSON C G
D194031	FORT UNION GP	NDE	LIGNITE	P-3G-3	NDGS-CARLSON C G
D194032	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	P-1A-1	NDGS-CARLSON C G
D194033	SENTINEL BUTTE	BEULAH-ZAP	LIGNITE	P-1A-2	NDGS-CARLSON C G
D194034	FORT UNION GP	NDE	LIGNITE	P-1G-1	NDGS-CARLSON C G
D194035	FORT UNION GP	NDE	LIGNITE	P-1G-2	NDGS-CARLSON C G
D194036	FORT UNION GP	NDE	LIGNITE	P-1G-3	NDGS-CARLSON C G

Table 1b. (cont'd.) Geologic information for 383 lignite samples from the Fort Union Region- North Dakota and Montana.

SAMPLE NUMBER	GROUP/FORMATION	BED NAME	ESTIMATED RANK	FIELD ID NO.	COLLECTOR
D196624	FORT UNION GP	UNNAMED	LIGNITE	WB-3-1	USCD-HARKSON J C
D196625	FORT UNION GP	UNNAMED	LIGNITE	WB-3-2	USCD-HARKSON J C
D196626	FORT UNION GP	UNNAMED	LIGNITE	WB-3-3	USCD-HARKSON J C
D196627	FORT UNION GP	UNNAMED	LIGNITE	WB-104-1	USCD-HARKSON J C
D196628	FORT UNION GP	UNNAMED	LIGNITE	WB-104-2	USCD-HARKSON J C
D196629	FORT UNION GP	UNNAMED	LIGNITE	WB-55-1	USCD-HARKSON J C
D196630	FORT UNION GP	UNNAMED	LIGNITE	WB-55-2	USCD-HARKSON J C
D196631	FORT UNION GP	UNNAMED	LIGNITE	WB-55-3	USCD-HARKSON J C
D196632	FORT UNION GP	UNNAMED	LIGNITE	WB-55-4	USCD-HARKSON J C
D196633	FORT UNION GP	UNNAMED	LIGNITE	WB-55-4A	USCD-HARKSON J C
D196634	FORT UNION GP	UNNAMED	LIGNITE	WB-55-5	USCD-HARKSON J C
D196635	FORT UNION GP	UNNAMED	LIGNITE	WB-107-1	USCD-HARKSON J C
D196636	FORT UNION GP	UNNAMED	LIGNITE	WB-107-2	USCD-HARKSON J C
D196637	FORT UNION GP	UNNAMED	LIGNITE	WB-14-1	USCD-HARKSON J C
D196638	FORT UNION GP	UNNAMED	LIGNITE	WB-14-2	USCD-HARKSON J C
D196639	FORT UNION GP	UNNAMED	LIGNITE	WB-14-3	USCD-HARKSON J C
D196640	FORT UNION GP	UNNAMED	LIGNITE	WB-24-1	USCD-HARKSON J C
D221097	FORT UNION GP	NDE	LIGNITE	79-101A	USGS-USBR
D221098	FORT UNION GP	NDE	LIGNITE	79-101B	USGS-USBR
D221099	FORT UNION GP	NDE	LIGNITE	79-101C	USGS-USBR
D221100	FORT UNION GP	NDE	LIGNITE	79-101D	USGS-USBR
D221101	FORT UNION GP	NDE	LIGNITE	79-102A	USGS-USBR
D221102	FORT UNION GP	NDE	LIGNITE	79-102B	USGS-USBR
D221103	FORT UNION GP	NDE	LIGNITE	79-102C	USGS-USBR
D221104	FORT UNION GP	NDE	LIGNITE	79-103A	USGS-USBR
D221105	FORT UNION GP	NDE	LIGNITE	79-103B	USGS-USBR
D221106	FORT UNION GP	NDE	LIGNITE	79-103C	USGS-USBR
D213983	FORT UNION GP	NDE	LIGNITE	79-112-1	USGS-USBR
D213984	FORT UNION GP	NDE	LIGNITE	79-112-2	USGS-USBR
D213985	FORT UNION GP	NDE	LIGNITE	79-111-1	USGS-USBR
D213986	FORT UNION GP	NDE	LIGNITE	79-111-2	USGS-USBR
D213987	FORT UNION GP	NDE	LIGNITE	79-111-3	USGS-USBR
D213988	FORT UNION GP	NDE	LIGNITE	79-109-1	USGS-USBR
D213989	FORT UNION GP	NDE	LIGNITE	79-109-2	USGS-USBR
D213990	FORT UNION GP	NDE	LIGNITE	79-109-3	USGS-USBR
D213991	FORT UNION GP	NDE	LIGNITE	79-107-1	USGS-USBR
D213992	FORT UNION GP	NDE	LIGNITE	79-107-2	USGS-USBR
D213993	FORT UNION GP	NDE	LIGNITE	79-107-3	USGS-USBR
D213994	FORT UNION GP	NDE	LIGNITE	79-110-1	USGS-USBR
D213995	FORT UNION GP	NDE	LIGNITE	79-110-2	USGS-USBR

Table 1b. (cont'd.) Geologic information for 383 lignite samples from the Fort Union Region- North Dakota and Montana.

SAMPLE NUMBER	GROUP/FORMATION	BED NAME	ESTIMATED RANK	FIELD ID NO.	COLLECTOR
D213996	FORT UNION GP	NDE	LIGNITE	79-114-1	USGS-USBR
D213997	FORT UNION GP	NDE	LIGNITE	79-106-1	USGS-USBR
D213998	FORT UNION GP	NDE	LIGNITE	79-106-2	USGS-USBR
D213999	FORT UNION GP	NDE	LIGNITE	79-102-1	USGS-USBR
D214000	FORT UNION GP	NDE	LIGNITE	79-102-2	USGS-USBR
D214001	FORT UNION GP	NDE	LIGNITE	79-102-3	USGS-USBR
D196399	FORT UNION GP	UNNAMED	LIGNITE	MK-7-1	USGD-SWANSON V E
D196400	FORT UNION GP	UNNAMED	LIGNITE	MK-12-1	USGD-SWANSON V E
D196401	FORT UNION GP	UNNAMED	LIGNITE	MK-15-1	USGD-SWANSON V E
D196402	FORT UNION GP	UNNAMED	LIGNITE	MK-17-1	USGD-SWANSON V E
D196403	FORT UNION GP	UNNAMED	LIGNITE	MK-17-2	USGD-SWANSON V E
D196404	FORT UNION GP	UNNAMED	LIGNITE	MK-40-1	USGD-SWANSON V E
D196405	FORT UNION GP	UNNAMED	LIGNITE	MK-41-1	USGD-SWANSON V E
D196406	FORT UNION GP	UNNAMED	LIGNITE	MK-45-1	USGD-SWANSON V E
D196407	FORT UNION GP	UNNAMED	LIGNITE	MK-45-2	USGD-SWANSON V E
D210365	FORT UNION GP	UNNAMED	LIGNITE	BU9C	NDGS-CARLSON C G
D210368	FORT UNION GP	UNNAMED	LIGNITE	MCL14C	NDGS-CARLSON C G
D210369	FORT UNION GP	UNNAMED	LIGNITE	MCL37C	NDGS-CARLSON C G
D210371	FORT UNION GP	UNNAMED	LIGNITE	RS12C-2	NDGS-CARLSON C G
D210372	FORT UNION GP	UNNAMED	LIGNITE	RS16C	NDGS-CARLSON C G
D218907	FORT UNION GP	UNNAMED	LIGNITE	C8-78	USCD-SCHELL E
D210366	FORT UNION GP	UNNAMED	LIGNITE	BU31C	NDGS-CARLSON C G
D210370	FORT UNION GP	UNNAMED	LIGNITE	RS12C-1	NDGS-CARLSON C G
D196593	FORT UNION GP	UNNAMED	LIGNITE	WB-4-1	USCD-HARKSON J C
D196594	FORT UNION GP	UNNAMED	LIGNITE	WB-7-1	USCD-HARKSON J C
D196595	FORT UNION GP	UNNAMED	LIGNITE	WB-13-1	USCD-HARKSON J C
D196596	FORT UNION GP	UNNAMED	LIGNITE	WB-54-1	USCD-HARKSON J C
D196597	FORT UNION GP	UNNAMED	LIGNITE	WB-103-1	USCD-HARKSON J C
D240973	FORT UNION GP	UNNAMED	LIGNITE	DH81-101-1	USGD-SCHNEIDER G B
D240974	FORT UNION GP	UNNAMED	LIGNITE	DH81-103-1	USGD-SCHNEIDER G B
D240975	FORT UNION GP	UNNAMED	LIGNITE	DH81-103-2	USGD-SCHNEIDER G B
D240976	FORT UNION GP	UNNAMED	LIGNITE	DH81-105-1	USGD-SCHNEIDER G B
D240977	FORT UNION GP	UNNAMED	LIGNITE	DH81-105-2	USGD-SCHNEIDER G B
D240978	FORT UNION GP	UNNAMED	LIGNITE	DH81-106-1	USGD-SCHNEIDER G B
D240979	FORT UNION GP	UNNAMED	LIGNITE	DH81-106-2	USGD-SCHNEIDER G B
D240980	FORT UNION GP	UNNAMED	LIGNITE	DH81-107-1	USGD-SCHNEIDER G B
D240981	FORT UNION GP	UNNAMED	LIGNITE	DH81-107-2	USGD-SCHNEIDER G B
D240982	FORT UNION GP	UNNAMED	LIGNITE	DH81-108-1	USGD-SCHNEIDER G B
D240983	FORT UNION GP	UNNAMED	LIGNITE	DH81-109-1	USGD-SCHNEIDER G B
D240984	FORT UNION GP	UNNAMED	LIGNITE	DH81-109-2	USGD-SCHNEIDER G B

Table 1b. (cont'd.) Geologic information for 383 lignite samples from the Fort Union Region- North Dakota and Montana.

SAMPLE NUMBER	GROUP/FORMATION	BED NAME	ESTIMATED RANK	FIELD ID NO.	COLLECTOR
D240985	FORT UNION GP	UNNAMED	LIGNITE	DH81-109-3	USGD-SCHNEIDER G B
D240986	FORT UNION GP	UNNAMED	LIGNITE	DH81-110-1	USGD-SCHNEIDER G B
D240987	FORT UNION GP	UNNAMED	LIGNITE	DH81-110-2	USGD-SCHNEIDER G B
D240988	FORT UNION GP	UNNAMED	LIGNITE	DH81-110-3	USGD-SCHNEIDER G B
D240989	FORT UNION GP	UNNAMED	LIGNITE	DH81-101A-1	USGD-SCHNEIDER G B
D240990	FORT UNION GP	UNNAMED	LIGNITE	DH81-101A-2	USGD-SCHNEIDER G B
D240991	FORT UNION GP	UNNAMED	LIGNITE	DH81-103A-1	USGD-SCHNEIDER G B
D240992	FORT UNION GP	UNNAMED	LIGNITE	DH81-103A-2	USGD-SCHNEIDER G B
D210367	FORT UNION GP	NDE	LIGNITE	MCL5C	NDGS-CARLSON C G
D175972	FORT UNION GP	NDE	LIGNITE	612	MTBM
D175973	FORT UNION GP	NDE	LIGNITE	613	MTBM
D175974	FORT UNION GP	NDE	LIGNITE	614	MTBM
D175975	FORT UNION GP	NDE	LIGNITE	615	MTBM
D165751	FORT UNION FM	NDE	LIGNITE	VW-1-73	USGD-SWANSON V E
D165752	FORT UNION FM	NDE	LIGNITE	VW-2-73	USGD-SWANSON V E
D165753	FORT UNION FM	NDE	LIGNITE	VW-3-73	USGD-SWANSON V E
D165754	FORT UNION FM	NDE	LIGNITE	VW-4-73	USGD-SWANSON V E
D165755	FORT UNION FM	NDE	LIGNITE	VW-5-73	USGD-SWANSON V E
D165756	FORT UNION FM	NDE	LIGNITE	VW-6-73	USGD-SWANSON V E
D165757	FORT UNION FM	NDE	LIGNITE	VW-7-73	USGD-SWANSON V E
D165758	FORT UNION FM	NDE	LIGNITE	VW-8-73	USGD-SWANSON V E
D165759	FORT UNION FM	NDE	LIGNITE	VW-9-73	USGD-SWANSON V E
D165760	FORT UNION FM	NDE	LIGNITE	VW-10-73	USGD-SWANSON V E
D165761	FORT UNION FM	NDE	LIGNITE	VW-11-73	USGD-SWANSON V E
D165762	FORT UNION FM	NDE	LIGNITE	VW-12-73	USGD-SWANSON V E
D165763	FORT UNION FM	NDE	LIGNITE	VW-13-73	USGD-SWANSON V E
D165764	FORT UNION FM	NDE	LIGNITE	VW-14-73	USGD-SWANSON V E
D165765	FORT UNION FM	NDE	LIGNITE	VW-15-73	USGD-SWANSON V E
D165766	FORT UNION FM	NDE	LIGNITE	VW-16-73	USGD-SWANSON V E
D178086	FORT UNION FM	NDE	LIGNITE	629	USGD-SWANSON V E
D178087	FORT UNION FM	NDE	LIGNITE	630	USGD-SWANSON V E
D178088	FORT UNION FM	NDE	LIGNITE	631	USGD-SWANSON V E
D188118	FORT UNION FM	S	LIGNITE	76C-001A	USGD-SWANSON V E
D188119	FORT UNION FM	S	LIGNITE	76C-001B	USGD-SWANSON V E
D188120	FORT UNION FM	S	LIGNITE	76C-002	USGD-SWANSON V E
D188121	FORT UNION FM	S	LIGNITE	76C-003	USGD-SWANSON V E
D188122	FORT UNION FM	S	LIGNITE	76C-004	USGD-SWANSON V E
D188123	FORT UNION FM	S	LIGNITE	76C-005	USGD-SWANSON V E
D188124	FORT UNION FM	S	LIGNITE	76C-006	USGD-SWANSON V E
D188125	FORT UNION FM	UNNAMED	LIGNITE	76C-007	USGD-SWANSON V E

Table 1b. (cont'd.) Geologic information for 383 lignite samples from the Fort Union Region- North Dakota and Montana.

SAMPLE NUMBER	GROUP/FORMATION	BED NAME	ESTIMATED RANK	FIELD ID NO.	COLLECTOR
D188126	FORT UNION FM	UNNAMED	LIGNITE	76C-008	USGD-SWANSON V E
D188127	FORT UNION FM	UNNAMED	LIGNITE	76C-009	USGD-SWANSON V E
D188128	FORT UNION FM	NDE	LIGNITE	632	USGD-SWANSON V E
D188129	FORT UNION FM	NDE	LIGNITE	633	USGD-SWANSON V E
D188130	FORT UNION FM	NDE	LIGNITE	634	USGD-SWANSON V E
D188131	FORT UNION FM	UNNAMED	LIGNITE	635	USGD-SWANSON V E
D188132	FORT UNION FM	UNNAMED	LIGNITE	636	USGD-SWANSON V E
D188133	FORT UNION FM	UNNAMED	LIGNITE	637	USGD-SWANSON V E
D188134	FORT UNION FM	UNNAMED	LIGNITE	638	USGD-SWANSON V E
D188135	FORT UNION FM	UNNAMED	LIGNITE	641	USGD-SWANSON V E
D188136	FORT UNION FM	UNNAMED	LIGNITE	639	USGD-SWANSON V E
D188137	FORT UNION FM	UNNAMED	LIGNITE	640	USGD-SWANSON V E
D188138	FORT UNION FM	UNNAMED	LIGNITE	76C-012	USGD-SWANSON V E
D188140	FORT UNION FM	UNNAMED	LIGNITE	76C-010A	USGD-SWANSON V E
D188141	FORT UNION FM	UNNAMED	LIGNITE	76C-010C	USGD-SWANSON V E
D188142	FORT UNION FM	UNNAMED	LIGNITE	76C-011A	USGD-SWANSON V E
D188143	FORT UNION FM	UNNAMED	LIGNITE	76C-011B	USGD-SWANSON V E
D188144	FORT UNION FM	UNNAMED	LIGNITE	76C-013	USGD-SWANSON V E
D188145	FORT UNION FM	UNNAMED	LIGNITE	76C-014	USGD-SWANSON V E
D189256	FORT UNION FM	NDE	LIGNITE	KR-1A	USGD-SWANSON V E
D189257	FORT UNION FM	NDE	LIGNITE	KR-1B	USGD-SWANSON V E
D189258	FORT UNION FM	NDE	LIGNITE	KR-1C	USGD-SWANSON V E
D189259	FORT UNION FM	NDE	LIGNITE	KR-1D	USGD-SWANSON V E
D189260	FORT UNION FM	NDE	LIGNITE	CP-1A	USGD-SWANSON V E
D189261	FORT UNION FM	NDE	LIGNITE	CP-1B	USGD-SWANSON V E
D189262	FORT UNION FM	NDE	LIGNITE	CP-1C	USGD-SWANSON V E
D189263	FORT UNION FM	NDE	LIGNITE	CP-1D	USGD-SWANSON V E
D196643	FORT UNION FM	UNNAMED	LIGNITE	WB-83-3	USGS-HARKSON J C
D196644	FORT UNION FM	UNNAMED	LIGNITE	WB-83-4	USGS-HARKSON J C
D196645	FORT UNION FM	UNNAMED	LIGNITE	WB-40-1	USGS-HARKSON J C
D196646	FORT UNION FM	UNNAMED	LIGNITE	WB-40-1A	USGS-HARKSON J C
D196647	FORT UNION FM	UNNAMED	LIGNITE	WB-40-2	USGS-HARKSON J C
D196648	FORT UNION FM	UNNAMED	LIGNITE	WB-40-3	USGS-HARKSON J C
D196649	FORT UNION FM	UNNAMED	LIGNITE	WB-40-4	USGS-HARKSON J C
D196650	FORT UNION FM	UNNAMED	LIGNITE	WB-31-1	USGS-HARKSON J C
D196651	FORT UNION FM	UNNAMED	LIGNITE	WB-31-2	USGS-HARKSON J C
D196652	FORT UNION FM	UNNAMED	LIGNITE	WB-87-1	USGS-HARKSON J C
D196653	FORT UNION FM	UNNAMED	LIGNITE	WB-36-1	USGS-HARKSON J C
D196654	FORT UNION FM	UNNAMED	LIGNITE	WB-36-2	USGS-HARKSON J C
D196655	FORT UNION FM	UNNAMED	LIGNITE	WB-58-1	USGS-HARKSON J C

Table 1b. (cont'd.) Geologic information for 383 lignite samples from the Fort Union Region- North Dakota and Montana.

SAMPLE NUMBER	GROUP/FORMATION	BED NAME	ESTIMATED RANK	FIELD ID NO.	COLLECTOR
D196656	FORT UNION FM	UNNAMED	LIGNITE	WB-58-1A	USGS-HARKSON J C
D196657	FORT UNION FM	UNNAMED	LIGNITE	WB-58-2	USGS-HARKSON J C
D196658	FORT UNION FM	UNNAMED	LIGNITE	WB-6-1	USGS-HARKSON J C
D196659	FORT UNION FM	UNNAMED	LIGNITE	WB-6-2	USGS-HARKSON J C
D196660	FORT UNION FM	UNNAMED	LIGNITE	WB-6-3	USGS-HARKSON J C
D196661	FORT UNION FM	UNNAMED	LIGNITE	WB-63-1	USGS-HARKSON J C
D196662	FORT UNION FM	UNNAMED	LIGNITE	WB-85-1	USGS-HARKSON J C
D196641	FORT UNION FM	UNNAMED	LIGNITE	WB-83-1	USGS-HARKSON J C
D196642	FORT UNION FM	UNNAMED	LIGNITE	WB-83-2	USGS-HARKSON J C
D221125	FORT UNION FM	UNCORRELATED	LIGNITE	GS-22C-1	USGD-ARNDT H H
D221126	FORT UNION FM	UNCORRELATED	LIGNITE	GS-22C-2	USGD-ARNDT H H
D221127	FORT UNION FM	UNCORRELATED	LIGNITE	GS-22C-3	USGD-ARNDT H H
D221128	FORT UNION FM	UNCORRELATED	LIGNITE	GS-22C-4	USGD-ARNDT H H
D221129	FORT UNION FM	UNCORRELATED	LIGNITE	GS-22C-5	USGD-ARNDT H H
D221130	FORT UNION FM	UNCORRELATED	LIGNITE	GS-13C-1	USGD-ARNDT H H
D221131	FORT UNION FM	UNCORRELATED	LIGNITE	GS-20C-1	USGD-ARNDT H H
D221132	FORT UNION FM	UNCORRELATED	LIGNITE	GS-28C-1	USGD-ARNDT H H
D221133	FORT UNION FM	UNCORRELATED	LIGNITE	GS-28C-2	USGD-ARNDT H H
D221134	FORT UNION FM	UNCORRELATED	LIGNITE	GS-28C-3	USGD-ARNDT H H
D221135	FORT UNION FM	UNCORRELATED	LIGNITE	GS-28C-4	USGD-ARNDT H H
D221136	FORT UNION FM	UNCORRELATED	LIGNITE	GS-34C-1	USGD-ARNDT H H
D221137	FORT UNION FM	UNCORRELATED	LIGNITE	GS-34C-2	USGD-ARNDT H H
D221138	FORT UNION FM	UNCORRELATED	LIGNITE	GS-44C-1	USGD-ARNDT H H
D221139	FORT UNION FM	UNCORRELATED	LIGNITE	GS-40C-1	USGD-ARNDT H H
D221140	FORT UNION FM	UNCORRELATED	LIGNITE	GS-40C-2	USGD-ARNDT H H
D221141	FORT UNION FM	UNCORRELATED	LIGNITE	GS-40C-3	USGD-ARNDT H H
D221142	FORT UNION FM	UNCORRELATED	LIGNITE	GS-41C-1	USGD-ARNDT H H
D221143	FORT UNION FM	UNCORRELATED	LIGNITE	GS-41C-2	USGD-ARNDT H H
D221144	FORT UNION FM	UNCORRELATED	LIGNITE	GS-41C-3	USGD-ARNDT H H
D221145	FORT UNION FM	UNCORRELATED	LIGNITE	GS-42C-1	USGD-ARNDT H H
D196598	FORT UNION FM	UNNAMED	LIGNITE	WB-37-1	USCD-HARKSON J C
D196599	FORT UNION FM	UNNAMED	LIGNITE	WB-59-1	USCD-HARKSON J C
D209953	FORT UNION FM	UNNAMED	LIGNITE	2C-1	USGD-HONEY J G
D209954	FORT UNION FM	UNNAMED	LIGNITE	2CP-1	USGD-HONEY J G
D209955	FORT UNION FM	UNNAMED	LIGNITE	2CP-2	USGD-HONEY J G
D209956	FORT UNION FM	UNNAMED	LIGNITE	2CP-3	USGD-HONEY J G
D209957	FORT UNION FM	UNNAMED	LIGNITE	1C-1	USGD-HONEY J G
D209958	FORT UNION FM	UNNAMED	LIGNITE	1C-2	USGD-HONEY J G
D209959	FORT UNION FM	UNNAMED	LIGNITE	4C-1	USGD-HONEY J G
D209960	FORT UNION FM	UNNAMED	LIGNITE	4C-3	USGD-HONEY J G

Table 1b. (cont'd.) Geologic information for 383 lignite samples from the Fort Union Region- North Dakota and Montana.

SAMPLE NUMBER	GROUP/FORMATION	BED NAME	ESTIMATED RANK	FIELD ID NO.	COLLECTOR
D209961	FORT UNION FM	UNNAMED	LIGNITE	4C-4	USGD-HONEY J G
D209962	FORT UNION FM	UNNAMED	LIGNITE	6C-1	USGD-HONEY J G
D209963	FORT UNION FM	UNNAMED	LIGNITE	6C-2	USGD-HONEY J G
D209964	FORT UNION FM	UNNAMED	LIGNITE	6C-4	USGD-HONEY J G
D209965	FORT UNION FM	UNNAMED	LIGNITE	8C-1	USGD-HONEY J G
D209966	FORT UNION FM	UNNAMED	LIGNITE	8C-3	USGD-HONEY J G
D209967	FORT UNION FM	UNNAMED	LIGNITE	9C-1	USGD-HONEY J G
D209968	FORT UNION FM	UNNAMED	LIGNITE	9C-3	USGD-HONEY J G
D240927	FORT UNION FM	UNNAMED	LIGNITE	DH 101-1	USGD-SCHNEIDER G B
D240928	FORT UNION FM	UNNAMED	LIGNITE	DH 101-2	USGD-SCHNEIDER G B
D240929	FORT UNION FM	UNNAMED	LIGNITE	DH 102-1	USGD-SCHNEIDER G B
D240930	FORT UNION FM	UNNAMED	LIGNITE	DH 102-2	USGD-SCHNEIDER G B
D240931	FORT UNION FM	UNNAMED	LIGNITE	DH 102-3	USGD-SCHNEIDER G B
D240932	FORT UNION FM	UNNAMED	LIGNITE	DH 103-1	USGD-SCHNEIDER G B
D240933	FORT UNION FM	UNNAMED	LIGNITE	DH 103-2	USGD-SCHNEIDER G B
D240934	FORT UNION FM	UNNAMED	LIGNITE	DH 105-1	USGD-SCHNEIDER G B
D240935	FORT UNION FM	UNNAMED	LIGNITE	DH 104-1	USGD-SCHNEIDER G B
D240936	FORT UNION FM	UNNAMED	LIGNITE	DH 104-2	USGD-SCHNEIDER G B
D240937	FORT UNION FM	UNNAMED	LIGNITE	DH 106-1	USGD-SCHNEIDER G B
D240938	FORT UNION FM	UNNAMED	LIGNITE	DH 107-1	USGD-SCHNEIDER G B
D240939	FORT UNION FM	UNNAMED	LIGNITE	DH 108-1	USGD-SCHNEIDER G B
D240940	FORT UNION FM	UNNAMED	LIGNITE	DH 108-2	USGD-SCHNEIDER G B
D240941	FORT UNION FM	UNNAMED	LIGNITE	DH 109-1	USGD-SCHNEIDER G B

Table 1c. Sample information for 383 lignites from the Fort Union Region- North Dakota and Montana. Values of 0 mean no data available. Data for associated sediments available in Table 2 for sample numbers marked with *.

SAMPLE NUMBER	DEPTH CM	DEPTH IN	SAMPLE THICKNESS CM	SAMPLE THICKNESS IN	SAMPLE TYPE	ANALYTICAL LABS	DATA VALUES REPRESENT	DATE YR/MO/DY
D165564	0.0	(0.0)	121.9	(48.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	731204
D165565	0.0	(0.0)	213.3	(84.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	731204
D165566	0.0	(0.0)	121.9	(48.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	731204
D165567	0.0	(0.0)	213.3	(84.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	731204
D165568	0.0	(0.0)	152.4	(60.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	731204
D165569	152.4	(60.0)	152.4	(60.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	731204
D165570	0.0	(0.0)	152.4	(60.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	731204
D165571	152.4	(60.0)	152.4	(60.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	731204
D165572	0.0	(0.0)	243.8	(96.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	UPPER SPLIT	731204
D165573	0.0	(0.0)	91.4	(36.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	LOWER SPLIT	731204
D165574	0.0	(0.0)	243.8	(96.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	UPPER SPLIT	731204
D165575	0.0	(0.0)	91.4	(36.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	LOWER SPLIT	731204
D165576	167.6	(66.0)	167.6	(66.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	731204
D165577	0.0	(0.0)	167.6	(66.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	731204
D165578	167.6	(66.0)	167.6	(66.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	731204
D165579	0.0	(0.0)	167.6	(66.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	731204
D165605	0.0	(0.0)	182.8	(72.0)	CHANNEL	US GEOL. SURVEY	PARTIAL SEAM	731217
D165606	182.8	(72.0)	182.8	(72.0)	CHANNEL	US GEOL. SURVEY	PARTIAL SEAM	731217
D165607	365.7	(144.0)	182.8	(72.0)	CHANNEL	US GEOL. SURVEY	PARTIAL SEAM	731217
D165608	0.0	(0.0)	182.8	(72.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	731217
D165609	182.8	(72.0)	182.8	(72.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	731217
D165610	365.7	(144.0)	182.8	(72.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	731217
D165611	0.0	(0.0)	182.8	(72.0)	CHANNEL	US GEOL. SURVEY	PARTIAL SEAM	731217
D165612	182.8	(72.0)	182.8	(72.0)	CHANNEL	US GEOL. SURVEY	PARTIAL SEAM	731217
D165613	365.7	(144.0)	182.8	(72.0)	CHANNEL	US GEOL. SURVEY	PARTIAL SEAM	731217
D165632	0.0	(0.0)	0.0	(0.0)	RUN OF MINE	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	731219
D165974	0.0	(0.0)	121.9	(48.0)	CHANNEL	US GEOL. SURVEY	PARTIAL UPPER SPLIT	740124
D165975	0.0	(0.0)	121.9	(48.0)	CHANNEL	US GEOL. SURVEY	PARTIAL UPPER SPLIT	740124
D165976	0.0	(0.0)	121.9	(48.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	740124
D165977	0.0	(0.0)	121.9	(48.0)	CHANNEL	US GEOL. SURVEY	SINGLE SAMPLE	740124
D165978	0.0	(0.0)	121.9	(48.0)	CHANNEL	US GEOL. SURVEY	PARTIAL UPPER SPLIT	740124
D165979	0.0	(0.0)	121.9	(48.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	PARTIAL UPPER SPLIT	740124
D165980	0.0	(0.0)	121.9	(48.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	PARTIAL LOWER SPLIT	740124
D165981	0.0	(0.0)	121.9	(48.0)	CHANNEL	US GEOL. SURVEY	PARTIAL LOWER SPLIT	740124
D165982	0.0	(0.0)	121.9	(48.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	740124
D165983	0.0	(0.0)	121.9	(48.0)	CHANNEL	US GEOL. SURVEY	SINGLE SAMPLE	740124
D165984	0.0	(0.0)	121.9	(48.0)	CHANNEL	US GEOL. SURVEY	PARTIAL UPPER SPLIT	740124
D165985	0.0	(0.0)	121.9	(48.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	PARTIAL UPPER SPLIT	740124
D165986	0.0	(0.0)	121.9	(48.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	PARTIAL LOWER SPLIT	740124
D165987	0.0	(0.0)	121.9	(48.0)	CHANNEL	US GEOL. SURVEY	PARTIAL LOWER SPLIT	740124

Table 1c. (cont'd.) Sample information for 383 lignites from the Fort Union Region- North Dakota and Montana.

SAMPLE NUMBER	DEPTH CM	DEPTH IN	SAMPLE THICKNESS CM	SAMPLE THICKNESS IN	SAMPLE TYPE	ANALYTICAL LABS	DATA VALUES REPRESENT	DATE YR/MO/DY
D165988	0.0	(0.0)	121.9	(48.0)	CHANNEL	US GEOL. SURVEY	PARTIAL UPPER SPLIT	740124
D165989	0.0	(0.0)	121.9	(48.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	PARTIAL UPPER SPLIT	740124
D165990	0.0	(0.0)	121.9	(48.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	PARTIAL LOWER SPLIT	740124
D165991	0.0	(0.0)	121.9	(48.0)	CHANNEL	US GEOL. SURVEY	PARTIAL LOWER SPLIT	740124
D173466	0.0	(0.0)	121.9	(48.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	750515
D173467	0.0	(0.0)	121.9	(48.0)	CHANNEL	US GEOL. SURVEY	PARTIAL SEAM	750515
D173468	0.0	(0.0)	121.9	(48.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	750515
D173469	0.0	(0.0)	121.9	(48.0)	CHANNEL	US GEOL. SURVEY	PARTIAL SEAM	750515
D175930	0.0	(0.0)	152.4	(60.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	UPPER SPLIT	750616
D175931	0.0	(0.0)	167.6	(66.0)	CHANNEL	US GEOL. SURVEY	LOWER SPLIT	750616
D175932	0.0	(0.0)	152.4	(60.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	UPPER SPLIT	750616
D175933	0.0	(0.0)	167.6	(66.0)	CHANNEL	US GEOL. SURVEY	LOWER SPLIT	750616
D175934	0.0	(0.0)	152.4	(60.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	UPPER SPLIT	750616
D175935	0.0	(0.0)	152.4	(60.0)	CHANNEL	US GEOL. SURVEY	LOWER SPLIT	750616
D175936	0.0	(0.0)	121.9	(48.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	UPPER SPLIT	750616
D175937	0.0	(0.0)	121.9	(48.0)	CHANNEL	US GEOL. SURVEY	LOWER SPLIT	750616
D175938	0.0	(0.0)	121.9	(48.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	UPPER SPLIT	750616
D175939	0.0	(0.0)	121.9	(48.0)	CHANNEL	US GEOL. SURVEY	LOWER SPLIT	750616
D178143	0.0	(0.0)	91.4	(36.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	UPPER SPLIT	751022
D178144	91.4	(36.0)	91.4	(36.0)	CHANNEL	US GEOL. SURVEY	MIDDLE SPLIT	751022
D178145	182.8	(72.0)	91.4	(36.0)	CHANNEL	US GEOL. SURVEY	LOWER SPLIT	751022
D178498	304.8	(120.0)	103.6	(40.8)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	751113
D178499	1008.8	(397.2)	173.7	(68.4)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	751113
D178500	4456.1	(1754.4)	164.5	(64.8)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	751113
D178501	4812.7	(1894.8)	182.8	(72.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	COMP. USBM, SINGLE USGS	751113
D178502	5151.1	(2028.0)	176.7	(69.6)	DRILL CORE	US GEOL. SURVEY	COMP. USBM, SINGLE USGS	751113
D178503	6464.8	(2545.2)	76.2	(30.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	751113
D178504	1417.3	(558.0)	64.0	(25.2)	DRILL CORE	US GEOL. SURVEY	SINGLE SAMPLE	751113
D178505	2462.7	(969.6)	164.5	(64.8)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	COMP. USBM, SINGLE USGS	751113
D178506	2746.2	(1081.2)	152.4	(60.0)	DRILL CORE	US GEOL. SURVEY	COMP. USBM, SINGLE USGS	751113
D178507	762.0	(300.0)	79.2	(31.2)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	751113
D178508	1365.5	(537.6)	152.4	(60.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	751113
D178509	3081.5	(1213.2)	64.0	(25.2)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	751113
D178510	4995.6	(1966.8)	67.0	(26.4)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	COMP. USBM, SINGLE USGS	751113
D178511	5141.9	(2024.4)	73.1	(28.8)	DRILL CORE	US GEOL. SURVEY	COMP. USBM, SINGLE USGS	751113
D178512	5288.2	(2082.0)	73.1	(28.8)	DRILL CORE	US GEOL. SURVEY	COMP. USBM, SINGLE USGS	751113
D179369	1688.5	(664.8)	152.4	(60.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	760126
D179370	4584.1	(1804.8)	70.1	(27.6)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	760126
D179371	5169.4	(2035.2)	381.0	(150.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	760126
D179372	2136.6	(841.2)	91.4	(36.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	760126

Table 1c. (cont'd.) Sample information for 383 lignites from the Fort Union Region- North Dakota and Montana.

SAMPLE NUMBER	DEPTH CM	DEPTH IN	SAMPLE THICKNESS CM	SAMPLE THICKNESS IN	SAMPLE TYPE	ANALYTICAL LABS	DATA VALUES REPRESENT	DATE YR/MO/DY
D179373	2465.8	(970.8)	630.9	(248.4)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	760126
D179374	1368.5	(538.8)	137.6	(54.2)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	760126
D179375	3706.3	(1459.2)	82.2	(32.4)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	760126
D179376	3919.7	(1543.2)	585.2	(230.4)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	760126
D179377	1146.0	(451.2)	88.3	(34.8)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	760126
D179378	1706.8	(672.0)	399.2	(157.2)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	760126
D179379	1039.3	(409.2)	85.3	(33.6)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	760126
D179380	1780.0	(700.8)	54.8	(21.6)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	760126
D179381	1959.8	(771.6)	70.1	(27.6)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	760126
D179382	2142.7	(843.6)	70.1	(27.6)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	760126
D179383	3404.6	(1340.4)	414.5	(163.2)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	760126
D179384	883.9	(348.0)	505.9	(199.2)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	760126
D180007	0.0	(0.0)	563.8	(222.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	760408
D180008	0.0	(0.0)	664.4	(261.6)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	760408
D180009	0.0	(0.0)	579.1	(228.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	760408
D180010	0.0	(0.0)	594.3	(234.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	760408
D180011	0.0	(0.0)	472.4	(186.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	760408
D180012	0.0	(0.0)	432.8	(170.4)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	760408
D180013	0.0	(0.0)	249.9	(98.4)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	760408
D180014	0.0	(0.0)	569.9	(224.4)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	760408
D180015	0.0	(0.0)	435.8	(171.6)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	760408
D180016	0.0	(0.0)	472.4	(186.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	760408
D180017	0.0	(0.0)	518.1	(204.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	760408
D180018	0.0	(0.0)	566.9	(223.2)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	760408
D180019	0.0	(0.0)	542.5	(213.6)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	760408
D180075	1456.9	(573.6)	573.0	(225.6)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	760415
D180076	2026.9	(798.0)	521.2	(205.2)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	760415
D180077	2636.5	(1038.0)	64.0	(25.2)	DRILL CORE	US GEOL. SURVEY	SINGLE SAMPLE	760415
D180078	1819.6	(716.4)	612.6	(241.2)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	760400
D180079	822.9	(324.0)	310.8	(122.4)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	760415
D180080	332.2	(130.8)	500.3	(197.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	760415
D180081	1027.1	(404.4)	48.7	(19.2)	DRILL CORE	US GEOL. SURVEY	SINGLE SAMPLE	760415
D180082	676.6	(266.4)	70.1	(27.6)	DRILL CORE	US GEOL. SURVEY	SINGLE SAMPLE	760415
D180083	899.1	(354.0)	554.7	(218.4)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	760415
D186051	0.0	(0.0)	0.0	(0.0)	GRAB	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	761021
D186052	0.0	(0.0)	127.0	(50.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	761021
D186053	0.0	(0.0)	121.9	(48.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	760121
D186054	0.0	(0.0)	213.3	(84.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	COMP. USBM, SINGLE USGS	761021
D186055	213.3	(84.0)	213.3	(84.0)	DRILL CORE	US GEOL. SURVEY	COMP. USBM, SINGLE USGS	761021
D165992	0.0	(0.0)	0.0	(0.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	740124

Table 1c. (cont'd.) Sample information for 383 lignites from the Fort Union Region- North Dakota and Montana.

SAMPLE NUMBER	DEPTH CM	DEPTH IN	SAMPLE THICKNESS CM	SAMPLE THICKNESS IN	SAMPLE TYPE	ANALYTICAL LABS	DATA VALUES REPRESENT	DATE YR/MO/DY
D165993	0.0	(0.0)	0.0	(0.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	740124
D196052	3718.5	(1464.0)	313.9	(123.6)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771117
D196053	4565.9	(1797.6)	173.7	(68.4)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771117
D196054	1731.2	(681.6)	73.1	(28.8)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771117
D196055	3060.1	(1204.8)	350.5	(138.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771117
D196056	3803.9	(1497.6)	170.6	(67.2)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771117
D196057	2456.6	(967.2)	548.6	(216.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771117
D196058	4843.2	(1906.8)	112.7	(44.4)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771117
D196059	3261.3	(1284.0)	76.2	(30.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771117
D196060	3364.9	(1324.8)	60.9	(24.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771117
D196061	4245.8	(1671.6)	579.1	(228.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771117
D196062	5145.0	(2025.6)	646.1	(254.4)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771117
D196075	2377.4	(936.0)	101.6	(40.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771117
D196076	3352.7	(1320.0)	274.3	(108.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771117
D196077	1310.6	(516.0)	231.1	(91.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771117
D196078	1706.8	(672.0)	304.8	(120.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771117
D196079	1859.2	(732.0)	304.8	(120.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771117
D196080	1981.1	(780.0)	213.3	(84.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771117
D196081	1463.0	(576.0)	320.0	(126.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771117
D194858	3938.0	(1550.4)	219.4	(86.4)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	770830
D194859	4236.7	(1668.0)	347.4	(136.8)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	770830
D194860	5974.0	(2352.0)	60.9	(24.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	770830
D194861	4242.8	(1670.4)	518.1	(204.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	770830
D194862	7455.4	(2935.2)	670.5	(264.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	770830
D194863	1670.3	(657.6)	612.6	(241.2)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	770830
D194864	6818.3	(2684.4)	252.9	(99.6)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	770830
D194865	7178.0	(2826.0)	259.0	(102.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	770830
D194866	4093.4	(1611.6)	70.1	(27.6)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	770830
D194867	4251.9	(1674.0)	320.0	(126.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	770830
D194868	4867.6	(1916.4)	73.1	(28.8)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	770830
D194869	5245.6	(2065.2)	335.2	(132.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	770830
D194870	6095.9	(2400.0)	179.8	(70.8)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	770830
D194029	3139.4	(1236.0)	132.0	(52.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	770901
D194030	5120.6	(2016.0)	304.8	(120.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	770901
D194031	6035.0	(2376.0)	193.0	(76.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	770901
D194032	4053.8	(1596.0)	274.3	(108.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	770901
D194033	4328.1	(1704.0)	213.3	(84.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	770901
D194034	1371.6	(540.0)	157.4	(62.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	770901
D194035	2346.9	(924.0)	187.9	(74.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	770901
D194036	4053.8	(1596.0)	185.4	(73.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	770901

Table 1c. (cont'd.) Sample information for 383 lignites from the Fort Union Region- North Dakota and Montana.

SAMPLE NUMBER	DEPTH CM	DEPTH IN	SAMPLE THICKNESS CM	SAMPLE THICKNESS IN	SAMPLE TYPE	ANALYTICAL LABS	DATA VALUES REPRESENT	DATE YR/MO/DY
D196624	1447.8	(570.0)	30.4	(12.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771230
D196625	2270.7	(894.0)	350.5	(138.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771230
D196626	0.0	(0.0)	332.2	(130.8)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771230
D196627	1493.5	(588.0)	60.9	(24.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771230
D196628	1767.8	(696.0)	335.2	(132.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771230
D196629	1066.8	(420.0)	158.4	(62.4)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771230
D196630	1453.8	(572.4)	27.9	(11.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771230
D196631	2337.8	(920.4)	67.0	(26.4)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771230
D196632	2804.1	(1104.0)	640.0	(252.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771230
D196633	0.0	(0.0)	615.6	(242.4)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771230
D196634	3630.1	(1429.2)	24.3	(9.6)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771230
D196635	4480.5	(1764.0)	728.4	(286.8)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771230
D196636	0.0	(0.0)	542.5	(213.6)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771230
D196637	1524.0	(600.0)	243.8	(96.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	771230
D196638	1767.8	(696.0)	457.2	(180.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	771230
D196639	0.0	(0.0)	374.9	(147.6)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771230
D196640	1325.8	(522.0)	685.8	(270.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771230
D221097	3992.8	(1572.0)	97.5	(38.4)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	791029
D221098	7516.3	(2959.2)	167.6	(66.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	791029
D221099	7940.0	(3126.0)	88.3	(34.8)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	791029
D221100	8677.6	(3416.4)	368.8	(145.2)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	791029
D221101	1603.2	(631.2)	128.0	(50.4)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	791029
D221102	3627.1	(1428.0)	347.4	(136.8)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	791029
D221103	3855.7	(1518.0)	149.3	(58.8)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	791029
D221104	807.7	(318.0)	155.4	(61.2)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	791029
D221105	2535.9	(998.4)	350.5	(138.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	791029
D221106	2709.6	(1066.8)	115.8	(45.6)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	791029
D213983	1185.6	(466.8)	140.2	(55.2)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	790612
D213984	4419.5	(1740.0)	198.1	(78.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	790612
D213985	874.7	(344.4)	256.0	(100.8)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	790612
D213986	3953.2	(1556.4)	115.8	(45.6)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	790612
D213987	5056.6	(1990.8)	210.3	(82.8)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	790612
D213988	899.1	(354.0)	112.7	(44.4)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	790612
D213989	2087.8	(822.0)	335.2	(132.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	790612
D213990	1108.4	(436.4)	109.7	(43.2)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	790612
D213991	4550.6	(1791.6)	323.0	(127.2)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	790612
D213992	5593.0	(2202.0)	73.1	(28.8)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	790612
D213993	5934.4	(2336.4)	228.6	(90.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	790612
D213994	2279.9	(897.6)	304.8	(120.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	790612
D213995	4541.5	(1788.0)	390.1	(153.6)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	790612

Table 1c. (cont'd.) Sample information for 383 lignites from the Fort Union Region- North Dakota and Montana.

SAMPLE NUMBER	DEPTH CM	DEPTH IN	SAMPLE THICKNESS CM	SAMPLE THICKNESS IN	SAMPLE TYPE	ANALYTICAL LABS	DATA VALUES REPRESENT	DATE YR/MO/DY
D213996	2883.4	(1135.2)	124.9	(49.2)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	790612
D213997	3297.9	(1298.4)	539.4	(212.4)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	790612
D213998	6345.9	(2498.4)	289.5	(114.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	790612
D213999	1621.5	(638.4)	152.4	(60.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	790612
D214000	4559.8	(1795.2)	307.8	(121.2)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	790612
D214001	5007.8	(1971.6)	134.1	(52.8)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	790612
D196399	5364.4	(2112.0)	274.3	(108.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	770212
D196400	2346.9	(924.0)	301.7	(118.8)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	770212
D196401	2103.1	(828.0)	396.2	(156.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	770212
D196402	3398.5	(1338.0)	274.3	(108.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	770212
D196403	4038.5	(1590.0)	243.8	(96.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	770212
D196404	3185.1	(1254.0)	381.0	(150.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	770212
D196405	2575.5	(1014.0)	350.5	(138.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	770212
D196406	545.5	(214.8)	173.7	(68.4)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	770212
D196407	1615.4	(636.0)	295.6	(116.4)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	770212
D210365	1524.0	(600.0)	274.3	(108.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	790116
D210368	3627.1	(1428.0)	213.3	(84.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	790116
D210369	4480.5	(1764.0)	396.2	(156.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	790116
D210371	6156.9	(2424.0)	701.0	(276.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	790116
D210372	4175.7	(1644.0)	365.7	(144.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	790116
D218907	4114.7	(1620.0)	274.3	(108.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	790905
D210366	2590.7	(1020.0)	274.3	(108.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	790116
D210370	1219.2	(480.0)	274.3	(108.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	790116
D196593	0.0	(0.0)	0.0	(0.0)	OTHER	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771230
D196594	0.0	(0.0)	0.0	(0.0)	OTHER	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771230
D196595	1524.0	(600.0)	0.0	(0.0)	OTHER	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771230
D196596	4480.5	(1764.0)	0.0	(0.0)	OTHER	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771230
D196597	0.0	(0.0)	0.0	(0.0)	OTHER	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771230
D240973	4968.2	(1956.0)	167.6	(66.0)	DRILL CORE	GEOCHEM. TESTING/US GEOL. SURVEY	SINGLE SAMPLE	820125
D240974	1694.6	(667.2)	326.1	(128.4)	DRILL CORE	GEOCHEM. TESTING/US GEOL. SURVEY	SINGLE SAMPLE	820125
D240975	3489.9	(1374.0)	94.4	(37.2)	DRILL CORE	GEOCHEM. TESTING/US GEOL. SURVEY	SINGLE SAMPLE	820125
D240976	7345.6	(2892.0)	100.5	(39.6)	DRILL CORE	GEOCHEM. TESTING/US GEOL. SURVEY	SINGLE SAMPLE	820125
D240977	9604.2	(3781.2)	551.6	(217.2)	DRILL CORE	GEOCHEM. TESTING/US GEOL. SURVEY	SINGLE SAMPLE	820125
D240978	5724.1	(2253.6)	115.8	(45.6)	DRILL CORE	GEOCHEM. TESTING/US GEOL. SURVEY	SINGLE SAMPLE	820125
D240979	7415.7	(2919.6)	316.9	(124.8)	DRILL CORE	GEOCHEM. TESTING/US GEOL. SURVEY	SINGLE SAMPLE	820125
D240980	2423.1	(954.0)	304.8	(120.0)	DRILL CORE	GEOCHEM. TESTING/US GEOL. SURVEY	SINGLE SAMPLE	820125
D240981	6760.4	(2661.6)	91.4	(36.0)	DRILL CORE	GEOCHEM. TESTING/US GEOL. SURVEY	SINGLE SAMPLE	820125
D240982	3831.3	(1508.4)	435.8	(171.6)	DRILL CORE	GEOCHEM. TESTING/US GEOL. SURVEY	SINGLE SAMPLE	820125
D240983	4066.0	(1600.8)	185.9	(73.2)	DRILL CORE	GEOCHEM. TESTING/US GEOL. SURVEY	SINGLE SAMPLE	820125
D240984	4376.9	(1723.2)	216.4	(85.2)	DRILL CORE	GEOCHEM. TESTING/US GEOL. SURVEY	SINGLE SAMPLE	820125

Table 1c. (cont'd.) Sample information for 383 lignites from the Fort Union Region- North Dakota and Montana.

SAMPLE NUMBER	DEPTH CM	DEPTH IN	SAMPLE THICKNESS CM	SAMPLE THICKNESS IN	SAMPLE TYPE	ANALYTICAL LABS	DATA VALUES REPRESENT	DATE YR/MO/DY
D240985	7071.3	(2784.0)	344.4	(135.6)	DRILL CORE	GEOCHEM. TESTING/US GEOL. SURVEY	SINGLE SAMPLE	820125
D240986	3054.0	(1202.4)	472.4	(186.0)	DRILL CORE	GEOCHEM. TESTING/US GEOL. SURVEY	SINGLE SAMPLE	820125
D240987	6111.2	(2406.0)	304.8	(120.0)	DRILL CORE	GEOCHEM. TESTING/US GEOL. SURVEY	SINGLE SAMPLE	820125
D240988	7851.6	(3091.2)	466.3	(183.6)	DRILL CORE	GEOCHEM. TESTING/US GEOL. SURVEY	SINGLE SAMPLE	820125
D240989	4480.5	(1764.0)	121.9	(48.0)	DRILL CORE	GEOCHEM. TESTING/US GEOL. SURVEY	SINGLE SAMPLE	820125
D240990	6751.3	(2658.0)	268.2	(105.6)	DRILL CORE	GEOCHEM. TESTING/US GEOL. SURVEY	SINGLE SAMPLE	820125
D240991	3499.1	(1377.6)	249.9	(98.4)	DRILL CORE	GEOCHEM. TESTING/US GEOL. SURVEY	SINGLE SAMPLE	820125
D240992	6278.8	(2472.0)	152.4	(60.0)	DRILL CORE	GEOCHEM. TESTING/US GEOL. SURVEY	SINGLE SAMPLE	820125
D210367	4724.3	(1860.0)	152.4	(60.0)	DRILL CORE	GEOCHEM. TESTING/US GEOL. SURVEY	SINGLE SAMPLE	751223
D175972	4389.1	(1728.0)	121.9	(48.0)	DRILL CORE	GEOCHEM. TESTING/US GEOL. SURVEY	SINGLE SAMPLE	750616
D175973	1737.3	(684.0)	152.4	(60.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	750616
D175974	3733.7	(1470.0)	2590.7	(1020.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	750616
D175975	3962.3	(1560.0)	152.4	(60.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	750616
D165751	0.0	(0.0)	426.7	(168.0)	DRILL CORE	US GEOL. SURVEY	PARTIAL SEAM	740108
D165752	0.0	(0.0)	426.7	(168.0)	DRILL CORE	US GEOL. SURVEY	PARTIAL SEAM	740108
D165753	0.0	(0.0)	426.7	(168.0)	CHANNEL	US GEOL. SURVEY	PARTIAL SEAM	740108
D165754	0.0	(0.0)	426.7	(168.0)	CHANNEL	US GEOL. SURVEY	PARTIAL SEAM	740108
D165755	0.0	(0.0)	426.7	(168.0)	CHANNEL	US GEOL. SURVEY	LOWER SPLIT	740108
D165756	0.0	(0.0)	426.7	(168.0)	CHANNEL	US GEOL. SURVEY	LOWER SPLIT	740108
D165757	0.0	(0.0)	426.7	(168.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	740108
D165758	0.0	(0.0)	426.7	(168.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	740108
D165759	0.0	(0.0)	426.7	(168.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	LOWER SPLIT	740108
D165760	0.0	(0.0)	426.7	(168.0)	CHANNEL	US GEOL. SURVEY	PARTIAL SEAM	740108
D165761	0.0	(0.0)	426.7	(168.0)	CHANNEL	US GEOL. SURVEY	PARTIAL SEAM	740108
D165762	0.0	(0.0)	426.7	(168.0)	CHANNEL	US GEOL. SURVEY	PARTIAL SEAM	740108
D165763	0.0	(0.0)	609.6	(240.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	740108
D165764	0.0	(0.0)	609.6	(240.0)	CHANNEL	US GEOL. SURVEY	PARTIAL SEAM	740108
D165765	0.0	(0.0)	274.3	(108.0)	CHANNEL	US GEOL. SURVEY	PARTIAL SEAM	740108
D165766	0.0	(0.0)	274.3	(108.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	740108
D178086	5974.0	(2352.0)	304.8	(120.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	751014
D178087	2956.5	(1164.0)	304.8	(120.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	751014
D178088	3261.3	(1284.0)	152.4	(60.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	751014
D188118	2377.4	(936.0)	152.4	(60.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	COMP. USBM, SINGLE USGS	770201
D188119	2529.8	(996.0)	152.4	(60.0)	DRILL CORE	US GEOL. SURVEY	P. USBM, SINGLE USGS	770201
D188120	2682.2	(1056.0)	137.1	(54.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	770201
D188121	5638.7	(2220.0)	304.8	(120.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	770201
D188122	5943.5	(2340.0)	222.5	(87.6)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	770201
D188123	2926.0	(1152.0)	289.5	(114.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	770201
D188124	3215.6	(1266.0)	198.1	(78.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	770201
D188125	967.7	(381.0)	304.8	(120.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	770201

Table 1c. (cont'd.) Sample information for 383 lignites from the Fort Union Region- North Dakota and Montana.

SAMPLE NUMBER	DEPTH CM	DEPTH IN	SAMPLE THICKNESS CM	SAMPLE THICKNESS IN	SAMPLE TYPE	ANALYTICAL LABS	DATA VALUES REPRESENT	DATE YR/MO/DY
D188126	1272.5	(501.0)	287.0	(113.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	770201
D188127	7498.0	(2952.0)	114.3	(45.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	770201
D188128	1097.2	(432.0)	243.8	(96.0)	DRILL CORE	STATE AGENCY/US GEOL. SURVEY	SINGLE SAMPLE	770201
D188129	2011.6	(792.0)	243.8	(96.0)	DRILL CORE	STATE AGENCY/US GEOL. SURVEY	PARTIAL SEAM	770201
D188130	2255.5	(888.0)	243.8	(96.0)	DRILL CORE	STATE AGENCY/US GEOL. SURVEY	PARTIAL SEAM	770201
D188131	5394.9	(2124.0)	248.9	(98.0)	DRILL CORE	STATE AGENCY/US GEOL. SURVEY	PARTIAL SEAM	770201
D188132	5643.8	(2222.0)	248.6	(97.9)	DRILL CORE	STATE AGENCY/US GEOL. SURVEY	PARTIAL SEAM	770201
D188133	5892.7	(2320.0)	248.9	(98.0)	DRILL CORE	STATE AGENCY/US GEOL. SURVEY	PARTIAL SEAM	770201
D188134	6141.7	(2418.0)	279.4	(110.0)	DRILL CORE	STATE AGENCY/US GEOL. SURVEY	PARTIAL SEAM	770201
D188135	2072.6	(816.0)	182.8	(72.0)	DRILL CORE	STATE AGENCY/US GEOL. SURVEY	SINGLE SAMPLE	770201
D188136	2865.1	(1128.0)	228.6	(90.0)	DRILL CORE	STATE AGENCY/US GEOL. SURVEY	PARTIAL SEAM	770201
D188137	3093.7	(1218.0)	76.2	(30.0)	DRILL CORE	STATE AGENCY/US GEOL. SURVEY	PARTIAL SEAM	770201
D188138	3352.7	(1320.0)	182.8	(72.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	770201
D188140*	4571.9	(1800.0)	30.4	(12.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	770201
D188141*	4617.7	(1818.0)	464.8	(183.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	770201
D188142	6644.6	(2616.0)	91.4	(36.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	COMP. USBM, SINGLE USGS	770201
D188143	6739.1	(2653.2)	134.1	(52.8)	DRILL CORE	US GEOL. SURVEY	COMP. USBM, SINGLE USGS	770201
D188144	1877.0	(739.0)	134.6	(53.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	770201
D188145	4571.9	(1800.0)	243.8	(96.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	770201
D189256	371.8	(146.4)	152.4	(60.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	770331
D189257	219.4	(86.4)	152.4	(60.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	770331
D189258	67.0	(26.4)	152.4	(60.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	770331
D189259	0.0	(0.0)	67.0	(26.4)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	770331
D189260	292.6	(115.2)	57.9	(22.8)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	770331
D189261	140.2	(55.2)	152.4	(60.0)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	770331
D189262	36.5	(14.4)	103.6	(40.8)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	770331
D189263	0.0	(0.0)	36.5	(14.4)	CHANNEL	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	770331
D196643	2255.5	(888.0)	426.7	(168.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771230
D196644	0.0	(0.0)	469.3	(184.8)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771230
D196645	1402.0	(552.0)	548.6	(216.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771230
D196646	0.0	(0.0)	548.6	(216.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771230
D196647	3322.3	(1308.0)	152.4	(60.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	771230
D196648	3550.9	(1398.0)	131.0	(51.6)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	771230
D196649	3703.3	(1458.0)	21.3	(8.4)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	771230
D196650	3078.4	(1212.0)	944.8	(372.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771230
D196651	4053.8	(1596.0)	60.9	(24.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771230
D196652	7315.1	(2880.0)	274.3	(108.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771230
D196653	1642.8	(646.8)	1280.1	(504.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	771230
D196654	2923.0	(1150.8)	30.4	(12.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	771230
D196655	1767.8	(696.0)	445.0	(175.2)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771230

Table 1c. (cont'd.) Sample information for 383 lignites from the Fort Union Region- North Dakota and Montana.

SAMPLE NUMBER	DEPTH CM	DEPTH IN	SAMPLE THICKNESS CM	SAMPLE THICKNESS IN	SAMPLE TYPE	ANALYTICAL LABS	DATA VALUES REPRESENT	DATE YR/MO/DY
D196656	0.0	(0.0)	341.3	(134.4)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771230
D196657	2496.3	(982.8)	396.2	(156.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771230
D196658	1405.1	(553.2)	64.0	(25.2)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771230
D196659	1661.1	(654.0)	274.3	(108.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771230
D196660	0.0	(0.0)	274.3	(108.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771230
D196661	1551.4	(610.8)	152.4	(60.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771230
D196662	2377.4	(936.0)	228.6	(90.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	771230
D196641	1310.6	(516.0)	121.9	(48.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	771230
D196642	1432.5	(564.0)	60.9	(24.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	771230
D221125	3419.8	(1346.4)	149.3	(58.8)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	810209
D221126	4571.9	(1800.0)	134.1	(52.8)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	810209
D221127	10988.0	(4326.0)	57.9	(22.8)	DRILL CORE	US GEOL. SURVEY	SINGLE SAMPLE	810209
D221128	11061.1	(4354.8)	128.0	(50.4)	DRILL CORE	US GEOL. SURVEY	SINGLE SAMPLE	810209
D221129	11311.1	(4453.2)	88.3	(34.8)	DRILL CORE	US GEOL. SURVEY	SINGLE SAMPLE	810210
D221130	4130.0	(1626.0)	134.1	(52.8)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	810210
D221131	6617.2	(2605.2)	149.3	(58.8)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	810210
D221132	5047.4	(1987.2)	57.9	(22.8)	DRILL CORE	US GEOL. SURVEY	SINGLE SAMPLE	810210
D221133	6294.1	(2478.0)	158.4	(62.4)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	810211
D221134	9927.3	(3908.4)	137.1	(54.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	810211
D221135	10091.9	(3973.2)	30.4	(12.0)	DRILL CORE	US GEOL. SURVEY	SINGLE SAMPLE	810211
D221136	6952.4	(2737.2)	155.4	(61.2)	DRILL CORE	US GEOL. SURVEY	SINGLE SAMPLE	810211
D221137	7437.1	(2928.0)	106.6	(42.0)	DRILL CORE	US GEOL. SURVEY	SINGLE SAMPLE	810211
D221138	3779.5	(1488.0)	182.8	(72.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	810211
D221139	3462.5	(1363.2)	73.1	(28.8)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	810211
D221140	3645.4	(1435.2)	377.9	(148.8)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	810211
D221141	4395.2	(1730.4)	112.7	(44.4)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	810211
D221142	1463.0	(576.0)	100.5	(39.6)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	810211
D221143	4916.4	(1935.6)	256.0	(100.8)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	810911
D221144	5196.8	(2046.0)	146.3	(57.6)	DRILL CORE	US GEOL. SURVEY	SINGLE SAMPLE	810211
D221145	874.7	(344.4)	329.1	(129.6)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	810911
D196598	1651.0	(650.0)	0.0	(0.0)	OTHER	US GEOL. SURVEY	SINGLE SAMPLE	771230
D196599	1778.0	(700.0)	0.0	(0.0)	OTHER	US GEOL. SURVEY	SINGLE SAMPLE	771230
D209953	7449.3	(2932.8)	94.4	(37.2)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	790104
D209954	7427.9	(2924.4)	155.4	(61.2)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	790104
D209955	8839.1	(3480.0)	137.1	(54.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	790104
D209956	9278.1	(3652.8)	201.1	(79.2)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	790104
D209957	3575.3	(1407.6)	265.1	(104.4)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	790104
D209958	4105.6	(1616.4)	274.3	(108.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	790104
D209959	4645.1	(1828.8)	64.0	(25.2)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	790104
D209960	4718.3	(1857.6)	42.6	(16.8)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	PARITAL SEAM	790104

Table 1c. (cont'd.) Sample information for 383 lignites from the Fort Union Region- North Dakota and Montana.

SAMPLE NUMBER	DEPTH CM	DEPTH IN	SAMPLE THICKNESS CM	SAMPLE THICKNESS IN	SAMPLE TYPE	ANALYTICAL LABS	DATA VALUES REPRESENT	DATE YR/MO/DY
D209961	6156.9	(2424.0)	215.9	(85.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	790104
D209962	2057.3	(810.0)	109.7	(43.2)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	790104
D209963	2880.3	(1134.0)	289.5	(114.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	790104
D209964	3221.7	(1268.4)	24.3	(9.6)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	SINGLE SAMPLE	790104
D209965	5394.9	(2124.0)	85.3	(33.6)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	790104
D209966	5489.4	(2161.2)	93.4	(36.8)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	790104
D209967	8409.4	(3310.8)	30.4	(12.0)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	790104
D209968	8449.0	(3326.4)	164.5	(64.8)	DRILL CORE	US BUR. MINES/US GEOL. SURVEY	PARTIAL SEAM	790104
D240927	2575.5	(1014.0)	594.3	(234.0)	DRILL CORE	GEOCHEM. TESTING/US GEOL. SURVEY	PARTIAL SEAM	820125
D240928	3169.9	(1248.0)	487.6	(192.0)	DRILL CORE	GEOCHEM. TESTING/US GEOL. SURVEY	PARTIAL SEAM	820125
D240929	6382.5	(2512.8)	307.8	(121.2)	DRILL CORE	GEOCHEM. TESTING/US GEOL. SURVEY	PARTIAL SEAM	820125
D240930	6906.7	(2719.2)	94.4	(37.2)	DRILL CORE	GEOCHEM. TESTING/US GEOL. SURVEY	PARTIAL SEAM	820125
D240931	7062.2	(2780.4)	609.6	(240.0)	DRILL CORE	GEOCHEM. TESTING/US GEOL. SURVEY	PARTIAL SEAM	820125
D240932	6217.9	(2448.0)	609.6	(240.0)	DRILL CORE	GEOCHEM. TESTING/US GEOL. SURVEY	PARTIAL SEAM	820125
D240933	6827.5	(2688.0)	435.8	(171.6)	DRILL CORE	GEOCHEM. TESTING/US GEOL. SURVEY	PARTIAL SEAM	820125
D240934	3105.9	(1222.8)	673.6	(265.2)	DRILL CORE	GEOCHEM. TESTING/US GEOL. SURVEY	SINGLE SAMPLE	820125
D240935	4596.3	(1809.6)	405.3	(159.6)	DRILL CORE	GEOCHEM. TESTING/US GEOL. SURVEY	SINGLE SAMPLE	820125
D240936	6288.0	(2475.6)	152.4	(60.0)	DRILL CORE	GEOCHEM. TESTING/US GEOL. SURVEY	SINGLE SAMPLE	820125
D240937	3099.8	(1220.4)	469.3	(184.8)	DRILL CORE	GEOCHEM. TESTING/US GEOL. SURVEY	SINGLE SAMPLE	820125
D240938	3617.9	(1424.4)	469.3	(184.8)	DRILL CORE	GEOCHEM. TESTING/US GEOL. SURVEY	SINGLE SAMPLE	820125
D240939	3255.2	(1281.6)	109.7	(43.2)	DRILL CORE	GEOCHEM. TESTING/US GEOL. SURVEY	SINGLE SAMPLE	820125
D240940	6291.0	(2476.8)	560.8	(220.8)	DRILL CORE	GEOCHEM. TESTING/US GEOL. SURVEY	SINGLE SAMPLE	820125
D240941	4197.0	(1652.4)	307.8	(121.2)	DRILL CORE	GEOCHEM. TESTING/US GEOL. SURVEY	SINGLE SAMPLE	820125

Table 1d. Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperature determinations for 328 coal samples from the Fort Union Region- North Dakota and Montana.

[All analyses in percent except Kcal/kg, Btu/lb, free-swelling index and ash-fusion temperatures. For each sample number, the analyses are reported three ways: first, as received (moisture included in H and O); second, moisture-free; and third, moisture- and ash-free. Analyses are by a commercial testing laboratory following ASTM standards. G for ash-fusion temperatures means greater than 1540 degrees C. Zero values indicate no data available. A "C" after the sample number indicates a composited sample. The USGS makes no claims as to the accuracy of rank calculated from parameters in Table 1d.]

	PROXIMATE ANALYSIS				ULTIMATE ANALYSIS					HEAT OF COMBUSTION	
SAMPLE NUMBER	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	KCAL/KG	BTU/LB
D165564	34.6	29.2	31.9	4.3	6.8	42.8	0.7	44.9	0.5	3,980	7,160
	---	44.6	48.8	6.6	4.5	65.4	1.1	21.6	.8	6,080	10,950
	---	47.8	52.2	---	4.8	70.0	1.1	23.1	.8	6,510	11,720
D165565	28.6	32.7	34.0	4.7	6.4	46.5	.8	41.1	.5	4,340	7,820
	---	45.8	47.6	6.6	4.5	65.1	1.1	22.0	.7	6,080	10,950
	---	49.0	51.0	---	4.8	69.7	1.2	23.5	.7	6,510	11,720
D165566	26.6	32.5	36.0	4.9	6.3	47.7	.9	39.6	.6	4,430	7,980
	---	44.3	49.0	6.7	4.6	65.0	1.2	21.7	.8	6,040	10,870
	---	47.4	52.6	---	4.9	69.6	1.3	23.3	.9	6,470	11,650
D165567	31.4	30.6	33.6	4.4	6.7	44.9	.8	42.7	.5	4,180	7,530
	---	44.6	49.0	6.4	4.7	65.5	1.2	21.6	.7	6,100	10,980
	---	47.7	52.3	---	5.0	69.9	1.2	23.0	.8	6,520	11,730
D165568	34.2	27.3	33.2	5.3	6.6	43.1	.7	43.8	.5	3,940	7,090
	---	41.5	50.5	8.1	4.3	65.5	1.1	20.4	.8	5,990	10,780
	---	45.1	54.9	---	4.6	71.2	1.2	22.1	.8	6,510	11,720
D165569	33.8	29.2	28.7	8.3	6.7	40.4	.7	42.2	1.7	3,810	6,860
	---	44.1	43.4	12.5	4.4	61.0	1.1	18.4	2.6	5,760	10,360
	---	50.4	49.6	---	5.1	69.8	1.2	21.0	2.9	6,580	11,850
D165570	33.2	29.5	32.9	4.4	6.6	43.5	.7	44.5	.3	4,030	7,260
	---	44.2	49.3	6.6	4.4	65.1	1.0	22.4	.4	6,040	10,870
	---	47.3	52.7	---	4.7	69.7	1.1	24.0	.5	6,460	11,630
D165571	34.7	28.9	32.0	4.4	6.9	42.5	.7	45.2	.3	3,940	7,100
	---	44.3	49.0	6.7	4.7	65.1	1.1	22.0	.5	6,040	10,870
	---	47.5	52.5	---	5.0	69.8	1.1	23.6	.5	6,480	11,660
D165572	29.8	29.1	32.4	8.7	6.3	42.4	.5	39.9	2.2	4,030	7,250
	---	41.5	46.2	12.4	4.3	60.4	.7	19.1	3.1	5,740	10,330
	---	47.3	52.7	---	4.9	68.9	.8	21.8	3.6	6,550	11,790
D165573	32.9	28.9	33.2	5.0	6.8	43.9	.5	43.1	.7	4,130	7,430
	---	43.1	49.5	7.5	4.7	65.4	.7	20.6	1.0	6,150	11,070
	---	46.5	53.5	---	5.1	70.7	.8	22.3	1.1	6,650	11,960
D165574	28.4	26.5	29.2	15.9	5.6	40.2	.7	36.5	1.1	3,570	6,420
	---	37.0	40.8	22.2	3.4	56.1	1.0	15.7	1.5	4,980	8,970
	---	47.6	52.4	---	4.4	72.2	1.3	20.2	2.0	6,400	11,530

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

SAMPLE NUMBER	AIR-DRIED LOSS	FORMS OF SULFUR			FREE SWELLING INDEX	ASH FUSION TEMPERATURE, C		
		SULFATE	PYRITIC	ORGANIC		INITIAL DEFORMATION	SOFTENING	FLUID
D165564	0.0	0.01	0.02	0.43	0.0	0	0	0
	---	.02	.03	.66				
	---	.02	.03	.70				
D165565	.0	.02	.03	.46	.0	0	0	0
	---	.03	.04	.64				
	---	.03	.04	.69				
D165566	.0	.01	.03	.54	.0	0	0	0
	---	.01	.04	.74				
	---	.01	.04	.79				
D165567	.0	.01	.03	.42	.0	0	0	0
	---	.01	.04	.61				
	---	.02	.05	.65				
D165568	.0	.01	.14	.31	.0	0	0	0
	---	.02	.21	.47				
	---	.02	.23	.51				
D165569	.0	.03	1.26	.44	.0	0	0	0
	---	.05	1.90	.66				
	---	.05	2.18	.76				
D165570	.0	.02	.04	.29	.0	0	0	0
	---	.03	.06	.43				
	---	.03	.06	.46				
D165571	.0	.02	.04	.28	.0	0	0	0
	---	.03	.06	.43				
	---	.03	.07	.46				
D165572	.0	.05	1.84	.33	.0	0	0	0
	---	.07	2.62	.47				
	---	.08	2.99	.54				
D165573	.0	.01	.13	.52	.0	0	0	0
	---	.01	.19	.77				
	---	.02	.21	.84				
D165574	.0	.01	.88	.22	.0	0	0	0
	---	.01	1.23	.31				
	---	.02	1.58	.39				

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

	PROXIMATE ANALYSIS				ULTIMATE ANALYSIS					HEAT OF COMBUSTION	
SAMPLE NUMBER	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	KCAL/KG	BTU/LB
D165575	30.1	25.1	28.0	16.8	5.6	38.0	0.7	38.0	0.9	3,410	6,140
	---	35.9	40.1	24.0	3.2	54.4	1.0	16.1	1.3	4,880	8,780
	---	47.3	52.7	---	4.2	71.6	1.3	21.2	1.7	6,420	11,560
D165576	31.1	26.7	32.1	10.1	6.0	42.6	.7	39.9	.7	3,890	7,010
	---	38.8	46.6	14.7	3.7	61.8	1.0	17.8	1.0	5,650	10,170
	---	45.4	54.6	---	4.3	72.4	1.2	20.8	1.2	6,620	11,920
D165577	30.1	27.1	30.5	12.3	5.9	40.9	.7	37.4	2.8	3,820	6,870
	---	38.8	43.6	17.6	3.7	58.5	1.0	15.2	4.0	5,460	9,830
	---	47.0	53.0	---	4.4	71.0	1.2	18.5	4.9	6,630	11,930
D165578	30.7	29.3	33.8	6.2	6.2	44.3	.7	42.1	.5	4,090	7,360
	---	42.3	48.8	8.9	4.0	63.9	1.0	21.4	.7	5,900	10,620
	---	46.4	53.6	---	4.4	70.2	1.1	23.5	.8	6,480	11,660
D165579	31.0	28.3	33.9	6.8	6.3	43.6	.7	42.2	.4	3,950	7,110
	---	41.0	49.1	9.9	4.1	63.2	1.0	21.2	.6	5,720	10,300
	---	45.5	54.5	---	4.6	70.1	1.1	23.5	.6	6,350	11,430
D165608	37.2	27.7	28.9	6.2	7.0	40.1	.7	45.5	.5	3,730	6,720
	---	44.1	46.0	9.9	4.6	63.9	1.1	19.8	.8	5,940	10,700
	---	48.9	51.1	---	5.1	70.8	1.2	22.0	.9	6,600	11,870
D165609	38.9	26.1	31.2	3.8	7.0	40.8	.6	47.5	.3	3,750	6,750
	---	42.7	51.1	6.2	4.4	66.8	1.0	21.1	.5	6,140	11,050
	---	45.5	54.5	---	4.7	71.2	1.0	22.6	.5	6,540	11,780
D165610	37.2	26.3	32.4	4.1	6.7	41.4	.7	47.0	.1	3,710	6,670
	---	41.9	51.6	6.5	4.1	65.9	1.1	22.2	.2	5,900	10,620
	---	44.8	55.2	---	4.4	70.5	1.2	23.7	.2	6,310	11,360
D165632	24.1	30.8	36.8	8.3	6.0	49.1	.9	35.2	.5	4,590	8,270
	---	40.6	48.5	10.9	4.4	64.7	1.2	18.2	.7	6,050	10,900
	---	45.6	54.4	---	4.9	72.6	1.3	20.4	.7	6,800	12,230
D165976	46.2	24.9	23.4	5.5	7.4	33.8	.4	52.0	.9	3,100	5,580
	---	46.3	43.5	10.2	4.2	62.8	.7	20.3	1.7	5,760	10,370
	---	51.6	48.4	---	4.7	70.0	.8	22.6	1.9	6,420	11,550
D165979	37.5	30.1	24.3	8.1	7.2	39.3	.6	43.8	1.0	3,760	6,760
	---	48.2	38.9	13.0	4.9	62.9	1.0	16.7	1.6	6,010	10,820
	---	55.3	44.7	---	5.6	72.2	1.1	19.2	1.8	6,900	12,430
D165980	42.2	25.5	25.9	6.4	7.3	36.6	.4	48.7	.6	3,430	6,180
	---	44.1	44.8	11.1	4.5	63.3	.7	19.4	1.0	5,940	10,690
	---	49.6	50.4	---	5.1	71.2	.8	21.8	1.2	6,680	12,020

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

SAMPLE NUMBER	AIR-DRIED LOSS	FORMS OF SULFUR			FREE SWELLING INDEX	ASH FUSION TEMPERATURE, C		
		SULFATE	PYRITIC	ORGANIC		INITIAL DEFORMATION	SOFTENING	FLUID
D165575	0.0	0.01	0.74	0.21	0.0	0	0	0
	---	.01	1.06	.30				
	---	.02	1.39	.40				
D165576	.0	.01	.43	.26	.0	0	0	0
	---	.01	.62	.38				
	---	.02	.73	.44				
D165577	.0	.03	2.39	.33	.0	0	0	0
	---	.04	3.42	.47				
	---	.05	4.15	.57				
D165578	.0	.01	.14	.34	.0	0	0	0
	---	.01	.20	.49				
	---	.02	.22	.54				
D165579	.0	.02	.08	.28	.0	0	0	0
	---	.03	.12	.41				
	---	.03	.13	.45				
D165608	.0	.01	.20	.27	.0	0	0	0
	---	.02	.32	.43				
	---	.02	.35	.48				
D165609	.0	.01	.01	.24	.0	0	0	0
	---	.02	.02	.39				
	---	.02	.02	.42				
D165610	.0	.01	.01	.13	.0	0	0	0
	---	.02	.02	.21				
	---	.02	.02	.22				
D165632	.0	.01	.10	.36	.0	0	0	0
	---	.01	.13	.47				
	---	.01	.15	.53				
D165976	.0	.03	.34	.50	.0	0	0	0
	---	.06	.63	.93				
	---	.06	.70	1.04				
D165979	.0	.01	.50	.50	.0	0	0	0
	---	.02	.80	.80				
	---	.02	.92	.92				
D165980	.0	.06	.06	.46	.0	0	0	0
	---	.10	.10	.80				
	---	.12	.12	.89				

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

	PROXIMATE ANALYSIS				ULTIMATE ANALYSIS					HEAT OF COMBUSTION	
SAMPLE NUMBER	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	KCAL/KG	BTU/LB
D165982	44.6	24.4	27.0	4.0	7.5	36.3	0.5	51.0	0.7	3,380	6,090
	---	44.0	48.7	7.2	4.6	65.5	.9	20.5	1.3	6,110	10,990
	---	47.5	52.5	---	5.0	70.6	1.0	22.1	1.4	6,580	11,850
D165985	45.0	24.4	26.2	4.4	7.5	35.6	.5	51.3	.7	3,340	6,010
	---	44.4	47.6	8.0	4.5	64.7	.9	20.5	1.3	6,070	10,930
	---	48.2	51.8	---	4.9	70.4	1.0	22.3	1.4	6,600	11,880
D165986	42.3	25.0	25.6	7.1	7.3	35.6	.4	47.8	1.8	3,380	6,080
	---	43.3	44.4	12.3	4.5	61.7	.7	17.7	3.1	5,850	10,540
	---	49.4	50.6	---	5.1	70.4	.8	20.2	3.6	6,680	12,020
D165989	36.5	27.1	28.0	8.4	6.6	38.6	.5	43.0	2.9	3,640	6,550
	---	42.7	44.1	13.2	4.0	60.8	.8	16.6	4.6	5,730	10,310
	---	49.2	50.8	---	4.6	70.1	.9	19.2	5.3	6,600	11,890
D165990	42.7	27.0	24.1	6.2	7.5	36.7	.5	48.2	.9	3,510	6,320
	---	47.1	42.1	10.8	4.8	64.0	.9	17.9	1.6	6,130	11,030
	---	52.8	47.2	---	5.4	71.8	1.0	20.0	1.8	6,870	12,370
D173466	23.1	32.5	28.6	15.8	5.5	41.9	.6	31.3	4.9	4,010	7,210
	---	42.3	37.2	20.5	3.8	54.5	.8	14.0	6.4	5,210	9,380
	---	53.2	46.8	---	4.8	68.6	1.0	17.6	8.0	6,560	11,800
D173468	36.9	27.1	25.1	10.9	6.7	37.0	.5	41.8	3.1	3,520	6,330
	---	42.9	39.8	17.3	4.1	58.6	.8	14.3	4.9	5,570	10,030
	---	51.9	48.1	---	5.0	70.9	1.0	17.2	5.9	6,740	12,130
D175930	27.5	30.0	36.3	6.2	6.1	46.7	.7	39.9	.4	4,280	7,700
	---	41.4	50.1	8.6	4.2	64.4	1.0	21.3	.6	5,900	10,620
	---	45.2	54.8	---	4.6	70.4	1.1	23.3	.6	6,450	11,610
D175932	27.5	28.6	35.6	8.3	6.0	45.3	.6	39.5	.3	4,120	7,410
	---	39.4	49.1	11.4	4.1	62.5	.8	20.8	.4	5,680	10,220
	---	44.5	55.5	---	4.6	70.6	.9	23.5	.5	6,410	11,540
D175934	30.0	29.3	35.4	5.3	6.2	45.2	.7	42.4	.2	4,170	7,510
	---	41.9	50.6	7.6	4.1	64.6	1.0	22.5	.3	5,960	10,730
	---	45.3	54.7	---	4.4	69.9	1.1	24.3	.3	6,450	11,610
D175936	27.7	30.6	33.5	8.2	6.1	45.6	.7	38.2	1.2	4,240	7,630
	---	42.3	46.3	11.3	4.2	63.1	1.0	18.8	1.7	5,860	10,550
	---	47.7	52.3	---	4.7	71.1	1.1	21.2	1.9	6,610	11,900
D175938	35.2	28.8	30.2	5.8	6.4	40.1	.8	46.6	.3	3,560	6,400
	---	44.4	46.6	9.0	3.8	61.9	1.2	23.6	.5	5,490	9,880
	---	48.8	51.2	---	4.2	68.0	1.4	26.0	.5	6,030	10,850

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

SAMPLE NUMBER	AIR-DRIED LOSS	FORMS OF SULFUR			FREE SWELLING INDEX	ASH FUSION TEMPERATURE, C		
		SULFATE	PYRITIC	ORGANIC		INITIAL DEFORMATION	SOFTENING	FLUID
D165982	0.0	0.01	0.05	0.67	0.0	0	0	0
	---	.02	.09	1.21				
	---	.02	.10	1.30				
D165985	.0	.01	.05	.70	.0	0	0	0
	---	.02	.09	1.27				
	---	.02	.10	1.38				
D165986	.0	.01	.11	1.70	.0	0	0	0
	---	.02	.19	2.95				
	---	.02	.22	3.36				
D165989	.0	.08	2.26	.61	.0	0	0	0
	---	.13	3.56	.96				
	---	.15	4.10	1.11				
D165990	.0	.01	.11	.82	.0	0	0	0
	---	.02	.19	1.43				
	---	.02	.22	1.60				
D173466	5.8	.08	4.13	.64	.0	0	0	0
	---	.10	5.37	.83				
	---	.13	6.76	1.05				
D173468	26.6	.04	2.58	.46	.0	0	0	0
	---	.06	4.09	.73				
	---	.08	4.94	.88				
D175930	17.3	.02	.04	.37	.0	1,140	1,165	1,195
	---	.03	.06	.51				
	---	.03	.06	.56				
D175932	16.8	.02	.04	.28	.0	1,110	1,140	1,180
	---	.03	.06	.39				
	---	.03	.06	.44				
D175934	20.7	.03	.01	.20	.0	1,140	1,165	1,195
	---	.04	.01	.29				
	---	.05	.02	.31				
D175936	16.1	.13	.79	.33	.0	1,150	1,175	1,205
	---	.18	1.09	.46				
	---	.20	1.23	.51				
D175938	25.9	.07	.01	.24	.0	1,105	1,140	1,180
	---	.11	.02	.37				
	---	.12	.02	.41				

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

	PROXIMATE ANALYSIS				ULTIMATE ANALYSIS					HEAT OF COMBUSTION	
SAMPLE NUMBER	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	KCAL/KG	BTU/LB
D178143	40.8	27.3	23.1	8.8	6.9	34.8	0.4	46.8	2.3	3,250	5,850
	---	46.1	39.0	14.9	4.0	58.8	.7	17.8	3.9	5,490	9,880
	---	54.2	45.8	---	4.7	69.0	.8	20.9	4.6	6,450	11,610
D178498	46.4	26.1	14.6	12.9	6.7	25.8	.5	52.9	1.2	2,160	3,890
	---	48.7	27.2	24.1	2.9	48.1	.9	21.7	2.2	4,030	7,260
	---	64.1	35.9	---	3.8	63.4	1.2	28.6	2.9	5,310	9,560
D178499	40.5	25.6	24.3	9.6	6.8	33.6	.5	46.9	2.6	3,100	5,580
	---	43.0	40.8	16.1	3.9	56.5	.8	18.3	4.4	5,210	9,380
	---	51.3	48.7	---	4.6	67.3	1.0	21.8	5.2	6,210	11,180
D178500	35.3	24.0	21.8	18.9	6.3	32.3	.4	41.0	1.1	3,060	5,510
	---	37.1	33.7	29.2	3.7	49.9	.6	14.9	1.7	4,730	8,520
	---	52.4	47.6	---	5.2	70.5	.9	21.0	2.4	6,680	12,030
D178501C	28.0	29.7	29.5	12.8	5.0	42.6	.4	38.4	.8	3,960	7,120
D178502C	---	41.2	41.0	17.8	2.6	59.2	.6	18.8	1.1	5,490	9,890
	---	50.2	49.8	---	3.2	72.0	.7	22.8	1.4	6,680	12,030
D178503	39.8	40.0	13.0	7.2	6.9	38.3	.5	46.3	.8	3,550	6,390
	---	66.4	21.6	12.0	4.1	63.6	.8	18.1	1.3	5,900	10,610
	---	75.5	24.5	---	4.7	72.3	.9	20.6	1.5	6,700	12,060
D178505C	43.2	24.3	23.6	8.9	7.1	33.9	.4	48.7	1.0	3,110	5,600
D178506C	---	42.8	41.5	15.7	4.0	59.7	.7	18.1	1.8	5,480	9,860
	---	50.7	49.3	---	4.8	70.8	.8	21.5	2.1	6,500	11,690
D178507	36.1	21.8	22.3	19.8	6.2	30.5	.2	40.8	2.5	2,910	5,230
	---	34.1	34.9	31.0	3.4	47.7	.3	13.6	3.9	4,550	8,180
	---	49.4	50.6	---	5.0	69.2	.5	19.8	5.7	6,590	11,860
D178508	43.1	24.7	25.5	6.7	7.3	36.2	.4	48.4	1.0	3,370	6,060
	---	43.4	44.8	11.8	4.4	63.6	.7	17.7	1.8	5,920	10,650
	---	49.2	50.8	---	5.0	72.1	.8	20.1	2.0	6,710	12,070
D178509	57.2	22.9	7.8	12.1	7.7	18.8	.3	59.8	1.3	1,560	2,810
	---	53.5	18.2	28.3	3.1	43.9	.7	20.9	3.0	3,650	6,570
	---	74.6	25.4	---	4.4	61.2	1.0	29.2	4.2	5,090	9,150
D178510C	42.2	24.6	26.4	6.8	7.2	36.4	.4	48.5	.7	3,380	6,090
D178511C	---	42.6	45.7	11.8	4.3	63.0	.7	19.0	1.2	5,850	10,540
D178512C	---	48.2	51.8	---	4.9	71.4	.8	21.5	1.4	6,630	11,940
D179369	42.7	24.1	25.0	8.2	7.2	35.1	.4	47.7	1.4	3,280	5,910
	---	42.1	43.6	14.3	4.3	61.3	.7	17.0	2.4	5,730	10,310
	---	49.1	50.9	---	5.0	71.5	.8	19.8	2.9	6,690	12,040

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

SAMPLE NUMBER	AIR-DRIED LOSS	FORMS OF SULFUR			FREE SWELLING INDEX	ASH FUSION TEMPERATURE, C		
		SULFATE	PYRITIC	ORGANIC		INITIAL DEFORMATION	SOFTENING	FLUID
D178143	26.1	0.19	1.67	0.39	0.0	1,115	1,190	1,240
	---	.32	2.82	.66				
	---	.38	3.31	.77				
D178498	29.4	.57	.04	.60	.0	1,075	1,115	1,130
	---	1.06	.07	1.12				
	---	1.40	.10	1.47				
D178499	28.0	.81	.39	1.44	.0	1,215	1,245	1,265
	---	1.36	.66	2.42				
	---	1.62	.78	2.89				
D178500	18.9	.04	.14	.91	.0	1,125	1,195	1,300
	---	.06	.22	1.41				
	---	.09	.31	1.99				
D178501C	10.0	.05	.66	.14	.0	1,105	1,155	1,190
D178502C	---	.07	.92	.19				
	---	.08	1.11	.24				
D178503	23.4	.04	.09	.71	.0	1,125	1,180	1,215
	---	.07	.15	1.18				
	---	.08	.17	1.34				
D178505C	30.5	.03	.08	.87	.0	1,240	1,315	1,315
D178506C	---	.05	.14	1.53				
	---	.06	.17	1.82				
D178507	22.9	.04	2.12	.34	.0	1,055	1,330	1,380
	---	.06	3.32	.53				
	---	.09	4.81	.77				
D178508	29.1	.04	.11	.87	.0	1,285	1,335	1,350
	---	.07	.19	1.53				
	---	.08	.22	1.73				
D178509	32.2	.22	.14	.96	.0	1,145	1,180	1,215
	---	.51	.33	2.24				
	---	.72	.46	3.13				
D178510C	28.3	.04	.09	.58	.0	1,205	1,255	1,275
D178511C	---	.07	.16	1.00				
D178512C	---	.08	.18	1.14				
D179369	27.5	.01	.14	1.28	.0	1,200	1,230	1,250
	---	.02	.24	2.23				
	---	.02	.29	2.61				

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

	PROXIMATE ANALYSIS				ULTIMATE ANALYSIS					HEAT OF COMBUSTION	
SAMPLE NUMBER	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	KCAL/KG	BTU/LB
D179370	40.5	24.1	26.9	8.5	7.0	36.1	0.4	46.2	1.8	3,400	6,120
	---	40.5	45.2	14.3	4.2	60.7	.7	17.1	3.0	5,710	10,290
	---	47.3	52.7	---	4.9	70.8	.8	20.0	3.5	6,670	12,000
D179371	39.9	25.9	27.2	7.0	7.0	38.0	.5	46.3	1.2	3,540	6,380
	---	43.1	45.3	11.6	4.3	63.2	.8	18.0	2.0	5,900	10,620
	---	48.8	51.2	---	4.8	71.6	.9	20.4	2.3	6,680	12,020
D179372	42.0	24.3	24.9	8.8	7.1	34.8	.5	48.1	.7	3,260	5,870
	---	41.9	42.9	15.2	4.2	60.0	.9	18.6	1.2	5,620	10,120
	---	49.4	50.6	---	4.9	70.7	1.0	21.9	1.4	6,630	11,930
D179373	43.3	23.1	23.4	10.2	7.0	33.2	.5	47.7	1.4	3,080	5,540
	---	40.7	41.3	18.0	3.9	58.6	.9	16.2	2.5	5,430	9,770
	---	49.7	50.3	---	4.7	71.4	1.1	19.8	3.0	6,620	11,910
D179374	40.1	25.9	26.1	7.9	7.0	36.5	.5	46.3	1.8	3,430	6,180
	---	43.2	43.6	13.2	4.2	60.9	.8	17.8	3.0	5,730	10,320
	---	49.8	50.2	---	4.9	70.2	1.0	20.5	3.5	6,600	11,880
D179375	37.9	25.0	24.0	13.1	6.6	34.2	.5	43.1	2.5	3,190	5,750
	---	40.3	38.6	21.1	3.8	55.1	.8	15.2	4.0	5,140	9,260
	---	51.0	49.0	---	4.9	69.8	1.0	19.2	5.1	6,520	11,730
D179376	39.1	26.4	27.1	7.4	6.9	38.0	.5	46.6	.6	3,530	6,360
	---	43.3	44.5	12.2	4.2	62.4	.8	19.4	1.0	5,800	10,440
	---	49.3	50.7	---	4.8	71.0	.9	22.1	1.1	6,600	11,890
D179377	45.4	23.6	25.8	5.2	7.3	35.4	.5	51.3	.3	3,280	5,900
	---	43.2	47.3	9.5	4.1	64.8	.9	20.0	.5	6,000	10,810
	---	47.8	52.2	---	4.6	71.7	1.0	22.2	.6	6,640	11,940
D179378	46.1	22.8	24.1	7.0	7.4	33.8	.5	50.3	1.0	3,140	5,650
	---	42.3	44.7	13.0	4.2	62.7	.9	17.3	1.9	5,820	10,480
	---	48.6	51.4	---	4.9	72.1	1.1	19.9	2.1	6,690	12,050
D179379	43.1	27.4	24.8	4.7	7.5	37.0	.4	49.7	.7	3,480	6,260
	---	48.2	43.6	8.3	4.8	65.0	.7	20.0	1.2	6,110	11,000
	---	52.5	47.5	---	5.2	70.9	.8	21.8	1.3	6,660	11,990
D179380	41.8	25.7	25.2	7.3	7.0	36.9	.6	47.9	.3	3,360	6,050
	---	44.2	43.3	12.5	4.0	63.4	1.0	18.5	.5	5,780	10,400
	---	50.5	49.5	---	4.6	72.5	1.2	21.1	.6	6,600	11,890
D179381	38.8	26.5	27.8	6.9	7.0	38.4	.6	46.9	.2	3,550	6,390
	---	43.3	45.4	11.3	4.4	62.7	1.0	20.3	.3	5,800	10,440
	---	48.8	51.2	---	5.0	70.7	1.1	22.9	.4	6,540	11,770

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

SAMPLE NUMBER	AIR-DRIED LOSS	FORMS OF SULFUR			FREE SWELLING INDEX	ASH FUSION TEMPERATURE, C		
		SULFATE	PYRITIC	ORGANIC		INITIAL DEFORMATION	SOFTENING	FLUID
D179370	28.4	0.01	0.10	1.68	0.0	1,110	1,170	1,195
	---	.02	.17	2.82				
	---	.02	.20	3.29				
D179371	23.4	.02	.06	1.09	.0	1,215	1,260	1,315
	---	.03	.10	1.81				
	---	.04	.11	2.05				
D179372	28.6	.01	.10	.54	.0	1,100	1,155	1,190
	---	.02	.17	.93				
	---	.02	.20	1.10				
D179373	28.0	.01	.21	1.12	.0	1,100	1,150	1,175
	---	.02	.37	1.98				
	---	.02	.45	2.41				
D179374	28.3	.01	.09	1.74	.0	1,195	1,240	1,255
	---	.02	.15	2.90				
	---	.02	.17	3.35				
D179375	24.7	.30	.41	1.79	.0	1,080	1,120	1,155
	---	.48	.66	2.88				
	---	.61	.84	3.65				
D179376	27.3	.01	.21	.34	.0	1,090	1,145	1,170
	---	.02	.34	.56				
	---	.02	.39	.64				
D179377	31.4	.01	.25	.04	.0	1,120	1,180	1,215
	---	.02	.46	.07				
	---	.02	.51	.08				
D179378	32.2	.01	.08	.89	.0	1,125	1,175	1,195
	---	.02	.15	1.65				
	---	.02	.17	1.90				
D179379	28.2	.01	.16	.50	.0	1,225	1,280	1,300
	---	.02	.28	.88				
	---	.02	.31	.96				
D179380	30.9	.01	.15	.13	.0	1,175	1,215	1,250
	---	.02	.26	.22				
	---	.02	.29	.26				
D179381	25.6	.01	.21	.02	.0	1,175	1,225	1,270
	---	.02	.34	.03				
	---	.02	.39	.04				

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

	PROXIMATE ANALYSIS				ULTIMATE ANALYSIS					HEAT OF COMBUSTION	
SAMPLE NUMBER	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	KCAL/KG	BTU/LB
D179382	42.8	27.3	26.2	3.7	7.4	37.6	0.5	50.5	0.3	3,520	6,340
	---	47.7	45.8	6.5	4.6	65.7	.9	21.8	.5	6,160	11,080
	---	51.0	49.0	---	4.9	70.3	.9	23.3	.6	6,580	11,850
D179383	47.0	24.0	23.7	5.3	7.6	34.0	.4	51.9	.8	3,170	5,710
	---	45.3	44.7	10.0	4.5	64.2	.8	19.1	1.5	5,990	10,770
	---	50.3	49.7	---	5.0	71.3	.8	21.2	1.7	6,650	11,970
D179384	47.4	22.3	24.1	6.2	7.5	33.3	.7	51.2	1.1	3,100	5,580
	---	42.4	45.8	11.8	4.2	63.3	1.3	17.2	2.1	5,890	10,610
	---	48.1	51.9	---	4.8	71.8	1.5	19.5	2.4	6,680	12,030
D180007	37.9	26.7	27.7	7.7	6.8	38.3	.6	45.6	1.1	3,530	6,360
	---	43.0	44.6	12.4	4.2	61.7	1.0	19.2	1.8	5,690	10,240
	---	49.1	50.9	---	4.8	70.4	1.1	21.9	2.0	6,500	11,690
D180008	40.1	25.4	27.9	6.6	6.9	37.7	.5	47.5	.7	3,490	6,290
	---	42.4	46.6	11.0	4.1	62.9	.8	19.8	1.2	5,830	10,500
	---	47.7	52.3	---	4.6	70.7	.9	22.2	1.3	6,550	11,800
D180009	40.5	25.7	27.5	6.3	7.0	37.4	.5	47.9	.8	3,470	6,250
	---	43.2	46.2	10.6	4.2	62.9	.8	20.0	1.3	5,830	10,500
	---	48.3	51.7	---	4.7	70.3	.9	22.4	1.5	6,520	11,740
D180010	41.0	25.4	28.2	5.4	7.1	37.8	.5	48.7	.5	3,500	6,300
	---	43.1	47.8	9.2	4.3	64.1	.8	20.8	.8	5,930	10,680
	---	47.4	52.6	---	4.7	70.5	.9	22.9	.9	6,530	11,760
D180011	39.9	25.8	27.8	6.5	7.0	37.8	.5	47.5	.7	3,510	6,310
	---	42.9	46.3	10.8	4.3	62.9	.8	20.0	1.2	5,840	10,500
	---	48.1	51.9	---	4.8	70.5	.9	22.5	1.3	6,540	11,780
D180012	37.8	27.4	28.4	6.4	6.9	38.6	.6	46.7	.8	3,580	6,450
	---	44.1	45.7	10.3	4.3	62.1	1.0	21.1	1.3	5,760	10,360
	---	49.1	50.9	---	4.8	69.2	1.1	23.5	1.4	6,420	11,550
D180013	34.6	27.0	26.7	11.7	6.4	37.1	.5	42.9	1.3	3,440	6,200
	---	41.3	40.8	17.9	3.9	56.7	.8	18.6	2.0	5,260	9,470
	---	50.3	49.7	---	4.8	69.1	.9	22.6	2.4	6,410	11,540
D180014	40.9	25.7	26.6	6.8	7.0	36.6	.5	48.1	1.0	3,400	6,120
	---	43.5	45.0	11.5	4.2	61.9	.8	19.9	1.7	5,750	10,350
	---	49.1	50.9	---	4.7	70.0	1.0	22.5	1.9	6,500	11,690
D180015	37.9	25.7	29.4	7.0	6.7	38.6	.6	46.5	.6	3,560	6,410
	---	41.4	47.3	11.3	4.0	62.2	1.0	20.6	1.0	5,740	10,330
	---	46.6	53.4	---	4.5	70.1	1.1	23.3	1.1	6,470	11,640

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

SAMPLE NUMBER	AIR-DRIED LOSS	FORMS OF SULFUR			FREE SWELLING INDEX	ASH FUSION TEMPERATURE, C		
		SULFATE	PYRITIC	ORGANIC		INITIAL DEFORMATION	SOFTENING	FLUID
D179382	31.9	0.01	0.11	0.15	0.0	1,275	1,320	1,345
	---	.02	.19	.26				
	---	.02	.21	.28				
D179383	31.4	.06	.24	.51	.0	1,195	1,255	1,295
	---	.11	.45	.96				
	---	.13	.50	1.07				
D179384	32.7	.01	.10	.98	.0	1,440	1,505	1,540
	---	.02	.19	1.86				
	---	.02	.22	2.11				
D180007	31.0	.30	.26	.54	.0	1,125	1,190	1,220
	---	.48	.42	.87				
	---	.55	.48	.99				
D180008	33.4	.17	.11	.43	.0	1,125	1,185	1,240
	---	.28	.18	.72				
	---	.32	.21	.81				
D180009	33.6	.17	.16	.50	.0	1,160	1,215	1,270
	---	.29	.27	.84				
	---	.32	.30	.94				
D180010	34.9	.12	.08	.33	.0	1,120	1,175	1,235
	---	.20	.14	.56				
	---	.22	.15	.62				
D180011	33.2	.12	.19	.44	.0	1,260	1,320	1,360
	---	.20	.32	.73				
	---	.22	.35	.82				
D180012	32.0	.01	.39	.42	.0	1,175	1,240	1,280
	---	.02	.63	.68				
	---	.02	.70	.75				
D180013	28.6	.37	.41	.49	.0	1,130	1,180	1,240
	---	.57	.63	.75				
	---	.69	.76	.91				
D180014	34.7	.25	.35	.42	.0	1,200	1,270	1,325
	---	.42	.59	.71				
	---	.48	.67	.80				
D180015	31.1	.14	.19	.31	.0	1,155	1,230	1,290
	---	.23	.31	.50				
	---	.25	.34	.56				

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

	PROXIMATE ANALYSIS				ULTIMATE ANALYSIS					HEAT OF COMBUSTION	
SAMPLE NUMBER	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	KCAL/KG	BTU/LB
D180016	39.7	26.1	26.5	7.7	7.0	36.7	0.5	47.1	1.0	3,420	6,150
	---	43.3	43.9	12.8	4.3	60.9	.8	19.6	1.7	5,670	10,200
	---	49.6	50.4	---	4.9	69.8	1.0	22.5	1.9	6,490	11,690
D180017	40.0	26.3	26.2	7.5	6.9	36.5	.5	47.4	1.2	3,400	6,120
	---	43.8	43.7	12.5	4.1	60.8	.8	19.7	2.0	5,660	10,190
	---	50.1	49.9	---	4.7	69.5	1.0	22.6	2.3	6,470	11,650
D180018	40.7	25.9	27.6	5.8	7.2	37.2	.5	48.7	.7	3,470	6,240
	---	43.7	46.5	9.8	4.5	62.7	.8	21.1	1.2	5,850	10,520
	---	48.4	51.6	---	5.0	69.5	.9	23.4	1.3	6,480	11,660
D180019	40.3	25.3	27.0	7.4	6.9	36.6	.5	47.9	.7	3,390	6,100
	---	42.4	45.2	12.4	4.1	61.3	.8	20.2	1.2	5,670	10,210
	---	48.4	51.6	---	4.6	70.0	1.0	23.1	1.3	6,480	11,660
D180075	43.8	26.9	24.7	4.6	7.4	37.1	.5	49.9	.5	3,460	6,230
	---	47.9	44.0	8.2	4.5	66.0	.9	19.5	.9	6,160	11,090
	---	52.1	47.9	---	4.9	71.9	1.0	21.3	1.0	6,710	12,070
D180076	44.0	26.2	21.6	8.2	7.3	34.4	.5	48.6	1.0	3,190	5,750
	---	46.8	38.6	14.6	4.3	61.4	.9	16.9	1.8	5,700	10,270
	---	54.8	45.2	---	5.0	72.0	1.0	19.9	2.1	6,680	12,030
D180078	46.6	22.6	25.0	5.8	7.5	33.8	.5	51.7	.7	3,180	5,720
	---	42.3	46.8	10.9	4.3	63.3	.9	19.2	1.3	5,950	10,710
	---	47.5	52.5	---	4.9	71.0	1.1	21.6	1.5	6,680	12,020
D180079	44.4	24.5	25.7	5.4	7.3	35.4	.5	50.8	.6	3,310	5,950
	---	44.1	46.2	9.7	4.3	63.7	.9	20.4	1.1	5,950	10,700
	---	48.8	51.2	---	4.7	70.5	1.0	22.6	1.2	6,580	11,850
D180080	44.7	25.5	25.2	4.6	7.5	36.6	.5	50.4	.4	3,370	6,060
	---	46.1	45.6	8.3	4.6	66.2	.9	19.3	.7	6,090	10,960
	---	50.3	49.7	---	5.0	72.2	1.0	21.0	.8	6,640	11,950
D180083	44.3	26.2	22.6	6.9	7.2	34.7	.5	49.6	1.1	3,190	5,740
	---	47.0	40.6	12.4	4.1	62.3	.9	18.4	2.0	5,730	10,310
	---	53.7	46.3	---	4.7	71.1	1.0	20.9	2.3	6,530	11,760
D186051	34.6	28.9	31.3	5.2	6.7	43.1	.6	44.1	.3	4,030	7,260
	---	44.2	47.9	8.0	4.4	65.9	.9	20.4	.5	6,160	11,090
	---	48.0	52.0	---	4.7	71.6	1.0	22.2	.5	6,700	12,050
D186052	38.7	27.5	28.7	5.1	7.1	40.1	.7	46.4	.6	3,800	6,850
	---	44.9	46.8	8.3	4.6	65.4	1.1	19.6	1.0	6,210	11,170
	---	48.9	51.1	---	5.0	71.4	1.2	21.4	1.1	6,770	12,190

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

SAMPLE NUMBER	AIR-DRIED LOSS	FORMS OF SULFUR			FREE SWELLING INDEX	ASH FUSION TEMPERATURE, C		
		SULFATE	PYRITIC	ORGANIC		INITIAL DEFORMATION	SOFTENING	FLUID
D180016	33.5	0.23	0.20	0.60	0.0	1,175	1,235	1,295
	---	.38	.33	1.00				
	---	.44	.38	1.14				
D180017	33.4	.31	.36	.52	.0	1,240	1,305	1,350
	---	.52	.60	.87				
	---	.59	.69	.99				
D180018	34.7	.02	.20	.48	.0	1,205	1,270	1,330
	---	.03	.34	.81				
	---	.04	.37	.90				
D180019	33.3	.04	.25	.43	.0	1,150	1,215	1,280
	---	.07	.42	.72				
	---	.08	.48	.82				
D180075	32.6	.07	.41	.03	.0	1,320	1,370	1,400
	---	.12	.73	.05				
	---	.14	.79	.06				
D180076	34.0	.03	.18	.82	.0	1,265	1,305	1,330
	---	.05	.32	1.46				
	---	.06	.38	1.72				
D180078	33.8	.01	.53	.15	.0	1,100	1,175	1,205
	---	.02	.99	.28				
	---	.02	1.11	.32				
D180079	34.2	.01	.18	.36	.0	1,325	1,375	1,405
	---	.02	.32	.65				
	---	.02	.36	.72				
D180080	34.1	.01	.09	.30	.0	1,320	1,380	1,425
	---	.02	.16	.54				
	---	.02	.18	.59				
D180083	32.2	.09	.09	.89	.0	1,220	1,275	1,310
	---	.16	.16	1.60				
	---	.18	.18	1.82				
D186051	21.6	.01	.06	.27	.0	1,155	1,215	1,270
	---	.02	.09	.41				
	---	.02	.10	.45				
D186052	28.4	.04	.09	.43	.0	1,270	1,325	1,380
	---	.07	.15	.70				
	---	.07	.16	.77				

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

	PROXIMATE ANALYSIS				ULTIMATE ANALYSIS					HEAT OF COMBUSTION	
SAMPLE NUMBER	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	KCAL/KG	BTU/LB
D186053	40.2	26.5	27.0	6.3	6.9	38.8	0.5	46.1	1.3	3,660	6,590
	---	44.3	45.2	10.5	4.1	64.9	.8	17.3	2.2	6,130	11,030
	---	49.5	50.5	---	4.5	72.5	.9	19.4	2.4	6,850	12,320
D186054C	38.0	26.8	27.0	8.2	6.8	38.6	.6	44.9	1.0	3,610	6,500
D186055C	---	43.2	43.5	13.2	4.2	62.3	1.0	17.9	1.6	5,830	10,490
	---	49.8	50.2	---	4.8	71.7	1.1	20.7	1.9	6,720	12,090
D165992	41.5	31.2	18.1	9.2	6.4	29.6	.7	52.5	1.6	2,460	4,420
	---	53.3	30.9	15.7	3.1	50.6	1.2	26.7	2.7	4,200	7,560
	---	63.3	36.7	---	3.6	60.0	1.4	31.7	3.2	4,980	8,970
D165993	38.8	31.5	23.4	6.3	6.5	34.3	.8	50.9	1.2	2,920	5,260
	---	51.5	38.2	10.3	3.6	56.0	1.3	26.8	2.0	4,770	8,590
	---	57.4	42.6	---	4.0	62.5	1.5	29.9	2.2	5,320	9,580
D196052	38.4	26.3	29.0	6.3	7.0	40.0	.5	45.3	.9	3,730	6,710
	---	42.7	47.1	10.2	4.4	64.9	.8	18.1	1.5	6,050	10,890
	---	47.6	52.4	---	4.9	72.3	.9	20.2	1.6	6,740	12,130
D196053	38.3	26.1	27.9	7.7	6.9	38.4	.6	45.0	1.4	3,640	6,550
	---	42.3	45.2	12.5	4.3	62.2	1.0	17.8	2.3	5,900	10,620
	---	48.3	51.7	---	4.9	71.1	1.1	20.3	2.6	6,740	12,130
D196054	40.3	26.1	28.1	5.5	7.2	38.7	.5	46.4	1.6	3,690	6,640
	---	43.7	47.1	9.2	4.6	64.8	.8	17.7	2.7	6,170	11,110
	---	48.2	51.8	---	5.0	71.4	.9	19.5	3.0	6,800	12,240
D196055	39.5	25.9	29.2	5.4	7.0	39.4	.6	46.9	.7	3,650	6,570
	---	42.8	48.3	8.9	4.3	65.1	1.0	19.5	1.2	6,030	10,860
	---	47.0	53.0	---	4.7	71.5	1.1	21.4	1.3	6,630	11,930
D196056	39.6	27.1	28.9	4.4	7.3	40.4	.7	46.6	.5	3,750	6,740
	---	44.9	47.8	7.3	4.8	66.9	1.2	18.9	.8	6,200	11,160
	---	48.4	51.6	---	5.2	72.1	1.2	20.4	.9	6,690	12,040
D196057	39.6	24.9	28.6	6.9	7.2	38.8	.6	45.7	.9	3,620	6,510
	---	41.2	47.4	11.4	4.6	64.2	1.0	17.4	1.5	5,990	10,780
	---	46.5	53.5	---	5.2	72.5	1.1	19.6	1.7	6,760	12,170
D196058	39.6	25.6	29.0	5.8	7.3	39.8	.6	45.8	.7	3,740	6,740
	---	42.4	48.0	9.6	4.8	65.9	1.0	17.5	1.2	6,200	11,150
	---	46.9	53.1	---	5.3	72.9	1.1	19.4	1.3	6,850	12,340
D196059	35.7	26.3	28.7	9.3	6.7	39.1	.5	42.3	1.9	3,720	6,700
	---	40.9	44.6	14.5	4.3	60.8	.8	16.4	3.0	5,790	10,420
	---	47.8	52.2	---	5.0	71.1	.9	19.2	3.5	6,770	12,180

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

SAMPLE NUMBER	AIR-DRIED LOSS	FORMS OF SULFUR			FREE SWELLING INDEX	ASH FUSION TEMPERATURE, C		
		SULFATE	PYRITIC	ORGANIC		INITIAL DEFORMATION	SOFTENING	FLUID
D186053	27.3	0.03	0.25	1.06	0.0	1,235	1,290	1,345
	---	.05	.42	1.77				
	---	.06	.47	1.98				
D186054C	25.3	.10	.16	.75	.0	1,170	1,220	1,270
D186055C	---	.16	.26	1.21				
	---	.19	.30	1.39				
D165992	.0	.12	.05	1.48	.0	0	0	0
	---	.21	.09	2.53				
	---	.24	.10	3.00				
D165993	.0	.71	.06	.44	.0	0	0	0
	---	1.16	.10	.72				
	---	1.29	.11	.80				
D196052	30.6	.01	.47	.45	.0	1,155	1,210	1,265
	---	.02	.76	.73				
	---	.02	.85	.81				
D196053	30.6	.02	.74	.63	.0	1,125	1,180	1,235
	---	.03	1.20	1.02				
	---	.04	1.37	1.17				
D196054	33.1	.01	.43	1.18	.0	1,125	1,180	1,235
	---	.02	.72	1.98				
	---	.02	.79	2.18				
D196055	32.8	.02	.14	.52	.0	1,325	1,380	1,435
	---	.03	.23	.86				
	---	.04	.25	.94				
D196056	32.7	.03	.11	.39	.0	1,345	1,400	1,455
	---	.05	.18	.65				
	---	.05	.20	.70				
D196057	33.4	.02	.37	.52	.0	1,125	1,180	1,235
	---	.03	.61	.86				
	---	.04	.69	.97				
D196058	32.8	.08	.29	.31	.0	1,155	1,215	1,270
	---	.13	.48	.51				
	---	.15	.53	.57				
D196059	29.3	.06	.63	1.24	.0	1,095	1,155	1,210
	---	.09	.98	1.93				
	---	.11	1.15	2.25				

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

	PROXIMATE ANALYSIS				ULTIMATE ANALYSIS					HEAT OF COMBUSTION	
SAMPLE NUMBER	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	KCAL/KG	BTU/LB
D196060	33.8	29.7	28.2	8.3	6.8	41.0	0.6	41.3	1.9	3,920	7,060
	---	44.9	42.6	12.5	4.6	61.9	.9	17.0	2.9	5,930	10,670
	---	51.3	48.7	---	5.3	70.8	1.0	19.4	3.3	6,780	12,200
D196061	37.9	26.7	29.3	6.1	7.1	39.9	.6	45.7	.6	3,730	6,720
	---	43.0	47.2	9.8	4.7	64.3	1.0	19.3	1.0	6,010	10,820
	---	47.7	52.3	---	5.2	71.2	1.1	21.4	1.1	6,670	12,000
D196062	38.1	26.2	27.8	7.9	6.9	38.2	.6	45.8	.6	3,590	6,470
	---	42.3	44.9	12.8	4.3	61.7	1.0	19.3	1.0	5,810	10,450
	---	48.5	51.5	---	4.9	70.7	1.1	22.1	1.1	6,660	11,980
D196075	29.3	22.0	18.0	30.7	5.3	26.7	.4	35.6	1.3	2,490	4,490
	---	31.1	25.5	43.4	2.9	37.8	.6	13.5	1.8	3,530	6,350
	---	55.0	45.0	---	5.1	66.7	1.0	23.9	3.2	6,230	11,210
D196076	34.3	26.3	30.1	9.3	6.5	40.3	.5	42.4	1.1	3,740	6,730
	---	40.0	45.8	14.2	4.1	61.3	.8	18.1	1.7	5,690	10,250
	---	46.6	53.4	---	4.8	71.5	.9	21.1	2.0	6,630	11,930
D196077	36.8	24.7	20.1	18.4	6.3	30.1	.6	43.4	1.2	2,710	4,880
	---	39.1	31.8	29.1	3.5	47.6	.9	16.9	1.9	4,290	7,720
	---	55.1	44.9	---	4.9	67.2	1.3	23.9	2.7	6,050	10,890
D196078	41.4	25.5	26.2	6.9	7.2	36.6	.6	47.7	1.1	3,420	6,160
	---	43.5	44.7	11.8	4.4	62.5	1.0	18.6	1.9	5,840	10,520
	---	49.3	50.7	---	5.0	70.8	1.2	21.1	2.1	6,620	11,920
D196079	29.5	26.7	24.7	19.1	5.8	35.0	.5	37.2	2.4	3,250	5,850
	---	37.9	35.0	27.1	3.6	49.6	.7	15.6	3.4	4,610	8,300
	---	51.9	48.1	---	4.9	68.1	1.0	21.4	4.7	6,320	11,380
D196080	35.5	27.0	24.0	13.5	6.6	36.0	.6	42.3	1.0	3,360	6,040
	---	41.9	37.2	20.9	4.1	55.8	.9	16.7	1.6	5,200	9,370
	---	52.9	47.1	---	5.2	70.6	1.2	21.1	2.0	6,580	11,850
D196081	35.4	27.6	28.5	8.5	6.7	39.9	1.0	42.5	1.5	3,750	6,740
	---	42.7	44.1	13.2	4.3	61.8	1.5	17.1	2.3	5,800	10,440
	---	49.2	50.8	---	4.9	71.1	1.8	19.7	2.7	6,680	12,020
D194858	31.7	27.0	30.6	10.7	6.2	40.8	.7	41.1	.6	3,680	6,620
	---	39.5	44.8	15.7	3.9	59.7	1.0	18.9	.9	5,390	9,690
	---	46.9	53.1	---	4.6	70.8	1.2	22.4	1.0	6,390	11,490
D194859	34.5	27.3	29.4	8.8	6.6	40.0	.6	43.0	1.1	3,700	6,650
	---	41.7	44.9	13.4	4.2	61.1	.9	18.8	1.7	5,640	10,160
	---	48.1	51.9	---	4.9	70.5	1.1	21.8	1.9	6,520	11,740

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

SAMPLE NUMBER	AIR-DRIED LOSS	FORMS OF SULFUR			FREE SWELLING INDEX	ASH FUSION TEMPERATURE, C		
		SULFATE	PYRITIC	ORGANIC		INITIAL DEFORMATION	SOFTENING	FLUID
D196060	27.1	0.19	0.36	1.38	0.0	1,095	1,155	1,205
	---	.29	.54	2.08				
	---	.33	.62	2.38				
D196061	31.8	.03	.18	.44	.0	1,100	1,150	1,215
	---	.05	.29	.71				
	---	.05	.32	.79				
D196062	32.1	.01	.20	.41	.0	1,100	1,150	1,215
	---	.02	.32	.66				
	---	.02	.37	.76				
D196075	17.7	.35	.62	.36	.0	1,140	1,165	1,275
	---	.50	.88	.51				
	---	.87	1.55	.90				
D196076	19.2	.06	.19	.82	.0	1,105	1,120	1,140
	---	.09	.29	1.25				
	---	.11	.34	1.45				
D196077	23.6	.44	.10	.66	.0	1,195	1,220	1,250
	---	.70	.16	1.04				
	---	.98	.22	1.47				
D196078	29.7	.13	.26	.67	.0	1,190	1,210	1,230
	---	.22	.44	1.14				
	---	.25	.50	1.30				
D196079	14.1	.59	1.08	.73	.0	1,075	1,095	1,110
	---	.84	1.53	1.04				
	---	1.15	2.10	1.42				
D196080	21.7	.18	.38	.49	.0	1,150	1,175	1,200
	---	.28	.59	.76				
	---	.35	.75	.96				
D196081	19.9	.11	.62	.71	.0	1,130	1,150	1,165
	---	.17	.96	1.10				
	---	.20	1.11	1.27				
D194858	16.6	.08	.12	.38	.0	1,150	1,165	1,180
	---	.12	.18	.56				
	---	.14	.21	.66				
D194859	20.9	.16	.36	.58	.0	1,140	1,150	1,165
	---	.24	.55	.89				
	---	.28	.63	1.02				

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

	PROXIMATE ANALYSIS				ULTIMATE ANALYSIS					HEAT OF COMBUSTION	
SAMPLE NUMBER	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	KCAL/KG	BTU/LB
D194860	31.1	26.9	27.4	14.6	6.2	38.2	0.9	39.8	0.4	3,480	6,270
	---	39.0	39.8	21.2	4.0	55.4	1.3	17.6	.6	5,050	9,100
	---	49.5	50.5	---	5.1	70.3	1.7	22.4	.7	6,410	11,550
D194861	36.6	25.3	30.0	8.1	6.7	39.7	.6	44.5	.3	3,620	6,510
	---	39.9	47.3	12.8	4.2	62.6	.9	18.9	.5	5,710	10,270
	---	45.8	54.2	---	4.8	71.8	1.1	21.6	.5	6,540	11,770
D194862	34.5	27.0	31.1	7.4	6.6	41.3	.6	43.4	.7	3,770	6,780
	---	41.2	47.5	11.3	4.2	63.1	.9	19.4	1.1	5,750	10,360
	---	46.5	53.5	---	4.8	71.1	1.0	21.9	1.2	6,490	11,670
D194863	35.7	27.1	29.8	7.4	6.8	40.5	.5	43.9	.8	3,740	6,730
	---	42.1	46.3	11.5	4.4	63.0	.8	18.9	1.2	5,820	10,470
	---	47.6	52.4	---	5.0	71.2	.9	21.4	1.4	6,570	11,830
D194864	30.0	25.1	27.0	17.9	6.4	41.7	.6	32.2	1.3	3,430	6,170
	---	35.9	38.6	25.6	4.4	59.6	.9	7.9	1.9	4,890	8,810
	---	48.2	51.8	---	5.9	80.0	1.2	10.6	2.5	6,570	11,830
D194865	36.0	26.2	30.9	6.9	6.7	41.3	.6	43.6	.9	3,770	6,790
	---	40.9	48.3	10.8	4.2	64.5	.9	18.1	1.4	5,890	10,600
	---	45.9	54.1	---	4.7	72.3	1.1	20.3	1.6	6,600	11,880
D194866	27.6	26.0	27.0	19.4	5.3	36.6	.6	36.9	1.2	3,420	6,160
	---	35.9	37.3	26.8	3.1	50.6	.8	17.1	1.7	4,730	8,510
	---	49.1	50.9	---	4.2	69.1	1.1	23.3	2.3	6,460	11,630
D194867	34.1	26.6	32.4	6.9	6.6	42.6	.6	42.5	.7	3,860	6,950
	---	40.4	49.2	10.5	4.3	64.6	.9	18.5	1.1	5,860	10,540
	---	45.1	54.9	---	4.8	72.2	1.0	20.7	1.2	6,540	11,780
D194868	34.9	26.9	33.7	4.5	6.6	43.8	.7	44.0	.4	3,960	7,140
	---	41.3	51.8	6.9	4.2	67.3	1.1	19.9	.6	6,090	10,960
	---	44.4	55.6	---	4.5	72.3	1.2	21.4	.7	6,540	11,770
D194869	36.5	26.2	30.2	7.1	6.7	40.6	.6	44.0	.9	3,730	6,710
	---	41.3	47.6	11.2	4.2	63.9	.9	18.2	1.4	5,870	10,570
	---	46.5	53.5	---	4.7	72.0	1.1	20.5	1.6	6,610	11,900
D194870	37.6	25.5	28.8	8.1	6.8	38.9	.5	44.5	1.3	3,600	6,480
	---	40.9	46.2	13.0	4.2	62.3	.8	17.8	2.1	5,770	10,380
	---	47.0	53.0	---	4.8	71.6	.9	20.4	2.4	6,630	11,930
D194029	33.1	29.2	30.6	7.1	6.7	41.9	.7	43.0	.6	3,870	6,970
	---	43.6	45.7	10.6	4.5	62.6	1.0	20.3	.9	5,780	10,410
	---	48.8	51.2	---	5.1	70.1	1.2	22.7	1.0	6,470	11,650

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

SAMPLE NUMBER	AIR-DRIED LOSS	FORMS OF SULFUR			FREE SWELLING INDEX	ASH FUSION TEMPERATURE, C		
		SULFATE	PYRITIC	ORGANIC		INITIAL DEFORMATION	SOFTENING	FLUID
D194860	16.8	0.02	0.10	0.27	0.0	1,140	1,165	1,190
	---	.03	.15	.39				
	---	.04	.18	.50				
D194861	21.2	.01	.03	.31	.0	1,140	1,165	1,195
	---	.02	.05	.49				
	---	.02	.05	.56				
D194862	18.4	.01	.18	.49	.0	1,080	1,110	1,140
	---	.02	.27	.75				
	---	.02	.31	.84				
D194863	22.9	.05	.25	.51	.0	1,200	1,255	1,310
	---	.08	.39	.79				
	---	.09	.44	.90				
D194864	17.6	.15	.30	.81	.0	1,140	1,165	1,200
	---	.21	.43	1.16				
	---	.29	.58	1.55				
D194865	22.5	.02	.28	.63	.0	1,170	1,230	1,305
	---	.03	.44	.98				
	---	.04	.49	1.10				
D194866	3.3	.16	.13	.93	.0	1,115	1,145	1,320
	---	.22	.18	1.28				
	---	.30	.25	1.75				
D194867	17.5	.04	.25	.44	.0	1,165	1,190	1,210
	---	.06	.38	.67				
	---	.07	.42	.75				
D194868	19.4	.01	.05	.32	.0	1,295	1,310	1,325
	---	.02	.08	.49				
	---	.02	.08	.53				
D194869	21.2	.05	.42	.47	.0	1,165	1,180	1,200
	---	.08	.66	.74				
	---	.09	.74	.83				
D194870	24.7	.11	.67	.50	.0	1,140	1,150	1,165
	---	.18	1.07	.80				
	---	.20	1.23	.92				
D194029	18.3	.08	.05	.45	.0	1,160	1,180	1,205
	---	.12	.07	.67				
	---	.13	.08	.75				

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

	PROXIMATE ANALYSIS				ULTIMATE ANALYSIS					HEAT OF COMBUSTION	
SAMPLE NUMBER	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	KCAL/KG	BTU/LB
D194030	34.4	28.1	30.0	7.5	6.6	40.9	0.6	43.7	0.6	3,780	6,800
	---	42.8	45.7	11.4	4.2	62.3	.9	20.0	.9	5,760	10,370
	---	48.4	51.6	---	4.8	70.4	1.0	22.6	1.0	6,510	11,710
D194031	30.8	28.2	29.4	11.6	6.2	39.8	.6	40.8	.9	3,690	6,650
	---	40.8	42.5	16.8	4.0	57.5	.9	19.4	1.3	5,340	9,610
	---	49.0	51.0	---	4.8	69.1	1.0	23.3	1.6	6,410	11,540
D194032	35.7	26.2	29.2	8.9	6.6	39.6	.6	42.8	1.4	3,610	6,500
	---	40.7	45.4	13.8	4.1	61.6	.9	17.2	2.2	5,610	10,100
	---	47.3	52.7	---	4.8	71.5	1.1	20.0	2.5	6,510	11,720
D194033	35.7	27.7	30.7	5.9	6.8	41.0	.6	44.7	1.1	3,800	6,840
	---	43.1	47.7	9.2	4.4	63.8	.9	20.2	1.7	5,910	10,640
	---	47.4	52.6	---	4.9	70.2	1.0	22.2	1.9	6,510	11,710
D194034	29.8	20.5	19.0	30.7	5.3	26.9	.5	35.9	.6	2,440	4,400
	---	29.2	27.1	43.7	2.8	38.3	.7	13.4	.9	3,480	6,260
	---	51.9	48.1	---	5.0	68.1	1.3	23.8	1.5	6,190	11,130
D194035	33.6	29.3	30.1	7.0	6.7	41.6	.7	43.5	.6	3,880	6,990
	---	44.1	45.3	10.5	4.5	62.7	1.1	20.5	.9	5,850	10,530
	---	49.3	50.7	---	5.0	70.0	1.2	23.0	1.0	6,540	11,770
D194036	33.3	29.3	31.9	5.5	6.7	42.9	.7	43.7	.4	3,940	7,090
	---	43.9	47.8	8.2	4.5	64.3	1.0	21.1	.6	5,910	10,630
	---	47.9	52.1	---	4.9	70.1	1.1	23.0	.7	6,440	11,590
D196624	39.9	26.4	25.0	8.7	7.0	34.8	.4	48.6	.6	3,260	5,880
	---	43.9	41.6	14.5	4.3	57.9	.7	21.9	1.0	5,430	9,780
	---	51.4	48.6	---	5.0	67.7	.8	25.6	1.2	6,350	11,430
D196625	38.3	26.5	27.0	8.2	6.8	37.8	.6	45.9	.8	3,450	6,200
	---	42.9	43.8	13.3	4.1	61.3	1.0	19.2	1.3	5,590	10,050
	---	49.5	50.5	---	4.8	70.7	1.1	22.2	1.5	6,440	11,590
D196626	38.8	25.8	28.7	6.7	6.6	37.4	.7	48.4	.2	3,430	6,170
	---	42.2	46.9	10.9	3.7	61.1	1.1	22.7	.3	5,600	10,080
	---	47.3	52.7	---	4.2	68.6	1.3	25.5	.4	6,290	11,320
D196627	34.3	22.9	21.9	20.9	5.9	30.8	.5	38.9	3.2	2,780	5,000
	---	34.9	33.3	31.8	3.2	46.9	.8	12.8	4.9	4,230	7,610
	---	51.1	48.9	---	4.7	68.7	1.1	18.8	7.1	6,200	11,150
D196628	40.4	25.4	27.0	7.2	7.0	36.4	.6	48.4	.5	3,330	5,990
	---	42.6	45.3	12.1	4.2	61.1	1.0	21.0	.8	5,590	10,050
	---	48.5	51.5	---	4.8	69.5	1.1	23.8	1.0	6,350	11,440

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

SAMPLE NUMBER	AIR-DRIED LOSS	FORMS OF SULFUR			FREE SWELLING INDEX	ASH FUSION TEMPERATURE, C		
		SULFATE	PYRITIC	ORGANIC		INITIAL DEFORMATION	SOFTENING	FLUID
D194030	21.6	0.04	0.05	0.56	0.0	1,110	1,140	1,165
	---	.06	.08	.85				
	---	.07	.09	.96				
D194031	14.6	.14	.37	.43	.0	1,065	1,080	1,120
	---	.20	.53	.62				
	---	.24	.64	.75				
D194032	21.6	.11	.54	.73	.0	1,170	1,200	1,225
	---	.17	.84	1.14				
	---	.20	.97	1.32				
D194033	18.9	.09	.15	.86	.0	1,260	1,290	1,315
	---	.14	.23	1.34				
	---	.15	.26	1.47				
D194034	19.4	.10	.04	.46	.0	1,200	1,255	1,400
	---	.14	.06	.66				
	---	.25	.10	1.16				
D194035	18.0	.05	.12	.43	.0	1,060	1,090	1,165
	---	.08	.18	.65				
	---	.08	.20	.72				
D194036	19.8	.06	.10	.26	.0	1,295	1,315	1,340
	---	.09	.15	.39				
	---	.10	.16	.42				
D196624	27.2	.01	.04	.52	.0	1,165	1,195	1,240
	---	.02	.07	.87				
	---	.02	.08	1.01				
D196625	23.8	.03	.48	.25	.0	1,245	1,265	1,290
	---	.05	.78	.41				
	---	.06	.90	.47				
D196626	23.3	.01	.02	.14	.0	1,290	1,305	1,320
	---	.02	.03	.23				
	---	.02	.04	.26				
D196627	22.3	.31	2.02	.82	.0	1,130	1,160	1,190
	---	.47	3.07	1.25				
	---	.69	4.51	1.83				
D196628	26.9	.03	.29	.16	.0	1,240	1,255	1,270
	---	.05	.49	.27				
	---	.06	.55	.31				

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

	PROXIMATE ANALYSIS				ULTIMATE ANALYSIS					HEAT OF COMBUSTION	
SAMPLE NUMBER	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	KCAL/KG	BTU/LB
D196629	39.2	28.3	25.8	6.7	7.3	37.7	0.7	46.7	0.9	3,610	6,490
	---	46.5	42.4	11.0	4.8	62.0	1.2	19.5	1.5	5,930	10,680
	---	52.3	47.7	---	5.4	69.7	1.3	21.9	1.7	6,670	12,000
D196630	26.2	38.8	26.6	8.4	7.0	39.3	.7	43.6	1.1	3,720	6,700
	---	52.6	36.0	11.4	5.5	53.3	.9	27.5	1.5	5,040	9,080
	---	59.3	40.7	---	6.3	60.1	1.1	31.1	1.7	5,690	10,240
D196631	35.4	30.0	27.1	7.5	6.9	40.1	.7	44.4	.4	3,780	6,800
	---	46.4	42.0	11.6	4.6	62.1	1.1	20.0	.6	5,850	10,520
	---	52.5	47.5	---	5.2	70.2	1.2	22.7	.7	6,610	11,900
D196632	39.7	24.9	27.4	8.0	6.8	37.4	.6	46.5	.8	3,430	6,170
	---	41.3	45.4	13.3	4.0	62.0	1.0	18.6	1.3	5,690	10,240
	---	47.6	52.4	---	4.6	71.5	1.1	21.4	1.5	6,560	11,800
D196633	40.3	24.6	27.9	7.2	6.9	37.5	.6	47.2	.6	3,420	6,150
	---	41.2	46.7	12.1	4.1	62.8	1.0	19.1	1.0	5,720	10,300
	---	46.9	53.1	---	4.6	71.4	1.1	21.7	1.1	6,510	11,710
D196634	37.0	24.3	25.8	12.9	6.5	32.8	.4	44.8	2.5	1,460	2,630
	---	38.6	41.0	20.5	3.8	52.1	.6	18.9	4.0	2,310	4,170
	---	48.5	51.5	---	4.8	65.5	.8	23.8	5.0	2,910	5,240
D196635	37.8	25.1	28.5	8.6	6.6	38.0	.6	45.6	.6	3,470	6,250
	---	40.4	45.8	13.8	3.9	61.1	1.0	19.3	1.0	5,580	10,050
	---	46.8	53.2	---	4.5	70.9	1.1	22.4	1.1	6,480	11,660
D196636	37.5	25.5	28.2	8.8	6.6	38.2	.6	45.0	.8	3,520	6,340
	---	40.8	45.1	14.1	3.9	61.1	1.0	18.7	1.3	5,630	10,140
	---	47.5	52.5	---	4.5	71.1	1.1	21.7	1.5	6,560	11,800
D196637	43.4	22.2	22.6	11.8	6.9	30.9	.5	49.1	.9	2,810	5,060
	---	39.2	39.9	20.8	3.7	54.6	.9	18.6	1.6	4,970	8,950
	---	49.6	50.4	---	4.6	69.0	1.1	23.5	2.0	6,280	11,300
D196638	40.6	24.7	26.6	8.1	6.9	36.1	.5	47.6	.7	3,280	5,900
	---	41.6	44.8	13.6	4.0	60.8	.8	19.4	1.2	5,520	9,930
	---	48.1	51.9	---	4.7	70.4	1.0	22.4	1.4	6,390	11,500
D196639	40.5	24.0	26.9	8.6	6.9	36.3	.5	46.3	1.4	3,320	5,980
	---	40.3	45.2	14.5	4.0	61.0	.8	17.3	2.4	5,580	10,050
	---	47.2	52.8	---	4.7	71.3	1.0	20.2	2.8	6,530	11,750
D196640	40.9	24.3	27.3	7.5	6.9	36.2	.5	48.0	.8	3,340	6,020
	---	41.1	46.2	12.7	4.0	61.3	.8	19.7	1.4	5,660	10,180
	---	47.1	52.9	---	4.6	70.2	1.0	22.6	1.6	6,480	11,660

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

SAMPLE NUMBER	AIR-DRIED LOSS	FORMS OF SULFUR			FREE SWELLING INDEX	ASH FUSION TEMPERATURE, C		
		SULFATE	PYRITIC	ORGANIC		INITIAL DEFORMATION	SOFTENING	FLUID
D196629	23.4	0.01	0.18	0.71	0.0	1,240	1,255	1,270
	---	.02	.30	1.17				
	---	.02	.33	1.31				
D196630	23.4	.16	.15	.79	.0	1,220	1,250	1,275
	---	.22	.20	1.07				
	---	.24	.23	1.21				
D196631	22.6	.01	.01	.38	.0	1,165	1,180	1,210
	---	.02	.02	.59				
	---	.02	.02	.67				
D196632	26.2	.02	.34	.39	.0	1,115	1,140	1,160
	---	.03	.56	.65				
	---	.04	.65	.75				
D196633	25.2	.01	.23	.38	.0	1,140	1,165	1,220
	---	.02	.39	.64				
	---	.02	.44	.72				
D196634	24.3	.52	.90	1.12	.0	1,105	1,130	1,190
	---	.83	1.43	1.78				
	---	1.04	1.80	2.24				
D196635	21.8	.01	.27	.34	.0	1,165	1,180	1,200
	---	.02	.43	.55				
	---	.02	.50	.63				
D196636	20.6	.04	.39	.35	.0	1,145	1,165	1,190
	---	.06	.62	.56				
	---	.07	.73	.65				
D196637	32.6	.11	.45	.31	.0	1,165	1,180	1,200
	---	.19	.80	.55				
	---	.25	1.00	.69				
D196638	30.1	.04	.40	.28	.0	1,255	1,270	1,290
	---	.07	.67	.47				
	---	.08	.78	.55				
D196639	27.4	.08	.92	.38	.0	1,220	1,240	1,255
	---	.13	1.55	.64				
	---	.16	1.81	.75				
D196640	29.9	.04	.43	.35	.0	1,220	1,230	1,250
	---	.07	.73	.59				
	---	.08	.83	.68				

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

	PROXIMATE ANALYSIS				ULTIMATE ANALYSIS					HEAT OF COMBUSTION	
SAMPLE NUMBER	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	KCAL/KG	BTU/LB
D221097	33.6	28.3	31.7	6.4	6.8	43.3	0.8	42.2	0.6	4,120	7,410
	---	42.6	47.7	9.6	4.6	65.2	1.2	18.6	.9	6,200	11,160
	---	47.2	52.8	---	5.1	72.2	1.3	20.6	1.0	6,860	12,350
D221098	28.6	27.9	33.4	10.1	6.2	44.1	.9	37.5	1.1	4,230	7,610
	---	39.1	46.8	14.1	4.2	61.8	1.3	16.9	1.5	5,920	10,650
	---	45.5	54.5	---	4.9	71.9	1.5	19.7	1.8	6,890	12,410
D221099	31.9	28.1	32.4	7.6	6.6	44.0	1.0	39.9	1.0	4,220	7,600
	---	41.3	47.6	11.2	4.5	64.6	1.5	17.0	1.5	6,200	11,160
	---	46.4	53.6	---	5.1	72.7	1.7	19.1	1.7	6,980	12,570
D221100	26.4	27.9	33.4	12.3	5.9	44.1	.9	35.5	1.2	4,190	7,550
	---	37.9	45.4	16.7	4.0	59.9	1.2	16.3	1.6	5,700	10,260
	---	45.5	54.5	---	4.8	71.9	1.5	19.6	2.0	6,840	12,310
D221101	28.7	25.1	29.2	17.0	5.8	39.0	.8	35.6	1.8	3,710	6,680
	---	35.2	41.0	23.8	3.7	54.7	1.1	14.1	2.5	5,200	9,360
	---	46.2	53.8	---	4.8	71.8	1.5	18.6	3.3	6,830	12,290
D221102	32.9	26.6	33.9	6.6	6.4	43.7	.9	41.7	.7	4,120	7,410
	---	39.6	50.5	9.8	4.1	65.1	1.3	18.6	1.0	6,140	11,050
	---	44.0	56.0	---	4.5	72.2	1.5	20.6	1.2	6,810	12,250
D221103	27.6	29.3	34.0	9.1	6.0	46.1	.9	35.7	2.1	4,390	7,900
	---	40.5	47.0	12.6	4.1	63.7	1.2	15.4	2.9	6,060	10,910
	---	46.3	53.7	---	4.6	72.8	1.4	17.6	3.3	6,930	12,480
D221104	36.0	28.3	17.9	17.8	5.7	28.0	.8	45.8	1.9	2,350	4,230
	---	44.2	28.0	27.8	2.7	43.7	1.2	21.6	3.0	3,680	6,620
	---	61.3	38.7	---	3.7	60.6	1.7	29.9	4.1	5,090	9,160
D221105	27.7	28.2	34.8	9.3	6.1	46.1	.9	36.4	1.3	4,330	7,790
	---	39.0	48.1	12.9	4.2	63.8	1.2	16.3	1.8	5,990	10,780
	---	44.8	55.2	---	4.8	73.2	1.4	18.7	2.1	6,870	12,370
D221106	30.0	28.3	35.7	6.0	6.4	46.6	.9	39.3	.8	4,400	7,920
	---	40.4	51.0	8.6	4.4	66.6	1.3	18.0	1.1	6,280	11,310
	---	44.2	55.8	---	4.8	72.8	1.4	19.7	1.2	6,870	12,370
D213983	42.6	27.0	24.9	5.5	7.5	36.4	.7	49.5	.4	3,450	6,220
	---	47.0	43.4	9.6	4.8	63.4	1.2	20.3	.7	6,020	10,830
	---	52.0	48.0	---	5.3	70.1	1.3	22.4	.8	6,650	11,980
D213984	40.9	22.3	23.8	13.0	6.8	31.9	.6	47.4	.3	2,950	5,320
	---	37.7	40.3	22.0	3.8	54.0	1.0	18.7	.5	5,000	8,990
	---	48.4	51.6	---	4.9	69.2	1.3	24.0	.7	6,410	11,530

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

SAMPLE NUMBER	AIR-DRIED LOSS	FORMS OF SULFUR			FREE SWELLING INDEX	ASH FUSION TEMPERATURE, C		
		SULFATE	PYRITIC	ORGANIC		INITIAL DEFORMATION	SOFTENING	FLUID
D221097	27.3	0.01	0.18	0.39	0.0	1,195	1,240	1,300
	---	.02	.27	.59				
	---	.02	.30	.65				
D221098	21.9	.01	.56	.57	.0	1,020	1,065	1,125
	---	.01	.78	.80				
	---	.02	.91	.93				
D221099	26.2	.01	.38	.59	.0	1,015	1,060	1,110
	---	.01	.56	.87				
	---	.02	.63	.98				
D221100	19.4	.01	.40	.85	.0	1,050	1,115	1,155
	---	.01	.54	1.15				
	---	.02	.65	1.39				
D221101	23.3	.01	.45	1.30	.0	1,150	1,195	1,240
	---	.01	.63	1.82				
	---	.02	.83	2.39				
D221102	25.4	.01	.18	.54	.0	1,155	1,220	1,270
	---	.01	.27	.80				
	---	.02	.30	.89				
D221103	20.3	.01	.93	1.18	.0	1,190	1,240	1,280
	---	.01	1.28	1.63				
	---	.02	1.47	1.86				
D221104	28.7	1.34	.04	.47	.0	1,115	1,180	1,250
	---	2.09	.06	.73				
	---	2.90	.09	1.02				
D221105	20.9	.01	.42	.84	.0	1,120	1,170	1,220
	---	.01	.58	1.16				
	---	.02	.67	1.33				
D221106	23.4	.01	.19	.65	.0	1,245	1,275	1,315
	---	.01	.27	.93				
	---	.02	.30	1.02				
D213983	37.2	.01	.02	.40	.0	1,210	1,255	1,305
	---	.02	.03	.70				
	---	.02	.04	.77				
D213984	34.5	.01	.02	.29	.0	1,075	1,125	1,195
	---	.02	.03	.49				
	---	.02	.04	.63				

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

	PROXIMATE ANALYSIS				ULTIMATE ANALYSIS					HEAT OF COMBUSTION	
SAMPLE NUMBER	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	KCAL/KG	BTU/LB
D213985	45.0	23.2	26.0	5.8	7.3	34.4	0.6	51.3	0.5	3,190	5,740
	---	42.2	47.3	10.5	4.2	62.5	1.1	20.5	.9	5,800	10,430
	---	47.2	52.8	---	4.7	69.9	1.2	23.0	1.0	6,480	11,660
D213986	35.7	20.6	17.8	25.9	6.0	27.0	.6	39.7	.8	2,540	4,570
	---	32.0	27.7	40.3	3.2	42.0	.9	12.4	1.2	3,950	7,100
	---	53.6	46.4	---	5.3	70.3	1.6	20.7	2.1	6,610	11,890
D213987	40.7	24.3	25.4	9.6	6.9	35.2	.6	46.4	1.3	3,280	5,910
	---	41.0	42.8	16.2	4.0	59.4	1.0	17.2	2.2	5,540	9,970
	---	48.9	51.1	---	4.8	70.8	1.2	20.6	2.6	6,610	11,890
D213988	40.4	23.9	21.5	14.2	6.7	30.9	.6	44.9	2.6	2,940	5,290
	---	40.1	36.1	23.8	3.7	51.8	1.0	15.1	4.4	4,930	8,880
	---	52.6	47.4	---	4.9	68.1	1.3	19.8	5.7	6,480	11,660
D213989	45.7	23.6	24.6	6.1	7.3	34.0	.6	51.6	.5	3,170	5,710
	---	43.5	45.3	11.2	4.1	62.6	1.1	20.2	.9	5,840	10,510
	---	49.0	51.0	---	4.6	70.5	1.2	22.8	1.0	6,580	11,840
D213990	43.9	23.0	24.1	9.0	7.0	33.6	.7	48.8	.9	3,120	5,610
	---	41.0	43.0	16.0	3.8	59.9	1.2	17.4	1.6	5,550	9,990
	---	48.8	51.2	---	4.5	71.3	1.5	20.8	1.9	6,610	11,900
D213991	45.1	23.5	25.7	5.7	7.3	34.7	.6	51.2	.5	3,240	5,830
	---	42.8	46.8	10.4	4.2	63.2	1.1	20.2	.9	5,890	10,610
	---	47.8	52.2	---	4.7	70.5	1.2	22.6	1.0	6,580	11,840
D213992	39.2	21.8	21.8	17.2	6.5	31.0	.6	43.6	1.1	2,890	5,200
	---	35.9	35.9	28.3	3.5	51.0	1.0	14.4	1.8	4,750	8,550
	---	50.0	50.0	---	4.9	71.1	1.4	20.1	2.5	6,620	11,920
D213993	41.5	21.1	23.3	14.1	6.7	30.5	.5	45.1	3.0	2,890	5,210
	---	36.1	39.8	24.1	3.6	52.1	.9	14.0	5.1	4,950	8,910
	---	47.5	52.5	---	4.7	68.7	1.1	18.5	6.8	6,520	11,730
D213994	44.8	24.0	25.2	6.0	7.2	34.6	.7	50.6	.8	3,240	5,830
	---	43.5	45.7	10.9	4.0	62.7	1.3	19.5	1.4	5,870	10,570
	---	48.8	51.2	---	4.5	70.3	1.4	21.9	1.6	6,590	11,850
D213995	41.5	22.7	23.8	12.0	6.8	32.9	.6	47.1	.7	3,060	5,510
	---	38.8	40.7	20.5	3.7	56.2	1.0	17.5	1.2	5,230	9,410
	---	48.8	51.2	---	4.7	70.8	1.3	22.0	1.5	6,580	11,840
D213996	39.0	23.6	22.6	14.8	6.5	32.6	.7	43.8	1.7	3,060	5,510
	---	38.7	37.0	24.3	3.6	53.4	1.1	15.0	2.8	5,020	9,030
	---	51.1	48.9	---	4.7	70.6	1.5	19.8	3.7	6,620	11,920

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

SAMPLE NUMBER	AIR-DRIED LOSS	FORMS OF SULFUR			FREE SWELLING INDEX	ASH FUSION TEMPERATURE, C		
		SULFATE	PYRITIC	ORGANIC		INITIAL DEFORMATION	SOFTENING	FLUID
D213985	39.1	0.12	0.02	0.40	0.0	1,125	1,170	1,220
	---	.22	.04	.73				
	---	.24	.04	.81				
D213986	30.8	.01	.20	.61	.0	1,155	1,230	1,280
	---	.02	.31	.95				
	---	.03	.52	1.59				
D213987	34.1	.01	.60	.67	.0	1,070	1,120	1,170
	---	.02	1.01	1.13				
	---	.02	1.21	1.35				
D213988	34.7	.34	1.95	.29	.0	990	1,025	1,060
	---	.57	3.27	.49				
	---	.75	4.30	.64				
D213989	39.8	.01	.08	.38	.0	1,055	1,100	1,160
	---	.02	.15	.70				
	---	.02	.17	.79				
D213990	37.6	.01	.37	.51	.0	1,015	1,060	1,110
	---	.02	.66	.91				
	---	.02	.79	1.08				
D213991	38.9	.01	.06	.41	.0	1,180	1,220	1,270
	---	.02	.11	.75				
	---	.02	.12	.83				
D213992	33.2	.07	.31	.71	.0	1,095	1,150	1,190
	---	.12	.51	1.17				
	---	.16	.71	1.63				
D213993	35.6	.05	2.74	.24	.0	1,010	1,060	1,110
	---	.09	4.68	.41				
	---	.11	6.17	.54				
D213994	37.6	.01	.48	.35	.0	1,150	1,190	1,225
	---	.02	.87	.63				
	---	.02	.98	.71				
D213995	35.9	.01	.24	.41	.0	1,060	1,120	1,170
	---	.02	.41	.70				
	---	.02	.52	.88				
D213996	32.4	.01	1.37	.32	.0	1,065	1,115	1,175
	---	.02	2.25	.52				
	---	.02	2.97	.69				

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

	PROXIMATE ANALYSIS				ULTIMATE ANALYSIS					HEAT OF COMBUSTION	
SAMPLE NUMBER	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	KCAL/KG	BTU/LB
D213997	43.7	23.1	26.3	6.9	6.9	34.8	0.7	50.0	0.6	3,250	5,850
	---	41.0	46.7	12.3	3.6	61.8	1.2	19.8	1.1	5,770	10,380
	---	46.8	53.2	---	4.1	70.4	1.4	22.6	1.2	6,570	11,830
D213998	39.6	22.9	26.0	11.5	6.6	34.7	.7	46.1	.4	3,220	5,790
	---	37.9	43.0	19.0	3.6	57.5	1.2	18.0	.7	5,330	9,590
	---	46.8	53.2	---	4.5	71.0	1.4	22.3	.8	6,580	11,840
D213999	41.1	25.3	24.5	9.1	6.6	33.9	.7	47.2	2.6	3,190	5,750
	---	43.0	41.6	15.4	3.5	57.6	1.2	18.1	4.4	5,420	9,760
	---	50.8	49.2	---	4.1	68.1	1.4	21.4	5.2	6,410	11,540
D214000	42.7	24.5	23.9	8.9	6.9	33.9	.7	48.8	.8	3,180	5,730
	---	42.8	41.7	15.5	3.8	59.2	1.2	18.9	1.4	5,550	9,990
	---	50.6	49.4	---	4.5	70.0	1.4	22.4	1.7	6,570	11,830
D214001	43.1	24.3	26.1	6.5	6.9	35.3	.7	50.2	.4	3,280	5,900
	---	42.7	45.9	11.4	3.7	62.0	1.2	20.9	.7	5,760	10,370
	---	48.2	51.8	---	4.2	70.0	1.4	23.6	.8	6,510	11,710
D196399	41.4	25.0	28.7	4.9	7.1	37.8	.7	49.1	.3	3,480	6,270
	---	42.7	49.0	8.4	4.3	64.5	1.2	21.0	.5	5,950	10,700
	---	46.6	53.4	---	4.7	70.4	1.3	22.9	.6	6,490	11,680
D196400	38.6	25.0	26.3	10.1	6.7	36.0	.6	44.2	2.4	3,350	6,020
	---	40.7	42.8	16.4	3.9	58.6	1.0	16.1	3.9	5,450	9,810
	---	48.7	51.3	---	4.7	70.2	1.2	19.3	4.7	6,520	11,740
D196401	37.6	25.4	26.3	10.7	6.6	36.5	.6	44.0	1.5	3,390	6,110
	---	40.7	42.1	17.1	3.9	58.5	1.0	17.0	2.4	5,440	9,790
	---	49.1	50.9	---	4.7	70.6	1.2	20.5	2.9	6,560	11,810
D196402	42.1	24.9	26.3	6.7	7.1	35.5	.6	49.2	.9	3,330	5,990
	---	43.0	45.4	11.6	4.2	61.3	1.0	20.3	1.6	5,740	10,340
	---	48.6	51.4	---	4.7	69.3	1.2	23.0	1.8	6,490	11,690
D196403	41.6	24.3	26.0	8.1	7.0	35.3	.6	47.4	1.5	3,300	5,940
	---	41.6	44.5	13.9	4.1	60.4	1.0	17.8	2.6	5,650	10,160
	---	48.3	51.7	---	4.7	70.2	1.2	20.7	3.0	6,560	11,800
D196404	41.1	23.2	23.1	12.6	6.8	31.7	.5	47.0	1.3	2,970	5,340
	---	39.4	39.2	21.4	3.8	53.8	.8	17.8	2.2	5,040	9,070
	---	50.1	49.9	---	4.8	68.5	1.1	22.6	2.8	6,410	11,540
D196405	41.9	25.1	23.9	9.1	7.0	34.4	.5	47.9	1.2	3,270	5,890
	---	43.2	41.1	15.7	4.0	59.2	.9	18.3	2.1	5,630	10,140
	---	51.2	48.8	---	4.8	70.2	1.0	21.7	2.4	6,680	12,020

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

SAMPLE NUMBER	AIR-DRIED LOSS	FORMS OF SULFUR			FREE SWELLING INDEX	ASH FUSION TEMPERATURE, C		
		SULFATE	PYRITIC	ORGANIC		INITIAL DEFORMATION	SOFTENING	FLUID
D213997	35.3	0.01	0.19	0.43	0.0	1,050	1,110	1,165
	---	.02	.34	.76				
	---	.02	.38	.87				
D213998	31.9	.02	.06	.34	.0	1,055	1,130	1,200
	---	.03	.10	.56				
	---	.04	.12	.70				
D213999	33.2	.01	2.03	.59	.0	1,050	1,105	1,155
	---	.02	3.45	1.00				
	---	.02	4.08	1.18				
D214000	35.1	.01	.34	.47	.0	1,015	1,065	1,125
	---	.02	.59	.82				
	---	.02	.70	.97				
D214001	33.6	.01	.03	.41	.0	1,020	1,090	1,145
	---	.02	.05	.72				
	---	.02	.06	.81				
D196399	27.4	.01	.05	.21	.0	1,155	1,165	1,180
	---	.02	.09	.36				
	---	.02	.09	.39				
D196400	25.8	.07	1.84	.49	.0	1,105	1,125	1,190
	---	.11	3.00	.80				
	---	.14	3.59	.96				
D196401	24.4	.07	.80	.68	.0	1,050	1,075	1,100
	---	.11	1.28	1.09				
	---	.14	1.55	1.32				
D196402	29.7	.06	.50	.39	.0	1,130	1,160	1,180
	---	.10	.86	.67				
	---	.12	.98	.76				
D196403	28.2	.10	.96	.45	.0	1,140	1,160	1,180
	---	.17	1.64	.77				
	---	.20	1.91	.89				
D196404	27.6	.06	.81	.45	.0	1,030	1,055	1,075
	---	.10	1.38	.76				
	---	.13	1.75	.97				
D196405	26.9	.04	.69	.44	.0	1,025	1,045	1,060
	---	.07	1.19	.76				
	---	.08	1.41	.90				

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

	PROXIMATE ANALYSIS				ULTIMATE ANALYSIS					HEAT OF COMBUSTION	
SAMPLE NUMBER	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	KCAL/KG	BTU/LB
D196406	42.9	24.4	26.0	6.7	7.2	35.3	0.6	49.8	0.4	3,260	5,870
	---	42.7	45.5	11.7	4.3	61.8	1.1	20.4	.7	5,710	10,280
	---	48.4	51.6	---	4.8	70.0	1.2	23.1	.8	6,470	11,650
D196407	41.8	24.8	25.6	7.8	7.0	35.7	.6	47.3	1.6	3,350	6,040
	---	42.6	44.0	13.4	4.0	61.3	1.0	17.4	2.7	5,760	10,370
	---	49.2	50.8	---	4.7	70.8	1.2	20.1	3.2	6,660	11,980
D210365	39.2	24.1	27.9	8.8	6.9	37.5	.6	44.9	1.2	3,570	6,430
	---	39.6	45.9	14.5	4.2	61.7	1.0	16.5	2.0	5,880	10,580
	---	46.3	53.7	---	4.9	72.1	1.2	19.3	2.3	6,870	12,370
D210368	31.2	24.4	23.2	21.2	6.4	33.4	.6	38.0	.4	3,100	5,580
	---	35.5	33.7	30.8	4.3	48.5	.9	14.9	.6	4,500	8,110
	---	51.3	48.7	---	6.2	70.2	1.3	21.6	.8	6,510	11,720
D210369	40.2	25.2	28.9	5.7	7.1	38.3	.6	47.8	.5	3,610	6,490
	---	42.1	48.3	9.5	4.4	64.0	1.0	20.2	.8	6,030	10,850
	---	46.6	53.4	---	4.9	70.8	1.1	22.3	.9	6,670	12,000
D210371	37.2	26.7	27.4	8.7	6.8	38.7	.7	43.2	1.9	3,710	6,690
	---	42.5	43.6	13.9	4.2	61.6	1.1	16.1	3.0	5,910	10,640
	---	49.4	50.6	---	4.9	71.5	1.3	18.7	3.5	6,860	12,360
D210372	41.4	23.1	22.9	12.6	7.1	32.1	.6	45.8	1.8	3,090	5,560
	---	39.4	39.1	21.5	4.3	54.8	1.0	15.4	3.1	5,270	9,480
	---	50.2	49.8	---	5.4	69.8	1.3	19.6	3.9	6,710	12,080
D218907	37.8	27.0	29.7	5.5	6.9	40.2	.8	46.2	.3	3,720	6,690
	---	43.4	47.7	8.8	4.3	64.6	1.3	20.3	.5	5,980	10,760
	---	47.6	52.4	---	4.8	70.9	1.4	22.2	.5	6,550	11,800
D210366	36.1	26.0	31.9	6.0	7.0	42.4	.8	43.4	.4	4,000	7,200
	---	40.7	49.9	9.4	4.7	66.4	1.3	17.7	.6	6,260	11,260
	---	44.9	55.1	---	5.2	73.2	1.4	19.5	.7	6,900	12,430
D210370	40.5	25.4	27.3	6.8	7.2	37.6	.7	46.8	.9	3,570	6,430
	---	42.7	45.9	11.4	4.5	63.2	1.2	18.2	1.5	6,010	10,810
	---	48.2	51.8	---	5.1	71.3	1.3	20.5	1.7	6,780	12,210
D196593	46.3	17.9	16.0	19.8	.0	.0	.0	.0	.8	2,220	3,990
	---	33.3	29.8	36.9	.0	.0	.0	.0	1.5	4,130	7,440
	---	52.8	47.2	---	.0	.0	.0	.0	2.4	6,540	11,780
D196594	54.6	18.0	17.7	9.7	.0	.0	.0	.0	.5	2,330	4,200
	---	39.6	39.0	21.4	.0	.0	.0	.0	1.1	5,140	9,250
	---	50.4	49.6	---	.0	.0	.0	.0	1.4	6,540	11,770

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

SAMPLE NUMBER	AIR-DRIED LOSS	FORMS OF SULFUR			FREE SWELLING INDEX	ASH FUSION TEMPERATURE, C		
		SULFATE	PYRITIC	ORGANIC		INITIAL DEFORMATION	SOFTENING	FLUID
D196406	30.5	0.08	0.16	0.17	0.0	1,025	1,045	1,060
	---	.14	.28	.30				
	---	.16	.32	.34				
D196407	27.2	.03	1.20	.36	.0	1,040	1,060	1,080
	---	.05	2.06	.62				
	---	.06	2.38	.71				
D210365	31.8	.01	.97	.22	.0	1,060	1,105	1,155
	---	.02	1.60	.36				
	---	.02	1.87	.42				
D210368	24.5	.01	.04	.36	.0	1,195	1,270	1,340
	---	.01	.06	.52				
	---	.02	.08	.76				
D210369	32.7	.01	.05	.40	.0	1,125	1,195	1,245
	---	.02	.08	.67				
	---	.02	.09	.74				
D210371	29.7	.01	.98	.86	.0	1,090	1,155	1,205
	---	.02	1.56	1.37				
	---	.02	1.81	1.59				
D210372	35.0	.01	1.42	.35	.0	1,045	1,095	1,155
	---	.02	2.42	.60				
	---	.02	3.09	.76				
D218907	31.8	.01	.05	.28	.0	1,255	1,300	1,360
	---	.02	.08	.45				
	---	.02	.09	.49				
D210366	28.6	.01	.14	.24	.0	0	0	0
	---	.02	.22	.38				
	---	.02	.24	.41				
D210370	33.7	.01	.49	.42	.0	1,160	1,225	1,290
	---	.02	.82	.71				
	---	.02	.93	.80				
D196593	41.6	.00	.00	.00	.0	0	0	0
	---	.00	.00	.00				
	---	.00	.00	.00				
D196594	49.9	.00	.00	.00	.0	0	0	0
	---	.00	.00	.00				
	---	.00	.00	.00				

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

	PROXIMATE ANALYSIS				ULTIMATE ANALYSIS					HEAT OF COMBUSTION	
SAMPLE NUMBER	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	KCAL/KG	BTU/LB
D196595	46.1	20.0	19.1	14.8	0.0	0.0	0.0	0.0	0.4	2,450	4,420
	---	37.1	35.4	27.5	.0	.0	.0	.0	.7	4,550	8,190
	---	51.2	48.8	---	.0	.0	.0	.0	1.0	6,270	11,290
D196596	49.9	19.5	18.6	12.0	.0	.0	.0	.0	1.0	2,480	4,460
	---	38.9	37.1	24.0	.0	.0	.0	.0	2.0	4,950	8,910
	---	51.2	48.8	---	.0	.0	.0	.0	2.6	6,510	11,710
D196597	50.0	19.1	17.7	13.2	.0	.0	.0	.0	.6	2,370	4,260
	---	38.2	35.4	26.4	.0	.0	.0	.0	1.2	4,730	8,520
	---	51.9	48.1	---	.0	.0	.0	.0	1.6	6,430	11,580
D240973	45.3	23.4	27.7	3.5	7.4	36.3	.6	51.9	.2	3,280	5,910
	---	42.8	50.7	6.4	4.4	66.4	1.1	21.2	.4	6,000	10,800
	---	45.8	54.2	---	4.7	71.0	1.2	22.7	.4	6,410	11,540
D240974	45.7	21.7	24.2	8.3	7.3	32.9	.5	50.3	.6	3,020	5,440
	---	40.0	44.7	15.3	4.1	60.6	1.0	17.8	1.2	5,570	10,030
	---	47.3	52.7	---	4.9	71.5	1.1	21.0	1.4	6,580	11,850
D240975	43.2	24.7	26.5	5.6	7.3	36.9	.6	49.1	.4	3,410	6,150
	---	43.4	46.6	9.9	4.4	64.9	1.1	18.8	.8	6,010	10,810
	---	48.2	51.8	---	4.9	72.1	1.2	20.9	.9	6,670	12,000
D240976	43.6	25.3	27.0	4.2	7.5	37.7	.6	49.5	.5	3,530	6,350
	---	44.8	47.8	7.4	4.7	66.8	1.1	19.1	.9	6,250	11,260
	---	48.4	51.6	---	5.1	72.2	1.2	20.6	1.0	6,760	12,160
D240977	46.5	23.2	26.3	3.9	7.5	35.5	.6	52.1	.3	3,290	5,920
	---	43.5	49.3	7.3	4.4	66.5	1.1	20.1	.6	6,150	11,060
	---	46.9	53.1	---	4.8	71.7	1.2	21.6	.7	6,630	11,930
D240978	45.1	23.0	25.1	6.8	7.4	33.6	.6	51.4	.3	3,110	5,600
	---	41.9	45.7	12.4	4.3	61.1	1.0	20.6	.6	5,670	10,200
	---	47.8	52.2	---	4.9	69.8	1.2	23.5	.7	6,470	11,640
D240979	42.0	24.8	27.9	5.2	7.3	38.1	.6	48.0	.7	3,510	6,320
	---	42.8	48.1	9.0	4.6	65.7	1.1	18.5	1.2	6,060	10,900
	---	47.1	52.9	---	5.0	72.2	1.2	20.3	1.3	6,660	11,980
D240980	46.8	23.2	23.2	6.7	7.5	33.1	.5	51.0	1.2	3,100	5,590
	---	43.6	43.7	12.7	4.3	62.3	.9	17.6	2.2	5,840	10,510
	---	49.9	50.1	---	5.0	71.3	1.1	20.1	2.5	6,680	12,030
D240981	42.5	22.1	17.8	17.6	6.8	27.6	.5	46.6	.9	2,550	4,600
	---	38.4	31.0	30.6	3.6	47.9	.9	15.4	1.6	4,440	8,000
	---	55.3	44.7	---	5.2	69.1	1.2	22.2	2.3	6,400	11,520

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

SAMPLE NUMBER	AIR-DRIED LOSS	FORMS OF SULFUR			FREE SWELLING INDEX	ASH FUSION TEMPERATURE, C		
		SULFATE	PYRITIC	ORGANIC		INITIAL DEFORMATION	SOFTENING	FLUID
D196595	40.9	0.00	0.00	0.00	0.0	0	0	0
	---	.00	.00	.00				
	---	.00	.00	.00				
D196596	45.6	.00	.00	.00	.0	0	0	0
	---	.00	.00	.00				
	---	.00	.00	.00				
D196597	45.6	.00	.00	.00	.0	0	0	0
	---	.00	.00	.00				
	---	.00	.00	.00				
D240973	36.1	.04	.02	.15	.0	1,390	1,395	1,405
	---	.07	.04	.27				
	---	.08	.04	.29				
D240974	37.5	.10	.25	.29	.0	1,150	1,220	1,230
	---	.18	.46	.53				
	---	.22	.54	.63				
D240975	34.4	.02	.09	.34	.0	1,245	1,260	1,265
	---	.04	.16	.60				
	---	.04	.18	.66				
D240976	34.5	.04	.09	.39	.0	1,380	1,395	1,405
	---	.07	.16	.69				
	---	.08	.17	.75				
D240977	38.1	.02	.06	.25	.0	1,265	1,330	1,395
	---	.04	.11	.47				
	---	.04	.12	.50				
D240978	36.6	.02	.01	.29	.0	1,190	1,210	1,215
	---	.04	.02	.53				
	---	.04	.02	.60				
D240979	32.8	.05	.33	.29	.0	1,270	1,305	1,315
	---	.09	.57	.50				
	---	.09	.63	.55				
D240980	38.7	.12	.75	.30	.0	1,305	1,310	1,310
	---	.23	1.41	.56				
	---	.26	1.61	.65				
D240981	35.2	.12	.26	.55	.0	1,255	1,290	1,305
	---	.21	.45	.96				
	---	.30	.65	1.38				

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

	PROXIMATE ANALYSIS				ULTIMATE ANALYSIS					HEAT OF COMBUSTION	
SAMPLE NUMBER	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	KCAL/KG	BTU/LB
D240982	43.0	24.3	26.4	6.2	7.2	36.2	0.7	49.3	0.4	3,340	6,010
	---	42.7	46.4	10.9	4.3	63.6	1.2	19.3	.7	5,860	10,550
	---	47.9	52.1	---	4.8	71.4	1.3	21.7	.8	6,570	11,830
D240983	41.7	21.5	23.7	13.1	6.8	31.7	.5	47.5	.4	2,930	5,280
	---	36.9	40.6	22.4	3.8	54.5	.9	17.8	.6	5,030	9,060
	---	47.6	52.4	---	4.9	70.2	1.1	23.0	.8	6,490	11,680
D240984	43.6	24.1	25.0	7.3	7.3	34.9	.6	48.2	1.7	3,340	6,010
	---	42.8	44.3	12.9	4.3	61.9	1.1	16.7	3.1	5,920	10,650
	---	49.1	50.9	---	5.0	71.0	1.3	19.2	3.5	6,790	12,220
D240985	43.8	24.0	27.9	4.3	7.4	36.8	.7	50.4	.4	3,410	6,140
	---	42.7	49.6	7.7	4.5	65.5	1.2	20.4	.7	6,070	10,920
	---	46.3	53.7	---	4.9	70.9	1.3	22.1	.8	6,570	11,830
D240986	44.1	24.8	24.7	6.5	7.4	35.2	.5	49.0	1.5	3,290	5,920
	---	44.3	44.1	11.6	4.4	62.9	1.0	17.6	2.6	5,880	10,590
	---	50.1	49.9	---	5.0	71.1	1.1	19.9	3.0	6,650	11,970
D240987	43.4	24.1	27.4	5.2	7.3	36.7	.7	49.9	.3	3,420	6,160
	---	42.5	48.3	9.1	4.4	64.9	1.2	19.9	.5	6,040	10,880
	---	46.8	53.2	---	4.9	71.4	1.3	21.9	.5	6,650	11,970
D240988	42.8	23.6	28.0	5.6	7.3	37.2	.7	48.7	.6	3,410	6,140
	---	41.2	49.0	9.7	4.4	65.1	1.2	18.6	1.0	5,960	10,740
	---	45.7	54.3	---	4.9	72.1	1.3	20.6	1.1	6,610	11,890
D240989	40.6	24.6	25.9	8.8	7.0	35.7	.6	47.0	.9	3,310	5,960
	---	41.5	43.6	14.9	4.1	60.2	1.0	18.3	1.5	5,580	10,040
	---	48.8	51.2	---	4.8	70.7	1.2	21.5	1.8	6,550	11,790
D240990	40.7	25.5	28.1	5.7	7.1	38.4	.7	47.0	1.0	3,600	6,490
	---	43.1	47.3	9.6	4.4	64.8	1.2	18.3	1.7	6,080	10,940
	---	47.6	52.4	---	4.9	71.7	1.4	20.2	1.9	6,720	12,100
D240991	43.5	24.1	23.8	8.6	7.3	34.2	.7	48.0	1.3	3,270	5,890
	---	42.6	42.2	15.2	4.3	60.5	1.2	16.6	2.3	5,790	10,430
	---	50.3	49.7	---	5.1	71.3	1.4	19.5	2.7	6,830	12,290
D240992	43.8	24.6	24.7	6.8	7.3	35.4	.6	49.4	.5	3,340	6,010
	---	43.9	44.0	12.1	4.3	63.1	1.1	18.5	.8	5,940	10,700
	---	49.9	50.1	---	4.9	71.8	1.3	21.1	1.0	6,760	12,170
D210367	30.3	24.5	23.7	21.5	6.1	34.3	.7	36.9	.5	3,240	5,830
	---	35.2	34.0	30.8	3.9	49.2	1.0	14.3	.7	4,640	8,360
	---	50.8	49.2	---	5.7	71.2	1.5	20.7	1.0	6,720	12,090

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

SAMPLE NUMBER	AIR-DRIED LOSS	FORMS OF SULFUR			FREE SWELLING INDEX	ASH FUSION TEMPERATURE, C		
		SULFATE	PYRITIC	ORGANIC		INITIAL DEFORMATION	SOFTENING	FLUID
D240982	34.4	0.01	0.03	0.37	0.0	1,170	1,245	1,260
	---	.02	.05	.65				
	---	.02	.06	.73				
D240983	33.9	.03	.02	.32	.0	1,170	1,270	1,305
	---	.05	.03	.55				
	---	.07	.04	.71				
D240984	35.6	.09	1.34	.31	.0	1,250	1,260	1,280
	---	.16	2.38	.55				
	---	.18	2.73	.63				
D240985	35.1	.03	.07	.30	.0	1,175	1,315	1,330
	---	.05	.12	.53				
	---	.06	.13	.58				
D240986	36.0	.10	.88	.48	.0	1,180	1,340	1,355
	---	.18	1.57	.86				
	---	.20	1.78	.97				
D240987	34.6	.02	.02	.22	.0	1,160	1,250	1,270
	---	.04	.04	.39				
	---	.04	.04	.43				
D240988	34.0	.03	.12	.44	.0	1,160	1,250	1,270
	---	.05	.21	.77				
	---	.06	.23	.85				
D240989	32.2	.06	.38	.45	.0	1,180	1,225	1,245
	---	.10	.64	.76				
	---	.12	.75	.89				
D240990	31.8	.05	.61	.36	.0	1,270	1,395	1,410
	---	.08	1.03	.61				
	---	.09	1.14	.67				
D240991	35.5	.09	.82	.39	.0	1,130	1,195	1,225
	---	.16	1.45	.69				
	---	.19	1.71	.81				
D240992	35.5	.03	.08	.36	.0	1,160	1,260	1,280
	---	.05	.14	.64				
	---	.06	.16	.73				
D210367	24.1	.01	.20	.33	.0	1,160	1,230	1,310
	---	.01	.29	.47				
	---	.02	.41	.68				

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

	PROXIMATE ANALYSIS				ULTIMATE ANALYSIS					HEAT OF COMBUSTION	
SAMPLE NUMBER	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	KCAL/KG	BTU/LB
D175972	35.6	28.3	30.1	6.0	0.0	0.0	0.0	0.0	0.5	3,910	7,030
	---	43.9	46.7	9.3	.0	.0	.0	.0	.8	6,070	10,920
	---	48.5	51.5	---	.0	.0	.0	.0	.9	6,690	12,040
D175973	35.5	28.7	29.5	6.3	.0	.0	.0	.0	1.2	3,980	7,160
	---	44.5	45.7	9.8	.0	.0	.0	.0	1.9	6,160	11,090
	---	49.3	50.7	---	.0	.0	.0	.0	2.1	6,830	12,300
D175974	36.5	27.6	29.2	6.7	.0	.0	.0	.0	1.6	3,870	6,970
	---	43.5	46.0	10.6	.0	.0	.0	.0	2.5	6,100	10,970
	---	48.6	51.4	---	.0	.0	.0	.0	2.8	6,820	12,270
D175975	37.7	27.7	29.5	5.1	.0	.0	.0	.0	1.4	3,860	6,960
	---	44.5	47.4	8.2	.0	.0	.0	.0	2.2	6,200	11,160
	---	48.4	51.6	---	.0	.0	.0	.0	2.4	6,760	12,160
D165757	34.5	24.6	33.5	7.4	6.2	41.4	.7	44.1	.2	3,650	6,570
	---	37.6	51.1	11.3	3.6	63.2	1.1	20.5	.3	5,570	10,030
	---	42.3	57.7	---	4.1	71.3	1.2	23.1	.3	6,280	11,310
D165758	34.4	28.6	31.9	5.1	6.6	42.5	.7	44.9	.2	3,930	7,070
	---	43.6	48.6	7.8	4.2	64.8	1.1	21.8	.3	5,990	10,780
	---	47.3	52.7	---	4.6	70.2	1.2	23.7	.3	6,490	11,690
D165759	33.3	29.6	32.4	4.6	6.9	44.1	.8	43.2	.4	4,140	7,450
	---	44.4	48.6	6.9	4.8	66.1	1.2	20.4	.6	6,210	11,170
	---	47.7	52.2	---	5.2	71.0	1.3	21.9	.6	6,660	12,000
D165763	36.4	24.0	30.0	9.6	6.6	38.2	.7	44.6	.3	3,400	6,120
	---	37.7	47.2	15.1	4.0	60.1	1.1	19.3	.5	5,350	9,620
	---	44.4	55.6	---	4.7	70.7	1.3	22.7	.6	6,300	11,330
D165766	38.4	23.7	30.2	7.7	6.7	38.6	.6	45.9	.5	3,490	6,290
	---	38.5	49.0	12.5	4.0	62.7	1.0	19.1	.8	5,670	10,210
	---	44.0	56.0	---	4.5	71.6	1.1	21.8	.9	6,480	11,670
D178086	34.9	27.1	30.4	7.6	.0	.0	.0	.0	.5	3,770	6,790
	---	41.6	46.7	11.6	.0	.0	.0	.0	.8	5,800	10,430
	---	47.1	52.9	---	.0	.0	.0	.0	.9	6,560	11,800
D178087	38.4	25.6	28.2	7.7	.0	.0	.0	.0	1.1	3,640	6,550
	---	41.6	45.9	12.5	.0	.0	.0	.0	1.8	5,910	10,640
	---	47.6	52.4	---	.0	.0	.0	.0	2.0	6,760	12,160
D178088	37.5	27.1	28.8	6.5	.0	.0	.0	.0	1.2	3,770	6,780
	---	43.4	46.2	10.4	.0	.0	.0	.0	2.0	6,030	10,850
	---	48.5	51.5	---	.0	.0	.0	.0	2.2	6,730	12,120

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

SAMPLE NUMBER	AIR-DRIED LOSS	FORMS OF SULFUR			FREE SWELLING INDEX	ASH FUSION TEMPERATURE, C		
		SULFATE	PYRITIC	ORGANIC		INITIAL DEFORMATION	SOFTENING	FLUID
D175972	31.3	0.00	0.00	0.00	0.0	0	0	0
	---	.00	.00	.00				
	---	.00	.00	.00				
D175973	30.6	.00	.00	.00	.0	0	0	0
	---	.00	.00	.00				
	---	.00	.00	.00				
D175974	31.8	.00	.00	.00	.0	0	0	0
	---	.00	.00	.00				
	---	.00	.00	.00				
D175975	33.0	.00	.00	.00	.0	0	0	0
	---	.00	.00	.00				
	---	.00	.00	.00				
D165757	.0	.00	.05	.18	.0	0	0	0
	---	.00	.08	.27				
	---	.00	.09	.31				
D165758	.0	.02	.06	.15	.0	0	0	0
	---	.03	.09	.23				
	---	.03	.10	.25				
D165759	.0	.00	.10	.30	.0	0	0	0
	---	.00	.15	.45				
	---	.00	.16	.48				
D165763	.0	.00	.07	.20	.0	0	0	0
	---	.00	.11	.31				
	---	.00	.13	.37				
D165766	.0	.00	.12	.34	.0	0	0	0
	---	.00	.19	.55				
	---	.00	.22	.63				
D178086	27.4	.00	.00	.00	.0	0	0	0
	---	.00	.00	.00				
	---	.00	.00	.00				
D178087	31.2	.00	.00	.00	.0	0	0	0
	---	.00	.00	.00				
	---	.00	.00	.00				
D178088	30.1	.00	.00	.00	.0	0	0	0
	---	.00	.00	.00				
	---	.00	.00	.00				

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

	PROXIMATE ANALYSIS				ULTIMATE ANALYSIS					HEAT OF COMBUSTION	
SAMPLE NUMBER	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	KCAL/KG	BTU/LB
D188118C	36.4	25.1	31.2	7.3	6.4	40.1	0.6	45.3	0.3	3,670	6,610
D188119C	---	39.5	49.1	11.5	3.7	63.1	.9	20.4	.5	5,770	10,390
	---	44.6	55.4	---	4.2	71.2	1.1	23.0	.5	6,520	11,730
D188120	38.1	24.8	31.0	6.1	6.6	39.7	.6	46.9	.2	3,630	6,530
	---	40.1	50.1	9.9	3.8	64.1	1.0	21.1	.3	5,860	10,540
	---	44.4	55.6	---	4.2	71.1	1.1	23.4	.4	6,500	11,690
D188121	37.2	13.3	44.0	5.5	6.6	41.5	.6	45.4	.4	3,800	6,840
	---	21.2	70.1	8.8	3.9	66.1	1.0	19.6	.6	6,050	10,890
	---	23.2	76.8	---	4.3	72.4	1.0	21.5	.7	6,630	11,940
D188122	38.0	15.1	41.3	5.6	6.5	40.7	.6	46.5	.2	3,720	6,690
	---	24.4	66.6	9.0	3.7	65.6	1.0	20.5	.3	6,000	10,790
	---	26.8	73.2	---	4.0	72.2	1.1	22.6	.4	6,590	11,860
D188123	34.9	15.8	39.7	9.6	6.6	40.0	.6	42.3	.8	3,680	6,630
	---	24.3	61.0	14.7	4.2	61.4	.9	17.3	1.2	5,650	10,180
	---	28.5	71.5	---	4.9	72.1	1.1	20.3	1.4	6,630	11,940
D188124	35.5	16.0	41.1	7.4	6.6	41.4	.6	42.9	1.0	3,860	6,940
	---	24.8	63.7	11.5	4.1	64.2	.9	17.6	1.6	5,980	10,760
	---	28.0	72.0	---	4.7	72.5	1.1	19.9	1.8	6,750	12,160
D188125	42.4	24.6	29.4	3.6	6.7	37.3	.6	51.5	.2	3,260	5,880
	---	42.7	51.0	6.2	3.5	64.8	1.0	24.0	.3	5,670	10,200
	---	45.6	54.4	---	3.7	69.1	1.1	25.6	.4	6,050	10,880
D188126	37.1	16.2	42.5	4.2	6.8	41.9	.6	46.3	.2	3,860	6,950
	---	25.8	67.6	6.7	4.3	66.6	1.0	21.2	.3	6,140	11,050
	---	27.6	72.4	---	4.6	71.4	1.0	22.7	.3	6,580	11,840
D188127	41.3	23.5	29.2	6.0	6.9	38.0	.5	48.1	.5	3,470	6,250
	---	40.0	49.7	10.2	3.9	64.7	.9	19.4	.9	5,910	10,640
	---	44.6	55.4	---	4.4	72.1	.9	21.6	.9	6,590	11,850
D188128	39.3	26.0	26.8	7.9	.0	.0	.0	.0	.9	3,330	5,990
	---	42.8	44.2	13.0	.0	.0	.0	.0	1.5	5,480	9,870
	---	49.2	50.8	---	.0	.0	.0	.0	1.7	6,300	11,340
D188129	38.1	27.6	26.8	7.5	.0	.0	.0	.0	.8	3,510	6,310
	---	44.6	43.3	12.1	.0	.0	.0	.0	1.3	5,660	10,200
	---	50.7	49.3	---	.0	.0	.0	.0	1.5	6,450	11,600
D188130	38.4	30.0	23.1	8.5	.0	0.0	0.0	0.0	0.5	3,380	6,080
	---	48.7	37.5	13.8	.0	.0	.0	.0	.8	5,490	9,870
	---	56.5	43.5	---	.0	.0	.0	.0	.9	6,360	11,460

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

SAMPLE NUMBER	AIR-DRIED LOSS	FORMS OF SULFUR			FREE SWELLING INDEX	ASH FUSION TEMPERATURE, C		
		SULFATE	PYRITIC	ORGANIC		INITIAL DEFORMATION	SOFTENING	FLUID
D188118C	24.8	0.01	0.04	0.23	0.0	1,265	1,320	1,370
D188119C	---	.02	.06	.36				
	---	.02	.07	.41				
D188120	28.1	.01	.04	.17	.0	1,285	1,330	1,380
	---	.02	.06	.27				
	---	.02	.07	.30				
D188121	25.8	.01	.06	.29	.0	1,235	1,290	1,340
	---	.02	.10	.46				
	---	.02	.10	.51				
D188122	28.2	.01	.04	.13	.0	1,205	1,255	1,320
	---	.02	.06	.21				
	---	.02	.07	.23				
D188123	24.3	.01	.25	.55	.0	1,095	1,155	1,205
	---	.02	.38	.84				
	---	.02	.45	.99				
D188124	25.5	.01	.41	.63	.0	1,180	1,230	1,290
	---	.02	.64	.98				
	---	.02	.72	1.10				
D188125	27.9	.01	.06	.15	.0	1,415	1,465	1,520
	---	.02	.10	.26				
	---	.02	.11	.28				
D188126	27.0	.01	.04	.20	.0	1,290	1,345	1,395
	---	.02	.06	.32				
	---	.02	.07	.34				
D188127	30.1	.01	.26	.22	.0	1,205	1,255	1,315
	---	.02	.44	.37				
	---	.02	.49	.42				
D188128	35.5	.00	.00	.00	.0	0	0	0
	---	.00	.00	.00				
	---	.00	.00	.00				
D188129	34.2	.00	.00	.00	.0	0	0	0
	---	.00	.00	.00				
	---	.00	.00	.00				
D188130	34.7	0.00	0.00	0.00	.0	0	0	0
	---	.00	.00	.00				
	---	.00	.00	.00				

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

SAMPLE NUMBER	PROXIMATE ANALYSIS				ULTIMATE ANALYSIS					HEAT OF COMBUSTION	
	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	KCAL/KG	BTU/LB
D188131	40.4	25.8	28.8	5.0	.0	.0	.0	.0	.3	3,420	6,160
	---	43.3	48.3	8.4	.0	.0	.0	.0	.5	5,740	10,340
	---	47.3	52.7	---	.0	.0	.0	.0	.5	6,270	11,290
D188132	37.0	27.4	29.3	6.3	.0	.0	.0	.0	.5	3,610	6,490
	---	43.5	46.5	10.0	.0	.0	.0	.0	.8	5,720	10,300
	---	48.3	51.7	---	.0	.0	.0	.0	.9	6,360	11,450
D188133	36.4	26.5	27.6	9.5	.0	.0	.0	.0	.3	3,390	6,090
	---	41.7	43.4	14.9	.0	.0	.0	.0	.5	5,320	9,580
	---	49.0	51.0	---	.0	.0	.0	.0	.6	6,260	11,260
D188134	36.6	26.3	26.6	11.6	.0	.0	.0	.0	.4	3,340	6,010
	---	41.5	42.0	18.3	.0	.0	.0	.0	.6	5,260	9,480
	---	50.8	51.4	---	.0	.0	.0	.0	.8	6,440	11,600
D188135	39.6	26.6	26.0	7.8	.0	.0	.0	.0	1.5	3,440	6,190
	---	44.0	43.0	12.9	.0	.0	.0	.0	2.5	5,690	10,250
	---	50.6	49.4	---	.0	.0	.0	.0	2.9	6,540	11,770
D188136	39.6	25.3	25.9	9.3	.0	.0	.0	.0	1.0	3,270	5,890
	---	41.9	42.9	15.4	.0	.0	.0	.0	1.7	5,420	9,760
	---	49.5	50.7	---	.0	.0	.0	.0	2.0	6,410	11,530
D188137	40.6	26.5	28.0	4.9	.0	.0	.0	.0	.3	3,420	6,150
	---	44.6	47.1	8.2	.0	.0	.0	.0	.5	5,760	10,360
	---	48.6	51.4	---	.0	.0	.0	.0	.6	6,270	11,290
D188138	41.0	27.0	25.1	6.9	7.1	36.9	.7	47.8	.6	3,430	6,170
	---	45.8	42.5	11.7	4.3	62.5	1.2	19.2	1.0	5,810	10,450
	---	51.8	48.2	---	4.9	70.8	1.3	21.8	1.2	6,580	11,840
D188140	37.9	26.6	27.4	8.1	6.9	38.8	.6	44.6	1.0	3,690	6,640
	---	42.8	44.1	13.0	4.3	62.5	1.0	17.6	1.6	5,940	10,700
	---	49.3	50.7	---	5.0	71.9	1.1	20.2	1.9	6,830	12,300
D188141	41.9	23.6	28.7	5.8	6.9	37.8	.6	48.4	.4	3,470	6,240
	---	40.6	49.4	10.0	3.9	65.1	1.0	19.2	.7	5,970	10,740
	---	45.1	54.9	---	4.3	72.3	1.1	21.3	.8	6,630	11,930
D188142C	36.0	26.8	30.9	6.3	6.9	41.3	.7	44.4	.3	3,830	6,890
D188143C	---	41.9	48.3	9.8	4.5	64.5	1.1	19.4	.5	5,980	10,760
	---	46.4	53.6	---	5.0	71.6	1.2	21.5	.5	6,630	11,940

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

SAMPLE NUMBER	AIR-DRIED LOSS	FORMS OF SULFUR			FREE SWELLING INDEX	ASH FUSION TEMPERATURE, C		
		SULFATE	PYRITIC	ORGANIC		INITIAL DEFORMATION	SOFTENING	FLUID
D188131	36.7	.00	.00	.00	0.0	0	0	0
	---	.00	.00	.00				
	---	.00	.00	.00				
D188132	33.3	.00	.00	.00	.0	0	0	0
	---	.00	.00	.00				
	---	.00	.00	.00				
D188133	33.0	.00	.00	.00	.0	0	0	0
	---	.00	.00	.00				
	---	.00	.00	.00				
D188134	32.1	.00	.00	.00	.0	0	0	0
	---	.00	.00	.00				
	---	.00	.00	.00				
D188135	36.2	.00	.00	.00	.0	0	0	0
	---	.00	.00	.00				
	---	.00	.00	.00				
D188136	36.2	.00	.00	.00	.0	0	0	0
	---	.00	.00	.00				
	---	.00	.00	.00				
D188137	37.1	.00	.00	.00	.0	0	0	0
	---	.00	.00	.00				
	---	.00	.00	.00				
D188138	29.7	.01	.09	.48	.0	1,075	1,130	1,190
	---	.02	.15	.81				
	---	.02	.17	.92				
D188140	28.5	.01	.10	.89	.0	1,075	1,125	1,180
	---	.02	.16	1.43				
	---	.02	.19	1.65				
D188141	29.7	.01	.06	.33	.0	1,155	1,205	1,255
	---	.02	.10	.57				
	---	.02	.11	.63				
D188142C	25.5	.01	.06	.25	.0	1,130	1,180	1,235
D188143C	---	.02	.09	.39				
	---	.02	.10	.43				

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

	PROXIMATE ANALYSIS				ULTIMATE ANALYSIS					HEAT OF COMBUSTION	
SAMPLE NUMBER	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	KCAL/KG	BTU/LB
D188144	39.6	27.0	27.0	6.4	7.2	38.5	.7	46.9	.3	3,610	6,500
	---	44.7	44.7	10.6	4.6	63.7	1.2	19.4	.5	5,970	10,750
	---	50.0	50.0	---	5.2	71.3	1.3	21.7	.6	6,680	12,030
D188145	37.9	24.4	26.7	11.0	6.7	37.0	.6	42.8	1.8	3,500	6,300
	---	39.3	43.0	17.7	4.0	59.6	1.0	14.7	2.9	5,630	10,140
	---	47.7	52.3	---	4.9	72.4	1.2	17.8	3.5	6,840	12,320
D189256	35.0	29.7	28.9	6.4	6.9	40.6	.6	45.0	.5	3,800	6,840
	---	45.7	44.5	9.8	4.6	62.5	.9	21.4	.8	5,850	10,530
	---	50.7	49.3	---	5.1	69.3	1.0	23.7	.9	6,490	11,680
D189257	35.0	31.5	28.5	5.0	7.0	41.5	.6	45.3	.4	3,900	7,020
	---	48.5	43.8	7.7	4.8	63.8	.9	21.8	.6	6,000	10,810
	---	52.5	47.5	---	5.2	69.2	1.0	23.6	.7	6,500	11,710
D189258	34.6	29.7	29.7	6.0	6.5	41.8	.6	44.4	.7	3,860	6,950
	---	45.4	45.4	9.2	4.1	63.9	.9	20.9	1.1	5,910	10,630
	---	50.0	50.0	---	4.5	70.4	1.0	23.0	1.2	6,500	11,710
D189259	35.6	28.9	29.7	5.8	6.7	40.9	.6	45.5	.4	3,760	6,770
	---	44.9	46.1	9.0	4.3	63.5	.9	21.5	.6	5,840	10,520
	---	49.3	50.7	---	4.7	69.8	1.0	23.6	.7	6,420	11,560
D189260	34.1	29.1	28.6	8.2	6.9	40.3	.8	42.7	1.2	3,810	6,860
	---	44.2	43.4	12.4	4.7	61.2	1.2	18.8	1.8	5,780	10,410
	---	50.4	49.6	---	5.4	69.8	1.4	21.5	2.1	6,610	11,890
D189261	34.4	30.6	30.8	4.2	7.0	42.5	.8	45.0	.6	3,990	7,180
	---	46.6	47.0	6.4	4.8	64.8	1.2	22.0	.9	6,080	10,940
	---	49.8	50.2	---	5.2	69.2	1.3	23.5	1.0	6,490	11,690
D189262	33.1	29.0	32.4	5.5	6.7	42.9	.7	43.8	.4	3,930	7,080
	---	43.3	48.4	8.2	4.5	64.1	1.0	21.5	.6	5,880	10,590
	---	47.2	52.8	---	4.9	69.9	1.1	23.4	.7	6,410	11,530
D189263	34.1	31.8	29.1	5.0	7.0	43.0	.6	43.5	.9	4,090	7,350
	---	48.3	44.2	7.6	4.9	65.3	.9	20.0	1.4	6,200	11,160
	---	52.2	47.8	---	5.3	70.6	1.0	21.7	1.5	6,710	12,070
D196643	36.4	26.5	26.8	10.3	6.8	37.5	.6	43.8	.9	3,440	6,200
	---	41.7	42.1	16.2	4.3	59.0	.9	18.0	1.4	5,420	9,750
	---	49.7	50.3	---	5.2	70.4	1.1	21.5	1.7	6,460	11,630
D196644	36.3	26.3	26.8	10.6	6.6	37.0	0.6	44.4	0.8	3,430	6,180
	---	41.3	42.1	16.6	4.0	58.1	.9	19.0	1.3	5,390	9,700
	---	49.5	50.5	---	4.8	69.7	1.1	22.8	1.5	6,460	11,630

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

SAMPLE NUMBER	AIR-DRIED LOSS	FORMS OF SULFUR			FREE SWELLING INDEX	ASH FUSION TEMPERATURE, C		
		SULFATE	PYRITIC	ORGANIC		INITIAL DEFORMATION	SOFTENING	FLUID
D188144	27.1	.01	.06	.27	0.0	1,175	1,235	1,285
	---	.02	.10	.45				
	---	.02	.11	.50				
D188145	28.6	.01	1.49	.32	.0	1,155	1,205	1,265
	---	.02	2.40	.52				
	---	.02	2.92	.63				
D189256	19.2	.01	.19	.32	.0	1,180	1,240	1,280
	---	.02	.29	.49				
	---	.02	.32	.55				
D189257	18.9	.01	.17	.24	.0	1,320	1,380	1,425
	---	.02	.26	.37				
	---	.02	.28	.40				
D189258	18.4	.01	.42	.27	.0	1,290	1,345	1,380
	---	.02	.64	.41				
	---	.02	.71	.45				
D189259	19.4	.01	.10	.24	.0	1,315	1,370	1,430
	---	.02	.16	.37				
	---	.02	.17	.41				
D189260	17.4	.01	.50	.66	.0	1,130	1,180	1,220
	---	.02	.76	1.00				
	---	.02	.87	1.14				
D189261	17.2	.01	.22	.36	.0	1,290	1,345	1,390
	---	.02	.34	.55				
	---	.02	.36	.59				
D189262	15.6	.01	.16	.20	.0	1,325	1,375	1,420
	---	.01	.24	.30				
	---	.02	.26	.33				
D189263	16.9	.01	.27	.62	.0	1,235	1,285	1,340
	---	.02	.41	.94				
	---	.02	.44	1.02				
D196643	24.5	.09	.45	.41	.0	1,325	1,375	1,590
	---	.14	.71	.64				
	---	.17	.84	.77				
D196644	25.4	0.09	0.39	0.37	.0	1,140	1,160	1,190
	---	.14	.61	.58				
	---	.17	.73	.70				

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

SAMPLE NUMBER	PROXIMATE ANALYSIS				ULTIMATE ANALYSIS					HEAT OF COMBUSTION	
	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	KCAL/KG	BTU/LB
D196645	37.9	24.6	25.8	11.7	6.6	35.5	.4	44.6	1.2	3,260	5,870
	---	39.6	41.5	18.8	3.8	57.2	.6	17.6	1.9	5,250	9,450
	---	48.8	51.2	---	4.7	70.4	.8	21.6	2.4	6,470	11,640
D196646	39.1	24.7	26.9	9.3	6.8	37.1	.5	45.5	.8	3,380	6,080
	---	40.6	44.2	15.3	4.0	60.9	.8	17.6	1.3	5,540	9,980
	---	47.9	52.1	---	4.8	71.9	1.0	20.8	1.6	6,540	11,780
D196647	36.8	24.6	25.3	13.3	6.3	33.8	.5	42.6	3.5	3,200	5,770
	---	38.9	40.0	21.0	3.5	53.5	.8	15.6	5.5	5,070	9,120
	---	49.3	50.7	---	4.4	67.7	1.0	19.8	7.0	6,420	11,560
D196648	39.1	25.8	27.1	8.0	6.9	37.4	.6	46.2	1.0	3,480	6,270
	---	42.4	44.5	13.1	4.2	61.4	1.0	18.8	1.6	5,720	10,290
	---	48.8	51.2	---	4.8	70.7	1.1	21.6	1.9	6,580	11,850
D196649	26.3	26.6	23.4	23.7	5.2	29.2	.5	29.7	11.7	2,960	5,330
	---	36.1	31.8	32.2	3.1	39.6	.7	8.6	15.9	4,020	7,230
	---	53.2	46.8	---	4.6	58.4	1.0	12.6	23.4	5,920	10,660
D196650	39.1	25.6	27.9	7.4	6.7	37.9	.5	46.7	.7	3,460	6,220
	---	42.0	45.8	12.2	3.9	62.2	.8	19.6	1.1	5,670	10,210
	---	47.9	52.1	---	4.4	70.8	.9	22.3	1.3	6,460	11,620
D196651	33.1	22.8	20.5	23.6	5.9	28.6	.4	39.4	2.1	2,690	4,840
	---	34.1	30.6	35.3	3.3	42.8	.6	14.9	3.1	4,020	7,230
	---	52.7	47.3	---	5.1	66.1	.9	23.0	4.8	6,200	11,170
D196652	33.4	24.6	29.1	12.9	6.1	38.3	.6	41.7	.3	3,440	6,200
	---	36.9	43.7	19.4	3.6	57.5	.9	18.0	.5	5,170	9,300
	---	45.8	54.2	---	4.4	71.3	1.1	22.4	.6	6,410	11,540
D196653	37.3	26.4	27.4	8.9	6.8	38.5	.5	44.4	.9	3,550	6,390
	---	42.1	43.7	14.2	4.2	61.4	.8	17.9	1.4	5,660	10,190
	---	49.1	50.9	---	4.9	71.6	.9	20.9	1.7	6,600	11,880
D196654	35.9	24.5	22.8	16.8	6.6	33.0	.5	41.9	1.1	3,120	5,610
	---	38.2	35.6	26.2	4.1	51.5	.8	15.6	1.7	4,860	8,750
	---	51.8	48.2	---	5.5	69.8	1.1	21.1	2.3	6,590	11,860
D196655	36.9	26.2	27.3	9.6	6.7	37.5	.6	44.3	1.4	3,440	6,190
	---	41.5	43.3	15.2	4.1	59.4	1.0	18.2	2.2	5,450	9,810
	---	49.0	51.0	---	4.9	70.1	1.1	21.5	2.6	6,430	11,570
D196656	36.9	26.2	26.5	10.4	6.5	36.9	0.6	43.8	1.9	3,380	6,080
	---	41.5	42.0	16.5	3.8	58.5	1.0	17.4	3.0	5,350	9,640
	---	49.7	50.3	---	4.6	70.0	1.1	20.9	3.6	6,410	11,540

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

SAMPLE NUMBER	AIR-DRIED LOSS	FORMS OF SULFUR			FREE SWELLING INDEX	ASH FUSION TEMPERATURE, C		
		SULFATE	PYRITIC	ORGANIC		INITIAL DEFORMATION	SOFTENING	FLUID
D196645	26.5	.10	.71	.40	0.0	1,100	1,120	1,190
	---	.16	1.14	.64				
	---	.20	1.41	.79				
D196646	27.1	.07	.39	.36	.0	1,190	1,205	1,220
	---	.11	.64	.59				
	---	.14	.76	.70				
D196647	24.6	.41	2.34	.70	.0	1,045	1,060	1,075
	---	.65	3.70	1.11				
	---	.82	4.69	1.40				
D196648	25.6	.05	.38	.54	.0	1,180	1,200	1,215
	---	.08	.62	.89				
	---	.09	.72	1.02				
D196649	16.1	.82	8.43	2.46	.0	1,215	1,230	1,250
	---	1.11	11.44	3.34				
	---	1.64	16.86	4.92				
D196650	26.6	.08	.23	.41	.0	1,250	1,275	1,305
	---	.13	.38	.67				
	---	.15	.43	.77				
D196651	22.9	.45	.67	.96	.0	1,165	1,175	1,195
	---	.67	1.00	1.43				
	---	1.04	1.55	2.22				
D196652	19.6	.03	.10	.21	.0	1,175	1,195	1,210
	---	.05	.15	.32				
	---	.06	.19	.39				
D196653	24.6	.05	.42	.42	.0	1,190	1,205	1,225
	---	.08	.67	.67				
	---	.09	.78	.78				
D196654	24.4	.12	.25	.74	.0	1,170	1,200	1,320
	---	.19	.39	1.15				
	---	.25	.53	1.56				
D196655	25.6	.27	.72	.44	.0	1,150	1,165	1,180
	---	.43	1.14	.70				
	---	.50	1.35	.82				
D196656	25.6	0.41	1.02	0.46	.0	1,160	1,175	1,195
	---	.65	1.62	.73				
	---	.78	1.94	.87				

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

	PROXIMATE ANALYSIS				ULTIMATE ANALYSIS					HEAT OF COMBUSTION	
SAMPLE NUMBER	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	KCAL/KG	BTU/LB
D196657	38.2	25.8	28.3	7.7	6.9	37.9	.6	46.5	.4	3,490	6,280
	---	41.7	45.8	12.5	4.3	61.3	1.0	20.3	.6	5,650	10,160
	---	47.7	52.3	---	4.9	70.1	1.1	23.2	.7	6,450	11,610
D196658	37.5	22.5	22.7	17.3	6.2	31.9	.4	42.4	1.8	2,860	5,150
	---	36.0	36.3	27.7	3.3	51.0	.6	14.5	2.9	4,580	8,240
	---	49.8	50.2	---	4.5	70.6	.9	20.1	4.0	6,330	11,400
D196659	39.4	24.8	25.3	10.5	6.8	35.7	.5	45.6	.9	3,270	5,880
	---	40.9	41.7	17.3	4.0	58.9	.8	17.5	1.5	5,390	9,700
	---	49.5	50.5	---	4.8	71.3	1.0	21.1	1.8	6,520	11,740
D196660	40.2	25.3	26.5	8.0	7.0	36.7	.5	47.1	.7	3,330	6,000
	---	42.3	44.3	13.4	4.2	61.4	.8	19.0	1.2	5,570	10,030
	---	48.8	51.2	---	4.9	70.8	1.0	21.9	1.4	6,430	11,580
D196661	32.6	25.4	23.3	18.7	5.8	30.5	.4	36.3	8.4	3,000	5,400
	---	37.7	34.6	27.7	3.2	45.3	.6	10.9	12.5	4,450	8,010
	---	52.2	47.8	---	4.5	62.6	.8	15.0	17.2	6,160	11,080
D196662	36.3	25.9	27.4	10.4	6.5	37.6	.6	43.3	1.5	3,550	6,380
	---	40.7	43.0	16.3	3.9	59.0	.9	17.3	2.4	5,570	10,020
	---	48.6	51.4	---	4.6	70.5	1.1	20.7	2.8	6,650	11,970
D196641	38.6	27.1	26.3	8.0	7.0	37.4	.7	45.8	1.1	3,500	6,300
	---	44.1	42.8	13.0	4.4	60.9	1.1	18.7	1.8	5,700	10,260
	---	50.7	49.3	---	5.1	70.0	1.3	21.5	2.1	6,560	11,800
D196642	36.5	27.9	26.2	9.4	6.8	34.3	.7	44.8	4.0	3,250	5,840
	---	43.9	41.3	14.8	4.3	54.0	1.1	19.5	6.3	5,110	9,200
	---	51.6	48.4	---	5.1	63.4	1.3	22.8	7.4	6,000	10,800
D221125	29.4	29.0	30.3	11.3	6.2	42.0	.6	38.7	1.1	3,930	7,070
	---	41.1	42.9	16.0	4.2	59.5	.8	17.8	1.6	5,560	10,010
	---	48.9	51.1	---	4.9	70.8	1.0	21.2	1.9	6,620	11,920
D221126	26.1	29.7	33.0	11.2	5.9	44.7	.7	36.6	.9	4,120	7,410
	---	40.2	44.7	15.2	4.1	60.5	.9	18.1	1.2	5,570	10,030
	---	47.4	52.6	---	4.8	71.3	1.1	21.4	1.4	6,570	11,820
D221130	33.7	27.1	30.8	8.4	6.6	41.0	.8	42.6	.6	3,800	6,850
	---	40.9	46.5	12.7	4.3	61.8	1.2	19.1	.9	5,740	10,330
	---	46.8	53.2	---	4.9	70.8	1.4	21.8	1.0	6,570	11,830
D221131	24.8	25.0	32.8	17.4	5.3	41.5	0.5	34.8	0.6	3,700	6,660
	---	33.2	43.6	23.1	3.4	55.2	.7	17.0	.8	4,920	8,860
	---	43.3	56.7	---	4.4	71.8	.9	22.1	1.0	6,410	11,530

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

SAMPLE NUMBER	AIR-DRIED LOSS	FORMS OF SULFUR			FREE SWELLING INDEX	ASH FUSION TEMPERATURE, C		
		SULFATE	PYRITIC	ORGANIC		INITIAL DEFORMATION	SOFTENING	FLUID
D196657	25.3	.01	.09	.34	0.0	1,200	1,220	1,230
	---	.02	.15	.55				
	---	.02	.17	.63				
D196658	26.2	.29	1.02	.51	.0	1,100	1,125	1,255
	---	.46	1.63	.82				
	---	.64	2.26	1.13				
D196659	27.2	.04	.72	.19	.0	1,150	1,165	1,180
	---	.07	1.19	.31				
	---	.08	1.44	.38				
D196660	28.9	.00	.44	.26	.0	1,195	1,210	1,225
	---	.00	.74	.43				
	---	.00	.85	.50				
D196661	20.8	.54	7.55	.31	.0	1,210	1,240	1,290
	---	.80	11.20	.46				
	---	1.11	15.50	.64				
D196662	21.6	.07	1.03	.41	.0	1,060	1,080	1,100
	---	.11	1.62	.64				
	---	.13	1.93	.77				
D196641	24.4	.09	.42	.55	.0	1,200	1,215	1,230
	---	.15	.68	.90				
	---	.17	.79	1.03				
D196642	25.1	.95	1.41	1.63	.0	1,250	1,275	1,345
	---	1.50	2.22	2.57				
	---	1.76	2.61	3.01				
D221125	21.4	.02	.69	.41	.0	1,125	1,145	1,160
	---	.03	.98	.58				
	---	.03	1.16	.69				
D221126	18.3	.03	.53	.37	.0	1,130	1,150	1,165
	---	.04	.72	.50				
	---	.05	.85	.59				
D221130	25.9	.02	.11	.48	.0	1,140	1,155	1,170
	---	.03	.17	.72				
	---	.03	.19	.83				
D221131	17.9	0.02	0.26	0.29	.0	1,155	1,210	1,315
	---	.03	.35	.39				
	---	.03	.45	.50				

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

	PROXIMATE ANALYSIS				ULTIMATE ANALYSIS					HEAT OF COMBUSTION	
SAMPLE NUMBER	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	KCAL/KG	BTU/LB
D221133	24.3	30.0	34.9	10.8	5.5	46.6	.8	35.4	.8	4,250	7,650
	---	39.6	46.1	14.3	3.7	61.6	1.1	18.2	1.1	5,620	10,110
	---	46.2	53.8	---	4.3	71.8	1.2	21.3	1.2	6,550	11,790
D221134	25.8	26.6	35.5	12.1	5.5	44.3	.6	37.0	.5	4,010	7,220
	---	35.8	47.8	16.3	3.5	59.7	.8	19.0	.7	5,400	9,730
	---	42.8	57.2	---	4.2	71.3	1.0	22.7	.8	6,460	11,620
D221138	37.9	24.4	30.1	7.6	6.8	39.0	.7	45.3	.6	3,600	6,480
	---	39.3	48.5	12.2	4.2	62.8	1.1	18.7	1.0	5,790	10,430
	---	44.8	55.2	---	4.8	71.6	1.3	21.3	1.1	6,600	11,880
D221139	35.3	25.8	27.5	11.4	6.7	37.7	.6	42.5	1.2	3,600	6,480
	---	39.9	42.5	17.6	4.3	58.3	.9	17.2	1.9	5,560	10,020
	---	48.4	51.6	---	5.2	70.7	1.1	20.9	2.3	6,750	12,160
D221140	30.9	27.1	32.6	9.4	6.4	42.5	.7	40.5	.6	3,930	7,080
	---	39.2	47.2	13.6	4.3	61.5	1.0	18.9	.9	5,690	10,240
	---	45.4	54.6	---	5.0	71.2	1.2	21.8	1.0	6,590	11,850
D221141	34.0	21.1	24.6	20.3	6.1	30.6	.6	38.3	4.1	3,030	5,450
	---	32.0	37.3	30.8	3.5	46.4	.9	12.2	6.2	4,590	8,250
	---	46.2	53.8	---	5.1	67.0	1.3	17.7	9.0	6,620	11,920
D221142	21.5	34.2	35.1	9.2	5.7	49.9	1.0	33.3	.9	4,600	8,290
	---	43.6	44.7	11.7	4.2	63.6	1.3	18.1	1.1	5,860	10,560
	---	49.4	50.6	---	4.8	72.0	1.4	20.5	1.3	6,640	11,960
D221143	20.4	29.9	31.4	18.3	5.2	42.8	.9	29.5	3.4	4,030	7,260
	---	37.6	39.4	23.0	3.7	53.8	1.1	14.3	4.3	5,070	9,120
	---	48.8	51.2	---	4.8	69.8	1.5	18.5	5.5	6,580	11,850
D221145	36.6	23.4	28.0	12.0	6.6	37.0	.7	42.6	1.1	3,470	6,250
	---	36.9	44.2	18.9	4.0	58.4	1.1	15.9	1.7	5,470	9,850
	---	45.5	54.5	---	4.9	72.0	1.4	19.6	2.1	6,750	12,150
D209953	34.3	23.9	33.4	8.4	6.4	42.6	.6	40.8	1.2	3,900	7,020
	---	36.4	50.8	12.8	3.9	64.8	.9	15.7	1.8	5,940	10,690
	---	41.7	58.3	---	4.5	74.3	1.0	18.0	2.1	6,810	12,250
D209954	35.4	23.9	32.9	7.8	6.7	41.5	.6	42.5	.9	3,840	6,920
	---	37.0	50.9	12.1	4.3	64.2	.9	17.1	1.4	5,950	10,710
	---	42.1	57.9	---	4.9	73.1	1.1	19.4	1.6	6,770	12,180
D209955	31.8	23.5	32.7	12.0	5.9	41.4	0.6	39.3	0.9	3,780	6,800
	---	34.5	47.9	17.6	3.5	60.7	.9	16.2	1.3	5,540	9,980
	---	41.8	58.2	---	4.2	73.7	1.1	19.6	1.6	6,730	12,110

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

SAMPLE NUMBER	AIR-DRIED LOSS	FORMS OF SULFUR			FREE SWELLING INDEX	ASH FUSION TEMPERATURE, C		
		SULFATE	PYRITIC	ORGANIC		INITIAL DEFORMATION	SOFTENING	FLUID
D221133	14.9	.01	.15	.64	0.0	1,130	1,200	1,260
	---	.01	.20	.85				
	---	.02	.23	.99				
D221134	17.8	.01	.06	.44	.0	1,095	1,120	1,150
	---	.01	.08	.59				
	---	.02	.10	.71				
D221138	32.9	.01	.23	.33	.0	1,180	1,230	1,280
	---	.02	.37	.53				
	---	.02	.42	.61				
D221139	30.8	.03	.59	.55	.0	1,120	1,155	1,230
	---	.05	.91	.85				
	---	.06	1.11	1.03				
D221140	23.2	.04	.14	.41	.0	1,120	1,150	1,175
	---	.06	.20	.59				
	---	.07	.23	.69				
D221141	29.9	.02	3.50	.56	.0	1,060	1,110	1,170
	---	.03	5.30	.85				
	---	.04	7.66	1.23				
D221142	13.3	.01	.42	.50	.0	1,190	1,240	1,280
	---	.01	.54	.64				
	---	.01	.61	.72				
D221143	13.5	.01	2.60	.76	.0	1,070	1,125	1,170
	---	.01	3.27	.95				
	---	.02	4.24	1.24				
D221145	31.2	.01	.79	.32	.0	1,125	1,175	1,245
	---	.02	1.25	.50				
	---	.02	1.54	.62				
D209953	27.2	.02	.82	.39	.0	1,095	1,155	1,200
	---	.03	1.25	.59				
	---	.03	1.43	.68				
D209954	28.0	.00	.50	.43	.0	1,120	1,190	1,250
	---	.00	.77	.67				
	---	.00	.88	.76				
D209955	24.3	0.00	0.57	0.35	.0	1,045	1,105	1,170
	---	.00	.84	.51				
	---	.00	1.01	.62				

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

	PROXIMATE ANALYSIS				ULTIMATE ANALYSIS					HEAT OF COMBUSTION	
SAMPLE NUMBER	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	KCAL/KG	BTU/LB
D209956	32.7	22.5	31.8	13.0	6.3	39.8	.6	39.8	.5	3,610	6,500
	---	33.4	47.3	19.3	4.0	59.1	.9	15.9	.7	5,360	9,660
	---	41.4	58.6	---	4.9	73.3	1.1	19.8	.9	6,650	11,970
D209957	35.6	25.1	28.2	11.1	6.9	38.0	.7	43.0	.4	3,580	6,450
	---	39.0	43.8	17.2	4.6	59.0	1.1	17.6	.6	5,560	10,010
	---	47.1	52.9	---	5.5	71.3	1.3	21.3	.8	6,720	12,100
D209958	35.3	26.2	31.5	7.0	6.8	40.8	.7	44.3	.3	3,800	6,840
	---	40.5	48.7	10.8	4.4	63.1	1.1	20.0	.5	5,880	10,580
	---	45.4	54.6	---	5.0	70.7	1.2	22.4	.5	6,590	11,860
D209959	35.5	25.7	29.6	9.2	6.9	39.6	.7	42.9	.7	3,710	6,670
	---	39.8	45.9	14.3	4.6	61.4	1.1	17.6	1.1	5,740	10,340
	---	46.5	53.5	---	5.3	71.6	1.3	20.5	1.3	6,700	12,060
D209960	34.3	26.4	33.4	5.9	6.6	43.1	.7	43.3	.3	3,980	7,170
	---	40.2	50.8	9.0	4.2	65.6	1.1	19.5	.5	6,060	10,920
	---	44.1	55.9	---	4.7	72.1	1.2	21.4	.5	6,660	11,990
D209961	36.3	24.7	30.7	8.3	6.7	39.4	.7	44.6	.3	3,700	6,660
	---	38.8	48.2	13.0	4.2	61.9	1.1	19.4	.5	5,810	10,450
	---	44.6	55.4	---	4.8	71.1	1.3	22.3	.5	6,680	12,020
D209962	34.7	24.9	27.9	12.5	6.3	37.7	.7	40.7	2.1	3,560	6,410
	---	38.1	42.7	19.1	3.7	57.7	1.1	15.1	3.2	5,450	9,810
	---	47.2	52.8	---	4.6	71.4	1.3	18.7	4.0	6,740	12,130
D209963	36.3	25.4	30.7	7.6	6.9	40.1	.7	44.3	.5	3,710	6,690
	---	39.9	48.2	11.9	4.5	63.0	1.1	18.9	.8	5,830	10,500
	---	45.3	54.7	---	5.1	71.5	1.2	21.4	.9	6,620	11,920
D209964	35.9	24.5	28.1	11.5	6.6	36.5	.5	43.2	1.7	3,470	6,250
	---	38.2	43.8	17.9	4.1	56.9	.8	17.6	2.7	5,420	9,750
	---	46.6	53.4	---	5.0	69.4	1.0	21.5	3.2	6,600	11,880
D209965	36.3	25.9	29.5	8.3	6.7	39.5	.7	44.4	.5	3,670	6,610
	---	40.7	46.3	13.0	4.2	62.0	1.1	19.0	.8	5,760	10,370
	---	46.8	53.2	---	4.8	71.3	1.3	21.9	.9	6,620	11,920
D209966	33.7	22.3	24.6	19.4	6.3	32.7	.6	40.2	.8	3,050	5,490
	---	33.6	37.1	29.3	3.9	49.3	.9	15.5	1.2	4,600	8,290
	---	47.5	52.5	---	5.4	69.7	1.3	21.8	1.7	6,510	11,710
D209967	28.5	20.6	25.0	25.9	5.3	32.2	0.5	34.6	1.5	2,930	5,280
	---	28.8	35.0	36.2	3.0	45.0	.7	13.0	2.1	4,100	7,380
	---	45.2	54.8	---	4.7	70.6	1.1	20.3	3.3	6,430	11,570

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

SAMPLE NUMBER	AIR-DRIED LOSS	FORMS OF SULFUR			FREE SWELLING INDEX	ASH FUSION TEMPERATURE, C		
		SULFATE	PYRITIC	ORGANIC		INITIAL DEFORMATION	SOFTENING	FLUID
D209956	25.1	.00	.17	.29	0.0	1,110	1,175	1,245
	---	.00	.25	.43				
	---	.00	.31	.53				
D209957	28.1	.01	.16	.26	.0	1,155	1,220	1,270
	---	.02	.25	.40				
	---	.02	.30	.49				
D209958	27.8	.00	.12	.19	.0	1,140	1,190	1,250
	---	.00	.19	.29				
	---	.00	.21	.33				
D209959	28.0	.00	.14	.56	.0	1,045	1,105	1,155
	---	.00	.22	.87				
	---	.00	.25	1.01				
D209960	26.3	.00	.03	.25	.0	1,205	1,255	1,300
	---	.00	.05	.38				
	---	.00	.05	.42				
D209961	28.6	.00	.02	.25	.0	1,070	1,130	1,180
	---	.00	.03	.39				
	---	.00	.04	.45				
D209962	27.2	.01	.84	1.22	.0	1,030	1,080	1,130
	---	.02	1.29	1.87				
	---	.02	1.59	2.31				
D209963	28.6	.00	.16	.37	.0	1,045	1,160	1,210
	---	.00	.25	.58				
	---	.00	.29	.66				
D209964	28.5	.08	.49	1.16	.0	1,080	1,145	1,195
	---	.12	.76	1.81				
	---	.15	.93	2.21				
D209965	28.5	.00	.04	.44	.0	1,180	1,250	1,295
	---	.00	.06	.69				
	---	.00	.07	.79				
D209966	26.9	.00	.12	.68	.0	1,225	1,290	1,340
	---	.00	.18	1.03				
	---	.00	.26	1.45				
D209967	21.7	0.07	0.39	1.00	.0	1,160	1,210	1,270
	---	.10	.55	1.40				
	---	.15	.86	2.19				

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

	PROXIMATE ANALYSIS				ULTIMATE ANALYSIS					HEAT OF COMBUSTION	
SAMPLE NUMBER	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	KCAL/KG	BTU/LB
D209968	31.9	23.0	29.4	15.7	6.1	37.2	.6	38.9	1.5	3,470	6,250
	---	33.8	43.2	23.1	3.8	54.6	.9	15.5	2.2	5,090	9,170
	---	43.9	56.1	---	4.9	71.0	1.1	20.1	2.9	6,620	11,920
D240927	41.9	23.3	28.2	6.6	6.9	37.6	.6	47.5	.8	3,470	6,250
	---	40.1	48.6	11.3	3.9	64.8	1.0	17.6	1.4	5,980	10,760
	---	45.2	54.8	---	4.4	73.0	1.1	19.8	1.6	6,740	12,140
D240928	40.5	23.9	27.0	8.6	6.8	37.0	.6	46.6	.3	3,390	6,100
	---	40.1	45.4	14.5	3.9	62.2	1.0	17.9	.5	5,690	10,250
	---	46.9	53.1	---	4.6	72.7	1.2	20.9	.6	6,660	11,990
D240929	41.9	24.5	29.3	4.3	7.1	38.8	.6	48.7	.5	3,570	6,430
	---	42.2	50.4	7.5	4.2	66.7	1.0	19.7	.8	6,150	11,060
	---	45.6	54.4	---	4.6	72.1	1.1	21.3	.9	6,640	11,960
D240930	40.9	25.3	29.4	4.4	7.2	39.5	.6	48.0	.3	3,630	6,530
	---	42.9	49.7	7.4	4.5	66.9	1.0	19.7	.5	6,130	11,040
	---	46.3	53.7	---	4.8	72.2	1.1	21.3	.6	6,630	11,930
D240931	41.9	23.8	28.7	5.6	7.1	37.8	.6	48.6	.3	3,430	6,180
	---	41.0	49.4	9.6	4.2	65.2	1.0	19.6	.5	5,910	10,630
	---	45.4	54.6	---	4.7	72.1	1.1	21.6	.5	6,530	11,760
D240932	43.1	26.1	25.8	5.0	7.1	37.4	.6	49.5	.4	3,430	6,180
	---	45.9	45.3	8.8	4.1	65.7	1.0	19.7	.7	6,030	10,860
	---	50.3	49.7	---	4.5	72.0	1.1	21.6	.7	6,610	11,910
D240933	42.1	26.0	26.1	5.8	7.1	38.0	.6	48.0	.6	3,480	6,260
	---	45.0	45.0	10.0	4.2	65.6	1.0	18.3	1.0	6,000	10,810
	---	50.0	50.0	---	4.6	72.8	1.1	20.3	1.1	6,670	12,010
D240934	43.4	26.2	24.5	5.9	6.8	36.8	.7	49.3	.5	3,370	6,070
	---	46.3	43.3	10.4	3.5	65.1	1.2	19.0	.8	5,960	10,720
	---	51.7	48.3	---	3.9	72.7	1.3	21.2	.9	6,650	11,970
D240935	42.0	25.1	27.8	5.0	7.3	38.0	.7	48.4	.6	3,540	6,370
	---	43.3	48.0	8.7	4.5	65.5	1.2	19.0	1.0	6,110	10,990
	---	47.4	52.6	---	4.9	71.8	1.4	20.8	1.1	6,690	12,040
D240936	37.5	26.7	25.2	10.6	6.8	37.4	.7	44.0	.5	3,470	6,240
	---	42.7	40.3	17.0	4.2	59.8	1.1	17.0	.9	5,550	9,980
	---	51.5	48.5	---	5.0	72.1	1.3	20.5	1.0	6,680	12,030
D240937	40.0	26.9	25.8	7.3	6.9	39.3	0.7	45.0	0.8	3,530	6,350
	---	44.8	43.0	12.2	4.0	65.4	1.2	15.8	1.3	5,870	10,570
	---	51.0	49.0	---	4.6	74.5	1.4	18.0	1.5	6,690	12,040

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

SAMPLE NUMBER	AIR-DRIED LOSS	FORMS OF SULFUR			FREE SWELLING INDEX	ASH FUSION TEMPERATURE, C		
		SULFATE	PYRITIC	ORGANIC		INITIAL DEFORMATION	SOFTENING	FLUID
D209968	24.5	.01	.25	1.27	0.0	1,095	1,155	1,205
	---	.01	.37	1.86				
	---	.02	.48	2.42				
D240927	35.7	.04	.46	.30	.0	1,270	1,320	1,340
	---	.07	.79	.52				
	---	.08	.89	.58				
D240928	34.6	.03	.17	.10	.0	1,155	1,215	1,255
	---	.05	.29	.17				
	---	.06	.33	.20				
D240929	35.4	.03	.10	.35	.0	1,340	1,400	1,420
	---	.05	.17	.60				
	---	.06	.19	.65				
D240930	34.2	.02	.13	.16	.0	1,340	1,405	1,430
	---	.03	.22	.27				
	---	.04	.24	.29				
D240931	35.8	.07	.04	.17	.0	1,325	1,375	1,400
	---	.12	.07	.29				
	---	.13	.08	.32				
D240932	36.8	.03	.11	.24	.0	1,295	1,360	1,375
	---	.05	.19	.42				
	---	.06	.21	.46				
D240933	35.8	.01	.35	.22	.0	1,315	1,355	1,370
	---	.02	.60	.38				
	---	.02	.67	.42				
D240934	37.1	.00	.17	.29	.0	1,315	1,365	1,375
	---	.00	.30	.51				
	---	.00	.34	.57				
D240935	36.2	.06	.23	.29	.0	1,275	1,355	1,370
	---	.10	.40	.50				
	---	.11	.43	.55				
D240936	31.3	.01	.11	.42	.0	1,230	1,295	1,370
	---	.02	.18	.67				
	---	.02	.21	.81				
D240937	33.5	0.00	0.59	0.21	.0	1,315	1,355	1,370
	---	.00	.98	.35				
	---	.00	1.12	.40				

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

	PROXIMATE ANALYSIS				ULTIMATE ANALYSIS					HEAT OF COMBUSTION	
SAMPLE NUMBER	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	KCAL/KG	BTU/LB
D240938	39.2	27.1	28.4	5.3	6.9	40.2	.7	46.4	.3	3,680	6,620
	---	44.6	46.6	8.8	4.2	66.2	1.2	19.1	.5	6,050	10,890
	---	48.9	51.1	---	4.6	72.5	1.3	21.0	.5	6,630	11,940
D240939	33.8	28.0	29.3	8.9	6.6	40.9	.7	42.3	.5	3,850	6,930
	---	42.3	44.2	13.4	4.4	61.8	1.1	18.5	.8	5,820	10,480
	---	48.9	51.1	---	5.0	71.4	1.3	21.4	.9	6,730	12,110
D240940	37.5	28.4	28.4	5.7	6.9	41.0	.6	45.5	.2	3,730	6,720
	---	45.4	45.4	9.2	4.3	65.6	1.0	19.5	.4	5,970	10,740
	---	50.0	50.0	---	4.7	72.2	1.1	21.5	.4	6,570	11,820
D240941	39.2	27.9	27.1	5.7	6.8	39.1	.7	47.4	.2	3,590	6,460
	---	45.9	44.6	9.5	4.1	64.4	1.1	20.7	.3	5,910	10,640
	---	50.7	49.3	---	4.5	71.1	1.2	22.8	.3	6,530	11,750

Table 1d. (cont'd.) Proximate and ultimate analyses, heat content, forms of sulfur, free-swelling index, and ash-fusion temperatures.

SAMPLE NUMBER	AIR-DRIED LOSS	FORMS OF SULFUR			FREE SWELLING INDEX	ASH FUSION TEMPERATURE, C		
		SULFATE	PYRITIC	ORGANIC		INITIAL DEFORMATION	SOFTENING	FLUID
D240938	32.3	.01	.06	.23	0.0	1,340	1,390	1,405
	---	.02	.10	.38				
	---	.02	.11	.41				
D240939	27.6	.04	.05	.41	.0	1,150	1,200	1,220
	---	.06	.08	.62				
	---	.07	.09	.72				
D240940	31.0	.03	.04	.15	.0	1,290	1,345	1,355
	---	.05	.06	.24				
	---	.05	.07	.26				
D240941	32.6	.02	.02	.12	.0	1,260	1,315	1,340
	---	.03	.03	.20				
	---	.04	.04	.22				

Table 1e. Major- and minor- oxides in the laboratory ash (525 degrees C) of 383 lignite samples from the Fort Union Region - North Dakota and Montana.
[Values in percent. L = less than the value shown; B not determined; H interference.]

SAMPLE NUMBER	ASH	SIO2	AL2O3	CAO	MGO	NA2O	K2O	FE2O3	TIO2	P2O5	SO3	SAMPLE NUMBER
D165564	7.0	13	2.9	27	5.6	8.3	0.10L	4.3	B	0.057L	20	D165564
D165565	7.2	19	6.8	23	4.9	10	.10L	5.0	B	.056	19	D165565
D165566	6.5	6.8	4.9	27	5.4	10	.20	4.4	B	.046L	24	D165566
D165567	5.8	12	4.7	28	4.9	9.2	.10L	5.4	B	.052L	23	D165567
D165568	10.8	12	3.4	20	6.0	1.2	.10L	20	B	.046L	35	D165568
D165569	9.9	30	11	18	5.6	.70	1.2	8.6	B	.050L	20	D165569
D165570	6.5	14	7.7	31	8.8	1.5	.10L	4.0	B	.046L	17	D165570
D165571	6.3	14	9.0	31	8.7	1.4	.29	4.4	B	.064	17	D165571
D165572	10.2	20	9.5	12	4.0	4.0	.71	19	B	.059	27	D165572
D165573	6.6	12	10	21	6.5	5.9	.55	7.7	B	.14	27	D165573
D165574	19.1	30	11	21	3.5	3.6	.18	6.5	B	.058	16	D165574
D165575	23.5	45	13	9.9	3.1	2.7	.76	7.0	B	.068	14	D165575
D165576	9.6	34	11	22	6.0	3.5	.10L	3.0	B	.97	12	D165576
D165577	10.6	26	11	18	5.3	3.8	.15	7.9	B	.26	22	D165577
D165578	10.4	16	8.0	17	4.7	3.3	.10L	15	B	.71	30	D165578
D165579	10.3	27	11	19	5.3	3.6	.10L	7.4	B	.58	20	D165579
D165605	6.9	6.3	6.0	37	9.3	.94	.10L	5.5	B	.044L	12	D165605
D165606	6.8	9.2	8.0	34	11	.98	.10L	4.9	B	.15	13	D165606
D165607	10.0	29	11	23	7.0	1.3	.10L	4.0	B	.19	15	D165607
D165608	10.5	27	12	22	6.9	1.4	.22	4.6	B	.24	17	D165608
D165609	6.8	11	5.7	33	9.8	1.0	.10L	7.0	B	.24	17	D165609
D165610	7.4	8.0	5.8	38	9.1	.93	.10L	3.8	B	.95	7	D165610
D165611	8.3	12	9.2	35	8.2	.78	.10L	3.7	B	.20	8	D165611
D165612	7.6	17	6.6	30	9.4	.85	.10L	5.1	B	.092	13	D165612
D165613	8.3	17	9.7	27	8.4	.84	.10L	4.5	B	.50	18	D165613
D165632	10.7	31	12	15	3.8	4.1	.74	5.9	B	.093	15	D165632
D165974	11.3	34	19	19	7.8	1.7	.10L	1.1	B	.053L	14	D165974
D165975	6.1	7.3	9.8	29	9.1	.50	.10L	3.6	B	.065	35	D165975
D165976	11.8	6.1	3.1	25	5.9	.26	.10L	20	B	.068	38	D165976
D165977	7.3	4.9	4.8	26	8.4	2.7	.10L	14	B	.096	39	D165977
D165978	7.7	29	11	23	8.3	1.1	.10L	.9	B	.052L	24	D165978
D165979	11.3	17	10	19	7.8	.50	.10L	12	B	.053L	32	D165979
D165980	10.4	11	6.3	21	7.1	.45	.10L	15	B	.067	37	D165980
D165981	7.4	14	9.6	32	11	.50	.10L	1.5	B	.054	28	D165981
D165982	6.4	1.1	6.7	29	7.8	1.2	.10L	11	B	.047L	20	D165982
D165983	8.0	2.0	4.7	30	9.4	1.6	.10L	9.5	B	.34	33	D165983
D165984	8.6	8.5	12	23	8.0	2.4	.10L	9.1	B	.34	22	D165984
D165985	7.4	6.2	12	27	10	3.0	.10L	2.0	B	.12	24	D165985
D165986	10.3	8.5	9.4	21	7.3	2.3	.10L	15	B	.049	17	D165986
D165987	11.7	29	19	21	6.9	1.7	.10L	.1	B	.051L	17	D165987

Table 1e. (cont'd.) Major- and minor- oxides in the laboratory ash of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	ASH	SIO2	AL2O3	CAO	MGO	NA2O	K2O	FE2O3	TIO2	P2O5	SO3	SAMPLE NUMBER
D165988	11.4	30	7.7	21	7.1	2.0	0.10L	5.2	B	0.36	34	D165988
D165989	10.4	15	5.4	20	7.1	3.0	.10L	18	B	.067	27	D165989
D165990	10.0	15	7.1	23	8.3	2.2	.10L	9.5	B	.30	34	D165990
D165991	8.2	6.	10	29	10	3.9	.10L	3.7	B	.049L	36	D165991
D173466	25.6	5.	3.4	6.3	2.2	.88	.07	50	.09	.11	18	D173466
D173467	12.2	37	9.3	17	6.1	3.9	.13	.3	1.0	.27	16	D173467
D173468	19.6	18	6.0	9.7	3.5	1.9	.32	24	.39	.15	22	D173468
D173469	11.0	8.	6.8	15	5.2	4.7	.06	17	.24	.25	37	D173469
D175930	11.7	10	4.7	12	4.5	7.5	.22	23	.50	1.0L	33	D175930
D175931	6.9	17	9.1	23	8.1	9.9	.20	5.6	.64	1.0L	17	D175931
D175932	12.1	47	10	15	5.0	4.9	.22	3.5	1.1	1.0L	6.7	D175932
D175933	5.6	11	6.9	24	8.5	12	.28	6.5	.47	1.0L	15	D175933
D175934	5.5	11	6.2	27	9.6	11	.24	5.4	.36	1.0L	12	D175934
D175935	7.3	27	9.0	16	6.1	12	.47	4.8	.95	1.0L	14	D175935
D175936	9.6	14	6.1	20	6.2	1.1	.14	16	.64	1.0L	32	D175936
D175937	8.4	27	7.9	23	7.5	1.2	.15	4.8	.93	1.0L	17	D175937
D175938	7.3	16	9.2	15	6.5	9.0	.42	10	.65	1.0L	20	D175938
D175939	7.5	24	9.3	18	7.5	6.2	.43	5.8	.79	1.0L	19	D175939
D178143	10.1	35	11	13	9.5	5.5	.38	1.7	.68	1.0L	12	D178143
D178144	8.9	14	10	18	9.6	6.9	.16	5.8	.29	1.0	21	D178144
D178145	15.6	8.5	5.0	8.5	4.2	3.8	.05	26	.50	1.0L	25	D178145
D178498	22.8	28	8.3	10	2.9	1.1	.21	13	.83	1.0L	19	D178498
D178499	15.6	13	6.4	10	6.7	2.2	.14	17	.40	1.0L	27	D178499
D178500	23.2	53	8.5	5.0	2.5	2.8	1.3	7.6	.72	1.0L	11	D178500
D178501	9.5	15	10	19	8.5	4.6	.15	3.6	.67	1.1	17	D178501
D178502	14.0	45	7.6	10	5.0	3.2	.60	4.3	.88	1.0L	18	D178502
D178503	11.1	11	3.4	14	6.6	8.3	.31	13	.33	1.0L	28	D178503
D178504	10.9	25	8.1	20	6.9	1.9	.49	5.4	.75	1.0L	11	D178504
D178505	19.8	8.1	5.4	31	3.9	1.4	.26	5.7	.31	1.0L	15	D178505
D178506	7.9	13	9.3	19	8.2	5.2	.40	6.0	.38	1.2	19	D178506
D178507	27.9	23	16	12	2.3	.82	.64	7.3	1.5	1.0L	25	D178507
D178508	9.1	13	6.4	18	12	1.6	.22	5.9	.35	1.0L	21	D178508
D178509	18.1	51	4.8	6.2	2.6	2.7	.53	9.3	.72	1.0L	12	D178509
D178510	10.6	11	5.7	15	6.9	2.8	.14	15	.39	1.0L	31	D178510
D178511	12.0	23	14	17	7.9	1.5	.23	1.6	.58	1.0L	.94	D178511
D178512	7.2	15	9.6	21	9.5	2.8	.30	7.0	.37	1.0L	17	D178512
D179369	10.8	19	9.7	16	6.8	1.9	.44	11	.70	1.0L	28	D179369
D179370	10.9	12	4.7	10	4.9	6.9	.36	21	.45	1.0L	34	D179370
D179371	9.4	9.5	8.2	20	8.8	1.7	.27	9.8	.61	1.0L	28	D179371
D179372	11.9	37	8.3	15	6.3	4.3	.70	4.5	.83	1.0L	19	D179372

Table 1e. (cont'd.) Major- and minor- oxides in the laboratory ash of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	ASH	SIO2	AL2O3	CAO	MGO	NA2O	K2O	FE2O3	TIO2	P2O5	SO3	SAMPLE NUMBER
D179373	14.2	23	9.1	12	5.2	3.3	0.70	13	0.68	1.0L	27	D179373
D179374	10.6	11	5.6	15	6.6	.92	.28	15	.62	1.0L	34	D179374
D179375	18.4	20	10	8.4	4.0	4.8	.71	17	.49	1.0L	28	D179375
D179376	10.7	26	9.7	15	6.6	8.4	.51	2.9	.73	1.0L	22	D179376
D179377	9.1	27	7.2	16	9.1	8.0	.50	2.1	.76	1.0L	16	D179377
D179378	11.9	8.9	7.2	14	5.6	6.3	.23	15	.38	1.0L	27	D179378
D179379	7.9	5.9	5.5	14	6.1	2.8	.27	20	.29	1.0L	30	D179379
D179380	10.6	26	8.9	16	6.6	.54	.38	4.4	1.2	1.0L	21	D179380
D179381	10.9	24	14	17	7.1	6.0	.37	1.7	.82	1.0L	16	D179381
D179382	6.8	10	9.4	21	8.3	.70	.39	2.7	.53	1.0L	27	D179382
D179383	9.6	9.5	9.1	18	7.9	.54	.34	3.1	.71	1.0L	36	D179383
D179384	11.6	12	7.4	13	5.4	3.9	.42	17	.45	1.0L	31	D179384
D180007	10.7	15	9.0	15	6.3	7.6	.28	8.7	.54	1.0L	24	D180007
D180008	10.8	16	8.3	15	5.8	7.3	.37	11	.46	1.0L	24	D180008
D180009	12.2	14	6.3	11	5.6	3.4	.18	15	.53	1.0L	28	D180009
D180010	9.1	17	8.5	16	6.6	9.1	.24	6.9	.59	1.0L	20	D180010
D180011	9.5	22	10	20	5.9	.47	.24	3.1	.58	1.0L	20	D180011
D180012	8.8	18	12	14	10	5.6	.38	3.0	.47	1.0L	21	D180012
D180013	14.5	40	7.3	10	5.5	3.7	.48	6.8	.69	1.0L	15	D180013
D180014	9.9	18	9.5	18	8.3	4.2	.24	6.8	.57	1.0L	21	D180014
D180015	11.6	16	8.9	15	6.4	1.1	.26	12	.45	1.0L	26	D180015
D180016	11.2	24	11	17	7.1	1.1	.34	5.9	.75	1.0L	21	D180016
D180017	11.4	14	9.6	16	7.4	1.8	.24	11	.57	1.0L	27	D180017
D180018	8.4	20	12	19	10	4.0	.41	3.4	.51	1.0L	16	D180018
D180019	10.9	24	11	15	6.8	6.0	.48	5.7	.79	1.0L	19	D180019
D180075	9.6	20	11	23	6.5	.36	.21	1.1	.48	1.0L	20	D180075
D180076	10.6	20	11	19	6.7	.30	.34	3.5	.66	1.0L	23	D180076
D180077	21.7	39	14	7.1	3.2	1.2	1.7	7.1	.55	1.0L	13	D180077
D180078	10.1	13	8.8	15	6.6	8.9	.29	7.9	.61	1.0L	28	D180078
D180079	9.3	13	9.9	23	5.9	1.6	.22	4.3	.33	1.6	25	D180079
D180080	9.2	11	8.6	19	7.9	.80	.10	4.4	.34	1.0L	31	D180080
D180081	15.5	37	12	8.5	4.6	3.3	1.4	6.0	.65	1.0L	16	D180081
D180082	7.8	10	9.8	24	11	2.1	.14	2.0	.49	1.6	16	D180082
D180083	8.9	16	11	20	8.3	2.0	.27	5.8	.59	1.2	21	D180083
D186051	7.9	19	7.9	25	6.3	12	.28	4.4	.77	1.0L	16	D186051
D186052	8.6	12	9.0	30	5.9	3.4	.56	11	.46	1.0L	29	D186052
D186053	10.9	16	7.6	20	8.7	1.8	.31	14	1.4	1.0L	30	D186053
D186054	10.4	15	5.2	21	6.3	1.3	.31	15	.73	1.0L	36	D186054
D186055	12.2	14	7.9	16	7.5	2.7	.35	16	2.5	1.0L	30	D186055
D165992	12.1	2.8	5.3	23	7.7	2.0	.10L	14	B	.058	45	D165992

Table 1e. (cont'd.) Major- and minor- oxides in the laboratory ash of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	ASH	SIO2	AL2O3	CAO	MGO	NA2O	K2O	FE2O3	TIO2	P2O5	SO3	SAMPLE NUMBER
D165993	8.8	4.5	6.4	24	11	2.7	0.10L	6.8	B	0.045L	44	D165993
D196052	10.9	15	6.2	17	4.5	.55	.40	18	.40	.18	33	D196052
D196053	11.1	24	6.2	13	4.9	5.0	1.1	16	.40	.090L	30	D196053
D196054	9.5	16	6.7	14	8.4	1.8	.70	12	.60	.11L	37	D196054
D196055	8.7	23	11	24	7.3	1.4	.50	3.6	.70	.46	27	D196055
D196056	7.4	13	5.1	26	7.6	1.3	.50	5.1	.40	.41	25	D196056
D196057	10.1	24	8.1	15	5.4	8.8	.50	5.6	.80	.40	25	D196057
D196058	9.2	17	7.6	15	5.7	10	.50	10	.70	.11L	27	D196058
D196059	16.9	36	7.4	8.7	2.7	.83	1.0	17	.60	.059L	22	D196059
D196060	12.3	25	9.9	14	4.4	1.4	.90	8.1	.50	.081L	31	D196060
D196061	9.9	20	8.5	17	7.5	2.4	.40	9.4	.60	.10	27	D196061
D196062	12.7	40	9.3	12	4.2	7.1	1.0	6.3	.90	.16	18	D196062
D196075	38.1	52	16	4.0	2.5	1.2	2.2	11	.70	.10	7.3	D196075
D196076	15.6	33	8.7	8.9	3.0	8.2	.90	11	.40	.26	23	D196076
D196077	31.0	56	16	5.3	2.1	1.1	1.6	5.5	.70	.065	11	D196077
D196078	11.3	19	8.9	21	2.6	3.6	.60	10	.60	.088L	33	D196078
D196079	25.7	43	15	6.8	1.4	2.6	1.3	9.3	.70	.12	13	D196079
D196080	18.5	38	8.5	13	2.5	.93	1.1	10	.60	.054L	21	D196080
D196081	11.9	30	12	16	2.6	.92	1.0	6.4	.60	.084L	23	D196081
D194858	15.7	39	11	16	4.0	.51	.50	5.2	1.0	1.0L	16	D194858
D194859	10.7	28	11	17	5.3	1.1	.80	6.6	.40	1.0L	22	D194859
D194860	20.0	54	12	9.0	4.5	3.1	1.6	5.2	.70	1.0L	6.8	D194860
D194861	10.2	38	12	14	6.2	9.4	.70	3.2	1.1	1.0L	14	D194861
D194862	10.5	25	9.4	13	5.4	8.3	.40	8.4	.60	1.0L	23	D194862
D194863	9.5	22	9.8	20	6.9	4.4	.30	6.3	.70	1.0L	25	D194863
D194864	19.6	55	9.4	7.2	3.3	4.7	.60	4.3	1.4	1.0L	17	D194864
D194865	9.1	14	5.8	19	6.2	9.4	.30	7.7	.60	1.0L	33	D194865
D194866	32.1	69	11	3.6	1.9	2.5	1.1	2.4	1.5	1.0L	8.5	D194866
D194867	9.2	17	10	18	6.3	9.5	.20	6.3	.60	1.0L	25	D194867
D194868	6.6	6.6	5.5	22	8.0	13	.30	4.7	.60	1.0L	22	D194868
D194869	9.5	22	8.1	17	6.6	1.7	.40	12	.60	1.0L	30	D194869
D194870	11.5	28	7.4	10	4.8	7.2	1.1	13	.50	1.0L	28	D194870
D194029	9.7	24	12	18	6.2	3.8	.80	7.2	.60	1.0	22	D194029
D194030	10.6	29	11	14	4.2	8.8	.90	5.9	.70	1.0L	22	D194030
D194031	16.4	41	15	8.3	2.2	5.4	.40	8.8	.90	1.0L	17	D194031
D194032	11.6	21	11	16	7.1	2.4	.20	7.7	.40	1.0	28	D194032
D194033	8.7	10	6.8	19	7.8	2.5	.20	10	.50	1.0L	38	D194033
D194034	33.4	73	14	3.5	1.7	2.7	1.6	2.1	.80	1.0L	5.5	D194034
D194035	9.8	30	7.6	15	4.2	8.5	.60	6.6	.70	1.0L	23	D194035
D194036	8.1	31	8.4	15	6.9	5.2	.60	6.8	.70	1.0L	24	D194036

Table 1e. (cont'd.) Major- and minor- oxides in the laboratory ash of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	ASH	SIO2	AL2O3	CAO	MGO	NA2O	K2O	FE2O3	TIO2	P2O5	SO3	SAMPLE NUMBER
D196624	14.4	50	14	7.5	4.9	0.76	2.3	3.2	0.60	0.069L	11	D196624
D196625	10.5	25	8.2	25	8.2	.78	.50	3.4	.60	.57	13	D196625
D196626	10.6	26	8.6	24	8.0	.76	.40	4.4	.60	.47	14	D196626
D196627	28.8	55	6.9	7.0	2.9	.19	.80	3.9	3.1	.035L	14	D196627
D196628	12.0	24	9.6	19	7.0	.33	.70	7.8	.60	.17	19	D196628
D196629	10.4	20	12	18	6.6	1.4	.40	7.6	.50	.096L	24	D196629
D196630	12.5	8.0	5.5	12	4.7	1.5	.50	7.3	6.4	.080L	33	D196630
D196631	12.0	39	12	15	5.4	5.5	.70	3.3	.70	.083L	11	D196631
D196632	10.5	23	9.7	16	6.4	7.3	.40	6.2	.60	.19	24	D196632
D196633	10.4	25	9.3	17	6.6	7.0	.40	6.2	.70	.29	24	D196633
D196634	21.3	36	12	4.8	2.7	3.1	1.8	16	.60	.047	18	D196634
D196635	11.3	31	13	15	5.9	6.5	.60	3.6	.70	.088L	16	D196635
D196636	11.8	30	13	15	5.8	6.2	.70	4.9	.60	.085L	18	D196636
D196637	17.6	31	11	13	5.5	.83	.40	7.3	.80	.057L	19	D196637
D196638	10.4	20	11	22	7.9	1.1	.50	7.5	.50	.48	25	D196638
D196639	10.8	17	10	19	7.7	1.1	.40	7.4	.60	.56	22	D196639
D196640	12.1	21	11	18	6.5	.76	.50	6.8	.50	.74	22	D196640
D221097	8.0	16	9.3	22	6.0	1.1	.23	12	.38	.50	B	D221097
D221098	9.6	26	12	12	4.8	8.5	.23	9.1	.42	.10	B	D221098
D221099	10.0	30	8.3	11	4.0	7.8	.64	10	.82	.10L	B	D221099
D221100	13.9	36	14	9.0	3.2	6.0	1.3	7.7	.50	.072	B	D221100
D221101	17.8	54	9.3	9.2	2.5	.20	.74	4.1	.68	.062	B	D221101
D221102	6.9	14	11	20	6.4	10	.24	4.9	.33	.14	B	D221102
D221103	10.1	4.5	2.5	15	7.0	6.6	.11	26	.17	.099L	B	D221103
D221104	19.9	39	9.5	12	5.3	.58	.62	8.3	.47	.10	B	D221104
D221105	10.3	21	8.3	17	9.0	5.9	.24	8.6	.47	.49	B	D221105
D221106	6.3	6.6	7.2	21	6.5	11	.24	6.1	.17	.16	B	D221106
D213983	7.2	34	19	13	4.1	2.4	.12	3.2	.60	.14L	B	D213983
D213984	16.0	43	18	11	2.3	8.9	.26	2.3	1.6	.063	B	D213984
D213985	8.5	14	9.6	15	8.5	14	.10	4.0	.32	.12L	B	D213985
D213986	31.6	66	7.4	4.2	1.8	3.9	1.1	3.6	1.1	.060	B	D213986
D213987	14.1	15	9.5	9.9	3.5	9.2	.12	19	.58	.071L	B	D213987
D213988	21.3	36	12	5.0	2.5	4.7	2.0	17	.48	.14	B	D213988
D213989	8.3	21	8.9	15	3.7	17	.12	3.4	.45	.12	B	D213989
D213990	15.1	20	8.1	11	2.5	10	.12	16	.84	.073L	B	D213990
D213991	7.7	12	9.1	17	4.6	17	.28	3.7	.25	.13L	B	D213991
D213992	24.2	51	10	6.2	1.8	5.8	.36	6.4	.87	.041	B	D213992
D213993	18.5	32	13	8.3	2.3	7.1	.12	12	1.2	.049	B	D213993
D213994	7.8	14	11	17	6.0	11	.22	6.7	.25	.13L	B	D213994
D213995	11.9	43	14	9.4	3.8	7.4	1.1	3.6	1.1	.084	B	D213995

Table 1e. (cont'd.) Major- and minor- oxides in the laboratory ash of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	ASH	SIO2	AL2O3	CAO	MGO	NA2O	K2O	FE2O3	TIO2	P2O5	SO3	SAMPLE NUMBER
D213996	20.8	34	8.7	8.5	2.0	5.3	0.12	14	1.6	0.048	B	D213996
D213997	9.5	20	7.9	15	5.5	8.6	.25	8.6	.48	.21	B	D213997
D213998	14.2	39	12	11	4.8	7.4	.36	1.4	1.5	.070	B	D213998
D213999	13.3	12	6.4	12	3.2	3.1	.10	29	.27	.083L	B	D213999
D214000	10.8	28	9.8	11	2.3	9.8	.12	8.6	.95	.19	B	D214000
D214001	9.3	21	14	14	5.1	12	.22	4.0	.50	.11L	B	D214001
D196399	7.6	15	21	25	7.2	15	.27	3.1	.50	.79	15	D196399
D196400	13.5	14	12	15	4.0	7.0	.42	22	.33	.59	34	D196400
D196401	15.3	49	9.1	15	4.3	3.3	.32	11	.49	.13	23	D196401
D196402	10.6	14	14	17	5.2	3.4	.27	21	.32	.28	B	D196402
D196403	13.5	13	15	13	4.1	7.0	.46	22	.21	.67	30	D196403
D196404	16.0	35	23	9.7	3.3	8.2	.97	9.0	B	.25	B	D196404
D196405	13.7	B	16	B	3.8	9.0	.23	15	.61	.073L	B	D196405
D196406	9.5	32	23	17	3.7	13	.40	4.5	.61	.11	13	D196406
D196407	11.6	10	8.3	15	2.9	11	.26	20	.32	.086	B	D196407
D210365	11.9	B	B	B	3.9	3.9	B	B	B	.17	B	D210365
D210368	23.1	58	13	6.7	2.5	4.5	1.7	3.0	.65	.043	B	D210368
D210369	8.5	B	B	B	5.0	12	B	B	B	.12	B	D210369
D210371	11.4	16	7.4	15	4.5	5.6	.24	14	.32	.35	B	D210371
D210372	17.7	34	12	11	3.3	1.6	1.4	12	.45	.17	B	D210372
D218907	5.0	20	8.1	27	6.4	4.7	.48	4.0	.33	1.2	B	D218907
D210366	8.3	B	B	B	4.0	9.9	B	B	B	.24	B	D210366
D210370	8.4	18	9.6	22	5.7	1.1	.42	9.3	.42	.12L	B	D210370
D196593	31.6	59	12	7.0	3.3	.38	2.2	4.8	.60	.22	6.8	D196593
D196594	20.5	47	11	11	5.0	.61	1.7	5.0	.60	.20	10	D196594
D196595	25.8	57	14	11	4.5	.80	2.0	2.8	.60	.19	5.5	D196595
D196596	22.9	48	13	10	4.8	3.0	2.3	4.8	.70	.13	11	D196596
D196597	29.2	57	12	6.6	3.7	2.3	2.2	4.1	.60	.14	8.3	D196597
D240973	7.0	8.6	7.3	34	5.3	.69	.17	4.1	.20	.69	B	D240973
D240974	12.9	35	12	16	4.6	1.5	1.6	6.0	.52	.078L	B	D240974
D240975	9.3	27	13	18	4.1	8.6	.52	5.3	.45	.11L	B	D240975
D240976	6.7	11	7.3	28	5.5	2.6	.17	5.3	.32	.15L	B	D240976
D240977	7.5	11	7.4	22	4.8	14	.22	4.0	.25	.45	B	D240977
D240978	12.7	35	23	11	3.7	9.2	.37	2.1	.53	.079L	B	D240978
D240979	8.0	8.4	6.1	16	4.6	13	.26	13	.37	.12L	B	D240979
D240980	11.3	16	7.5	17	4.6	2.7	.28	17	.40	.088L	B	D240980
D240981	30.2	49	18	6.9	3.2	1.8	2.0	5.6	.57	.21	B	D240981
D240982	12.2	32	13	14	3.2	11	1.3	3.6	.48	.48	B	D240982
D240983	13.9	29	13	9.7	3.7	8.1	1.2	4.4	.55	.32	B	D240983
D240984	8.6	12	8.6	18	4.0	.74	.16	17	.37	.59	B	D240984

Table 1e. (cont'd.) Major- and minor- oxides in the laboratory ash of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	ASH	SIO2	AL2O3	CAO	MGO	NA2O	K2O	FE2O3	TIO2	P2O5	SO3	SAMPLE NUMBER
D240985	7.8	10	8.2	17	4.8	13	0.19	6.2	0.33	0.76	B	D240985
D240986	13.7	10	8.1	11	3.7	8.6	.13	22	.32	.31	B	D240986
D240987	9.0	26	12	17	4.5	12	1.0	4.5	.53	.57	B	D240987
D240988	9.3	17	9.2	15	4.1	13	.55	8.4	.32	.66	B	D240988
D240989	13.8	28	13	14	4.0	2.3	.38	11	.63	.072L	B	D240989
D240990	11.4	H	H	H	3.7	11	H	H	H	.22	B	D240990
D240991	14.2	27	9.4	11	4.0	5.5	.98	14	.90	.27	B	D240991
D240992	11.5	24	12	14	3.7	10	.95	6.4	.50	.31	B	D240992
D210367	21.8	51	14	8.8	2.0	5.3	2.2	4.0	.43	.046	B	D210367
D175972	9.2	22	11	15	5.9	9.6	.36	7.9	.75	1.0L	19	D175972
D175973	9.2	9.9	5.1	17	6.1	1.7	.28	19	.36	1.0L	28	D175973
D175974	10.7	8.1	5.1	18	5.8	1.3	.27	17	.31	1.0L	35	D175974
D175975	8.3	4.4	4.9	19	6.6	3.0	.32	15	.24	1.0L	41	D175975
D165751	6.4	14	13	31	11	.20	.10L	.9	B	1.1	12	D165751
D165752	8.0	11	12	31	12	.30	.10L	1.6	B	4.2	15	D165752
D165753	7.1	11	11	38	7.2	.11	.10L	.7	B	1.6	8.3	D165753
D165754	7.9	6.1	11	31	5.8	.23	.10L	8.4	B	3.4	27	D165754
D165755	6.5	3.4	11	27	9.3	.13	.10L	9.1	B	4.6	28	D165755
D165756	6.2	2.9	14	30	9.4	.14	.10L	5.9	B	7.0	23	D165756
D165757	11.3	23	14	27	9.8	.17	.10L	.8	B	.053L	8.9	D165757
D165758	8.7	23	13	25	11	.38	.10L	.9	B	.43	8.7	D165758
D165759	6.2	8.5	12	30	8.1	.57	.10L	3.4	B	2.1	19	D165759
D165760	8.6	28	11	23	9.5	.35	.10L	2.1	B	.14	15	D165760
D165761	7.2	19	15	28	12	.44	.10L	.5	B	1.3	9.5	D165761
D165762	5.0	5.9	11	33	14	.65	.10L	1.4	B	.81	19	D165762
D165763	14.2	31	19	23	6.3	.14	.10L	1.6	B	.049L	7.4	D165763
D165764	12.2	27	14	30	6.3	.08	.10L	1.4	B	.049L	9.8	D165764
D165765	12.1	22	21	20	6.4	.15	.10L	3.0	B	1.3	15	D165765
D165766	15.8	28	20	16	5.0	.12	.10L	2.7	B	.051L	12	D165766
D178086	13.1	22	16	13	5.6	2.2	.27	8.2	.39	1.0L	17	D178086
D178087	13.1	12	10	13	5.4	.51	.08	15	.24	1.0L	24	D178087
D178088	11.5	3.3	5.0	15	5.6	.53	.14	26	.26	1.0L	33	D178088
D188118	13.7	35	14	25	7.6	2.0	.84	3.3	.57	1.0L	5.2	D188118
D188119	9.4	16	6.1	35	7.6	3.3	.60	6.4	.55	1.0L	12	D188119
D188120	10.2	24	11	32	7.9	3.5	.61	3.8	.53	1.0L	9.6	D188120
D188121	9.2	12	7.3	28	7.1	8.8	.33	9.7	.27	1.0L	22	D188121
D188122	8.8	22	10	29	7.1	9.3	.39	2.1	.44	1.0L	6.4	D188122
D188123	13.1	26	14	24	5.1	4.3	.45	7.5	.61	1.0L	17	D188123
D188124	10.3	13	4.2	24	6.0	6.8	.37	15	.43	1.0L	30	D188124
D188125	7.7	7.6	5.0	40	12	2.5	.40	5.3	.58	1.0L	5.8	D188125

Table 1e. (cont'd.) Major- and minor- oxides in the laboratory ash of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	ASH	SIO2	AL2O3	CAO	MGO	NA2O	K2O	FE2O3	TIO2	P2O5	SO3	SAMPLE NUMBER
D188126	6.7	13	6.9	36	9.4	3.3	0.39	7.5	0.61	1.0L	11	D188126
D188127	9.4	19	7.9	31	4.8	9.1	.55	6.1	.76	1.0L	11	D188127
D188128	14.5	18	10	22	6.5	.23	.36	16	.69	1.0L	27	D188128
D188129	10.4	21	9.1	28	8.8	.30	.46	7.5	.77	1.0L	18	D188129
D188130	12.9	29	12	22	7.1	.33	.73	7.2	.66	1.0L	13	D188130
D188131	8.4	14	8.6	36	12	.34	.35	3.0	.52	1.0L	13	D188131
D188132	10.3	14	8.0	29	10	.32	.39	8.4	.80	1.0L	20	D188132
D188133	16.8	49	14	14	4.8	.24	2.5	2.0	.75	1.0L	4.9	D188133
D188134	19.0	45	16	16	5.4	.35	1.5	2.7	.83	1.0L	7.9	D188134
D188135	10.1	9.8	6.9	26	7.1	.18	.33	20	.40	1.0L	32	D188135
D188136	14.7	22	9.7	21	5.8	.30	.84	15	.48	1.0L	26	D188136
D188137	8.4	17	7.3	37	11	.35	.28	.7	.49	1.0L	13	D188137
D188138	11.1	21	9.7	22	5.3	8.4	1.0	6.6	.86	1.0L	22	D188138
D188140	10.4	33	11	13	3.7	8.6	1.5	6.4	.66	1.0L	23	D188140
D188141	12.4	14	7.6	18	4.7	8.0	.33	16	.95	1.0L	29	D188141
D188142	17.5	25	10	22	6.1	11	.50	4.3	1.1	1.0L	13	D188142
D188143	9.1	22	13	24	6.2	11	.55	4.8	1.0	1.0L	10	D188143
D188144	9.7	31	8.0	24	7.4	3.0	.64	7.5	.77	1.0L	17	D188144
D188145	14.0	22	12	19	3.7	6.8	.37	13	1.1	1.0L	24	D188145
D189256	9.0	20	12	26	8.2	.15	.24	4.7	.53	1.0L	17	D189256
D189257	7.1	14	12	33	10	.17	.03L	3.0	.78	1.2	15	D189257
D189258	9.0	9.7	5.4	25	8.9	.15	.04	13	.71	1.0L	27	D189258
D189259	8.7	19	9.4	31	10	.19	.03L	1.4	.62	1.0L	11	D189259
D189260	11.5	22	11	16	4.2	1.8	.69	12	.61	1.0L	21	D189260
D189261	6.1	7.6	8.2	31	7.5	4.4	.03L	6.8	.47	1.0L	24	D189261
D189262	7.8	14	10	31	8.3	3.6	.04	4.1	.50	1.0L	14	D189262
D189263	6.8	4.9	4.9	24	7.5	1.9	.08	17	.36	1.0L	35	D189263
D196643	13.2	32	11	14	6.4	1.1	1.1	8.3	.60	.083	7.9	D196643
D196644	12.9	32	11	14	6.5	1.1	1.1	7.0	.50	.093	8.4	D196644
D196645	13.6	29	13	14	5.7	2.9	.50	4.5	1.1	.029	7.7	D196645
D196646	13.3	30	14	15	6.0	3.0	.50	4.4	1.3	.023	8.0	D196646
D196647	17.2	18	6.0	9.1	3.7	2.3	.70	24	.80	.012L	11	D196647
D196648	14.0	28	11	12	4.6	2.8	1.2	5.9	.40	.007L	12	D196648
D196649	40.2	16	4.3	2.3	.95	.62	.70	53	.10	.010L	5.5	D196649
D196650	10.9	24	13	19	7.0	3.0	.50	4.0	.70	.018	9.0	D196650
D196651	31.9	55	17	3.7	2.1	1.1	1.9	6.0	.50	.009L	3.7	D196651
D196652	17.0	47	13	11	4.9	1.9	.80	2.8	.90	.018	3.5	D196652
D196653	10.5	25	13	16	6.1	1.8	.60	8.3	.40	.019	9.9	D196653
D196654	27.1	56	13	5.1	3.1	1.7	3.0	5.5	.50	.011L	4.8	D196654
D196655	15.2	21	7.8	11	4.1	2.3	.60	19	.60	.020	12	D196655

Table 1e. (cont'd.) Major- and minor- oxides in the laboratory ash of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	ASH	SIO2	AL203	CAO	MGO	NA2O	K2O	FE203	TIO2	P2O5	SO3	SAMPLE NUMBER
D196656	15.5	20	7.1	11	4.0	2.4	0.50	18	0.40	0.019	11	D196656
D196657	10.6	25	17	15	5.9	6.8	.40	3.7	.50	.009L	6.8	D196657
D196658	22.9	44	9.0	7.4	4.6	.18	1.1	10	1.2	.009L	7.6	D196658
D196659	13.4	24	8.0	17	6.6	.26	.80	8.5	.50	.022	11	D196659
D196660	12.8	24	7.8	18	6.9	.32	.80	9.6	.50	.031	9.8	D196660
D196661	26.4	12	5.4	5.4	2.4	.60	.20	46	.20	.011L	6.7	D196661
D196662	13.0	28	12	12	4.7	5.5	.70	11	.50	.008L	11	D196662
D196641	12.9	28	11	14	5.9	.37	1.0	7.3	.60	.008	7.9	D196641
D196642	17.5	11	7.0	8.6	4.1	.21	.50	36	.20	.011L	8.7	D196642
D221125	12.8	30	12	14	5.7	.34	.80	11	.99	.078L	B	D221125
D221126	13.0	30	18	15	5.4	.37	.78	9.0	.32	.077	B	D221126
D221127	20.0	34	18	8.5	2.5	4.2	1.2	10	.57	.050L	B	D221127
D221128	23.1	47	23	9.5	2.2	4.0	1.7	2.3	.63	.043	B	D221128
D221129	13.3	34	13	15	1.4	.51	1.2	4.0	.45	.075	B	D221129
D221130	9.7	32	16	18	4.8	.77	.98	6.0	.48	.21	B	D221130
D221131	18.5	41	25	8.7	1.5	4.6	1.6	3.9	.58	.054	B	D221131
D221132	29.3	41	16	7.3	3.4	.61	1.9	12	.47	.068	B	D221132
D221133	12.4	28	16	20	5.3	1.2	.43	4.4	.50	.081L	B	D221133
D221134	14.6	41	17	12	2.2	5.0	1.9	3.9	.58	.41	B	D221134
D221135	27.8	45	23	6.6	1.4	3.5	2.4	2.2	.80	.072	B	D221135
D221136	21.0	26	9.1	11	4.2	1.0	1.0	21	.25	.29	B	D221136
D221137	24.7	41	16	6.7	3.4	1.1	2.0	11	.53	.12	B	D221137
D221138	9.3	28	19	21	5.9	.44	.43	3.4	.45	.11	B	D221138
D221139	15.0	28	21	9.9	3.0	5.4	.44	9.3	.38	.067L	B	D221139
D221140	10.9	34	16	12	4.0	6.9	1.3	5.4	.43	.46	B	D221140
D221141	21.5	43	18	5.3	2.1	3.7	1.1	11	.58	.093	B	D221141
D221142	18.6	28	18	12	4.4	.25	.29	11	.55	.054	B	D221142
D221143	9.8	18	12	20	6.8	4.0	.48	9.7	.28	.61	B	D221143
D221144	14.4	28	14	13	4.9	3.4	1.2	9.1	.43	.14	B	D221144
D221145	13.9	21	11	13	4.6	1.2	.53	17	.30	.36	B	D221145
D196598	21.1	44	12	11	5.0	.90	1.9	5.8	.60	.14	13	D196598
D196599	40.7	53	11	8.5	3.7	1.0	2.6	5.3	.50	.10	7.0	D196599
D209953	10.7	16	10	15	4.5	10	.25	10	.27	.093L	B	D209953
D209954	9.4	12	7.4	14	4.2	10	.26	14	.23	.11L	B	D209954
D209955	16.0	39	19	8.5	2.7	6.3	1.1	5.1	.45	.063L	B	D209955
D209956	15.6	41	21	10	2.7	6.8	1.2	2.7	.77	.13	B	D209956
D209957	12.9	36	18	13	6.2	.63	1.3	5.7	.63	.39	B	D209957
D209958	9.0	28	16	20	9.2	.84	.66	4.3	.57	.33	B	D209958
D209959	10.8	28	13	13	5.2	7.3	1.1	9.1	.53	.56	B	D209959
D209960	7.4	15	12	22	6.7	9.5	.36	7.0	.42	.95	B	D209960

Table 1e. (cont'd.) Major- and minor- oxides in the laboratory ash of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	ASH	SIO2	AL2O3	CAO	MGO	NA2O	K2O	FE2O3	TIO2	P2O5	SO3	SAMPLE NUMBER
D209961	10.9	34	17	14	5.0	9.0	0.83	4.4	0.58	0.18	B	D209961
D209962	16.2	30	13	10	4.9	.90	1.0	12	.43	.19	B	D209962
D209963	10.1	26	15	18	8.7	.96	.53	4.6	.55	1.3	B	D209963
D209964	15.6	21	7.4	7.3	3.9	.61	1.1	29	.37	.064	B	D209964
D209965	11.4	32	21	15	6.7	.77	1.0	3.2	.62	.088	B	D209965
D209966	27.5	51	21	6.3	3.3	.80	1.8	2.9	.65	.036	B	D209966
D209967	31.7	51	16	4.6	1.7	3.8	.98	6.4	.94	.032L	B	D209967
D209968	22.6	43	17	6.3	2.3	4.6	1.1	6.4	.55	.044L	B	D209968
D240927	9.0	18	12	22	9.8	6.3	.20	2.8	.33	.12	B	D240927
D240928	13.4	36	18	13	6.5	5.1	.78	3.3	.63	.075L	B	D240928
D240929	7.9	13	8.6	29	12	.49	.18	3.9	.27	.25	B	D240929
D240930	7.2	10	12	31	14	1.9	.20	2.7	.28	.14L	B	D240930
D240931	10.0	19	13	24	9.6	1.2	.22	3.6	.43	.54	B	D240931
D240932	9.7	15	9.1	24	10	.45	.24	7.4	.33	.29	B	D240932
D240933	7.9	15	12	28	12	.42	.23	1.8	.28	.13L	B	D240933
D240934	9.1	16	11	28	9.3	.24	.28	2.4	.28	.55	B	D240934
D240935	7.7	13	8.4	25	11	1.8	.22	7.0	.28	.38	B	D240935
D240936	17.8	36	24	13	4.8	2.2	.34	4.0	.70	.11	B	D240936
D240937	9.8	14	11	24	9.1	3.1	.28	9.1	.25	.83	B	D240937
D240938	8.6	15	14	28	12	.90	.14	2.5	.32	.88	B	D240938
D240939	10.4	29	15	14	6.8	8.5	1.2	6.3	.43	.096L	B	D240939
D240940	7.9	19	11	28	11	4.4	.26	2.5	.35	.25	B	D240940
D240941	9.1	21	11	24	7.6	8.0	.35	4.3	.35	.56	B	D240941

Table 1f. Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region-North Dakota and Montana.

[Values in percent or parts-per-million. Elements not determined on whole coal (figure 3) have been calculated from analyses of ash. S = analysis by six-step emission spectrography; L, less than the value shown; H, interference for an element which cannot be resolved by any routine method; B, not determined; G, greater than; N not detected.]

SAMPLE NUMBER	SI (PERCENT)	AL (PERCENT)	CA (PERCENT)	MG (PERCENT)	NA (PERCENT)	K (PERCENT)	FE (PERCENT)	TI (PERCENT)	AG-S (PPM)	AS (PPM)	SAMPLE NUMBER
D165564	0.43	0.11	1.3	0.24	0.43	0.006L	0.21	B	N	10	D165564
D165565	.64	.26	1.2	.21	.53	.006L	.25	B	N	5.0	D165565
D165566	.21	.17	1.3	.21	.50	.011	.20	B	N	15	D165566
D165567	.31	.14	1.1	.17	.39	.005L	.22	B	N	5.0	D165567
D165568	.58	.19	1.5	.39	.092	.009L	1.5	B	N	10	D165568
D165569	1.4	.59	1.3	.33	.052	.10	.60	B	N	8.0	D165569
D165570	.41	.26	1.4	.34	.070	.005L	.18	B	N	5.0	D165570
D165571	.41	.30	1.4	.33	.065	.015	.19	B	N	5.0	D165571
D165572	.94	.51	.87	.25	.30	.060	1.3	B	N	30	D165572
D165573	.38	.35	1.0	.26	.29	.030	.36	B	N	10	D165573
D165574	2.7	1.1	2.8	.40	.50	.029	.87	B	N	5.0	D165574
D165575	5.0	1.6	1.7	.43	.47	.15	1.2	B	N	8.0	D165575
D165576	1.5	.54	1.5	.35	.25	.008L	.20	B	N	4.0	D165576
D165577	1.3	.63	1.4	.34	.30	.013	.58	B	N	10	D165577
D165578	.79	.44	1.3	.29	.25	.009L	1.1	B	N	10	D165578
D165579	1.3	.59	1.4	.33	.27	.009L	.53	B	N	15	D165579
D165605	.20	.22	1.8	.38	.048	.006L	.27	B	N	4.0	D165605
D165606	.29	.28	1.6	.44	.049	.006L	.23	B	N	5.0	D165606
D165607	1.4	.59	1.7	.42	.096	.008L	.28	B	N	10	D165607
D165608	1.3	.68	1.7	.43	.11	.019	.34	B	N	10	D165608
D165609	.34	.20	1.6	.40	.050	.006L	.33	B	N	5.0	D165609
D165610	.27	.23	2.0	.41	.051	.006L	.20	B	N	4.0	D165610
D165611	.46	.41	2.1	.41	.048	.007L	.22	B	N	4.0	D165611
D165612	.62	.27	1.6	.43	.048	.006L	.27	B	N	4.0	D165612
D165613	.66	.43	1.6	.42	.052	.007L	.26	B	N	5.0	D165613
D165632	1.6	.71	1.1	.24	.33	.066	.44	B	N	8.0	D165632
D165974	1.8	1.1	1.6	.53	.14	.009L	.087	B	N	1.0	D165974
D165975	.21	.32	1.3	.34	.023	.005L	.16	B	N	2.0	D165975
D165976	.34	.19	2.1	.42	.023	.010L	1.6	B	N	4.0	D165976
D165977	.17	.19	1.4	.37	.14	.006L	.69	B	N	4.0	D165977
D165978	1.0	.44	1.3	.39	.060	.006L	.048	B	N	1.0	D165978
D165979	.88	.61	1.6	.53	.042	.009L	.96	B	N	5.0	D165979
D165980	.55	.35	1.6	.44	.035	.009L	1.1	B	N	2.0	D165980
D165981	.47	.38	1.7	.50	.027	.006L	.078	B	N	1.0	D165981
D165982	.03	.23	1.3	.30	.057	.005L	.51	B	N	10	D165982
D165983	.07	.20	1.7	.45	.092	.007L	.54	B	N	2.0	D165983
D165984	.34	.57	1.4	.42	.15	.007L	.55	B	N	2.0	D165984
D165985	.21	.48	1.4	.44	.16	.006L	.11	B	N	2.0	D165985
D165986	.41	.51	1.6	.45	.17	.009L	1.1	B	N	5.0	D165986
D165987	1.6	1.2	1.8	.49	.14	.010L	.010	B	N	1.0	D165987

Table 1f. (cont'd.) Major-, minor-, and trace element-concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	B-S (PPM)	BA-S (PPM)	BE-S (PPM)	CD (PPM)	CE (PPM)	CL (PPM)	CO (PPM)	CR (PPM)	CU (PPM)	DY-S (PPM)	SAMPLE NUMBER
D165564	110	350	0.35	0.070L	B	B	0.49	1.4	3.4	N	D165564
D165565	110	360	.36	.072L	B	B	.72	7.2	6.4	B	D165565
D165566	98	330	.20	.065L	B	B	.65	2.0	3.7	B	D165566
D165567	120	400	.87	.058L	B	B	.87	1.7	2.4	B	D165567
D165568	160	220	N	.11L	B	B	N	.76	3.2	B	D165568
D165569	150	300	.30	.099L	B	B	.99	7.0	7.2	B	D165569
D165570	190	130	N	.065	B	B	.45	1.9	2.9	B	D165570
D165571	190	190	N	.063L	B	B	.44	.94	4.3	B	D165571
D165572	100	310	.31	.10L	B	B	1.5	5.1	4.7	B	D165572
D165573	200	460	.33	.066L	B	B	1.3	2.0	3.3	N	D165573
D165574	95	1,300	2.9	.19L	B	B	1.3	5.7	7.3	N	D165574
D165575	160	2,300	3.5	.24L	B	B	2.4	12	11	N	D165575
D165576	96	670	.29	.096L	B	B	.67	2.9	7.5	B	D165576
D165577	110	740	1.1	.11L	B	B	1.6	3.2	11	N	D165577
D165578	100	1,000	.31	.10L	B	B	.73	1.6	5.6	B	D165578
D165579	72	720	.31	.10L	B	B	.72	2.1	5.8	B	D165579
D165605	100	340	14	.069L	B	B	.69	1.0	3.4	B	D165605
D165606	100	1,000	N	.068L	B	B	.68	2.0	4.7	B	D165606
D165607	100	700	N	.10L	B	B	1.0	2.0	8.0	B	D165607
D165608	100	520	N	.11L	B	B	1.1	5.3	12	B	D165608
D165609	140	680	N	.068L	B	B	N	1.0	3.4	B	D165609
D165610	110	740	N	.074L	B	B	N	1.1	3.4	B	D165610
D165611	83	830	N	.083L	B	B	N	2.5	4.3	B	D165611
D165612	110	530	N	.076L	B	B	N	2.3	4.0	B	D165612
D165613	130	580	N	.083L	B	B	N	1.3	5.7	B	D165613
D165632	53	320	1.1	.11	B	B	2.1	7.5	11	B	D165632
D165974	170	170	1.1	.11L	B	B	3.4	2.3	7.5	N	D165974
D165975	180	120	1.8	.061L	B	B	1.8	3.1	4.2	N	D165975
D165976	83	180	N	.12L	B	B	1.2	.83	3.3	B	D165976
D165977	150	220	N	.073L	B	B	.73	1.1	2.3	B	D165977
D165978	150	120	N	.077L	B	B	1.2	2.3	6.7	B	D165978
D165979	230	79	N	.11L	B	B	N	1.7	8.1	B	D165979
D165980	310	520	N	.10L	B	B	N	1.0	4.2	B	D165980
D165981	220	52	N	.074L	B	B	N	1.1	3.6	B	D165981
D165982	190	13	N	.064L	B	B	N	.96	2.9	B	D165982
D165983	160	16	N	.080L	B	B	N	1.2	3.7	B	D165983
D165984	260	86	N	.086L	B	B	N	.86	4.0	B	D165984
D165985	220	22	N	.074L	B	B	.74	1.5	4.7	B	D165985
D165986	310	51	N	.10L	B	B	1.0	1.5	3.3	B	D165986
D165987	230	350	N	.12L	B	B	1.2	5.9	15	B	D165987

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	EU (PPM)	F (PPM)	GA-S (PPM)	GD-S (PPM)	GE-S (PPM)	HF (PPM)	HG (PPM)	LA (PPM)	LI (PPM)	MN (PPM)	SAMPLE NUMBER
D165564	N	20L	0.49	N	N	N	0.10	4.9	0.98	35	D165564
D165565	N	20L	1.4	B	1.4	N	.090	5.0	1.1	11	D165565
D165566	N	20L	.98	B	N	N	.080	4.6	.65	20	D165566
D165567	N	20L	1.2	B	4.0	N	.050	4.0	.46	8.7	D165567
D165568	N	20	1.1	B	N	N	.22	7.6	.86	11	D165568
D165569	N	30	2.0	B	N	N	.11	7.0	1.6	15	D165569
D165570	N	20L	.97	B	N	N	.050	4.5	.91	19	D165570
D165571	N	20L	1.3	B	N	N	.050	N	.88	31	D165571
D165572	N	20L	2.0	B	N	N	.21	N	1.8	20	D165572
D165573	N	20L	.99	N	N	N	.19	N	.66	20	D165573
D165574	N	20	5.7	N	13	N	.10	N	7.6	190	D165574
D165575	N	50	7.1	N	12	N	.10	16	9.9	70	D165575
D165576	N	20L	1.9	B	N	N	.050	9.6	3.4	48	D165576
D165577	N	20L	3.2	N	N	N	.070	7.4	3.8	32	D165577
D165578	N	20L	2.1	B	N	N	.34	7.3	2.1	31	D165578
D165579	N	20L	2.1	B	N	N	.11	7.2	3.3	31	D165579
D165605	N	40	1.0	B	N	N	.090	N	1.5	210	D165605
D165606	N	20	1.4	B	N	N	.070	N	2.0	20	D165606
D165607	N	20L	2.0	B	N	N	.23	7.0	7.0	15	D165607
D165608	N	35	2.1	B	N	N	.17	7.4	7.2	21	D165608
D165609	N	30	.68	B	N	N	.080	N	1.5	20	D165609
D165610	N	35	1.1	B	N	N	.15	5.2	1.4	74	D165610
D165611	N	20L	1.3	B	N	N	.070	5.8	4.3	58	D165611
D165612	N	20	1.1	B	N	N	.10	N	2.5	23	D165612
D165613	N	30	1.3	B	N	N	.25	5.8	4.3	17	D165613
D165632	N	70	2.1	B	2.1L	N	.090	7.5	3.9	32	D165632
D165974	N	40	5.7	N	N	N	.080	7.9	8.1	34	D165974
D165975	N	20L	1.8	N	1.8	N	.050	4.3	2.5	43	D165975
D165976	N	30	B	B	N	N	.15	N	1.2L	18	D165976
D165977	N	20L	B	B	N	N	.12	N	1.0	15	D165977
D165978	N	20L	1.5	B	N	N	.14	N	5.1	77	D165978
D165979	N	20L	1.7	B	N	N	.48	N	7.5	56	D165979
D165980	N	20	B	B	N	N	.37	N	2.1	73	D165980
D165981	N	20L	1.1	B	N	N	.070	5.2	2.1	74	D165981
D165982	N	20L	.96	B	N	N	.090	N	.64L	64	D165982
D165983	N	20L	.80	B	N	N	.060	N	.96	80	D165983
D165984	N	20L	1.3	B	1.7L	N	.40	6.0	4.5	43	D165984
D165985	N	20	2.2	B	N	N	.090	N	3.8	52	D165985
D165986	N	20L	1.5	B	2.1L	N	.42	N	5.6	51	D165986
D165987	N	20L	8.2	B	8.2	N	.12	8.2	19	82	D165987

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	MO-S (PPM)	NB-S (PPM)	ND-S (PPM)	NI-S (PPM)	P (PPM)	PB (PPM)	SB (PPM)	SC (PPM)	SE (PPM)	SN-S (PPM)	SAMPLE NUMBER
D165564	0.49	N	N	1.1	17L	1.8L	0.20	1.1	0.70	N	D165564
D165565	2.1	1.4	N	2.1	17	1.8L	.70	1.4	.78	N	D165565
D165566	2.0	N	N	1.3	13L	2.0	.40	.98	.76	N	D165566
D165567	1.7	1.7	N	1.2	13L	1.4L	3.0	1.7	.46	N	D165567
D165568	.76	N	N	1.1	22L	2.7L	.10	N	1.0	N	D165568
D165569	1.5	N	N	3.0	22L	5.0	.50	1.5	1.3	N	D165569
D165570	.45	N	N	.97	13L	1.6	.30	N	1.6	N	D165570
D165571	.44	N	N	.94	17	2.5	.30	.94	.74	N	D165571
D165572	1.5	N	N	3.1	26	3.1	.50	3.1	.63	N	D165572
D165573	.99	N	N	2.0	39	1.6L	.20	2.0	.63	N	D165573
D165574	1.3	3.8	N	1.9	48	7.6	1.1	5.7	1.2	N	D165574
D165575	1.6	4.7	N	4.7	70	7.1	1.0	7.1	1.5	N	D165575
D165576	1.4	1.9	N	1.4	410	4.8	.30	1.9	.54	N	D165576
D165577	5.3	N	N	5.3	120	5.3	1.4	3.2	.79	N	D165577
D165578	1.6	N	N	1.0	320	3.1	.40	1.6	.88	N	D165578
D165579	1.5	N	N	2.1	260	5.2	.30	2.1	.96	N	D165579
D165605	.48	N	N	.69	13L	2.1	.20	N	.46	N	D165605
D165606	.68	N	N	1.0	44	2.0	.20	.68	.39	N	D165606
D165607	1.0	N	N	1.5	83	3.0	.30	1.0	.99	N	D165607
D165608	1.6	N	N	3.2	110	4.2	.50	1.6	1.3	N	D165608
D165609	.48	N	N	.68	70	2.0	.10	N	.34	N	D165609
D165610	.52	N	N	.74	310	2.2	.10	N	.31	N	D165610
D165611	.58	N	N	.83	74	2.5	.20	1.3	.50	N	D165611
D165612	.53	N	N	.76	31	2.3	.20	.76	.53	N	D165612
D165613	.58	N	N	1.3	180	3.3	.20	.83	.84	N	D165613
D165632	.75	N	N	5.4	44	4.3	1.0	2.1	.47	N	D165632
D165974	N	2.3	N	7.9	26L	6.8	.20	1.7	1.0	N	D165974
D165975	.43	N	9.2	1.2	17	2.1	.20	4.3	.39	N	D165975
D165976	N	N	N	1.8	35	3.0L	.20	N	.53	N	D165976
D165977	.51	N	N	1.5	31	1.8	.20	N	.42	N	D165977
D165978	N	1.5	N	1.2	17L	3.1	.20	.77	.84	N	D165978
D165979	1.1	N	N	N	26L	5.1	.50	N	1.2	N	D165979
D165980	N	N	N	1.0	31	4.2	.20	N	.72	N	D165980
D165981	.52	N	N	.74	17	3.3	.10	N	.24	N	D165981
D165982	1.9	N	N	.64	13L	2.6	.10	N	.41	N	D165982
D165983	1.2	N	N	.80	120	3.2	.10	N	.38	N	D165983
D165984	2.6	N	N	.86	130	3.9	.20	N	.88	N	D165984
D165985	11	N	N	1.1	39	3.3	.50	.74	.63	N	D165985
D165986	3.1	N	N	1.5	22	4.6	.40	1.0	.55	N	D165986
D165987	1.2	2.3	N	1.8	26L	11	.40	1.8	1.1	N	D165987

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	SR-S (PPM)	TH (PPM)	TL-S (PPM)	U (PPM)	V-S (PPM)	W (PPM)	Y-S (PPM)	YB (PPM)	ZN (PPM)	ZR-S (PPM)	SAMPLE NUMBER
D165564	490	9.4	N	2.1	2.1	N	4.9	1.1	1.4	11	D165564
D165565	500	N	N	1.1	11	N	3.6	.36	2.1	14	D165565
D165566	650	N	N	.61	6.5	N	3.3	.20	1.3	4.6	D165566
D165567	580	N	N	.65	4.0	N	2.9	.29	2.3	12	D165567
D165568	540	N	N	.47	1.6	N	N	B	2.2	5.4	D165568
D165569	500	3.7	N	1.5	9.9	N	2.0	.20	1.8	7.0	D165569
D165570	650	N	N	.84	4.5	N	1.3	.13	1.6	4.5	D165570
D165571	630	N	N	.70	4.4	N	1.9	.13	1.3	6.3	D165571
D165572	510	N	N	.66	10	N	5.1	.51	28	5.1	D165572
D165573	660	3.0L	N	.43	6.6	N	4.6	.46	3.6	3.3	D165573
D165574	1,300	5.5	N	1.6	29	N	13	1.3	5.3	57	D165574
D165575	1,200	5.6	N	2.2	35	N	16	1.6	15	70	D165575
D165576	670	3.4	N	.93	6.7	N	4.8	.29	1.5	19	D165576
D165577	740	4.0	N	1.9	16	N	7.4	.74	9.1	21	D165577
D165578	730	5.2	N	.71	7.3	N	3.1	.31	2.1	10	D165578
D165579	720	5.0	N	.92	7.2	N	5.2	.31	4.7	15	D165579
D165605	480	N	N	1.4	2.1	N	1.4	.14	3.2	4.8	D165605
D165606	680	N	N	.76	4.7	N	1.4	.14	2.3	6.8	D165606
D165607	500	N	N	1.8	5.0	N	3.0	.30	2.6	15	D165607
D165608	520	4.3	N	2.6	16	N	3.2	.32	2.5	21	D165608
D165609	480	N	N	1.00L	2.0	N	1.4	N	1.8	10	D165609
D165610	520	N	N	.26	3.7	N	1.5	N	1.8	7.4	D165610
D165611	580	N	N	.21	5.8	N	2.5	.25	2.0	13	D165611
D165612	530	3.0L	N	.51	3.8	N	1.5	.15	1.7	11	D165612
D165613	580	3.8	N	1.3	4.2	N	1.7	.17	1.5	13	D165613
D165632	530	N	N	1.0	16	N	5.4	.32	5.8	16	D165632
D165974	340	9.2	N	2.1	3.4	N	7.9	.79	16	56	D165974
D165975	310	4.1	N	1.7	4.3	N	12	1.2	6.1	6.1	D165975
D165976	240	3.0L	N	.31	1.8	N	N	B	2.1	5.9	D165976
D165977	150	N	N	.69	1.1	N	N	B	1.5	2.2	D165977
D165978	230	N	N	.85	2.3	N	3.9	.23	1.9	15	D165978
D165979	560	N	N	1.6	2.3	N	3.4	.34	2.3L	17	D165979
D165980	730	N	N	.31	1.6	N	2.1	.31	2.1L	10	D165980
D165981	520	N	N	.24	2.2	N	1.5	N	1.5L	5.2	D165981
D165982	130	N	N	1.00L	1.3	N	N	N	1.3L	1.9	D165982
D165983	160	N	N	1.00L	1.6	N	N	N	1.6L	2.4	D165983
D165984	600	N	N	1.3	1.7	N	1.7	N	1.7L	6.0	D165984
D165985	520	N	N	.85	3.7	N	2.2	.22	1.5L	7.4	D165985
D165986	510	N	N	.79	5.2	N	2.1	B	2.1L	5.2	D165986
D165987	580	5.6	N	3.2	5.9	N	2.3	N	3.0	18	D165987

Table 1f. (cont'd.) Major-, minor-, and trace- element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	SI (PERCENT)	AL (PERCENT)	CA (PERCENT)	MG (PERCENT)	NA (PERCENT)	K (PERCENT)	FE (PERCENT)	TI (PERCENT)	AG-S (PPM)	AS (PPM)	SAMPLE NUMBER
D165988	1.6	0.47	1.7	0.49	0.17	0.010L	0.42	B	N	2.0	D165988
D165989	.74	.30	1.5	.44	.23	.009L	1.3	B	N	2.0	D165989
D165990	.71	.38	1.7	.50	.16	.008L	.66	B	N	2.0	D165990
D165991	.25	.46	1.7	.51	.24	.007L	.21	B	N	2.0	D165991
D173466	.60	.47	1.2	.34	.17	.015	8.9	.014	N	30	D173466
D173467	2.1	.60	1.5	.45	.35	.013	.025	.074	N	2.0	D173467
D173468	1.6	.62	1.4	.41	.28	.052	3.3	.046	N	15	D173468
D173469	.44	.39	1.2	.35	.38	.006	1.3	.016	.17	4.0	D173469
D175930	.55	.29	1.0	.32	.65	.021	1.9	.035	N	12	D175930
D175931	.54	.33	1.1	.33	.50	.012	.27	.026	N	2.0	D175931
D175932	2.7	.64	1.3	.36	.44	.022	.30	.078	N	2.0	D175932
D175933	.29	.20	.96	.29	.49	.013	.25	.016	N	2.0	D175933
D175934	.28	.18	1.1	.32	.46	.011	.21	.012	N	1.0	D175934
D175935	.94	.35	.83	.27	.67	.029	.24	.042	N	1.0	D175935
D175936	.63	.31	1.4	.36	.079	.011	1.1	.037	N	15	D175936
D175937	1.1	.35	1.4	.38	.075	.011	.28	.047	N	3.0	D175937
D175938	.56	.35	.78	.28	.49	.026	.51	.028	N	8.0	D175938
D175939	.84	.37	.96	.34	.35	.027	.30	.035	N	5.0	D175939
D178143	1.6	.61	.94	.57	.41	.032	.12	.041	.20	4.0	D178143
D178144	.58	.47	1.2	.51	.46	.012	.36	.015	.27	3.5	D178144
D178145	.62	.41	.95	.39	.43	.007	2.8	.047	.31	18	D178145
D178498	3.0	1.0	1.6	.40	.18	.040	2.1	.11	N	9.0	D178498
D178499	.93	.53	1.1	.63	.26	.018	1.9	.037	N	5.0	D178499
D178500	5.7	1.0	.83	.35	.49	.25	1.2	.10	N	13	D178500
D178501	.68	.52	1.3	.48	.33	.012	.24	.038	N	3.0	D178501
D178502	2.9	.56	1.0	.42	.34	.070	.42	.074	N	2.0	D178502
D178503	.54	.20	1.1	.44	.68	.029	1.0	.022	N	18	D178503
D178504	1.3	.46	1.5	.45	.15	.044	.41	.049	N	3.0	D178504
D178505	.75	.57	4.4	.47	.21	.043	.79	.037	N	5.0	D178505
D178506	.48	.39	1.1	.39	.31	.026	.33	.018	N	1.5	D178506
D178507	3.0	2.4	2.4	.39	.17	.15	1.4	.25	N	9.5	D178507
D178508	.54	.31	1.2	.63	.11	.017	.37	.019	N	3.0	D178508
D178509	4.3	.46	.80	.29	.36	.080	1.2	.078	N	5.5	D178509
D178510	.54	.32	1.1	.44	.22	.012	1.1	.025	N	16	D178510
D178511	1.3	.89	1.5	.57	.14	.023	.13	.042	N	2.0	D178511
D178512	.50	.36	1.1	.41	.15	.018	.35	.016	N	2.0	D178512
D179369	.96	.55	1.2	.44	.15	.040	.83	.045	N	5.0	D179369
D179370	.61	.27	.81	.32	.56	.033	1.6	.029	N	8.5	D179370
D179371	.42	.41	1.3	.50	.12	.021	.64	.034	N	4.0	D179371
D179372	2.0	.53	1.3	.45	.38	.069	.37	.059	N	8.5	D179372

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	B-S (PPM)	BA-S (PPM)	BE-S (PPM)	CD (PPM)	CE (PPM)	CL (PPM)	CO (PPM)	CR (PPM)	CU (PPM)	DY-S (PPM)	SAMPLE NUMBER
D165988	230	57	N	0.11L	B	B	N	2.3	7.1	B	D165988
D165989	310	31	N	.10L	B	B	N	1.6	4.4	B	D165989
D165990	300	150	N	.10L	B	B	N	1.5	5.0	B	D165990
D165991	250	41	N	.082L	B	B	N	2.5	6.3	B	D165991
D173466	77	380	N	.26L	N	B	N	1.8	7.2	B	D173466
D173467	180	370	N	.12L	N	B	1.8	3.7	8.3	B	D173467
D173468	140	590	N	.20L	N	B	2.0L	2.9	6.3	B	D173468
D173469	160	330	.77	.11L	N	B	3.3	2.2	4.8	B	D173469
D175930	82	580	N	.12L	N	B	1.2L	1.2	4.0	B	D175930
D175931	48	340	N	.069L	N	B	.69L	1.0	4.6	B	D175931
D175932	180	600	N	.12L	N	B	1.2L	1.8	7.5	B	D175932
D175933	84	110	N	.056L	N	B	.84	1.7	3.1	B	D175933
D175934	82	55	N	.055L	N	B	.55	.83	2.4	B	D175934
D175935	73	510	N	.073L	N	B	.37	2.2	5.4	B	D175935
D175936	96	480	N	.096L	N	B	.96L	1.4	3.8	B	D175936
D175937	59	420	N	.084L	N	B	.84L	8.4	6.2	B	D175937
D175938	73	510	.22	.073L	N	B	.73	1.1	3.9	B	D175938
D175939	110	370	.23	.075L	N	B	1.1	1.5	5.0	B	D175939
D178143	150	100	.71	.10L	51L	B	1.0L	7.1	7.9	N	D178143
D178144	180	89	N	.089L	N	B	.89	2.7	3.4	B	D178144
D178145	160	470	N	.16L	N	B	1.6L	2.3	3.9	B	D178145
D178498	34	68	2.3	1.0	46	B	11	11	21	N	D178498
D178499	160	47	.47	.16L	N	B	1.6	3.1	6.6	B	D178499
D178500	70	350	1.2	.23L	N	B	1.2	12	14	B	D178500
D178501	66	950	.29	.095L	N	B	N	1.9	4.0	N	D178501
D178502	70	280	N	.14L	N	B	.70	7.0	3.6	B	D178502
D178503	78	560	1.7	.11L	N	B	2.2	2.2	6.2	N	D178503
D178504	76	1,100	1.1	.11L	N	B	1.1	3.3	13	N	D178504
D178505	59	590	N	.20L	N	B	N	4.0	6.1	B	D178505
D178506	79	390	.24	.079L	N	B	1.2	1.6	2.9	N	D178506
D178507	20	5,600	4.2	2.7	84	B	20	42	78	28	D178507
D178508	140	91	.91	.091L	N	B	1.4	9.1	4.8	N	D178508
D178509	130	180	1.3	.18L	N	B	1.3	5.4	11	N	D178509
D178510	74	160	.53	.11L	N	B	N	2.1	6.5	N	D178510
D178511	84	240	N	.12L	N	B	N	2.4	5.5	B	D178511
D178512	72	360	.22	.072L	N	B	1.1	3.6	2.4	B	D178512
D179369	110	110	N	.11L	N	B	.76	3.2	9.3	B	D179369
D179370	76	760	.55	.11L	N	B	1.1	1.6	3.5	B	D179370
D179371	66	660	N	.094L	N	B	.66	1.9	3.0	B	D179371
D179372	59	830	N	.12L	N	B	1.2	6.0	11	B	D179372

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	EU (PPM)	F (PPM)	GA-S (PPM)	GD-S (PPM)	GE-S (PPM)	HF (PPM)	HG (PPM)	LA (PPM)	LI (PPM)	MN (PPM)	SAMPLE NUMBER
D165988	N	70	1.7	B	N	N	0.31	8.0	5.2	80	D165988
D165989	N	20L	B	B	N	N	.60	N	2.1	73	D165989
D165990	N	30	1.5	B	N	N	.31	7.0	4.6	100	D165990
D165991	N	20	4.1	B	N	N	.20	5.8	4.4	82	D165991
D173466	N	25	B	B	N	N	.49	N	3.3	51	D173466
D173467	N	40	2.4	B	N	N	.030	N	5.4	85	D173467
D173468	N	30	B	B	N	N	.35	N	5.5	39	D173468
D173469	N	35	2.2	B	7.7	N	.17	N	2.8	33	D173469
D175930	N	20L	1.8	B	N	N	.37	N	2.1	22	D175930
D175931	N	20L	.69	B	N	N	.040	N	.97	10	D175931
D175932	N	20L	3.6	B	N	N	.040	12L	5.1	18	D175932
D175933	N	20L	1.1	B	N	N	.010	N	.62	7.3	D175933
D175934	N	20L	.55	B	N	N	.010L	5.5L	.55	17	D175934
D175935	N	20	1.5	B	N	N	.030	7.3L	1.7	10	D175935
D175936	N	20L	.96	B	N	N	.12	N	1.2	14	D175936
D175937	N	20L	1.3	B	N	N	.020	N	2.2	13	D175937
D175938	N	20L	1.1	B	N	N	.030	7.3L	1.2	23	D175938
D175939	N	25	1.1	B	N	N	.030	7.5L	1.7	23	D175939
D178143	N	20L	5.1	N	N	N	.020	10L	4.5	140	D178143
D178144	N	20L	2.7	B	N	N	.030	8.9L	3.5	150	D178144
D178145	N	20L	4.7	B	N	N	.14	N	2.2	120	D178145
D178498	N	55	3.4	N	N	N	.23	23	3.4	220	D178498
D178499	N	20L	3.1	B	3.1	N	.12	N	3.3	220	D178499
D178500	N	70	4.6	B	N	N	.17	N	7.0	37	D178500
D178501	N	30	1.9	N	N	N	.10	N	4.4	39	D178501
D178502	N	35	2.8	B	N	N	.12	N	2.9	27	D178502
D178503	N	20L	1.1	N	N	N	.21	N	1.1L	29	D178503
D178504	N	30	1.6	N	N	N	.10	N	3.2	410	D178504
D178505	N	20L	3.0	B	N	N	.11	N	3.2	660	D178505
D178506	N	35	1.6	N	N	N	.060	N	2.0	81	D178506
D178507	N	230	8.4	N	N	N	.40	42	5.3	160	D178507
D178508	N	30	1.8	N	2.7	N	.060	N	3.2	210	D178508
D178509	N	40	3.6	N	N	N	.080	N	3.4	96	D178509
D178510	N	20L	2.1	N	N	N	.13	N	1.9	60	D178510
D178511	N	20L	2.4	B	N	N	.070	N	7.7	69	D178511
D178512	N	25	1.4	B	N	N	.12	N	1.4	42	D178512
D179369	N	20L	2.2	B	N	N	.18	N	2.7	160	D179369
D179370	N	20L	1.6	B	N	N	.19	N	1.4	43	D179370
D179371	N	20	1.9	B	N	N	.17	N	2.3	50	D179371
D179372	N	30	2.4	B	N	N	.12	N	3.2	67	D179372

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	MO-S (PPM)	NB-S (PPM)	ND-S (PPM)	NI-S (PPM)	P (PPM)	PB (PPM)	SB (PPM)	SC (PPM)	SE (PPM)	SN-S (PPM)	SAMPLE NUMBER
D165988	N	N	N	N	180	2.9L	0.20	1.1	0.85	N	D165988
D165989	1.0	1.0	N	1.0	31	2.6L	.40	N	.93	N	D165989
D165990	.70	N	N	1.0	130	2.5L	.40	1.0	.84	N	D165990
D165991	.82	N	N	.82	17L	4.1	.40	1.2	1.0	N	D165991
D173466	3.8	5.1L	B	5.1	120	6.4L	1.8	N	2.0	N	D173466
D173467	2.4	3.7	B	2.4	140	3.1	.30	1.8	.42	N	D173467
D173468	1.4	3.9L	B	2.9	130	4.9L	.70	2.0L	1.4	N	D173468
D173469	7.7	2.2L	B	2.2	120	3.3	1.0	1.7	.69	N	D173469
D175930	1.2	2.3L	B	1.8	510L	2.9L	.10	1.2L	.50	N	D175930
D175931	1.0	1.4L	B	.69	300L	2.8	.10	.69L	.67	N	D175931
D175932	1.2	2.4	N	2.4	530L	3.0	.10L	1.8	.56	N	D175932
D175933	.56	1.1L	B	1.7	240L	1.7	.10L	.84	.45	N	D175933
D175934	.83	1.1L	N	2.8	240L	1.4	.10L	.55L	.37	N	D175934
D175935	.51	2.2	N	1.1	320L	1.8	.10	1.1	.81	N	D175935
D175936	.96	1.9	B	1.4	420L	2.4	.10	.96L	.71	N	D175936
D175937	1.3	2.5	B	1.3	370L	2.1	.10	.84	.96	N	D175937
D175938	.73	1.5L	N	1.5	320L	1.8L	.20	1.1	.58	N	D175938
D175939	.53	1.5L	N	1.5	330L	1.9	.20	1.1	.66	N	D175939
D178143	3.0	3.0	N	1.5	440L	4.0	.60	3.0	.97	N	D178143
D178144	4.5	2.7	N	2.7	410	2.2L	.40	1.3	.43	N	D178144
D178145	4.7	4.7	B	3.1	680L	3.9L	.50	N	.97	N	D178145
D178498	4.6	N	46	34	1,000L	5.7L	.30	3.4	1.7	N	D178498
D178499	4.7	N	B	7.8	680L	3.9L	.40	1.1	.95	N	D178499
D178500	4.6	4.6	B	1.6	1,000L	5.8	.80	2.3	.40	N	D178500
D178501	.95	N	B	.67	460	2.9	.10	.67	.15	N	D178501
D178502	2.8	2.8	B	2.1	610L	3.5L	.20	1.4	.10L	N	D178502
D178503	3.3	N	B	3.3	490L	2.8	.10L	1.1	.10L	N	D178503
D178504	1.1	2.2	B	1.1	480L	5.5	.20	1.6	.10L	N	D178504
D178505	2.0	N	B	1.4	870L	5.0	.20	N	.37	N	D178505
D178506	1.6	N	B	1.6	400	4.0	.10L	.55	.10L	N	D178506
D178507	280	N	84	84	1,200L	7.0	.20	14	3.3	N	D178507
D178508	4.6	N	B	1.8	400L	2.3	.30	1.8	.45	N	D178508
D178509	5.4	3.6	B	1.8	790L	4.5L	.40	1.3	.10L	N	D178509
D178510	5.3	N	B	1.1	460L	2.7L	.40	.74	.10L	N	D178510
D178511	1.2	N	B	1.8	520L	3.0	.10	.60	.10L	N	D178511
D178512	2.2	N	B	2.2	310L	2.5	.20	.36	.18	N	D178512
D179369	1.6	2.2	B	1.6	470L	13	.40	1.1	1.1	N	D179369
D179370	3.3	N	B	2.2	480L	2.7L	.10L	.76	.20	N	D179370
D179371	.94	N	B	1.4	410L	2.4	.10	.47	.56	N	D179371
D179372	1.8	N	B	1.8	520L	4.2	.50	.83	.43	N	D179372

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	SR-S (PPM)	TH (PPM)	TL-S (PPM)	U (PPM)	V-S (PPM)	W (PPM)	Y-S (PPM)	YB (PPM)	ZN (PPM)	ZR-S (PPM)	SAMPLE NUMBER
D165988	570	N	N	0.90	2.3	N	3.4	0.34	2.3L	17	D165988
D165989	730	N	N	.33	1.6	N	2.1	B	2.1L	7.3	D165989
D165990	700	3.1	N	.26	3.0	N	2.0	.30	2.0L	15	D165990
D165991	580	N	N	1.8	5.8	N	2.5	.25	1.6L	12	D165991
D173466	380	4.7	N	.75	3.8	N	5.1L	B	6.9	N	D173466
D173467	610	4.7	N	1.1	6.1	N	3.7	.37	7.8	24	D173467
D173468	390	N	N	.86	5.9	N	3.9L	B	4.9	20	D173468
D173469	550	N	N	2.6	3.3	N	5.5	B	1.8	7.7	D173469
D175930	350	N	N	.49	2.3	N	2.3	B	2.6	8.2	D175930
D175931	140	N	N	.96	1.4	N	1.4L	B	1.9	3.5	D175931
D175932	600	8.0	N	.79	6.1	N	3.6	.24	2.4	18	D175932
D175933	390	N	N	.52	1.7	N	1.1	.11	1.1	3.9	D175933
D175934	380	N	N	.05	1.7	N	1.1	.11	1.2	3.9	D175934
D175935	220	N	N	.51	3.7	N	1.5	.15	1.6	15	D175935
D175936	190	N	N	.42	2.9	N	1.9L	.19	1.7	9.6	D175936
D175937	170	N	N	.85	2.5	N	2.5	.25	1.5	17	D175937
D175938	220	N	N	.39	3.7	N	2.2	.22	4.2	7.3	D175938
D175939	220	N	N	.46	3.8	N	2.3	.15	2.1	15	D175939
D178143	100	N	N	1.9	15	N	7.1	.71	2.1	20	D178143
D178144	180	N	N	.70	6.2	N	4.5	.27	1.6	13	D178144
D178145	110	N	N	.64	11	N	4.7	B	3.1	23	D178145
D178498	110	N	N	1.2	16	N	23	B	51	23	D178498
D178499	78	N	N	.69	11	N	3.1	B	14	11	D178499
D178500	230	12	N	1.6	16	N	7.0	.70	9.3	35	D178500
D178501	140	4.7	N	1.00L	4.8	N	6.7	.29	2.6	6.7	D178501
D178502	98	N	N	.47	9.8	N	4.2	.70	2.8L	21	D178502
D178503	110	N	N	.51	3.3	N	7.8	B	7.9	2.2	D178503
D178504	76	N	N	1.5	7.6	N	7.6	.76	9.9	11	D178504
D178505	200	N	N	.85	9.9	N	4.0	.40	5.0	9.9	D178505
D178506	120	N	N	.54	4.0	N	5.5	.55	5.8	5.5	D178506
D178507	42	N	N	11	84	N	84	8.4	88	42	D178507
D178508	91	N	N	2.9	14	N	6.4	.64	3.7	9.1	D178508
D178509	180	N	N	2.8	13	N	13	1.3	5.4	36	D178509
D178510	110	N	N	1.4	5.3	N	7.4	B	2.4	7.4	D178510
D178511	120	N	N	1.5	8.4	N	N	N	4.8	12	D178511
D178512	140	N	N	.59	3.6	N	3.6	.22	6.3	5.0	D178512
D179369	220	N	N	.92	11	N	3.2	B	7.9	11	D179369
D179370	220	N	N	.41	3.3	N	3.3	B	4.1	7.6	D179370
D179371	280	N	N	.33	2.8	N	1.9	B	4.3	6.6	D179371
D179372	240	N	N	1.1	8.3	N	6.0	.36	6.2	18	D179372

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	SI (PERCENT)	AL (PERCENT)	CA (PERCENT)	MG (PERCENT)	NA (PERCENT)	K (PERCENT)	FE (PERCENT)	TI (PERCENT)	AG-S (PPM)	AS (PPM)	SAMPLE NUMBER
D179373	1.5	0.68	1.2	0.44	0.35	0.083	1.3	0.058	N	9.0	D179373
D179374	.54	.31	1.1	.42	.072	.025	1.1	.039	N	3.0	D179374
D179375	1.7	.97	1.1	.44	.66	.11	2.2	.054	N	39	D179375
D179376	1.3	.55	1.1	.42	.67	.045	.22	.047	N	2.5	D179376
D179377	1.2	.35	1.0	.50	.54	.038	.13	.041	N	1.5	D179377
D179378	.49	.45	1.2	.40	.56	.023	1.2	.027	N	5.0	D179378
D179379	.22	.23	.79	.29	.16	.018	1.1	.014	N	13	D179379
D179380	1.3	.50	1.2	.42	.042	.034	.33	.076	N	4.5	D179380
D179381	1.2	.82	1.3	.46	.48	.034	.13	.054	N	1.5	D179381
D179382	.32	.34	1.0	.34	.035	.022	.13	.022	N	1.5	D179382
D179383	.43	.46	1.2	.46	.038	.027	.21	.041	N	2.5	D179383
D179384	.66	.45	1.1	.38	.33	.041	1.4	.031	N	14	D179384
D180007	.74	.51	1.2	.41	.60	.025	.65	.035	N	5.0	D180007
D180008	.80	.48	1.1	.37	.59	.033	.80	.030	N	9.0	D180008
D180009	.79	.40	1.0	.41	.31	.018	1.3	.039	N	26	D180009
D180010	.73	.41	1.1	.36	.62	.018	.44	.032	N	6.0	D180010
D180011	.98	.51	1.3	.34	.033	.019	.21	.033	N	3.5	D180011
D180012	.75	.56	.87	.53	.37	.028	.19	.025	N	3.0	D180012
D180013	2.7	.56	1.1	.48	.40	.058	.69	.060	N	3.5	D180013
D180014	.84	.50	1.3	.49	.31	.020	.47	.034	N	5.0	D180014
D180015	.85	.55	1.3	.45	.093	.025	.97	.031	N	4.5	D180015
D180016	1.3	.66	1.3	.48	.092	.032	.46	.050	N	5.0	D180016
D180017	.75	.58	1.3	.50	.15	.023	.86	.039	N	15	D180017
D180018	.79	.53	1.2	.52	.25	.029	.20	.026	N	3.0	D180018
D180019	1.2	.62	1.2	.44	.49	.044	.43	.052	N	5.0	D180019
D180075	.91	.57	1.6	.37	.026	.017	.076	.028	N	2.0	D180075
D180076	.99	.62	1.4	.43	.024	.030	.26	.042	N	3.0	D180076
D180077	4.0	1.6	1.1	.42	.20	.30	1.1	.071	N	24	D180077
D180078	.63	.47	1.1	.40	.67	.024	.56	.037	N	7.5	D180078
D180079	.57	.49	1.5	.33	.11	.017	.28	.018	N	1.5	D180079
D180080	.47	.42	1.3	.44	.055	.008	.29	.019	.64	3.0	D180080
D180081	2.7	.98	.95	.43	.38	.19	.65	.060	N	17	D180081
D180082	.36	.40	1.3	.54	.12	.009	.11	.023	N	2.0	D180082
D180083	.65	.50	1.3	.45	.13	.020	.36	.031	N	4.0	D180083
D186051	.70	.33	1.4	.30	.70	.018	.24	.036	N	B	D186051
D186052	.48	.41	1.8	.30	.21	.040	.66	.024	N	26	D186052
D186053	.81	.44	1.6	.57	.14	.028	1.1	.091	N	7.2	D186053
D186054	.73	.29	1.6	.40	.097	.027	1.1	.045	N	13	D186054
D186055	.80	.51	1.4	.55	.24	.036	1.4	.18	N	8.5	D186055
D165992	.16	.34	2.0	.56	.18	.010L	1.2	B	N	8.0	D165992

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	B-S (PPM)	BA-S (PPM)	BE-S (PPM)	CD (PPM)	CE (PPM)	CL (PPM)	CO (PPM)	CR (PPM)	CU (PPM)	DY-S (PPM)	SAMPLE NUMBER
D179373	71	430	0.43	0.14L	N	B	1.4	4.3	7.8	B	D179373
D179374	110	160	N	.11L	N	B	1.1	2.1	5.8	B	D179374
D179375	92	550	2.8	.18L	N	B	2.8	9.2	19	N	D179375
D179376	110	750	N	.11L	N	B	.75	5.4	6.4	B	D179376
D179377	91	450	.64	.091L	N	B	.64	4.6	5.7	N	D179377
D179378	83	590	N	.12L	N	B	.60	1.8	4.2	B	D179378
D179379	79	240	.40	.079L	N	B	.79	1.2	3.2	B	D179379
D179380	74	1,600	.74	.11L	N	B	.53	5.3	5.2	N	D179380
D179381	76	1,100	N	.11L	N	B	N	2.2	8.2	B	D179381
D179382	48	680	N	.068L	N	B	.68	1.4	2.5	B	D179382
D179383	96	1,400	N	.096L	N	B	.96	1.9	3.8	B	D179383
D179384	58	580	N	.12L	N	B	.81	2.3	4.1	B	D179384
D180007	75	750	N	.11L	N	B	1.1	3.2	4.5	B	D180007
D180008	76	540	N	.11L	N	B	1.6	3.2	4.3	B	D180008
D180009	85	610	N	.12L	N	B	.85	1.8	3.9	B	D180009
D180010	64	640	N	.091L	N	B	.64	2.7	3.6	B	D180010
D180011	66	660	N	.095L	N	B	.67	2.9	3.1	N	D180011
D180012	62	260	N	.088	N	B	.62	13	4.2	N	D180012
D180013	43	430	.15	.15L	N	B	1.5	10	4.5	N	D180013
D180014	69	690	.10	.15	N	B	.69	5.0	4.0	N	D180014
D180015	81	350	.12	.12L	N	B	1.7	3.5	4.3	N	D180015
D180016	78	340	N	.11L	N	B	.78	7.8	7.5	B	D180016
D180017	80	800	N	.11L	N	B	.80	3.4	5.5	N	D180017
D180018	59	250	.08	.084L	N	B	.84	5.9	4.3	N	D180018
D180019	76	760	N	.11L	N	B	.76	7.6	5.5	B	D180019
D180075	67	480	N	.096L	N	B	1.4	1.9	5.8	B	D180075
D180076	110	740	N	.11L	N	B	.53	5.3	5.2	B	D180076
D180077	110	220	4.3	.22L	N	B	3.3	43	28	N	D180077
D180078	71	1,000	N	.10L	N	B	.51	3.0	4.3	B	D180078
D180079	93	280	N	.093L	N	B	.93	1.9	3.3	B	D180079
D180080	92	460	N	.092L	N	B	.46	1.8	3.2	B	D180080
D180081	110	460	4.7	.16L	N	B	2.3	23	17	N	D180081
D180082	78	550	.23	.078L	N	B	2.3	3.9	3.8	N	D180082
D180083	62	620	.27	.089L	N	B	.45	2.7	4.1	B	D180083
D186051	120	550	N	.079L	N	B	.56	1.4	5.5	N	D186051
D186052	86	260	.43	.086L	N	B	.90	2.3	4.3	N	D186052
D186053	110	1,600	.33	.11L	N	B	.05	.25	5.5	B	D186053
D186054	73	310	N	.10L	N	B	1.4	3.4	8.3	B	D186054
D186055	85	6,100	.85	.12L	N	B	.80	5.0	5.5	N	D186055
D165992	180	1,800	N	.12L	B	B	1.2	1.2	5.1	B	D165992

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	EU (PPM)	F (PPM)	GA-S (PPM)	GD-S (PPM)	GE-S (PPM)	HF (PPM)	HG (PPM)	LA (PPM)	LI (PPM)	MN (PPM)	SAMPLE NUMBER
D179373	N	25	2.8	B	N	N	0.22	N	3.6	60	D179373
D179374	N	20L	1.6	B	N	N	.15	N	1.6	150	D179374
D179375	N	25	3.7	N	N	N	.25	N	6.3	89	D179375
D179376	N	25	2.1	B	N	N	.080	N	4.0	75	D179376
D179377	N	20L	.91	N	N	N	.060	N	2.2	87	D179377
D179378	N	20L	1.8	B	N	N	.24	N	3.9	84	D179378
D179379	N	20L	1.6	B	N	N	.26	N	.87	48	D179379
D179380	N	20L	2.1	N	N	N	.070	N	2.9	62	D179380
D179381	N	20L	2.2	B	N	N	.050	N	8.8	59	D179381
D179382	N	20L	1.0	B	N	N	.050	N	1.7	26	D179382
D179383	N	20L	1.4	B	1.9L	N	.13	N	3.1	150	D179383
D179384	N	20L	2.3	B	N	N	.20	N	2.7	34	D179384
D180007	N	20L	2.1	B	N	N	.17	N	2.9	49	D180007
D180008	N	20L	3.2	B	N	N	.25	N	3.0	30	D180008
D180009	N	20L	2.4	B	N	N	.25	N	2.8	21	D180009
D180010	N	20L	1.8	B	N	N	.20	N	2.4	25	D180010
D180011	N	20L	2.9	N	N	N	.15	N	2.5	88	D180011
D180012	N	20	2.6	N	N	N	.11	N	4.7	26	D180012
D180013	N	40	4.4	N	N	N	.13	N	3.3	43	D180013
D180014	N	20	3.0	N	N	N	.12	N	2.8	46	D180014
D180015	N	20L	2.3	N	N	N	.15	N	3.9	36	D180015
D180016	N	30	3.4	B	N	N	.12	N	4.7	130	D180016
D180017	N	30	3.4	N	N	N	.28	N	4.0	55	D180017
D180018	N	20L	2.5	N	N	N	.10	N	3.1	58	D180018
D180019	N	30	3.3	B	N	N	.18	N	4.4	67	D180019
D180075	N	65	1.4	B	N	N	.070	N	3.7	61	D180075
D180076	N	30	2.1	B	N	N	.11	N	3.5	180	D180076
D180077	N	120	6.5	N	6.5	N	.30	15	8.0	90	D180077
D180078	N	20L	1.5	B	N	N	.19	N	3.2	71	D180078
D180079	N	20L	1.9	B	N	N	.12	N	3.1	200	D180079
D180080	N	20L	1.4	B	N	N	.12	N	1.8	89	D180080
D180081	N	70	4.7	N	4.7	N	.10	N	4.3	48	D180081
D180082	N	20L	2.3	N	1.6L	N	.13	5.5	1.8	65	D180082
D180083	N	40	1.3	B	N	N	.15	N	2.9	58	D180083
D186051	N	20L	1.2	N	N	N	.060	7.9L	1.3	12	D186051
D186052	N	25	1.3	N	N	N	.14	8.6L	1.6	60	D186052
D186053	N	25	1.6	B	N	N	.25	11L	4.5	63	D186053
D186054	N	20L	1.6	B	N	N	.38	10L	2.5	120	D186054
D186055	N	20L	1.8	N	N	N	.25	N	5.0	45	D186055
D165992	N	20L	1.2	B	N	N	.13	N	2.7	85	D165992

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	MO-S (PPM)	NB-S (PPM)	ND-S (PPM)	NI-S (PPM)	P (PPM)	PB (PPM)	SB (PPM)	SC (PPM)	SE (PPM)	SN-S (PPM)	SAMPLE NUMBER
D179373	2.1	N	B	4.3	620L	5.7	0.30	0.99	0.64	N	D179373
D179374	3.2	N	B	2.1	460L	2.7L	.30	N	.72	N	D179374
D179375	3.7	N	B	9.2	800L	4.6	1.0	3.7	1.4	N	D179375
D179376	2.1	N	B	2.1	470L	2.7	.40	1.1	.50	N	D179376
D179377	.91	N	B	.91	400L	2.3	.20	.91	.48	N	D179377
D179378	2.4	N	B	2.4	520L	4.2	.20	.60	.79	N	D179378
D179379	2.4	1.6	B	.55	350L	2.0L	.30	.55	.36	N	D179379
D179380	1.6	3.2	B	1.1	460L	3.7	.20	1.6	.51	N	D179380
D179381	N	N	B	1.1	480L	17	.20	.76	.64	N	D179381
D179382	N	N	B	2.0	300L	2.0	.30	.34	.19	N	D179382
D179383	1.9	N	B	1.9	420L	3.4	.30	.48	.49	N	D179383
D179384	1.2	2.3	B	1.2	510L	3.5	.50	.81	.60	N	D179384
D180007	2.1	N	B	2.1	470L	2.7	.20	1.6	.59	N	D180007
D180008	1.6	N	B	3.2	470L	2.7	.30	1.6	.68	N	D180008
D180009	.85	N	B	1.8	530L	3.1L	.10	.85	.85	N	D180009
D180010	.64	N	B	1.4	400L	2.3L	.40	1.4	.52	N	D180010
D180011	.67	N	B	1.9	420L	2.9	.30	.67	.40	N	D180011
D180012	.88	N	B	2.6	380L	2.6	.30	1.3	.41	N	D180012
D180013	1.5	2.9	B	2.2	630L	3.6L	.50	2.2	.50	N	D180013
D180014	.99	N	B	3.0	430L	2.5	.30	1.5	.49	N	D180014
D180015	1.7	N	B	3.5	510L	2.9L	.30	1.7	.82	N	D180015
D180016	1.7	N	B	2.2	490L	3.4	.40	1.7	.68	N	D180016
D180017	1.7	N	B	3.4	500L	2.9	.30	1.1	.63	N	D180017
D180018	1.3	N	B	2.5	370L	2.9	.50	1.3	.57	N	D180018
D180019	1.6	2.2	B	3.3	480L	3.3	.40	1.6	.75	N	D180019
D180075	1.9	N	B	1.9	420L	6.7	.30	.48	1.3	N	D180075
D180076	1.1	2.1	B	.74	460L	3.2	.30	.53	.50	N	D180076
D180077	11	4.3	N	11	950L	6.5	3.8	6.5	1.6	N	D180077
D180078	1.0	N	B	1.5	440L	2.5	.10	.71	1.4	N	D180078
D180079	.93	N	B	1.9	630	2.3	.20	.47	.61	N	D180079
D180080	.92	N	B	.64	400L	2.3L	2.1	N	.68	N	D180080
D180081	7.8	3.1	B	7.8	680L	3.9	.30	7.8	.98	N	D180081
D180082	.78	1.6	N	.78	530	2.0	.40	.78	.68	N	D180082
D180083	1.3	N	B	1.3	470	2.2	.30	.45	1.1	N	D180083
D186051	.55	1.6	N	1.2	350L	2.4	.20	1.2	.80	N	D186051
D186052	1.3	1.7L	N	1.3	380L	2.6	.30	.86	.80	N	D186052
D186053	1.6	2.2	N	1.1	480L	6.5	.30	1.1L	.90	N	D186053
D186054	1.6	2.1	N	1.6	450L	14	.90	1.0	1.0	N	D186054
D186055	.85	2.4L	B	1.8	530L	5.5	.60	1.8	.80	N	D186055
D165992	.85	N	N	1.2	31	3.6	.20	N	.60	N	D165992

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	SR-S (PPM)	TH (PPM)	TL-S (PPM)	U (PPM)	V-S (PPM)	W (PPM)	Y-S (PPM)	YB (PPM)	ZN (PPM)	ZR-S (PPM)	SAMPLE NUMBER
D179373	280	N	N	0.79	9.9	N	7.1	B	9.5	9.9	D179373
D179374	160	N	N	.79	7.4	N	2.1	B	1.9	7.4	D179374
D179375	280	N	N	2.4	28	N	13	B	19	18	D179375
D179376	320	N	N	1.1	7.5	N	5.4	.54	2.9	16	D179376
D179377	270	N	N	.79	6.4	N	6.4	.46	3.5	14	D179377
D179378	240	N	N	.73	6.0	N	2.4	B	6.5	8.3	D179378
D179379	160	N	N	.44	4.0	N	4.0	B	1.7	5.5	D179379
D179380	320	N	N	.62	7.4	N	7.4	.74	3.2	16	D179380
D179381	330	N	N	.84	5.5	N	2.2	.22	10	11	D179381
D179382	340	N	N	.19	2.0	N	1.4	.14	2.0	4.8	D179382
D179383	290	N	N	.54	4.8	N	1.9	.19	3.4	6.7	D179383
D179384	230	N	N	.61	5.8	N	3.5	B	9.7	8.1	D179384
D180007	320	N	N	1.00L	7.5	N	5.4	.54	14	53	D180007
D180008	320	N	N	.59	16	N	5.4	.54	14	7.6	D180008
D180009	180	N	N	1.00L	6.1	N	3.7	.37	8.3	8.5	D180009
D180010	640	N	N	.54	6.4	N	4.6	.46	12	14	D180010
D180011	140	5.8	N	1.00L	6.7	N	6.7	.48	35	14	D180011
D180012	260	N	N	.91	13	N	6.2	.62	9.7	13	D180012
D180013	220	N	N	1.3	22	N	10	1.0	13	29	D180013
D180014	490	N	N	1.00L	6.9	N	6.9	.69	24	15	D180014
D180015	350	N	N	.71	8.1	N	8.1	.81	8.5	17	D180015
D180016	220	N	N	.96	17	N	5.6	.56	8.2	17	D180016
D180017	340	N	N	.68	8.0	N	8.0	.80	13	11	D180017
D180018	420	N	N	.52	8.4	N	5.9	.59	14	13	D180018
D180019	330	N	N	.66	16	N	5.5	.55	5.9	16	D180019
D180075	48	N	N	.70	4.8	N	1.9	.19	7.3	9.6	D180075
D180076	160	N	N	.76	7.4	N	2.1	.21	3.8	11	D180076
D180077	330	N	N	6.1	110	N	22	3.3	75	43	D180077
D180078	300	N	N	.50	7.1	N	2.0	.20	2.7	10	D180078
D180079	190	N	N	.80	2.8	N	2.8	.19	2.7	9.3	D180079
D180080	180	N	N	.32	4.6	N	N	.18	3.5	6.4	D180080
D180081	150	3.0L	N	3.6	46	N	23	2.3	14	23	D180081
D180082	390	N	N	.62	5.5	N	5.5	.39	3.4	7.8	D180082
D180083	270	N	N	1.0	6.2	N	1.8	.18	3.5	8.9	D180083
D186051	550	1.7	N	.81	2.4	N	5.5	.55	2.0	12	D186051
D186052	170	.95	N	.70	2.6	N	6.0	.60	2.7	6.0	D186052
D186053	220	1.5	N	.84	3.3	N	3.3	.33	3.4	7.6	D186053
D186054	160	.89	N	.85	7.3	N	3.1	.31	3.7	7.3	D186054
D186055	370	1.5	N	.79	6.1	N	8.5	.85	3.3	12	D186055
D165992	600	N	N	.38	1.8	N	N	N	3.4	3.6	D165992

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	SI (PERCENT)	AL (PERCENT)	CA (PERCENT)	MG (PERCENT)	NA (PERCENT)	K (PERCENT)	FE (PERCENT)	TI (PERCENT)	AG-S (PPM)	AS (PPM)	SAMPLE NUMBER
D165993	0.18	0.30	1.5	0.56	0.17	0.007L	0.42	B	N	8.0	D165993
D196052	.76	.36	1.3	.30	.044	.036	1.4	.026	N	8.9	D196052
D196053	1.2	.36	1.0	.33	.41	.10	1.2	.027	N	18	D196053
D196054	.71	.34	.95	.48	.13	.055	.80	.034	N	11	D196054
D196055	.93	.51	1.5	.38	.092	.036	.22	.036	N	1.4	D196055
D196056	.45	.20	1.4	.34	.069	.031	.26	.018	N	7.0	D196056
D196057	1.1	.43	1.1	.33	.66	.042	.40	.048	N	3.9	D196057
D196058	.73	.37	.99	.32	.68	.038	.64	.039	N	15	D196058
D196059	2.8	.66	1.0	.27	.10	.14	2.0	.061	N	14	D196059
D196060	1.4	.64	1.2	.33	.13	.092	.70	.037	N	10	D196060
D196061	.92	.45	1.2	.45	.17	.033	.65	.036	N	6.1	D196061
D196062	2.4	.62	1.1	.32	.67	.11	.56	.068	N	4.4	D196062
D196075	9.3	3.2	1.1	.56	.34	.70	2.9	.16	N	15	D196075
D196076	2.4	.72	.99	.28	.95	.12	1.2	.037	N	17	D196076
D196077	8.1	2.6	1.2	.40	.26	.41	1.2	.13	N	16	D196077
D196078	1.0	.53	1.7	.18	.30	.056	.79	.041	N	4.1	D196078
D196079	5.2	2.0	1.2	.22	.50	.28	1.7	.11	N	32	D196079
D196080	3.3	.83	1.7	.28	.13	.17	1.3	.066	N	6.6	D196080
D196081	1.7	.76	1.4	.19	.081	.099	.53	.043	N	4.2	D196081
D194858	2.9	.91	1.8	.38	.059	.065	.57	.094	N	7.0	D194858
D194859	1.4	.62	1.3	.34	.086	.071	.49	.026	N	11	D194859
D194860	5.0	1.3	1.3	.54	.46	.27	.73	.084	N	6.1	D194860
D194861	1.8	.65	1.0	.38	.71	.059	.23	.067	N	5.4	D194861
D194862	1.2	.52	.97	.34	.65	.035	.62	.038	N	7.5	D194862
D194863	.98	.49	1.4	.39	.31	.024	.42	.040	N	1.8	D194863
D194864	5.0	.97	1.0	.39	.68	.098	.59	.16	N	4.2	D194864
D194865	.59	.28	1.2	.34	.63	.023	.49	.033	N	3.4	D194865
D194866	10	1.9	.83	.37	.60	.29	.54	.29	N	7.2	D194866
D194867	.73	.49	1.2	.35	.65	.015	.41	.033	N	3.0	D194867
D194868	.20	.19	1.0	.32	.66	.016	.22	.024	N	4.0	D194868
D194869	.98	.41	1.2	.38	.12	.032	.80	.034	N	4.9	D194869
D194870	1.5	.45	.82	.33	.61	.11	1.0	.034	N	19	D194870
D194029	1.1	.62	1.2	.36	.27	.065	.49	.035	N	19	D194029
D194030	1.4	.62	1.1	.27	.69	.079	.44	.044	N	22	D194030
D194031	3.1	1.3	.97	.22	.66	.055	1.0	.088	N	28	D194031
D194032	1.1	.68	1.3	.50	.21	.019	.62	.028	N	1.1	D194032
D194033	.41	.31	1.2	.41	.16	.014	.61	.026	N	2.7	D194033
D194034	11	2.5	.83	.34	.67	.45	.49	.16	.50	13	D194034
D194035	1.4	.39	1.0	.25	.62	.049	.45	.041	N	11	D194035
D194036	1.2	.36	.87	.34	.31	.040	.39	.034	N	4.8	D194036

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	B-S (PPM)	BA-S (PPM)	BE-S (PPM)	CD (PPM)	CE (PPM)	CL (PPM)	CO (PPM)	CR (PPM)	CU (PPM)	DY-S (PPM)	SAMPLE NUMBER
D165993	260	440	N	0.088L	B	B	N	0.62	4.0	B	D165993
D196052	110	540	N	.11L	N	200	.60	1.6	4.1	B	D196052
D196053	110	560	.33	.11L	N	100L	1.1	3.8	5.9	B	D196053
D196054	140	660	.29	.19	N	200	1.1	3.1	4.3	B	D196054
D196055	87	610	.26	.087L	N	100L	.40	2.3	2.8	B	D196055
D196056	110	370	.74	.074L	N	200	1.2	2.5	6.9	N	D196056
D196057	150	1,000	.30	.10L	N	100L	1.1	4.2	6.7	B	D196057
D196058	92	920	1.4	.092L	N	100	5.4	3.2	4.3	N	D196058
D196059	120	510	N	.17L	N	100L	1.7	8.6	7.6	B	D196059
D196060	120	180	.86	.12	N	100L	3.1	8.4	13	N	D196060
D196061	99	690	N	.099L	N	100L	.60	2.2	4.5	B	D196061
D196062	89	640	.38	.13L	N	200	.90	5.6	6.5	B	D196062
D196075	110	380	1.1	.38L	N	100	.10L	28	33	N	D196075
D196076	160	470	.47	.16L	N	100	1.4	5.0	7.3	B	D196076
D196077	220	460	.93	.31	N	100L	2.5	16	28	B	D196077
D196078	170	560	N	.11L	N	100L	.70	2.5	6.9	B	D196078
D196079	180	510	N	.26L	N	100L	2.6	13	23	B	D196079
D196080	280	180	N	.19L	N	100L	.60	5.5	8.7	B	D196080
D196081	180	360	N	.12L	N	100L	1.3	5.6	6.4	B	D196081
D194858	79	790	N	.16L	N	B	.60	7.5	7.9	B	D194858
D194859	110	210	.54	.11L	N	B	2.0	7.1	8.6	B	D194859
D194860	100	400	.60	.20L	N	B	3.1	11	7.0	B	D194860
D194861	71	1,000	N	.10L	N	B	.80	4.9	7.1	B	D194861
D194862	73	520	.32	.11L	N	B	.80	4.2	4.4	B	D194862
D194863	140	660	N	.095L	N	B	.70	2.2	4.8	B	D194863
D194864	140	590	.59	.20L	N	B	1.9	10	11	B	D194864
D194865	140	640	N	.091L	N	B	.60	1.9	4.1	B	D194865
D194866	160	480	.96	.32L	N	B	1.9	27	19	B	D194866
D194867	140	640	.28	.092L	N	B	.80	2.7	3.7	N	D194867
D194868	130	660	.46	.066L	N	B	.70	1.2	2.3	N	D194868
D194869	140	470	.29	.095L	N	B	.80	2.3	3.8	B	D194869
D194870	170	570	.35	.12L	N	B	1.4	5.0	4.0	B	D194870
D194029	97	490	.97	.097L	N	B	1.0	4.3	6.4	N	D194029
D194030	110	740	N	.11	N	B	.80	4.6	6.4	B	D194030
D194031	110	820	1.1	.16	N	B	2.1	7.0	13	N	D194031
D194032	120	230	N	.12L	N	B	.50	2.0	2.9	B	D194032
D194033	130	610	.26	.087L	N	B	1.0	1.5	3.0	B	D194033
D194034	100	670	1.0	.33L	N	B	.80	19	26	B	D194034
D194035	150	490	.29	.098	N	B	.10	4.9	7.1	N	D194035
D194036	120	570	.24	.081L	N	B	.10L	1.7	3.0	B	D194036

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	EU (PPM)	F (PPM)	GA-S (PPM)	GD-S (PPM)	GE-S (PPM)	HF (PPM)	HG (PPM)	LA (PPM)	LI (PPM)	MN (PPM)	SAMPLE NUMBER
D165993	N	20L	0.88	B	N	N	0.11	N	4.0	260	D165993
D196052	B	20	B	B	N	N	.14	N	1.7	190	D196052
D196053	B	30	B	B	N	N	.16	N	2.2	40	D196053
D196054	B	20	1.9	B	N	N	.070	N	1.2	130	D196054
D196055	B	15	1.7	B	N	N	.020	N	2.8	87	D196055
D196056	B	20	1.1	N	N	N	.040	N	.74L	77	D196056
D196057	B	15	2.0	B	7.1	N	.060	N	3.4	50	D196057
D196058	B	15	2.8	N	4.6	N	.13	N	2.9	11	D196058
D196059	B	35	B	B	N	N	.11	N	3.0	160	D196059
D196060	B	35	2.5	N	3.7	N	.090	N	3.0	210	D196060
D196061	B	20	1.5	B	N	N	.12	N	3.2	61	D196061
D196062	B	35	2.5	B	N	N	.10	N	3.9	71	D196062
D196075	N	210	11	N	7.6L	N	.060	27	22	580	D196075
D196076	N	35	2.3	B	N	N	.12	N	2.8	70	D196076
D196077	N	190	9.3	B	N	N	.18	22	33	390	D196077
D196078	N	35	1.7	B	N	N	.11	N	2.9	190	D196078
D196079	N	110	7.7	B	N	N	.39	18	27	93	D196079
D196080	N	55	2.8	B	N	N	.50	N	7.2	120	D196080
D196081	N	45	2.4	B	N	N	.060	N	3.3	98	D196081
D194858	N	35	4.7	B	N	N	.10	N	6.0	160	D194858
D194859	N	40	3.2	B	N	N	.090	N	2.5	110	D194859
D194860	N	75	6.0	B	N	N	.070	N	5.4	130	D194860
D194861	N	30	3.1	B	N	N	.060	N	4.2	50	D194861
D194862	N	20	3.2	B	N	N	.10	N	4.0	21	D194862
D194863	N	20L	2.9	B	N	N	.080	N	2.2	82	D194863
D194864	N	30	5.9	B	5.9	N	.19	N	6.1	76	D194864
D194865	N	20L	1.4	B	N	N	.11	N	1.6	130	D194865
D194866	N	80	16	B	N	N	.14	N	14	72	D194866
D194867	N	20L	1.4	N	N	N	.060	N	4.0	68	D194867
D194868	N	20L	.66	N	N	N	.050	N	.86	28	D194868
D194869	N	20L	1.4	B	N	N	.080	N	1.7	64	D194869
D194870	N	35	1.7	B	N	N	.16	N	2.3	31	D194870
D194029	N	25	4.9	N	2.9	N	.13	9.7L	3.0	33	D194029
D194030	N	30	3.2	B	N	N	.12	N	2.9	13	D194030
D194031	N	30	8.2	N	N	N	.50	N	8.9	13	D194031
D194032	N	25	3.5	B	N	N	.040	N	5.9	56	D194032
D194033	N	20L	1.7	B	1.7L	N	.11	N	1.1	49	D194033
D194034	N	120	10	B	N	N	.14	N	11	50	D194034
D194035	N	20L	2.9	N	N	N	.11	N	2.2	41	D194035
D194036	N	20L	1.2	B	N	N	.070	N	.89	48	D194036

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	MO-S (PPM)	NB-S (PPM)	ND-S (PPM)	NI-S (PPM)	P (PPM)	PB (PPM)	SB (PPM)	SC (PPM)	SE (PPM)	SN-S (PPM)	SAMPLE NUMBER
D165993	N	N	N	0.88	17L	2.2L	0.20	N	0.50	N	D165993
D196052	1.6	N	B	2.2	87	2.7L	.20	1.1L	.50	N	D196052
D196053	3.3	N	B	3.3	44L	2.8L	.30	1.1	.60	N	D196053
D196054	1.4	N	B	1.9	44L	2.4L	.40	1.9	.30	N	D196054
D196055	N	N	B	1.3	170	3.0	.10	1.3	.30	N	D196055
D196056	2.2	N	B	3.7	130	2.2	.30	1.5	.50	N	D196056
D196057	1.5	2.0L	B	3.0	170	2.5	.40	1.5	.70	N	D196057
D196058	1.4	2.8	B	4.6	44L	3.2	1.1	6.4	.50	N	D196058
D196059	2.5	N	B	3.4	44L	4.2L	.30	1.7	.40	N	D196059
D196060	1.8	3.7	B	6.2	44L	4.3	.40	3.7	.80	N	D196060
D196061	.69	N	B	2.0	44	2.5	.20	.99	.50	N	D196061
D196062	1.9	N	B	1.9	87	3.2	.30	1.9	.60	N	D196062
D196075	5.7	7.6	N	57	170	11	.10L	11	.80	N	D196075
D196076	1.6	N	B	3.1	170	5.5	1.0	1.6	.40	N	D196076
D196077	3.1	N	N	6.2	87	12	1.6	4.6	2.1	N	D196077
D196078	.79	N	B	1.7	44L	3.4	.30	N	.80	N	D196078
D196079	5.1	5.1L	N	7.7	130	12	1.1	3.9	1.6	N	D196079
D196080	5.6	N	B	1.9L	44L	4.6	.30	1.9	1.2	N	D196080
D196081	1.8	N	B	2.4	44L	4.8	.60	1.8	.80	N	D196081
D194858	1.1	3.1L	B	1.6L	690L	6.3	.30	2.4	1.0	N	D194858
D194859	2.1	2.1L	B	7.5	470L	3.7	1.0	2.1	.80	N	D194859
D194860	N	N	B	10	870L	6.0	.40	2.0	.90	N	D194860
D194861	.71L	N	B	2.0	450L	2.6	.30	1.5	.60	N	D194861
D194862	1.1	N	B	2.1	460L	2.6	.40	1.1	1.0	N	D194862
D194863	.67L	N	B	1.9	420L	2.4	.10	.95	.40	N	D194863
D194864	2.9	5.9	B	3.9	860L	4.9	.50	2.9	1.2	N	D194864
D194865	.64L	N	B	1.8	400L	2.7	.10	.91L	.60	N	D194865
D194866	2.2	9.6	B	3.2	1,400L	8.0L	1.0	4.8	1.7	N	D194866
D194867	.64	1.8L	B	1.4	400L	2.3	.10	1.4	.50	N	D194867
D194868	.46	N	B	2.0	290L	1.7	.10	1.3	.27	N	D194868
D194869	.95	N	B	1.4	420L	2.9	.20	1.4	.60	N	D194869
D194870	1.7	N	B	2.3	500L	4.0	.30	1.2	.55	N	D194870
D194029	1.5	2.9	N	1.9	420	4.4	1.1	2.9	1.2	N	D194029
D194030	1.6	N	B	1.6	460L	4.2	.60	1.6	.90	N	D194030
D194031	1.6	4.9	B	4.9	720L	8.2	1.2	3.3	.10L	N	D194031
D194032	.81	2.3	B	1.7	510	4.6	.10	1.7	.90	N	D194032
D194033	.61	N	B	1.3	380L	3.0	.20	.87	.51	N	D194033
D194034	5.0	6.7	B	10	1,500L	8.4L	.10L	5.0	1.7	N	D194034
D194035	2.0	2.0L	B	2.9	430L	2.5L	.63	2.9	.95	N	D194035
D194036	1.2	N	B	5.7	350L	4.5	.10L	.81	.53	N	D194036

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	SR-S (PPM)	TH (PPM)	TL-S (PPM)	U (PPM)	V-S (PPM)	W (PPM)	Y-S (PPM)	YB (PPM)	ZN (PPM)	ZR-S (PPM)	SAMPLE NUMBER
D165993	440	N	N	0.22	1.3	N	N	N	1.8L	4.4	D165993
D196052	220	.80	N	.85	2.2	N	2.2	B	4.5	11	D196052
D196053	560	.50	N	.81	7.8	N	3.3	B	3.9	11	D196053
D196054	280	.50	N	1.2	6.7	N	4.8	.29	6.6	6.7	D196054
D196055	430	1.0	N	.62	4.4	N	4.4	.26	4.6	13	D196055
D196056	370	.50	N	1.4	5.2	N	5.2	.37	4.4	7.4	D196056
D196057	710	1.1	N	1.1	7.1	N	5.1	.30	6.8	20	D196057
D196058	920	1.5	N	1.3	6.4	N	9.2	.92	5.7	28	D196058
D196059	250	.90	N	1.3	12	N	5.1	B	5.7	25	D196059
D196060	250	1.4	N	2.0	18	N	8.6	.86	17	25	D196060
D196061	690	.90	N	.78	3.0	N	3.0	.30	4.2	15	D196061
D196062	640	1.2	N	1.1	8.9	N	3.8	.38	14	19	D196062
D196075	380	4.1	N	4.0	76	N	27	2.7	76	57	D196075
D196076	470	1.0	N	1.3	11	N	4.7	.47	4.5	23	D196076
D196077	310	6.6	N	5.0	46	N	16	1.6	33	46	D196077
D196078	340	1.1	N	.81	3.4	N	2.3	N	7.0	7.9	D196078
D196079	390	5.2	N	4.3	39	N	13	.77	30	51	D196079
D196080	370	2.3	N	1.7	9.3	N	5.6	.56	7.6	28	D196080
D196081	240	1.7	N	1.7	8.3	N	3.6	.36	42	18	D196081
D194858	470	1.9	N	1.2	24	N	4.7	.31	2.8	24	D194858
D194859	320	1.3	N	1.6	16	N	5.4	.32	29	11	D194859
D194860	400	2.3	N	1.6	14	N	6.0	.60	17	20	D194860
D194861	710	1.4	N	.86	10	N	3.1	.20	6.5	15	D194861
D194862	520	1.5	N	.84	7.4	N	3.2	.32	6.3	11	D194862
D194863	470	.84	N	.65	4.8	N	2.9	.19	2.9	14	D194863
D194864	390	2.9	N	2.0	20	N	5.9	.59	13	39	D194864
D194865	640	.96	N	.57	2.7	N	1.8	.18L	7.8	9.1	D194865
D194866	480	5.3	N	2.9	48	N	16	.96	20	64	D194866
D194867	640	1.0	N	.70	9.2	N	6.4	.28	2.6	14	D194867
D194868	660	.28	N	.34	3.3	N	6.6	.46	2.1	4.6	D194868
D194869	470	1.4	N	1.1	2.9	N	2.9	.29	3.0	14	D194869
D194870	340	.73	N	.66	8.1	N	2.3	.35	7.1	8.1	D194870
D194029	490	1.4	N	1.7	15	N	6.8	.68	4.1	19	D194029
D194030	320	.98	N	1.5	7.4	N	2.1	.21	3.4	11	D194030
D194031	330	4.9	N	3.2	11	N	11	1.1	3.4	49	D194031
D194032	350	1.7	N	1.0	3.5	N	2.3L	.23L	1.9	17	D194032
D194033	430	.48	N	.71	2.6	N	2.6	.26	2.3	6.1	D194033
D194034	330	3.7	N	3.2	50	N	10	1.7	22	100	D194034
D194035	490	1.2	N	1.1	9.8	N	6.9	.69	2.7	20	D194035
D194036	410	.77	N	1.1	1.6	N	2.4	.24	2.3	8.1	D194036

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	SI (PERCENT)	AL (PERCENT)	CA (PERCENT)	MG (PERCENT)	NA (PERCENT)	K (PERCENT)	FE (PERCENT)	TI (PERCENT)	AG-S (PPM)	AS (PPM)	SAMPLE NUMBER
D196624	3.4	1.1	0.77	0.42	0.081	0.28	0.32	0.052	N	8.9	D196624
D196625	1.2	.46	1.9	.52	.061	.044	.25	.038	N	2.2	D196625
D196626	1.3	.48	1.8	.51	.060	.035	.33	.038	N	2.7	D196626
D196627	7.4	1.1	1.4	.50	.041	.19	.79	.53	N	10	D196627
D196628	1.3	.61	1.6	.51	.029	.070	.65	.043	N	4.6	D196628
D196629	.97	.66	1.3	.41	.11	.035	.55	.031	N	15	D196629
D196630	.47	.36	1.1	.35	.14	.052	.64	.48	N	19	D196630
D196631	2.2	.76	1.3	.39	.49	.070	.28	.050	N	5.2	D196631
D196632	1.1	.54	1.2	.40	.57	.035	.46	.038	N	4.5	D196632
D196633	1.2	.51	1.3	.41	.54	.035	.45	.044	N	4.3	D196633
D196634	3.6	1.4	.73	.34	.50	.32	2.4	.077	N	63	D196634
D196635	1.6	.78	1.2	.40	.54	.056	.28	.047	N	6.3	D196635
D196636	1.7	.81	1.3	.41	.54	.069	.40	.042	N	6.3	D196636
D196637	2.5	1.0	1.6	.58	.11	.059	.90	.084	N	7.1	D196637
D196638	.97	.61	1.6	.49	.087	.043	.55	.031	N	6.6	D196638
D196639	.86	.57	1.5	.50	.085	.036	.56	.039	N	8.0	D196639
D196640	1.2	.70	1.6	.47	.068	.050	.58	.036	N	1.6	D196640
D221097	.60	.39	1.3	.29	.065	.015	.70	.018	.074L	9.6	D221097
D221098	1.2	.62	.82	.28	.61	.018	.61	.024	.088L	4.3	D221098
D221099	1.4	.44	.80	.24	.58	.053	.70	.049	.092L	11	D221099
D221100	2.4	1.0	.89	.27	.61	.15	.75	.042	.13L	14	D221100
D221101	4.4	.87	1.2	.27	.027	.11	.52	.073	.16L	3.9	D221101
D221102	.46	.40	.97	.27	.52	.014	.23	.014	.063L	1.7	D221102
D221103	.21	.13	1.1	.43	.50	.009	1.8	.010	.093L	7.8	D221103
D221104	3.6	.99	1.7	.63	.085	.10	1.2	.056	.18L	7.1	D221104
D221105	1.0	.45	1.2	.56	.45	.021	.62	.029	.095L	2.8	D221105
D221106	.20	.24	.94	.25	.52	.013	.27	.006	.058L	2.6	D221106
D213983	1.2	.72	.68	.18	.13	.007	.16	.026	N	B	D213983
D213984	3.2	1.6	1.2	.22	1.1	.035	.26	.15	N	B	D213984
D213985	.54	.43	.93	.43	.88	.007	.24	.016	N	B	D213985
D213986	9.8	1.2	.95	.35	.92	.28	.79	.21	N	B	D213986
D213987	1.0	.70	1.0	.30	.96	.014	1.8	.049	N	B	D213987
D213988	3.6	1.3	.77	.32	.74	.36	2.6	.061	N	B	D213988
D213989	.80	.39	.91	.18	1.0	.008	.20	.022	N	B	D213989
D213990	1.4	.65	1.2	.23	1.1	.015	1.7	.076	N	B	D213990
D213991	.43	.37	.92	.22	.95	.018	.20	.012	N	B	D213991
D213992	5.8	1.3	1.1	.27	1.0	.073	1.1	.13	N	B	D213992
D213993	2.8	1.2	1.1	.26	.98	.018	1.6	.13	N	B	D213993
D213994	.52	.44	.94	.28	.62	.014	.37	.012	N	B	D213994
D213995	2.4	.89	.80	.27	.65	.11	.30	.080	N	B	D213995

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	B-S (PPM)	BA-S (PPM)	BE-S (PPM)	CD (PPM)	CE (PPM)	CL (PPM)	CO (PPM)	CR (PPM)	CU (PPM)	DY-S (PPM)	SAMPLE NUMBER
D196624	140	140	2.2	0.14L	N	100L	1.6	9.8	10	N	D196624
D196625	160	100	.53	.11L	N	100L	1.1	3.6	5.6	N	D196625
D196626	160	110	.53	.11L	N	100L	1.0	3.6	5.6	N	D196626
D196627	200	5,800	4.3	.29L	N	100L	2.0	14	10	N	D196627
D196628	180	240	.60	.12L	N	100L	.81	3.7	4.4	B	D196628
D196629	160	100	1.6	.42	N	100L	3.0	4.0	21	N	D196629
D196630	190	12,000G	2.5	.13L	N	100	6.2	6.3	9.0	N	D196630
D196631	180	120	3.6	.12L	N	100	3.1	5.1	8.0	N	D196631
D196632	160	210	.32	.21	N	100L	.53	3.0	4.1	B	D196632
D196633	160	52	.31	.10	N	100L	.52	2.8	4.6	B	D196633
D196634	150	150	1.5	.21L	N	100L	28	29	25	N	D196634
D196635	110	340	.34	.11L	N	100L	.69	3.3	4.4	B	D196635
D196636	83	350	.35	.12L	N	100L	.73	4.2	5.2	B	D196636
D196637	120	180	.53	.18L	N	100L	.58	6.3	13	B	D196637
D196638	160	210	.31	.10L	N	100L	.59	1.7	3.6	B	D196638
D196639	160	540	.32	.11L	N	100L	.59	1.8	2.7	B	D196639
D196640	180	360	.36	.12L	N	100L	3.5	2.8	4.2	B	D196640
D221097	96	150	.64	.080L	7.4L	100L	10	18	5.5	1.6L	D221097
D221098	120	340	.84	.096L	8.9L	100L	16	19	5.2	1.9L	D221098
D221099	110	710	.79	.10L	13	100L	6.9	54	7.0	2.0L	D221099
D221100	140	790	1.1	.14L	18	100L	10	54	11	2.8L	D221100
D221101	160	180	.71	.18L	20	100L	12	64	8.9	3.6L	D221101
D221102	140	260	.19	.069L	8.3	100L	19	1.4L	2.7	1.4L	D221102
D221103	130	210	.54	.10L	9.4L	100	48	52	3.0	2.0L	D221103
D221104	110	1,200	.66	.20L	26	100	13	50	11	4.0L	D221104
D221105	140	330	.30	.10L	10	100L	19	34	4.6	2.1L	D221105
D221106	160	160	.39	.063L	7.6	100L	68	30	2.4	1.3L	D221106
D213983	500	110	.72	.22	N	100L	4.6	2.8	5.1	N	D213983
D213984	320	1,600	.80	.32	N	100L	1.2	7.1	13	N	D213984
D213985	590	590	N	.085L	N	100L	2.0	1.7	2.3	N	D213985
D213986	320	470	.95L	.95	N	100L	3.2	17	19	N	D213986
D213987	210	1,400	.42L	.14L	N	100L	1.1	3.5	4.4	N	D213987
D213988	320	1,100	2.1	.21	N	100L	4.0	21	14	N	D213988
D213989	410	1,700	.42	.17	N	100L	.70	2.4	4.5	N	D213989
D213990	300	1,100	.45L	.15L	N	100L	1.6	3.4	5.4	N	D213990
D213991	380	770	.23L	.077L	N	100L	1.1	2.1	3.9	N	D213991
D213992	480	1,200	1.2	.48	N	100L	3.8	18	19	N	D213992
D213993	180	920	N	.19L	N	100L	3.4	8.0	10	B	D213993
D213994	160	780	N	.16	N	100L	.48	2.6	2.9	B	D213994
D213995	120	830	N	.12L	N	100L	1.2	12	9.9	B	D213995

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	EU (PPM)	F (PPM)	GA-S (PPM)	GD-S (PPM)	GE-S (PPM)	HF (PPM)	HG (PPM)	LA (PPM)	LI (PPM)	MN (PPM)	SAMPLE NUMBER
D196624	B	90	10	N	2.9L	N	0.060	N	5.9	41	D196624
D196625	B	20	2.1	N	N	N	.060	N	3.5	190	D196625
D196626	B	20	3.2	N	N	N	.080	N	3.5	140	D196626
D196627	B	40	14	N	5.8L	N	.18	N	12	52	D196627
D196628	B	20	3.6	B	N	N	.060	N	4.7	96	D196628
D196629	B	20	5.2	N	2.1L	N	.23	N	5.4	77	D196629
D196630	B	20	13	N	8.8	N	.10	N	1.3L	32	D196630
D196631	B	25	6.0	N	6.0	N	.060	N	6.8	89	D196631
D196632	B	25	2.1	B	N	N	.15	N	4.3	100	D196632
D196633	B	25	3.1	B	N	N	.13	N	4.4	100	D196633
D196634	B	110	15	N	6.4	N	1.2	N	6.8	62	D196634
D196635	B	35	3.4	B	N	N	.11	N	5.9	140	D196635
D196636	B	35	2.4	B	N	N	.12	N	5.5	140	D196636
D196637	B	20	5.3	B	3.5L	N	.24	N	12	100	D196637
D196638	B	20	1.6	B	N	N	.15	N	4.7	130	D196638
D196639	B	20	1.6	B	N	N	.15	N	5.0	130	D196639
D196640	B	25	1.8	B	2.4L	N	.080	N	5.7	180	D196640
D221097	.16L	25	.96	1.6L	.22	16L	.15	3.6	2.5	42	D221097
D221098	.19L	25	2.4	1.9L	.19L	19L	.080	4.4	3.1	50	D221098
D221099	.20L	25	2.0	2.0L	1.3	20L	.14	2.9	2.3	33	D221099
D221100	.28L	55	3.1	2.8L	.71	28L	.10	7.1	5.3	21	D221100
D221101	.36L	50	2.3	3.6L	1.8	36L	.040	6.8	5.2	190	D221101
D221102	.14L	20L	1.2	1.4L	.34	14L	.030	3.2	2.8	38	D221102
D221103	.20L	20L	.60	2.0L	.37	20L	.26	4.1	1.0L	50	D221103
D221104	.40L	65	2.0	4.0L	1.0	40L	.15	11	4.8	110	D221104
D221105	.21L	20L	1.0	2.1L	.52	21L	.080	4.0	2.9	87	D221105
D221106	.13L	20L	.47	1.3L	1.3	13L	.080	3.5	.95	36	D221106
D213983	N	140	3.6	N	1.4	N	.020	7.2L	4.2	670	D213983
D213984	B	25	11	N	N	N	.16	N	7.5	210	D213984
D213985	B	25	2.6	N	N	N	.040	N	2.2	88	D213985
D213986	B	110	6.3	N	N	N	.16	N	6.6	140	D213986
D213987	B	35	4.2	N	N	N	.48	N	4.2	84	D213987
D213988	B	110	6.4	N	N	N	.17	N	3.6	160	D213988
D213989	B	20	2.5	N	1.7	N	.080	N	1.2	95	D213989
D213990	B	20L	4.5	N	4.5	N	.31	N	2.6	120	D213990
D213991	B	20	2.3	N	N	N	.050	N	1.5	180	D213991
D213992	B	20	7.3	N	N	N	.24	N	5.8	110	D213992
D213993	B	20	13	B	3.7	N	.34	N	8.0	140	D213993
D213994	B	20L	2.3	B	N	N	.090	N	3.3	91	D213994
D213995	B	45	6.0	B	N	N	.090	N	5.4	37	D213995

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	MO-S (PPM)	NB-S (PPM)	ND-S (PPM)	NI-S (PPM)	P (PPM)	PB (PPM)	SB (PPM)	SC (PPM)	SE (PPM)	SN-S (PPM)	SAMPLE NUMBER
D196624	2.9	2.9L	B	2.2	44L	5.8	1.9	7.2	0.60	N	D196624
D196625	2.1	2.1L	B	1.1	260	3.7	.39	1.6	.69	N	D196625
D196626	1.6	L	B	1.1	220	4.8	.40	1.6	.70	N	D196626
D196627	2.9	5.8L	B	4.3	44L	7.2	2.0	8.6	1.2	N	D196627
D196628	3.6	2.4L	B	1.2	87	4.2	.41	1.8	.60	N	D196628
D196629	7.3	2.1L	B	3.1	44L	3.1	1.1	2.1	.51	N	D196629
D196630	6.3	8.8	B	6.3	44L	3.1	4.7	3.8	.61	N	D196630
D196631	1.8	3.6	B	2.4	44L	6.0	1.1	3.6	1.0	N	D196631
D196632	1.6	2.1	B	1.1	87	4.2	.38	1.1	.66	N	D196632
D196633	1.6	2.1L	B	1.0	130	3.1	.33	1.0	.66	N	D196633
D196634	15	11	B	43	44	9.6	7.3	6.4	1.1	N	D196634
D196635	1.1	2.3L	B	1.7	44L	4.5	.36	1.1L	.69	N	D196635
D196636	.83	2.4L	B	1.2	44L	4.1	.36	1.2L	.81	N	D196636
D196637	1.2	3.5L	B	1.8	44L	29	.77	2.6	1.6	N	D196637
D196638	1.6	N	B	1.6	220	4.7	.61	1.0L	.10L	N	D196638
D196639	1.6	N	B	1.6	260	4.3	.55	1.1L	.53	N	D196639
D196640	1.8	2.4L	B	1.8	390	3.0L	.33	1.2L	.59	N	D196640
D221097	2.6	1.5	7.4L	1.4	170	4.3	.17	.96	.56	.74L	D221097
D221098	2.8	4.2	8.9L	5.1	44	3.2	.46	1.2	.79	.89L	D221098
D221099	2.6	3.2	9.3L	2.6	44L	3.8	1.3	2.3	1.1	.93L	D221099
D221100	3.1	4.7	13L	5.8	44	6.0	.90	2.6	1.6	1.3L	D221100
D221101	2.0	7.3	17L	5.5	48	4.6	.32	3.4	.56	1.7L	D221101
D221102	.67	1.8	6.4L	2.5	44	2.6	.10	.58	.39	.64L	D221102
D221103	2.2	2.2	9.4L	4.2	44L	3.0L	.070	1.4	.50	.94L	D221103
D221104	1.9	6.2	19L	6.6	87	6.0L	.33	3.2	.82	1.9L	D221104
D221105	.70	1.9	9.6L	3.7	220	3.1L	.22	1.1	.48	.96L	D221105
D221106	1.0	1.6	5.9L	3.3	44	1.9L	.18	1.2	.43	.59L	D221106
D213983	7.2	1.4	N	36	44L	3.3	.43	3.6	.80	N	D213983
D213984	8.0	3.2	B	3.2	44	10	.80	4.8	2.6	N	D213984
D213985	6.0	1.7L	B	6.0	44L	2.1L	.16	.85	.44	N	D213985
D213986	4.7	6.3	B	16	83	7.9L	.92	6.3	1.4	N	D213986
D213987	2.8	N	B	2.8	44L	4.4	.49	2.8	1.2	N	D213987
D213988	4.3	N	B	15	130	5.3L	1.4	6.4	.10L	N	D213988
D213989	2.5	1.7L	B	1.7	44	2.1L	.41	2.5	.54	N	D213989
D213990	15	3.0L	B	7.6	48L	3.8	1.0	2.3	.96	N	D213990
D213991	2.3	N	B	3.9	44L	2.4	.32	1.5	.66	N	D213991
D213992	7.3	4.8L	B	24	44	7.7	1.5	7.3	2.0	N	D213992
D213993	37	3.7	B	9.3	39	6.8	.91	2.8	2.2	N	D213993
D213994	1.2	1.6L	B	.78	44L	2.4	.21	1.2	.82	N	D213994
D213995	1.8	2.4	B	3.6	44	3.3	.88	2.4	1.3	N	D213995

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	SR-S (PPM)	TH (PPM)	TL-S (PPM)	U (PPM)	V-S (PPM)	W (PPM)	Y-S (PPM)	YB (PPM)	ZN (PPM)	ZR-S (PPM)	SAMPLE NUMBER
D196624	220	2.5	N	11	22	N	14	1.4	16	29	D196624
D196625	210	2.4	N	.83	7.4	N	7.4	.53	6.0	16	D196625
D196626	210	2.3	N	.90	7.4	N	18	.53	5.9	16	D196626
D196627	430	5.3	N	9.8	29	N	29	2.0	25	86	D196627
D196628	240	2.0	N	2.7	8.4	N	3.6	.36	6.5	18	D196628
D196629	160	1.6	N	2.4	16	N	7.3	.73	83	16	D196629
D196630	250	1.1	N	10	38	N	13	1.9	34	63	D196630
D196631	180	3.6	N	4.1	18	N	18	1.8	31	60	D196631
D196632	210	1.8	N	.91	5.3	N	3.2	.32	19	16	D196632
D196633	210	1.9	N	.91	3.1	N	3.1	.31	20	16	D196633
D196634	210	5.7	N	13	64	N	21	3.2	170	64	D196634
D196635	230	2.3	N	.84	5.7	N	3.4	.34	29	17	D196635
D196636	180	2.3	N	.93	3.5	N	3.5	.35	28	18	D196636
D196637	260	4.4	N	4.3	12	N	8.8	.53	19	26	D196637
D196638	210	1.4	N	.89	1.6	N	3.1	.21	5.0	10	D196638
D196639	220	1.3	N	1.0	1.6	N	3.2	.22	5.2	11	D196639
D196640	240	1.8	N	1.2	3.6	N	3.6	.36	17	18	D196640
D221097	250	.98	.74L	1.7	1.8	93L	5.7	.33	2.2	17	D221097
D221098	290	1.9	.89L	1.2	14	93L	6.4	.37	6.8	30	D221098
D221099	320	1.1	.93L	1.1	12	93L	7.2	.48	4.0	28	D221099
D221100	400	1.8	1.3L	2.0	19	93L	6.8	.57	7.2	43	D221100
D221101	250	1.7	1.7L	1.3	21	93L	11	.98	3.6L	64	D221101
D221102	300	.89	.64L	.33	3.7	93L	3.4	.24	1.4L	12	D221102
D221103	350	.74	.94L	.20	6.0	93L	8.2	.54	14	12	D221103
D221104	500	1.6	1.9L	1.3	19	93L	12	1.1	8.8	38	D221104
D221105	360	1.0	.96L	.55	9.7	93L	4.2	.33	3.9	23	D221105
D221106	570G	.32	.59L	.20L	3.3	93L	6.9	.42	21	5.7	D221106
D213983	110	2.4	N	1.2	7.2	N	7.2	.72	16	36	D213983
D213984	320	5.1	N	2.3	24	N	24	1.6	53	80	D213984
D213985	250	1.2	N	1.4	6.0	N	6.0	.43	1.7L	26	D213985
D213986	470	3.9	N	2.8	47	N	22	2.2	15	160	D213986
D213987	140	2.3	N	1.5	9.9	N	9.9	.99	2.8L	28	D213987
D213988	430	2.1	N	2.8	110	N	21	2.1	10	110	D213988
D213989	410	1.4	N	1.9	12	N	8.3	.58	6.2	41	D213989
D213990	300	2.1	N	4.8	15	N	11	.76	3.0L	45	D213990
D213991	380	1.0	N	.89	7.7	N	7.7	.54	1.5L	12	D213991
D213992	360	5.0	N	4.0	48	N	24	2.4	43	120	D213992
D213993	280	5.3	N	3.0	13	N	9.3	.93	6.7	55	D213993
D213994	230	1.4	N	.56	5.5	N	3.9	.39	6.6	12	D213994
D213995	240	3.2	N	1.3	24	N	6.0	.60	3.8	36	D213995

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	SI (PERCENT)	AL (PERCENT)	CA (PERCENT)	MG (PERCENT)	NA (PERCENT)	K (PERCENT)	FE (PERCENT)	TI (PERCENT)	AG-S (PPM)	AS (PPM)	SAMPLE NUMBER
D213996	3.3	0.96	1.3	0.25	0.81	0.021	2.1	0.20	0.42	B	D213996
D213997	.90	.40	1.0	.31	.61	.020	.57	.027	N	B	D213997
D213998	2.6	.87	1.1	.41	.78	.043	.14	.13	N	B	D213998
D213999	.74	.45	1.2	.25	.31	.011	2.7	.022	N	B	D213999
D214000	1.4	.56	.89	.15	.79	.011	.65	.061	N	B	D214000
D214001	.93	.71	.90	.29	.85	.017	.26	.028	N	B	D214001
D196399	.53	.84	1.4	.33	.83	.017	.16	.023	N	3.7	D196399
D196400	.88	.84	1.5	.32	.70	.047	2.1	.027	N	22	D196400
D196401	3.5	.73	1.7	.40	.37	.040	1.2	.045	N	6.6	D196401
D196402	.69	.76	1.3	.33	.27	.024	1.6	.020	N	14	D196402
D196403	.82	1.1	1.3	.33	.70	.052	2.1	.017	N	10	D196403
D196404	2.6	1.9	1.1	.32	.97	.13	1.0	B	N	12	D196404
D196405	B	1.2	B	.31	.91	.027	1.4	.050	N	9.1	D196405
D196406	1.4	1.1	1.1	.21	.94	.032	.30	.035	N	8.2	D196406
D196407	.54	.51	1.3	.21	.92	.025	1.6	.022	N	B	D196407
D210365	B	B	B	.28	.35	B	B	B	N	2.3	D210365
D210368	6.2	1.6	1.1	.34	.77	.32	.48	.090	N	3.8	D210368
D210369	B	B	B	.26	.73	B	B	B	N	7.9	D210369
D210371	.83	.44	1.3	.31	.47	.023	1.1	.022	N	9.8	D210371
D210372	2.8	1.1	1.3	.35	.21	.21	1.5	.048	N	12	D210372
D218907	.47	.22	.95	.19	.18	.020	.14	.010	.046L	3.8	D218907
D210366	B	B	B	.20	.61	B	B	B	N	1.5	D210366
D210370	.71	.43	1.3	.29	.066	.029	.55	.021	N	3.3	D210370
D196593	8.7	2.0	1.6	.63	.089	.58	1.1	.11	N	3.4	D196593
D196594	4.5	1.2	1.6	.62	.093	.29	.72	.074	N	4.9	D196594
D196595	6.9	1.9	2.0	.70	.15	.43	.50	.093	N	4.9	D196595
D196596	5.1	1.6	1.6	.66	.50	.44	.77	.096	N	3.4	D196596
D196597	7.8	1.9	1.4	.65	.49	.53	.84	.10	N	8.1	D196597
D240973	.28	.27	1.7	.22	.036	.010	.20	.008	.007L	1.4	D240973
D240974	2.1	.85	1.5	.36	.14	.18	.54	.040	.013L	4.4	D240974
D240975	1.2	.65	1.2	.23	.60	.040	.34	.025	.009L	6.1	D240975
D240976	.34	.26	1.3	.22	.13	.009	.25	.013	.007L	3.1	D240976
D240977	.39	.29	1.2	.22	.75	.014	.21	.011	.008L	3.6	D240977
D240978	2.1	1.5	.98	.28	.86	.039	.18	.040	.013L	8.7	D240978
D240979	.31	.26	.89	.22	.75	.017	.72	.018	.008L	8.9	D240979
D240980	.83	.45	1.3	.32	.23	.026	1.3	.027	.011L	9.7	D240980
D240981	6.9	2.9	1.5	.57	.39	.51	1.2	.10	.051	24	D240981
D240982	1.8	.84	1.2	.23	.99	.14	.31	.035	.022	4.1	D240982
D240983	1.9	.93	.96	.31	.83	.14	.43	.046	.014L	9.2	D240983
D240984	.46	.39	1.1	.21	.047	.011	1.0	.019	.009L	20	D240984

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	B-S (PPM)	BA-S (PPM)	BE-S (PPM)	CD (PPM)	CE (PPM)	CL (PPM)	CO (PPM)	CR (PPM)	CU (PPM)	DY-S (PPM)	SAMPLE NUMBER
D213996	210	1,500	N	0.21L	N	100L	1.3	8.4	16	N	D213996
D213997	190	950	.29L	.095L	N	100	.61	2.5	6.7	B	D213997
D213998	210	1,400	N	.57	N	100L	.90	5.7	12	B	D213998
D213999	130	930	.67	.13L	N	100L	.61	2.4	6.9	B	D213999
D214000	110	760	.32L	.11	N	200	.72	5.0	8.0	N	D214000
D214001	190	930	1.9	.093	N	100L	1.4	3.7	9.3	B	D214001
D196399	53	530	.38	.076L	B	100L	1.9	1.2	3.3	B	D196399
D196400	200	400	.41L	.14L	N	100L	.72	2.5	4.2	B	D196400
D196401	150	760	.46	.15L	N	100	2.0	2.8	5.7	B	D196401
D196402	110	320	.32L	.11L	N	100L	.85	1.7	3.7	B	D196402
D196403	94	270	N	.14L	N	100	1.4	2.7	4.2	B	D196403
D196404	160	2,400	.48	.16L	N	100	2.0	7.0	9.9	B	D196404
D196405	210	410	.41	.14L	N	100L	.74	3.7	7.3	B	D196405
D196406	95	280	.48	.095L	N	100L	2.4	2.9	5.9	B	D196406
D196407	120	350	.35	.12L	N	100L	.89	2.7	4.8	B	D196407
D210365	120	360	N	.12L	N	100L	.97	1.6	8.0	B	D210365
D210368	120	1,200	N	.23L	N	100L	1.6	14	9.9	B	D210368
D210369	85	250	.26	.085L	N	100L	1.0	3.5	7.6	B	D210369
D210371	230	570	N	.11L	N	100L	1.3	2.4	6.8	B	D210371
D210372	180	880	.53L	.18L	N	100L	1.7	8.5	9.9	B	D210372
D218907	40	150	.15	.050L	4.6L	100L	1.3	2.5	3.5	1.0L	D218907
D210366	58	580	.42	.17	N	100L	2.1	1.8	5.1	N	D210366
D210370	250	250	.25	.084L	N	100L	.81	2.7	5.1	B	D210370
D196593	220	320	N	.32L	N	100L	4.3	16	7.3	B	D196593
D196594	140	200	2.1	.21L	N	100L	2.0	8.7	8.0	N	D196594
D196595	180	520	1.3	.26L	N	100L	3.0	11	10	B	D196595
D196596	160	1,100	.69	.23L	N	100L	2.8	8.9	6.9	B	D196596
D196597	200	580	.88	.29L	N	100L	2.9	12	8.2	B	D196597
D240973	53	490	.18	.007L	3.0L	180	.71	1.6	1.3	1.5L	D240973
D240974	88	660	.61	.041	5.5L	210	2.5	9.5	3.5	2.8L	D240974
D240975	68	160	1.8	.009L	4.0L	180	3.2	3.7	3.5	2.0L	D240975
D240976	60	180	1.3	.007L	2.9L	210	3.6	2.5	2.6	1.9	D240976
D240977	57	510	.27	.012	3.2L	270	.64	1.6	1.5	1.7L	D240977
D240978	66	71	.75	.013L	5.5L	260	2.7	3.7	3.8	2.8L	D240978
D240979	72	450	.38	.008L	6.0	190	1.1	1.2	1.3	1.8L	D240979
D240980	100	380	.86	.011L	6.8	190	.88	2.6	2.9	2.5L	D240980
D240981	130	390	3.3	.097	21	160	8.4	20	17	7.2	D240981
D240982	63	1,200	.33	.012L	5.2L	200	1.1	7.3	4.0	2.7L	D240982
D240983	69	420	.38	.014L	6.0L	180	2.9	10	5.0	3.1L	D240983
D240984	73	280	1.1	.009L	6.4	180	1.1	1.7	2.0	1.9L	D240984

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	EU (PPM)	F (PPM)	GA-S (PPM)	GD-S (PPM)	GE-S (PPM)	HF (PPM)	HG (PPM)	LA (PPM)	LI (PPM)	MN (PPM)	SAMPLE NUMBER
D213996	B	20	10	N	N	N	0.91	N	7.9	83	D213996
D213997	B	40	1.9	B	N	N	.10	N	2.4	44	D213997
D213998	B	35	7.1	B	N	N	.050	N	6.2	49	D213998
D213999	B	20L	4.0	B	N	N	.21	N	2.4	180	D213999
D214000	B	20	3.2	N	N	N	.18	N	3.7	32	D214000
D214001	B	20	6.5	B	4.7	N	.080	N	3.7	35	D214001
D196399	B	35	1.1	B	N	N	.020	N	2.3	73	D196399
D196400	B	30	B	B	N	N	.15	N	2.2	120	D196400
D196401	B	20	B	B	N	N	.060	N	4.1	89	D196401
D196402	B	20	B	B	N	N	.070	N	1.7	81	D196402
D196403	B	35	B	B	N	N	.10	N	3.2	88	D196403
D196404	B	65	B	B	N	N	.14	N	7.8	140	D196404
D196405	B	25	B	B	N	N	.12	N	5.3	120	D196405
D196406	B	25	1.4	B	N	N	.020	N	2.6	120	D196406
D196407	B	20L	B	B	N	N	.26	N	5.9	110	D196407
D210365	B	42	3.6	B	N	N	.060	N	4.3	180	D210365
D210368	B	80	4.6	B	N	N	.070	N	6.7	57	D210368
D210369	B	20L	1.7	B	1.7	N	.080	N	2.7	21	D210369
D210371	B	25	1.7	B	N	N	.22	N	3.4	44	D210371
D210372	B	35	5.3	B	N	N	.12	N	5.0	110	D210372
D218907	.10L	30	.38	1.0L	.13	10L	.080	1.7	1.2	21	D218907
D210366	N	20L	2.5	N	1.7L	N	.040	8.3L	2.7	27	D210366
D210370	B	45	2.5	B	N	N	.070	N	1.9	79	D210370
D196593	B	170	9.5	B	N	N	.11	N	13	140	D196593
D196594	B	80	6.2	N	N	N	.10	N	8.0	110	D196594
D196595	B	120	7.7	B	N	N	.080	N	13	210	D196595
D196596	B	130	4.6	B	N	N	.090	N	8.9	190	D196596
D196597	B	160	8.8	B	N	N	.10	N	13	150	D196597
D240973	.15L	20	.61	2.2L	.32L	1.1L	.010	4.2	.35	70	D240973
D240974	.28L	72	1.9	4.1L	.59L	1.9L	.030	5.2	1.5	120	D240974
D240975	.21L	42	3.0	3.0L	3.4	3.9	.020	4.1	.74	73	D240975
D240976	.26	31	.74	2.1L	1.5	1.0L	.030	3.8	.34	120	D240976
D240977	.17L	35	1.5	2.4L	.35L	1.1L	.050	3.8	.38	27	D240977
D240978	.28L	40	5.1	4.1L	.58L	1.9L	.040	4.2	3.2	60	D240978
D240979	.18L	32	1.5	2.6L	.49	1.2L	.10	2.6	.40	38	D240979
D240980	.25L	31	1.8	3.6L	.52L	1.7L	.080	6.2	.79	96	D240980
D240981	.66L	230	6.9	9.7L	1.4	4.5L	.19	22	6.6	75	D240981
D240982	.27L	81	2.6	3.9L	.56L	1.8L	.070	6.8	2.1	15	D240982
D240983	.31L	79	2.2	4.4L	.64L	2.1L	.030	5.7	1.5	65	D240983
D240984	.19L	42	1.7	2.8L	.40L	1.3L	.17	5.3	.60	56	D240984

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	MO-S (PPM)	NB-S (PPM)	ND-S (PPM)	NI-S (PPM)	P (PPM)	PB (PPM)	SB (PPM)	SC (PPM)	SE (PPM)	SN-S (PPM)	SAMPLE NUMBER
D213996	2.1	4.2	B	10	44	8.1	1.0	4.2	3.0	N	D213996
D213997	1.4	1.9L	B	1.4	87	2.4L	.30	1.4	.69	N	D213997
D213998	2.8	2.8	B	2.1	44	5.0	.43	2.1	1.2	N	D213998
D213999	2.0	N	B	1.3	48L	3.3L	.38	1.3	.78	N	D213999
D214000	.76	2.2L	B	1.1	92	3.5	.61	1.6	1.2	N	D214000
D214001	.93	1.9L	B	1.4	44L	3.4	1.5	6.5	1.1	N	D214001
D196399	1.1	N	B	5.3	260	4.2	.30	1.5	.29	N	D196399
D196400	2.0	N	B	2.0	350	3.4	.55	1.4	.44	N	D196400
D196401	3.1	N	B	3.1	87	3.8	.64	1.5	.46	N	D196401
D196402	3.2	N	B	1.6	130	3.7	.26	1.1	.30	N	D196402
D196403	2.0	N	B	2.0	390	11	.57	1.4	.44	N	D196403
D196404	3.2	N	B	4.8	170	5.6	.68	2.4	.79	N	D196404
D196405	2.1	N	B	1.4	44L	4.8	.72	1.4	.98	N	D196405
D196406	1.4	N	B	1.9	44	2.4	.47	1.9	.46	N	D196406
D196407	1.2	N	B	1.2	44	2.9	.54	2.3	.68	N	D196407
D210365	2.4	N	B	2.4	87	6.3	.20	1.2L	.60	N	D210365
D210368	N	N	B	3.5	44	5.8L	.37	2.3	.84	N	D210368
D210369	1.7	1.7L	B	2.6	44	2.3	.60	1.3	.60	N	D210369
D210371	1.7	N	B	2.3	170	2.9L	.43	1.1	.60	N	D210371
D210372	2.7	N	B	3.5	130	4.4L	.97	2.7	.10L	N	D210372
D218907	.35	.80	4.7L	1.6	260	4.7	.47	.55	.48	.47L	D218907
D210366	.58L	N	N	4.2	87	3.3	.42	.83	.42	N	D210366
D210370	1.7	1.7L	B	1.3	44L	2.2	.43	.84	.38	N	D210370
D196593	3.2	6.3L	B	4.7	310	7.9	.65	4.7	.10L	N	D196593
D196594	3.1	4.1	B	3.1	180	7.2	.74	4.1	.58	N	D196594
D196595	2.6	5.2	B	3.9	210	15	.56	3.9	.72	N	D196595
D196596	N	N	B	3.4	130	5.7	.43	3.4	.10L	N	D196596
D196597	N	5.8L	B	4.4	180	7.3	.72	4.4	.10L	N	D196597
D240973	.27	.48L	2.2L	1.8	210	.35	.13	.67	B	.32L	D240973
D240974	.48	.88L	4.1L	3.9	44L	.65	.45	1.5	.48	.71	D240974
D240975	1.4	1.3	3.0L	2.8	44L	1.7	1.3	3.0	B	.49	D240975
D240976	3.4	1.1	2.1L	4.0	44L	1.5	.62	1.4	.78	.31L	D240976
D240977	.50	.64	2.4L	1.3	150	.60	.25	.74	.67	.35L	D240977
D240978	.86	1.0	4.1L	3.6	44L	6.0	.67	1.7	1.3	.58L	D240978
D240979	.58	.54L	2.6L	1.7	44L	1.2	.40	.70	.69	.37L	D240979
D240980	3.5	1.0	3.6L	1.0	44L	1.4	.59	.77	.69	.52L	D240980
D240981	5.1	5.4	9.7L	22	280	8.8	1.8	4.8	3.4	1.4L	D240981
D240982	2.0	1.0	3.9L	3.3	250	2.7	.81	1.2	1.5	.65	D240982
D240983	1.5	1.0	4.4L	3.8	190	3.1	1.0	1.5	1.4	.70	D240983
D240984	1.1	1.8	2.8L	1.8	220	1.5	.52	1.5	.63	.40L	D240984

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	SR-S (PPM)	TH (PPM)	TL-S (PPM)	U (PPM)	V-S (PPM)	W (PPM)	Y-S (PPM)	YB (PPM)	ZN (PPM)	ZR-S (PPM)	SAMPLE NUMBER
D213996	310	4.8	N	3.2	31	N	15	1.5	4.2L	100	D213996
D213997	280	1.3	N	.85	4.8	N	4.8	.48	2.5	19	D213997
D213998	280	3.0	N	2.2	21	N	7.1	.71	2.8	43	D213998
D213999	200	1.7	N	1.3	6.7	N	6.7	B	8.9	20	D213999
D214000	220	2.5	N	1.1	16	N	5.4	.54	3.2	22	D214000
D214001	280	2.4	N	3.2	19	N	14	1.4	7.4	65	D214001
D196399	230	.55	N	.43	5.3	N	2.3	.23	6.6	15	D196399
D196400	270	.52	N	.99	9.5	N	2.7L	B	4.5	14	D196400
D196401	230	.65	N	1.1	7.7	N	3.1	.31	3.5	15	D196401
D196402	320	.34	N	.47	7.4	N	2.1	B	5.3	5.3	D196402
D196403	270	.85	N	1.0	9.5	N	2.7L	B	28	14	D196403
D196404	240	1.5	N	1.7	24	N	3.2	B	9.1	24	D196404
D196405	270	1.2	N	1.5	9.6	N	2.7	B	4.8	21	D196405
D196406	190	1.2	N	1.0	14	N	2.9	.29	2.9	19	D196406
D196407	230	.49	N	.93	12	N	2.3L	B	5.3	17	D196407
D210365	240	1.8	N	10	2.4	N	2.4	B	75	8.3	D210365
D210368	350	2.4	N	1.2	23	N	4.6	.69	22	46	D210368
D210369	590	.70	N	.71	13	N	2.6	.26	44	17	D210369
D210371	570	.83	N	.82	8.0	N	3.4	B	9.6	11	D210371
D210372	350	1.7	N	1.7	27	N	5.3	B	62	27	D210372
D218907	110	8.6	.47L	.86	2.5	4.7	1.5	.10	2.1	6.5	D218907
D210366	580	1.0	N	.85	5.8	N	5.8	.42	13	17	D210366
D210370	420	.92	N	.74	5.9	N	4.2	.25	11	8.4	D210370
D196593	630	3.9	N	.94	22	N	16	.95	32	95	D196593
D196594	410	3.2	N	2.1	14	N	14	1.0	19	61	D196594
D196595	520	3.6	N	1.3	18	N	7.7	.77	29	52	D196595
D196596	460	2.5	N	.46	16	N	6.9	.69	20	34	D196596
D196597	440	3.8	N	1.1	20	N	8.8	.88	35	44	D196597
D240973	380	.46	.70L	.21	2.0	15L	2.9	.18	.56	11	D240973
D240974	180	1.3	1.3L	.83	8.8	15L	3.7	.35	6.8	35	D240974
D240975	240	1.0	.93L	1.3	6.7	15L	7.3	.84	.65	100	D240975
D240976	210	.75	.67L	3.8	4.6	15L	6.6	.74	.54	14	D240976
D240977	370	.52	.75L	.33	2.6	15L	2.2	.15	1.3	12	D240977
D240978	240	2.0	1.3L	1.1	7.1	15L	5.7	.56	1.0	17	D240978
D240979	360	.46	.80L	.15L	2.2	15L	2.0	.10	.72	5.4	D240979
D240980	330	1.3	1.1L	1.7	5.1	15L	3.3	.16	1.1	24	D240980
D240981	360	6.2	3.0L	4.1	30	15L	19	2.0	16	72	D240981
D240982	300	1.5	1.2L	1.7	9.3	15L	3.1	.26	2.7	15	D240982
D240983	390	1.6	1.4L	1.2	12	15L	3.6	.39	5.4	18	D240983
D240984	170	1.2	.86L	1.0	4.6	15L	4.3	.40	3.4	40	D240984

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	SI (PERCENT)	AL (PERCENT)	CA (PERCENT)	MG (PERCENT)	NA (PERCENT)	K (PERCENT)	FE (PERCENT)	TI (PERCENT)	AG-S (PPM)	AS (PPM)	SAMPLE NUMBER
D240985	0.37	0.34	0.94	0.23	0.73	0.012	0.34	0.015	0.008L	9.0	D240985
D240986	.65	.59	1.0	.30	.88	.015	2.1	.026	.055	13	D240986
D240987	1.1	.59	1.1	.24	.77	.077	.28	.029	.009L	3.8	D240987
D240988	.74	.45	.97	.23	.88	.043	.54	.018	.009L	12	D240988
D240989	1.8	.95	1.4	.33	.23	.044	1.0	.052	.014L	12	D240989
D240990	H	H	H	.25	.96	H	H	H	.011L	9.1	D240990
D240991	1.8	.70	1.1	.34	.58	.12	1.4	.077	.031	13	D240991
D240992	1.3	.75	1.1	.25	.86	.091	.52	.034	.012L	5.0	D240992
D210367	5.2	1.6	1.4	.27	.86	.39	.61	.056	N	13	D210367
D175972	.97	.52	.99	.33	.65	.028	.51	.041	N	8.0	D175972
D175973	.43	.25	1.1	.34	.12	.021	1.2	.020	N	5.0	D175973
D175974	.40	.29	1.4	.38	.099	.024	1.3	.020	N	2.0	D175974
D175975	.17	.21	1.1	.33	.18	.022	.85	.012	.12	3.0	D175975
D165751	.42	.44	1.4	.43	.009	.005L	.040	B	N	1.0	D165751
D165752	.41	.51	1.8	.56	.018	.007L	.090	B	N	2.0	D165752
D165753	.37	.41	1.9	.31	.006	.006L	.037	B	N	1.0	D165753
D165754	.23	.46	1.8	.28	.014	.007L	.47	B	N	2.0	D165754
D165755	.10	.38	1.2	.36	.006	.005L	.41	B	N	2.0	D165755
D165756	.08	.46	1.3	.35	.006	.005L	.26	B	N	1.0	D165756
D165757	1.2	.84	2.2	.67	.014	.009L	.066	B	N	2.0	D165757
D165758	.94	.60	1.6	.56	.025	.007L	.053	B	N	1.0	D165758
D165759	.25	.39	1.3	.30	.026	.005L	.15	B	N	1.0	D165759
D165760	1.1	.50	1.4	.49	.022	.007L	.13	B	N	2.0	D165760
D165761	.64	.57	1.4	.53	.024	.006L	.024	B	N	1.0	D165761
D165762	.14	.29	1.2	.43	.024	.004L	.049	B	N	1.0	D165762
D165763	2.1	1.4	2.3	.54	.015	.012L	.16	B	N	3.0	D165763
D165764	1.5	.90	2.6	.46	.007	.010L	.12	B	N	3.0	D165764
D165765	1.2	1.3	1.7	.47	.013	.010L	.25	B	N	5.0	D165765
D165766	2.1	1.7	1.8	.48	.014	.013L	.30	B	N	5.0	D165766
D178086	1.3	1.1	1.2	.44	.21	.029	.75	.031	N	16	D178086
D178087	.73	.69	1.2	.42	.050	.008	1.4	.019	N	2.5	D178087
D178088	.18	.30	1.2	.39	.045	.013	2.1	.018	N	4.0	D178088
D188118	2.2	1.0	2.4	.62	.20	.096	.32	.047	N	1.9	D188118
D188119	.70	.30	2.3	.43	.23	.047	.42	.031	N	2.7	D188119
D188120	1.1	.59	2.3	.48	.26	.052	.27	.032	N	2.5	D188120
D188121	.52	.36	1.8	.39	.60	.025	.62	.015	N	.74	D188121
D188122	.90	.47	1.8	.38	.61	.029	.13	.023	N	.88	D188122
D188123	1.6	.97	2.2	.40	.42	.049	.69	.048	N	1.5	D188123
D188124	.63	.23	1.8	.37	.52	.032	1.1	.027	N	1.7	D188124
D188125	.27	.20	2.2	.55	.14	.026	.29	.027	N	1.2	D188125

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	B-S (PPM)	BA-S (PPM)	BE-S (PPM)	CD (PPM)	CE (PPM)	CL (PPM)	CO (PPM)	CR (PPM)	CU (PPM)	DY-S (PPM)	SAMPLE NUMBER
D240985	57	1,200	0.33	0.008L	3.4L	180	1.4	1.6	1.8	1.7L	D240985
D240986	120	750	1.4	.014L	9.6	100L	1.4	2.4	3.3	4.1	D240986
D240987	44	330	.22	.009L	3.9L	160	1.5	4.2	3.7	2.0L	D240987
D240988	60	1,000	.67	.033	4.1	220	2.3	5.1	3.5	2.0L	D240988
D240989	95	390	1.7	.014L	5.9L	210	2.1	4.7	3.7	3.0L	D240989
D240990	97	600	.57	.011L	4.9L	280	2.5	4.4	2.7	2.5L	D240990
D240991	120	120	.33	.045	6.1L	300	2.1	7.0	11	3.1L	D240991
D240992	98	2,900	.61	.012L	4.9L	350	1.6	8.9	5.2	2.5	D240992
D210367	110	1,100	1.1	.022L	N	100L	.83	2.2	11	B	D210367
D175972	140	640	.28	.092L	N	B	1.4	2.8	5.2	B	D175972
D175973	180	280	.28	.092L	N	B	.92	2.8	4.4	B	D175973
D175974	160	210	N	.11L	N	B	1.1L	1.1	3.0	B	D175974
D175975	170	170	.58	.083L	N	B	1.2	1.2	9.0	B	D175975
D165751	64	960	N	.064L	B	B	.64	.96	3.4	B	D165751
D165752	56	560	N	.080L	B	B	N	1.2	4.3	B	D165752
D165753	36	500	.21	.071L	B	B	N	1.1	3.4	B	D165753
D165754	16	550	N	.079L	B	B	N	.55	3.8	B	D165754
D165755	45	970	N	.065L	B	B	.65	.45	3.4	B	D165755
D165756	44	620	N	.062L	B	B	.62	.62	3.9	B	D165756
D165757	56	560	N	.11L	B	B	N	2.3	5.4	B	D165757
D165758	61	1,300	N	.087L	B	B	N	1.3	4.5	B	D165758
D165759	62	620	N	.062L	B	B	.62	.93	3.6	B	D165759
D165760	60	600	N	.086L	B	B	N	2.6	9.0	B	D165760
D165761	72	360	.22	.072L	B	B	.72	1.4	3.9	B	D165761
D165762	50	150	N	.050L	B	B	.76	.76	2.9	B	D165762
D165763	43	430	.99	.14L	B	B	N	2.1	6.0	B	D165763
D165764	24	180	1.8	.12	B	B	N	3.7	6.1	N	D165764
D165765	85	360	.85	.12	61	B	1.8	2.4	5.6	B	D165765
D165766	47	790	.79	.16	N	B	1.6	2.4	9.5	B	D165766
D178086	130	260	1.3	.13L	N	B	N	6.6	9.4	B	D178086
D178087	130	130	N	.13	N	B	N	2.0	7.6	B	D178087
D178088	110	23	1.2	.12L	N	B	.81	2.3	10	B	D178088
D188118	96	96	N	.14L	N	B	.59	3.2	4.8	N	D188118
D188119	140	280	N	.094L	N	B	.53	1.9	3.1	N	D188119
D188120	150	31	N	.10L	N	B	2.0	4.2	5.5	N	D188120
D188121	140	64	N	.28	N	B	.35	1.3	3.4	N	D188121
D188122	130	44	.44	.088L	N	B	.97	2.0	3.9	N	D188122
D188123	92	260	N	.13L	N	B	.47	3.1	4.8	N	D188123
D188124	72	72	N	.10L	N	B	.89	1.7	4.5	N	D188124
D188125	54	540	N	.077L	N	B	.41	.99	2.2	N	D188125

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	EU (PPM)	F (PPM)	GA-S (PPM)	GD-S (PPM)	GE-S (PPM)	HF (PPM)	HG (PPM)	LA (PPM)	LI (PPM)	MN (PPM)	SAMPLE NUMBER
D240985	0.17L	38	1.2	2.5L	0.36L	1.2L	0.040	5.2	0.39	31	D240985
D240986	.30L	49	4.1	4.4L	.84	2.1L	.10	5.2	.96	55	D240986
D240987	.20L	40	1.4	2.9L	.41L	1.4L	.030	4.0	.63	44	D240987
D240988	.21L	34	2.7	3.0L	1.2	1.4L	.060	4.6	.47	24	D240988
D240989	.30L	35	3.6	4.4L	1.4	2.1L	.040	3.7	1.9	77	D240989
D240990	.25L	25	1.8	3.6L	.52L	1.7L	.11	4.1	.57	82	D240990
D240991	.31L	46	2.1	4.5L	.65L	2.1L	.10	5.4	.99	84	D240991
D240992	.25L	44	3.6	3.7L	.53L	1.7L	.080	6.9	1.3	74	D240992
D210367	N	55	6.5	B	4.4	N	.080	22L	7.4	48	D210367
D175972	N	35	1.8	B	N	N	.050	N	2.5	43	D175972
D175973	N	25	1.4	B	N	N	.28	N	1.4	88	D175973
D175974	N	40	1.6	B	N	N	.040	N	1.7	73	D175974
D175975	N	30	.83	B	N	N	.080	N	.83	41	D175975
D165751	N	55	1.9	B	N	N	.050	4.5	2.5	45	D165751
D165752	N	50	1.2	B	N	N	.060	5.6	2.5	56	D165752
D165753	N	60	1.1	B	N	N	.040	5.0	2.3	36	D165753
D165754	N	60	1.6	B	N	N	.070	5.5	1.5	40	D165754
D165755	N	90	.97	B	N	N	.15	4.5	.32L	32	D165755
D165756	N	70	.93	B	N	N	.11	4.4	.37	31	D165756
D165757	N	40	1.1	B	N	N	.040	7.9	11	56	D165757
D165758	N	40	1.7	B	N	N	.060	N	6.2	44	D165758
D165759	N	55	.93	B	N	N	.090	9.3	1.1	44	D165759
D165760	N	80	2.6	B	N	N	.12	N	4.4	43	D165760
D165761	N	120	1.4	B	N	N	.040	7.2	5.1	51	D165761
D165762	N	90	1.0	B	N	N	.030	7.6	.76	35	D165762
D165763	N	30	1.4	B	N	N	.040	9.9	16	71	D165763
D165764	N	90	2.4	N	N	N	.030	8.5	10	37	D165764
D165765	N	80	3.6	B	2.4L	N	.090	36	14	36	D165765
D165766	N	70	3.2	B	N	N	.070	N	23	47	D165766
D178086	N	20	3.9	B	N	N	.13	N	9.0	100	D178086
D178087	N	20L	2.6	B	N	N	.090	N	6.8	86	D178087
D178088	N	20L	2.3	B	N	N	.11	N	1.2L	64	D178088
D188118	N	40	4.1	N	N	N	.080	N	12	55	D188118
D188119	N	25	1.4	N	N	N	.16	N	1.5	140	D188119
D188120	N	30	3.1	N	N	N	.030	N	3.8	71	D188120
D188121	N	25	1.4	N	N	N	.050	N	2.6	72	D188121
D188122	N	40	1.3	N	N	N	.030	N	3.4	74	D188122
D188123	N	45	3.9	N	N	N	.080	N	17	82	D188123
D188124	N	30	1.5	N	N	N	.080	N	2.0	75	D188124
D188125	N	30	.77	N	N	N	.020	N	.77L	66	D188125

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	MO-S (PPM)	NB-S (PPM)	ND-S (PPM)	NI-S (PPM)	P (PPM)	PB (PPM)	SB (PPM)	SC (PPM)	SE (PPM)	SN-S (PPM)	SAMPLE NUMBER
D240985	1.3	0.53L	2.5L	3.0	260	0.86	0.38	0.94	0.77	0.36L	D240985
D240986	3.0	1.4	4.4L	1.3	190	1.4	.74	1.2	.75	.63L	D240986
D240987	1.2	.61L	2.9L	3.1	220	1.8	.40	.90	1.2	.41L	D240987
D240988	2.4	.81	3.0L	5.5	270	1.7	.99	1.8	.96	.43L	D240988
D240989	1.3	1.7	4.4L	2.2	44L	3.0	1.9	1.8	.93	.63L	D240989
D240990	7.1	.78L	3.6L	5.7	110	.57	.57	.88	.53	.52L	D240990
D240991	1.6	1.1	4.5L	5.4	170	3.0	.79	1.0	1.2	.65L	D240991
D240992	10	1.3	3.7L	5.2	160	2.5	1.0	2.9	1.2	.53L	D240992
D210367	1.5L	N	N	6.5	44	5.5L	1.9	3.3	.70	N	D210367
D175972	1.8	1.8L	B	2.8	400L	5.5	.40	1.4	.81	N	D175972
D175973	1.4	1.8L	B	1.8	400L	2.8	.30	1.4	1.8	N	D175973
D175974	1.1	2.1L	B	1.1	470L	5.4	.20	N	.63	N	D175974
D175975	2.5	1.7L	B	1.7	360L	8.3	.20	.83L	.38	N	D175975
D165751	.45	N	N	.64	310	3.2	.20	.64	.20	N	D165751
D165752	.56	N	N	.80	1,500	2.8	.10L	.80	.10	N	D165752
D165753	.50	N	N	.71	500	2.1	.10	.71	.20	N	D165753
D165754	.55	N	N	N	1,200	2.4	.20	N	.30	N	D165754
D165755	.97	.06	N	.97	1,300	1.6L	.10L	.65	.40	N	D165755
D165756	.93	.06	N	.93	1,900	1.9	.20	.62	.40	N	D165756
D165757	1.7	N	N	N	26L	2.8L	.10	1.1	.30	N	D165757
D165758	N	1.7	N	1.3	170	3.1	.10	.87	.30	N	D165758
D165759	.44	N	N	1.2	570	1.9	.10L	.93	.10	N	D165759
D165760	.60	1.7	N	.86	52	3.5	.50	1.3	.60	N	D165760
D165761	N	1.4	N	1.1	410	2.5	.20	1.1	.20	N	D165761
D165762	.35	N	N	1.0	180	1.5	.10	.50	.20	N	D165762
D165763	.99	N	N	N	31L	3.6L	.10	1.4	.30	N	D165763
D165764	3.7	N	N	1.2	26L	4.9	.60	1.8	.90	N	D165764
D165765	2.4	N	18	1.8	690	3.0L	1.6	1.8	.40	N	D165765
D165766	2.4	N	N	1.6	35L	4.0L	1.1	2.4	.70	N	D165766
D178086	3.9	2.6	B	2.0	570L	7.2	.40	1.3	.10L	N	D178086
D178087	3.9	N	B	.66	570L	4.6	.30	N	.36	N	D178087
D178088	3.5	N	B	1.7	500L	3.5	.40	1.2	.35	N	D178088
D188118	2.1	N	B	.96	600L	6.9	.31	1.4	.93	N	D188118
D188119	2.8	N	B	.94	410L	2.4	.19	N	.25	N	D188119
D188120	1.5	3.1	B	2.0	450L	5.1	.37	1.0	.43	N	D188120
D188121	1.4	N	B	.64	400L	3.7	.18	.64	.45	N	D188121
D188122	1.3	N	B	1.3	380L	2.2	.33	1.3	.35	N	D188122
D188123	2.0	3.9	B	.92	570L	5.2	.31	.92	1.2	N	D188123
D188124	1.0	N	B	.72	450L	3.1	.24	N	.56	N	D188124
D188125	.54	N	B	.77	340L	2.7	.060	N	.27	N	D188125

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	SR-S (PPM)	TH (PPM)	TL-S (PPM)	U (PPM)	V-S (PPM)	W (PPM)	Y-S (PPM)	YB (PPM)	ZN (PPM)	ZR-S (PPM)	SAMPLE NUMBER
D240985	440	0.57	0.78L	0.75	4.2	15L	3.4	0.22	1.7	10	D240985
D240986	470	1.3	1.4L	1.4	4.2	15L	4.4	.23	1.6	23	D240986
D240987	330	1.2	.90L	.73	6.8	15L	2.2	.16	2.9	8.1	D240987
D240988	430	.78	.93L	1.2	11	15L	3.7	.33	5.2	31	D240988
D240989	180	2.2	1.4L	2.0	9.7	15L	5.8	.69	1.8	46	D240989
D240990	380	.73	1.1L	.82	5.1	15L	2.6	.16	1.1	18	D240990
D240991	300	1.4	1.4L	1.7	10	15L	3.6	.24	6.4	14	D240991
D240992	380	1.6	1.2L	1.1	13	15L	6.6	.58	1.6	26	D240992
D210367	330	1.9	N	1.6	33	N	11	1.1	30	65	D210367
D175972	280	4.0	N	.40	6.4	N	2.8	.28	4.6	14	D175972
D175973	180	N	N	.58	2.8	N	2.8	.28	3.7	9.2	D175973
D175974	160	N	N	.76	2.1	N	2.1L	.21L	3.9	5.4	D175974
D175975	170	N	N	1.00L	2.5	N	2.5	.25	5.6	5.8	D175975
D165751	450	N	N	.43	3.2	N	1.3	.13	1.4	9.6	D165751
D165752	560	N	N	.37	1.6	N	2.4	.24	2.2	8.0	D165752
D165753	210	N	N	.53	3.6	N	1.4	.14	2.0	7.1	D165753
D165754	400	N	N	.75	1.2	N	1.6	.16	1.6	7.9	D165754
D165755	450	N	N	1.0L	1.3	N	1.9	.13	1.0	4.5	D165755
D165756	620	3.3	N	.88	1.9	N	1.9	.12	1.2	6.2	D165756
D165757	340	N	N	.33	3.4	N	3.4	.34	2.3	17	D165757
D165758	610	N	N	.48	4.4	N	1.7	.18	3.0	17	D165758
D165759	440	N	N	.53	3.1	N	1.9	.19	2.1	6.2	D165759
D165760	430	N	N	.79	8.6	N	1.7	.17	1.9	17	D165760
D165761	510	N	N	.31	5.1	N	2.2	.22	1.4	11	D165761
D165762	350	N	N	.47	1.5	N	1.5	.10	1.0	5.0	D165762
D165763	280	4.9	N	.72	4.3	N	7.1	.43	1.7	14	D165763
D165764	240	5.8	N	3.0	6.1	N	8.5	.61	2.2	12	D165764
D165765	600	5.8	N	2.3	12	N	6.1	.36	16	12	D165765
D165766	240	8.6	N	5.1	11	N	4.7	.47	4.7	16	D165766
D178086	130	3.5	N	1.4	9.2	N	6.6	B	8.6	20	D178086
D178087	130	2.0	N	1.2	2.6	N	N	B	3.9	9.2	D178087
D178088	170	.92	N	.55	5.8	N	5.8	B	3.3	8.1	D178088
D188118	410	2.7	N	1.5	4.1	N	6.9	.41	4.7	21	D188118
D188119	470	.53	N	2.1	2.8	N	1.9	.19	3.3	2.8	D188119
D188120	510	1.8	N	1.7	7.1	N	5.1	.31	8.0	10	D188120
D188121	640	.87	N	.97	2.8	N	2.8	.28	4.4	14	D188121
D188122	620	1.1	N	1.2	6.2	N	6.2	.62	2.5	13	D188122
D188123	390	2.5	N	2.1	3.9	N	3.9	.39	3.1	20	D188123
D188124	720	.87	N	1.1	3.1	N	2.1	.31	3.1	3.1	D188124
D188125	540	.35	N	.41	2.3	N	1.5	.23	2.6	2.3	D188125

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	SI (PERCENT)	AL (PERCENT)	CA (PERCENT)	MG (PERCENT)	NA (PERCENT)	K (PERCENT)	FE (PERCENT)	TI (PERCENT)	AG-S (PPM)	AS (PPM)	SAMPLE NUMBER
D188126	0.41	0.24	1.7	0.38	0.16	0.022	0.35	0.024	N	2.7	D188126
D188127	.83	.39	2.1	.27	.64	.043	.40	.043	N	3.2	D188127
D188128	1.2	.77	2.3	.56	.025	.043	1.6	.060	.44	4.1	D188128
D188129	1.0	.50	2.1	.55	.023	.040	.55	.048	N	6.4	D188129
D188130	1.7	.82	2.0	.55	.032	.078	.65	.051	N	110	D188130
D188131	.55	.38	2.2	.63	.021	.024	.18	.026	N	1.3	D188131
D188132	.67	.44	2.1	.64	.024	.033	.60	.049	N	2.1	D188132
D188133	3.8	1.2	1.7	.48	.030	.35	.23	.075	N	2.5	D188133
D188134	4.0	1.6	2.2	.62	.049	.24	.36	.094	N	45	D188134
D188135	.46	.37	1.9	.43	.013	.028	1.4	.024	N	1.9	D188135
D188136	1.5	.75	2.2	.51	.033	.10	1.5	.042	N	6.0	D188136
D188137	.67	.32	2.2	.54	.022	.020	.038	.025	N	.91	D188137
D188138	1.1	.57	1.7	.35	.69	.092	.51	.057	N	6.3	D188138
D188140	1.6	.61	.97	.23	.66	.13	.47	.041	N	15	D188140
D188141	.81	.50	1.6	.35	.74	.034	1.4	.071	N	4.8	D188141
D188142	2.0	.93	2.7	.65	1.4	.073	.53	.12	N	B	D188142
D188143	.93	.63	1.6	.34	.75	.042	.31	.055	N	3.1	D188143
D188144	1.4	.41	1.7	.43	.21	.052	.51	.045	N	1.3	D188144
D188145	1.4	.89	1.9	.31	.70	.043	1.3	.092	N	5.6	D188145
D189256	.84	.57	1.7	.44	.010	.018	.30	.029	N	21	D189256
D189257	.46	.45	1.7	.44	.009	.002L	.15	.033	N	1.3	D189257
D189258	.41	.26	1.6	.48	.010	.003	.82	.038	N	1.9	D189258
D189259	.77	.43	1.9	.53	.012	.002L	.085	.032	N	1.2	D189259
D189260	1.2	.67	1.3	.29	.15	.066	.96	.042	N	8.0	D189260
D189261	.22	.26	1.4	.28	.20	.002L	.29	.017	N	2.7	D189261
D189262	.51	.41	1.7	.39	.21	.002	.22	.023	N	1.2	D189262
D189263	.16	.18	1.2	.30	.095	.004	.81	.015	N	3.2	D189263
D196643	2.0	.77	1.3	.51	.10	.12	.77	.047	N	8.3	D196643
D196644	1.9	.75	1.3	.50	.11	.12	.63	.039	N	4.6	D196644
D196645	1.8	.94	1.4	.47	.29	.057	.43	.090	N	5.6	D196645
D196646	1.9	.99	1.4	.48	.29	.055	.41	.10	N	5.7	D196646
D196647	1.4	.55	1.1	.38	.29	.10	2.9	.082	N	28	D196647
D196648	1.8	.81	1.2	.39	.29	.14	.58	.034	N	33	D196648
D196649	3.0	.91	.66	.23	.18	.23	15	.024	N	170	D196649
D196650	1.2	.75	1.5	.46	.24	.045	.30	.046	N	2.6	D196650
D196651	8.2	2.9	.84	.40	.26	.50	1.3	.096	N	19	D196651
D196652	3.7	1.2	1.3	.50	.24	.11	.33	.092	N	3.5	D196652
D196653	1.2	.72	1.2	.39	.14	.052	.61	.025	N	3.5	D196653
D196654	7.1	1.9	.99	.51	.34	.68	1.0	.081	N	23	D196654
D196655	1.5	.63	1.2	.38	.26	.076	2.0	.055	N	19	D196655

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	B-S (PPM)	BA-S (PPM)	BE-S (PPM)	CD (PPM)	CE (PPM)	CL (PPM)	CO (PPM)	CR (PPM)	CU (PPM)	DY-S (PPM)	SAMPLE NUMBER
D188126	100	200	0.34	0.067L	N	B	1.1	2.2	4.0	N	D188126
D188127	280	660	.66	.094L	N	B	1.5	3.2	3.9	N	D188127
D188128	100	1,000	.73	.15L	N	B	.67	2.5	5.4	N	D188128
D188129	73	310	.31	.10L	N	B	2.5	2.7	6.9	N	D188129
D188130	90	64	.90	.13L	N	B	2.7	4.5	8.8	N	D188130
D188131	59	130	N	.084L	N	B	.38	1.5	3.9	N	D188131
D188132	72	720	N	.10L	N	B	.42	1.8	4.0	N	D188132
D188133	50	250	N	.17L	N	B	1.2	12	8.4	N	D188133
D188134	57	280	.57	.19L	N	B	1.3	7.9	18	N	D188134
D188135	71	71	N	.10L	N	B	2.0	1.4	3.3	N	D188135
D188136	73	220	.44	.15L	N	B	1.2	3.4	5.1	N	D188136
D188137	84	25	N	.084L	N	B	.51	1.2	3.9	N	D188137
D188138	110	1,100	1.1	.11L	N	B	1.1	3.5	8.8	N	D188138
D188140	73	730	1.6	.10L	N	B	2.1	5.1	7.6	N	D188140
D188141	87	870	N	.12L	N	B	.73	2.0	4.1	N	D188141
D188142	120	1,700	2.6	.18L	N	B	1.5	3.0	9.1	N	D188142
D188143	64	1,400	.64	.091L	N	B	.77	2.4	5.6	N	D188143
D188144	150	190	.97	.097L	N	B	1.5	3.2	6.2	N	D188144
D188145	98	980	.98	.14L	N	B	1.1	3.0	5.2	N	D188145
D189256	63	450	.63	.090L	N	B	.61	2.1	4.4	N	D189256
D189257	50	500	N	.071L	N	B	.46	.83	3.2	B	D189257
D189258	45	630	N	.090L	N	B	.37	.83	2.6	B	D189258
D189259	61	130	N	.087L	N	B	.45	1.8	3.7	B	D189259
D189260	57	340	.81	.12L	N	B	1.5	6.1	13	N	D189260
D189261	43	120	N	.061L	N	B	.39	.81	4.1	B	D189261
D189262	55	160	N	.078L	N	B	.36	.96	4.1	B	D189262
D189263	48	100	N	.068L	N	B	.70	.72	2.4	N	D189263
D196643	130	130	.40	.13L	N	B	1.3	6.0	9.5	B	D196643
D196644	130	130	.39	.13L	N	B	.67	4.0	9.3	B	D196644
D196645	140	2,700	.41	.14L	N	B	.63	3.6	5.3	B	D196645
D196646	130	2,700	.93	.13L	N	B	.65	3.5	5.2	B	D196646
D196647	120	3,400	.52	.17L	N	B	1.0	4.3	6.0	B	D196647
D196648	210	70	.98	.14L	N	B	1.3	7.3	8.7	N	D196648
D196649	80	400	4.0	.40L	N	B	8.4	15	18	B	D196649
D196650	160	330	.33	.11L	N	B	.86	2.4	4.8	B	D196650
D196651	160	220	2.2	.32L	N	B	7.7	22	30	N	D196651
D196652	170	510	.51	.17L	N	B	.96	6.3	7.5	B	D196652
D196653	160	100	.53	.11L	N	B	1.0	3.3	5.1	B	D196653
D196654	140	270	2.7	.27L	N	B	6.7	20	24	N	D196654
D196655	110	760	.46	.15L	N	B	1.7	4.3	6.4	B	D196655

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	EU (PPM)	F (PPM)	GA-S (PPM)	GD-S (PPM)	GE-S (PPM)	HF (PPM)	HG (PPM)	LA (PPM)	LI (PPM)	MN (PPM)	SAMPLE NUMBER
D188126	N	30	1.3	N	N	N	0.030	N	1.3	64	D188126
D188127	N	30	1.4	N	N	N	.030	6.6	2.9	67	D188127
D188128	N	20L	2.2	N	N	N	.20	N	5.8	76	D188128
D188129	N	25	3.1	N	N	N	.080	7.3	2.9	66	D188129
D188130	N	40	1.9	N	N	N	.24	N	5.8	71	D188130
D188131	N	20L	1.3	N	N	N	.030	N	3.4	93	D188131
D188132	N	25	1.5	N	N	N	.090	N	5.0	120	D188132
D188133	N	150	5.0	N	N	N	.060	N	7.2	85	D188133
D188134	N	100	5.7	N	N	N	.24	N	16	120	D188134
D188135	N	30	1.5	N	N	N	.070	N	2.5	53	D188135
D188136	N	45	2.2	N	N	N	.10	N	6.8	72	D188136
D188137	N	45	1.3	N	N	N	.020	N	2.4	81	D188137
D188138	N	45	3.3	N	N	N	.050	N	4.1	70	D188138
D188140	N	55	7.3	N	3.1	N	.050	N	2.8	31	D188140
D188141	N	30	2.5	N	N	N	.030	N	3.8	53	D188141
D188142	N	45	5.3	N	N	N	.030	12	6.8	63	D188142
D188143	N	60	4.6	N	1.8	N	.030	6.4	5.0	32	D188143
D188144	N	20	2.9	N	N	N	.040	N	3.3	83	D188144
D188145	N	25	4.2	N	N	N	.10	N	11	74	D188145
D189256	N	45	1.8	N	N	N	.15	9.0	6.6	58	D189256
D189257	N	45	1.4	B	N	N	.050	N	4.0	58	D189257
D189258	N	35	.90	B	N	N	.12	N	3.2	58	D189258
D189259	N	30	1.3	B	N	N	.040	N	6.3	74	D189259
D189260	N	95	2.3	N	N	N	.060	N	6.7	92	D189260
D189261	N	85	.92	B	N	N	.030	N	1.3	91	D189261
D189262	N	65	1.2	B	N	N	.040	N	4.1	110	D189262
D189263	N	55	1.0	N	N	N	.060	N	.68L	64	D189263
D196643	B	50	2.0	B	N	N	.14	N	5.4	84	D196643
D196644	B	45	2.6	B	N	N	.12	N	5.4	83	D196644
D196645	B	30	4.1	B	N	N	.090	N	7.1	140	D196645
D196646	B	30	4.0	B	N	N	.090	N	7.0	130	D196646
D196647	B	25	3.4	B	N	N	.21	N	2.9	84	D196647
D196648	B	45	4.2	N	N	N	.11	N	4.9	73	D196648
D196649	B	50	B	B	N	N	.74	N	5.6	98	D196649
D196650	B	25	2.2	B	N	N	.080	N	15	130	D196650
D196651	B	180	9.6	N	N	N	.46	N	32	91	D196651
D196652	B	45	5.1	B	N	N	.10	N	12	110	D196652
D196653	B	30	3.2	B	N	N	.15	N	10	100	D196653
D196654	B	190	19	N	N	N	.18	N	12	98	D196654
D196655	B	25	2.3	B	N	N	.18	N	5.3	120	D196655

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	MO-S (PPM)	NB-S (PPM)	ND-S (PPM)	NI-S (PPM)	P (PPM)	PB (PPM)	SB (PPM)	SC (PPM)	SE (PPM)	SN-S (PPM)	SAMPLE NUMBER
D188126	2.0	N	B	1.0	290L	2.7	0.34	0.47	0.39	N	D188126
D188127	1.4	2.8	N	1.4	410L	2.4	.35	.66	.33	N	D188127
D188128	2.9	N	B	1.0	630L	5.1	.48	N	.53	N	D188128
D188129	1.6	3.1	N	2.1	450L	4.2	1.0	.73	.75	N	D188129
D188130	1.9	2.6	B	3.9	560L	4.5	1.0	1.9	1.1	N	D188130
D188131	N	N	B	.59	370L	4.2	.18	N	.73	N	D188131
D188132	1.5	2.1	B	.52	450L	4.1	.19	N	.66	N	D188132
D188133	N	3.4	B	1.2	730L	5.0	.60	2.5	.70	N	D188133
D188134	2.9	3.8	B	2.9	830L	7.6	.96	2.9	.85	5.7	D188134
D188135	2.0	N	B	1.5	440L	3.5	.13	N	.68	N	D188135
D188136	4.4	2.9	B	1.0	640L	7.4	.75	1.0	.78	N	D188136
D188137	1.3	N	B	.59	370L	2.1	.14	N	.39	N	D188137
D188138	3.3	2.2	B	1.7	490L	5.0	1.1	1.7	.62	N	D188138
D188140	7.3	5.2	B	3.1	450L	3.1	2.5	3.1	.36	N	D188140
D188141	1.9	N	B	.87	540L	3.1	.63	.87	.55	N	D188141
D188142	5.3	5.3	N	2.6	760L	7.9	.64	2.6	.10L	N	D188142
D188143	1.8	1.8	N	1.4	400L	4.1	.91	1.8	.48	N	D188143
D188144	2.9	1.9	B	1.5	420L	2.9	.41	2.9	.58	N	D188144
D188145	2.8	2.8	B	2.1	610L	6.3	.57	1.4	.84	N	D188145
D189256	1.4	1.8L	N	.63	390L	2.3	.52	1.8	.41	N	D189256
D189257	.71	N	B	.71	370	2.1	.21	.50	.38	N	D189257
D189258	N	N	B	.63	390L	2.3L	.13	N	.50	N	D189258
D189259	.87	N	B	.87	380L	3.5	.22	.61	.60	N	D189259
D189260	2.3	2.3L	B	1.2	500L	2.9L	2.1	2.3	.49	N	D189260
D189261	.92	N	B	.61	270L	1.5L	.39	.61	.37	N	D189261
D189262	N	N	B	.55	340L	2.7	.26	.55	.34	N	D189262
D189263	1.0	1.4L	B	.68	300L	1.7L	.25	N	.29	N	D189263
D196643	1.3	N	B	2.0	48	4.0	.68	L	.97	N	D196643
D196644	1.3	2.6L	B	1.3	52	4.5	.39	L	.58	N	D196644
D196645	1.4	N	B	1.4	17	5.4	.31	2.0	.67	N	D196645
D196646	1.3	N	B	2.0	13	5.3	.30	2.0	.10L	N	D196646
D196647	5.2	N	B	3.4	8.7L	4.3L	.88	1.7	.39	N	D196647
D196648	4.2	2.8L	B	2.8	4.4L	3.5L	1.4	2.8	.44	N	D196648
D196649	20	N	B	28	17L	10L	4.0	6.0	.82	N	D196649
D196650	1.6	N	B	1.6	8.7	4.9	.34	1.1	.10L	N	D196650
D196651	9.6	6.4	B	16	13L	9.6	2.9	9.6	.84	N	D196651
D196652	1.7	3.4	B	2.6	13	6.8	.40	1.7	.80	N	D196652
D196653	1.6	2.1L	B	1.6	8.7	4.2	.54	1.6	.51	N	D196653
D196654	14	5.4L	B	14	13L	6.8L	3.8	8.1	.10L	N	D196654
D196655	3.0	N	B	3.0	13	3.8L	1.8	1.5	.10L	N	D196655

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	SR-S (PPM)	TH (PPM)	TL-S (PPM)	U (PPM)	V-S (PPM)	W (PPM)	Y-S (PPM)	YB (PPM)	ZN (PPM)	ZR-S (PPM)	SAMPLE NUMBER
D188126	330	0.88	N	1.2	4.7	N	4.7	0.34	2.6	4.7	D188126
D188127	280	1.1	N	1.1	4.7	N	6.6	.66	5.3	6.6	D188127
D188128	220	2.4	N	2.5	4.4	N	7.3	.73	5.5	15	D188128
D188129	310	1.7	N	1.7	7.3	N	7.3	.52	7.5	10	D188129
D188130	190	2.5	N	1.8	9.0	N	9.0	.90	11	19	D188130
D188131	250	.96	N	.69	2.5	N	1.7	.17	2.9	5.9	D188131
D188132	310	1.2	N	.93	3.1	N	2.1	.21	4.1	7.2	D188132
D188133	250	3.1	N	1.6	12	N	5.0	.50	7.9	17	D188133
D188134	380	3.7	N	2.2	13	N	5.7	.95	12	29	D188134
D188135	71	.91	N	13	3.0	N	3.0	.30	3.8	7.1	D188135
D188136	220	2.1	N	3.1	4.4	N	4.4	.74	8.7	10	D188136
D188137	250	.67	N	.84	2.5	N	1.7	.25	2.8	5.9	D188137
D188138	330	1.3	N	2.9	17	N	7.8	.78	11	17	D188138
D188140	210	1.7	N	6.5	31	N	16	1.6	12	16	D188140
D188141	620	1.5	N	1.4	6.2	N	3.7	.37	5.6	19	D188141
D188142	870	1.7	N	1.2	12	N	12	1.2	8.8	26	D188142
D188143	640	1.8	N	1.9	14	N	6.4	.64	2.5	18	D188143
D188144	190	1.5	N	1.8	6.8	N	6.8	.68	3.5	15	D188144
D188145	420	2.1	N	1.6	4.2	N	7.0	.70	4.9	21	D188145
D189256	180	1.6	N	1.1	4.5	N	9.0	.63	4.6	14	D189256
D189257	210	.92	N	.96	1.4	N	1.4	.14	2.1	7.1	D189257
D189258	130	.81	N	1.3	.90	N	1.4	.18	4.2	4.5	D189258
D189259	170	1.5	N	.95	2.6	N	1.7	.17	2.8	8.7	D189259
D189260	230	1.7	N	2.4	17	N	8.1	.81	7.2	12	D189260
D189261	300	.86	N	1.2	3.1	N	1.2	.18	1.8	6.1	D189261
D189262	390	1.5	N	1.3	2.3	N	1.6	.16	2.9	7.8	D189262
D189263	200	.40	N	.93	1.4	N	4.8	.34	2.5	4.8	D189263
D196643	200	2.4	N	1.5	6.6	N	2.6	.40	40	13	D196643
D196644	190	1.7	N	1.5	6.5	N	3.9	.39	41	13	D196644
D196645	270	2.1	N	1.5	9.5	N	6.8	.41	8.8	20	D196645
D196646	270	2.0	N	1.5	9.3	N	6.7	.40	8.6	13	D196646
D196647	340	1.8	N	2.2	8.6	N	5.2	B	12	17	D196647
D196648	210	1.6	N	2.9	21	N	9.8	.98	17	21	D196648
D196649	200	.10L	N	5.4	28	N	12	B	75	40	D196649
D196650	220	1.8	N	.88	3.3	N	3.3	.33	6.2	16	D196650
D196651	220	5.7	N	7.4	48	N	22	2.2	74	48	D196651
D196652	340	3.8	N	1.5	12	N	5.1	.51	15	26	D196652
D196653	210	1.6	N	1.2	7.4	N	5.3	.53	17	16	D196653
D196654	270	4.3	N	16	27	N	19	2.7	65	41	D196654
D196655	300	2.3	N	1.8	4.6	N	4.6	B	16	15	D196655

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	SI (PERCENT)	AL (PERCENT)	CA (PERCENT)	MG (PERCENT)	NA (PERCENT)	K (PERCENT)	FE (PERCENT)	TI (PERCENT)	AG-S (PPM)	AS (PPM)	SAMPLE NUMBER
D196656	1.4	0.58	1.2	0.37	0.27	0.065	2.0	0.037	N	21	D196656
D196657	1.2	.95	1.1	.38	.53	.035	.27	.032	N	18	D196657
D196658	4.7	1.1	1.2	.63	.031	.21	1.6	.16	N	19	D196658
D196659	1.5	.57	1.6	.53	.026	.089	.80	.040	N	10	D196659
D196660	1.4	.53	1.6	.53	.030	.085	.86	.038	N	9.6	D196660
D196661	1.5	.75	1.0	.39	.12	.044	8.5	.032	N	22	D196661
D196662	1.7	.83	1.1	.37	.53	.076	1.0	.039	N	8.4	D196662
D196641	1.7	.75	1.3	.46	.035	.11	.66	.046	N	13	D196641
D196642	.90	.65	1.1	.43	.027	.073	4.4	.021	N	180	D196642
D221125	1.8	.84	1.3	.44	.032	.085	1.0	.076	.12L	10	D221125
D221126	1.8	1.2	1.4	.42	.036	.084	.82	.025	.12L	6.2	D221126
D221127	3.2	1.9	1.2	.30	.62	.19	1.4	.068	.18L	37	D221127
D221128	5.1	2.8	1.6	.31	.68	.32	.37	.087	.21L	8.4	D221128
D221129	2.1	.94	1.5	.11	.050	.13	.37	.036	.12L	3.3	D221129
D221130	1.5	.81	1.3	.28	.055	.079	.41	.028	.089L	5.7	D221130
D221131	3.5	2.4	1.1	.17	.63	.24	.50	.064	.17L	9.8	D221131
D221132	5.6	2.5	1.5	.60	.13	.47	2.5	.082	.27L	39	D221132
D221133	1.6	1.0	1.7	.39	.11	.044	.38	.037	.11L	15	D221133
D221134	2.8	1.3	1.3	.20	.54	.23	.39	.051	.13L	3.6	D221134
D221135	5.8	3.3	1.3	.23	.72	.56	.42	.13	.26L	3.0	D221135
D221136	2.5	1.0	1.7	.53	.16	.17	3.1	.031	.19L	11	D221136
D221137	4.7	2.0	1.2	.50	.21	.42	1.9	.078	.23L	8.8	D221137
D221138	1.2	.93	1.4	.33	.031	.033	.22	.025	.086L	2.3	D221138
D221139	1.9	1.6	1.1	.27	.60	.055	.97	.034	.14L	11	D221139
D221140	1.7	.89	.94	.26	.56	.12	.41	.028	.10L	5.7	D221140
D221141	4.3	2.0	.82	.27	.58	.20	1.6	.075	.20L	210	D221141
D221142	2.4	1.7	1.6	.49	.034	.045	1.5	.061	.17L	14	D221142
D221143	.84	.61	1.4	.40	.29	.039	.67	.016	.090L	2.5	D221143
D221144	1.9	1.0	1.3	.43	.36	.14	.92	.037	.13L	8.4	D221144
D221145	1.4	.82	1.3	.39	.12	.061	1.7	.025	.13L	10	D221145
D196598	4.3	1.3	1.7	.64	.14	.33	.86	.076	N	4.7	D196598
D196599	10	2.4	2.5	.91	.30	.88	1.5	.12	N	11	D196599
D209953	.82	.59	1.2	.29	.81	.022	.75	.017	N	7.4	D209953
D209954	.53	.37	.94	.24	.72	.020	.89	.013	N	4.8	D209954
D209955	2.9	1.6	.98	.26	.74	.14	.58	.043	N	6.9	D209955
D209956	3.0	1.7	1.1	.25	.78	.15	.30	.072	N	1.7	D209956
D209957	2.2	1.2	1.2	.48	.061	.14	.52	.049	N	32	D209957
D209958	1.2	.76	1.3	.50	.056	.049	.27	.031	N	1.7	D209958
D209959	1.4	.77	1.0	.34	.58	.099	.69	.034	N	4.8	D209959
D209960	.52	.47	1.2	.30	.52	.022	.36	.019	N	1.4	D209960

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	B-S (PPM)	BA-S (PPM)	BE-S (PPM)	CD (PPM)	CE (PPM)	CL (PPM)	CO (PPM)	CR (PPM)	CU (PPM)	DY-S (PPM)	SAMPLE NUMBER
D196656	110	460	0.78	0.16L	N	B	3.3	4.6	5.4	B	D196656
D196657	160	53	1.1	.11L	B	B	1.2	.10L	6.9	N	D196657
D196658	160	1,100	1.6	.23L	N	B	2.6	8.6	13	N	D196658
D196659	130	130	.94	.13L	N	B	.93	6.2	7.1	N	D196659
D196660	130	130	.90	.13L	N	B	.82	5.3	6.1	N	D196660
D196661	79	530	2.6	.26L	N	B	2.3	4.5	4.2	B	D196661
D196662	130	65	1.3	.13L	N	B	1.5	4.0	7.5	B	D196662
D196641	130	390	1.9	.13L	N	B	4.9	14	17	N	D196641
D196642	120	26	3.5	.18L	N	B	43	9.0	8.4	N	D196642
D221125	110	170	1.7	.13L	20	B	1.2	7.0	6.3	2.6L	D221125
D221126	110	480	1.1	.13L	20	B	1.1	3.3	6.4	2.6L	D221126
D221127	180	220	1.7	.20L	24	B	5.1	15	18	4.0L	D221127
D221128	170	830	1.9	.23	21L	B	.74	8.4	5.5	4.6L	D221128
D221129	210	800	1.9	.13	25	B	1.6	7.0	12	2.7L	D221129
D221130	97	300	1.3	.39	16	B	1.9	7.0	11	1.9L	D221130
D221131	300	850	1.9	.19L	31	B	1.1	4.6	5.6	3.7L	D221131
D221132	220	180	4.4	.29L	27L	B	13	15	20	5.9L	D221132
D221133	290	200	1.2	.12	16	B	.96	3.8	6.6	2.5L	D221133
D221134	380	550	1.1	.15	18	B	1.8	7.3	19	2.9L	D221134
D221135	360	1,500	3.6	.28	44	B	2.0	14	21	5.6L	D221135
D221136	170	1,400	2.3	.21L	20L	B	1.9	7.0	6.1	4.2L	D221136
D221137	220	1,900	2.7	.25L	23L	B	4.3	17	9.4	4.9L	D221137
D221138	100	140	.43	.19	10	B	.64	4.0	4.0	1.9L	D221138
D221139	120	760	2.9	.30	30L	B	6.2	5.0	9.5	3.0L	D221139
D221140	89	720	.66	.11L	14	B	1.7	6.4	4.8	2.2L	D221140
D221141	180	560	3.4	.22L	39	B	2.6	13	10	4.3L	D221141
D221142	120	480	3.2	.37	43	B	1.4	5.7	20	3.7L	D221142
D221143	130	230	.41	.098	13	B	1.2	2.5	3.4	2.0L	D221143
D221144	160	2,000	1.6	.14	22	B	3.7	8.8	9.5	2.9L	D221144
D221145	120	580	.93	.14L	13L	B	1.1	4.4	5.0	2.8L	D221145
D196598	150	420	N	.21L	N	B	2.0	8.2	6.3	B	D196598
D196599	200	810	1.2	.41L	N	B	.10L	20	16	B	D196599
D209953	160	530	.54	.11	B	B	.57	.10L	11	N	D209953
D209954	140	1,400	.66	.094L	B	B	.60	1.3	7.1	B	D209954
D209955	160	320	.80	.16	N	B	1.4	4.6	14	B	D209955
D209956	160	1,600	.78	.16L	N	B	.96	5.4	17	B	D209956
D209957	130	130	.65	.13	N	B	1.2	.10L	12	B	D209957
D209958	130	130	.27	.090	N	B	.45	2.8	7.6	B	D209958
D209959	110	110	.54	.22	N	B	4.3	7.7	15	N	D209959
D209960	110	220	1.1	.074	B	B	1.5	2.7	4.9	N	D209960

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	EU (PPM)	F (PPM)	GA-S (PPM)	GD-S (PPM)	GE-S (PPM)	HF (PPM)	HG (PPM)	LA (PPM)	LI (PPM)	MN (PPM)	SAMPLE NUMBER
D196656	B	25	4.7	B	N	N	0.16	N	5.1	120	D196656
D196657	B	25	5.3	N	N	N	.13	N	8.3	110	D196657
D196658	B	55	6.9	N	N	N	.12	N	9.4	42	D196658
D196659	B	25	2.7	N	N	N	.14	N	4.3	91	D196659
D196660	B	25	2.6	N	N	N	.13	N	4.2	79	D196660
D196661	B	20L	5.3	B	7.9	N	.56	N	8.7	40	D196661
D196662	B	30	3.9	B	N	N	.19	N	6.9	64	D196662
D196641	B	45	9.0	N	6.5	N	.080	N	5.4	68	D196641
D196642	B	25	12	N	12	N	.79	N	5.4	58	D196642
D221125	.26L	65	5.1	2.6L	1.2	26L	.12	7.0	6.3	83	D221125
D221126	.26L	55	3.9	2.6L	.62	26L	.10	7.1	7.9	35	D221126
D221127	.40L	60	8.0	4.0L	.98	40L	.26	9.8	13	50	D221127
D221128	.51	40	7.2	4.6L	.76	46L	.11	12	24	65	D221128
D221129	.43	55	6.9	2.7L	1.2	27L	.040	10	3.6	75	D221129
D221130	.19L	60	2.8	1.9L	.48	19L	.060	6.4	4.0	53	D221130
D221131	.41	40	12	3.7L	1.1	37L	.060	17	23	37	D221131
D221132	.59L	140	9.7	5.9L	3.2	59L	.17	16	16	61	D221132
D221133	.25L	30	3.6	2.5L	.66	25L	.070	7.1	6.8	45	D221133
D221134	.29L	75	6.4	2.9	.93	29L	.050	10	8.8	81	D221134
D221135	.67	120	19	5.6L	1.9	56L	.090	24	28	99	D221135
D221136	.42L	65	5.7	4.2L	1.4	42L	.11	12	6.1	69	D221136
D221137	.49L	110	5.9	4.9L	1.6	49L	.050	17	10	42	D221137
D221138	.19L	40	2.7	1.9L	.42	19L	.020	6.0	6.4	45	D221138
D221139	.30L	55	8.4	3.0L	1.5	30L	.20	13	10	68	D221139
D221140	.22L	60	2.8	2.2L	.46	22L	.090	5.7	5.6	41	D221140
D221141	.43L	95	11	4.3L	4.5	43L	.42	13	9.5	39	D221141
D221142	.37L	40	7.8	3.7L	2.4	37L	.16	16	10	50	D221142
D221143	.20L	30	2.3	2.0L	.58	20L	.040	5.7	3.7	52	D221143
D221144	.29L	60	4.9	2.9L	.60	29L	.12	11	4.5	56	D221144
D221145	.28L	40	3.5	2.8L	.54	28L	.12	7.1	5.3	49	D221145
D196598	B	110	6.3	B	N	N	.12	N	13	180	D196598
D196599	B	290	12	B	N	N	.18	N	16	200	D196599
D209953	B	20	3.2	N	N	N	.20	N	1.8	40	D209953
D209954	B	20	2.8	B	N	N	.16	N	1.1	33	D209954
D209955	B	70	4.8	B	N	N	.11	N	11	57	D209955
D209956	B	50	7.8	B	N	N	.050	N	9.8	54	D209956
D209957	B	70	6.5	B	N	N	.32	N	5.5	43	D209957
D209958	B	20	2.7	B	N	N	.050	N	5.5	42	D209958
D209959	B	30	7.6	N	7.6	N	.11	N	2.5	71	D209959
D209960	N	20L	2.2	N	N	N	.13	L	1.7	90	D209960

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	MO-S (PPM)	NB-S (PPM)	ND-S (PPM)	NI-S (PPM)	P (PPM)	PB (PPM)	SB (PPM)	SC (PPM)	SE (PPM)	SN-S (PPM)	SAMPLE NUMBER
D196656	2.3	N	B	2.3	13	3.9L	2.1	1.6	1.1	N	D196656
D196657	3.2	N	B	1.6	4.4L	3.2	.80	2.1	.65	N	D196657
D196658	3.4	4.6	B	4.6	8.7L	5.7L	3.6	3.4	1.3	N	D196658
D196659	2.0	2.7	B	2.0	13	4.7	.44	2.0	.70	N	D196659
D196660	1.9	2.6L	B	1.9	17	6.4	.43	1.9	.10L	N	D196660
D196661	7.9	N	B	4.0	13L	7.9	1.5	4.0	.94	N	D196661
D196662	3.9	2.6L	B	2.0	4.4L	5.9	.98	2.0	.54	N	D196662
D196641	2.6	3.9	B	3.9	4.4	3.9	2.1	3.9	.81	N	D196641
D196642	12	8.8	B	35	8.7L	5.3	11	5.3	1.7	N	D196642
D221125	4.0	7.6	12L	2.4	44L	3.6	1.0	2.3	N	1.2L	D221125
D221126	4.0	6.1	12L	2.0	44	4.7	.85	1.6	N	1.2L	D221126
D221127	4.4	7.0	19L	12	44L	9.0	2.4	3.8	2.2	1.9L	D221127
D221128	1.3	9.0	21L	1.9	44	13	.85	2.5	N	2.1L	D221128
D221129	2.8	4.9	12L	4.3	44	4.5	1.3	3.5	.83	1.2L	D221129
D221130	3.3	3.6	9.0L	4.1	87	4.2	1.1	2.3	.75	.90L	D221130
D221131	1.4	11	17L	3.5	44	10	.90	3.3	1.7	1.7L	D221131
D221132	7.0	9.7	27L	20	87	13	2.0	7.3	1.0	2.7L	D221132
D221133	2.6	5.3	12L	2.7	44L	8.4	.89	2.0	.88	1.2L	D221133
D221134	1.9	5.5	14L	4.5	260	6.6	.67	2.8	1.0	1.4L	D221134
D221135	1.9	28	26L	8.9	87	22	1.2	5.8	2.4	2.6L	D221135
D221136	5.7	7.6	20L	6.1	260	6.3L	1.2	2.7	N	2.0L	D221136
D221137	3.7	10	23L	9.1	130	6.9	1.8	4.2	N	2.3L	D221137
D221138	1.2	3.8	8.6L	1.8	44	7.7	.30	1.2	.49	.86L	D221138
D221139	6.0	9.0	14L	14	44L	7.4	2.6	5.0	N	1.4L	D221139
D221140	2.0	3.7	10L	4.3	220	3.8	.97	1.7	.57	1.0L	D221140
D221141	3.2	11	20L	10	87	7.1	2.4	4.7	N	2.0L	D221141
D221142	7.3	7.3	17L	4.8	44	7.4	.96	3.9	1.2	1.7L	D221142
D221143	1.5	3.2	9.1L	2.1	260	3.2	.73	.96	N	.91L	D221143
D221144	3.6	5.2	13L	5.8	87	4.3L	1.0	3.2	.42	1.3L	D221144
D221145	2.4	3.5	13L	2.4	220	4.3	.68	1.4	.50	1.3L	D221145
D196598	N	N	B	3.2	130	7.4	.46	2.1	.68	N	D196598
D196599	2.8	N	B	12	180	10	3.3	6.1	.10L	N	D196599
D209953	1.6	L	B	2.1	44L	3.9	.42	2.1	.81	N	D209953
D209954	1.9	L	B	2.8	44L	2.4L	.55	2.8	1.1	N	D209954
D209955	1.6	L	B	8.0	44L	8.0	.82	1.6	1.4	N	D209955
D209956	1.1L	L	B	4.7	87	10	.61	4.7	1.5	N	D209956
D209957	1.9	L	B	3.9	220	4.0	.74	2.6	.60	N	D209957
D209958	.90	L	B	.90	130	3.2	.56	1.4	.63	N	D209958
D209959	3.2	L	B	16	260	3.2	1.7	3.2	.49	N	D209959
D209960	1.5	1.5	N	5.2	310	1.9	.32	2.2	.30	N	D209960

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	SR-S (PPM)	TH (PPM)	TL-S (PPM)	U (PPM)	V-S (PPM)	W (PPM)	Y-S (PPM)	YB (PPM)	ZN (PPM)	ZR-S (PPM)	SAMPLE NUMBER
D196656	230	2.2	N	1.7	7.8	N	7.8	0.78	6.2	16	D196656
D196657	160	2.4	N	1.4	7.4	N	7.4	.74	26	21	D196657
D196658	230	3.7	N	5.2	16	N	16	1.6	39	46	D196658
D196659	200	2.7	N	2.1	9.4	N	9.4	.94	5.4	20	D196659
D196660	190	2.5	N	2.1	9.0	N	9.0	.90	6.1	19	D196660
D196661	260	2.5	N	1.8	7.9	N	7.9	B	130	40	D196661
D196662	260	2.1	N	1.8	9.1	N	6.5	.65	5.5	20	D196662
D196641	64	2.8	N	13	39	N	13	1.9	150	39	D196641
D196642	170	3.5	N	17	35	N	18	2.6	57	87	D196642
D221125	120	3.3	1.2L	5.9	14	93L	9.5	.65	4.5	69	D221125
D221126	84	4.4	1.2L	2.7	6.4	93L	7.5	.61	4.2	38	D221126
D221127	280	4.6	1.9L	4.1	36	93L	13	1.0	13	68	D221127
D221128	440	9.0	2.1L	3.9	17	93L	12	1.0	7.9	97	D221128
D221129	470	2.4	1.2L	2.4	21	93L	15	1.3	36	65	D221129
D221130	83	2.2	.90L	2.7	16	93L	9.7	.81	9.1	51	D221130
D221131	500	5.8	1.7L	2.1	24	93L	13	1.3	3.7L	140	D221131
D221132	250	5.4	2.7L	5.3	44	93L	29	2.0	23	160	D221132
D221133	320	N	1.2L	3.4	16	93L	8.4	.63	3.1	81	D221133
D221134	360	3.3	1.4L	1.6	20	93L	9.2	.72	6.1	64	D221134
D221135	560	12	2.6L	4.7	64	93L	28	2.3	21	310	D221135
D221136	340	N	2.0L	2.1	19	93L	12	1.1	6.9	69	D221136
D221137	370	3.8	2.3L	3.3	35	93L	17	1.1	16	150	D221137
D221138	110	2.6	.86L	1.0	5.0	93L	4.0	.42	6.3	33	D221138
D221139	420	4.0	1.4L	3.2	21	93	23	2.3	25	160	D221139
D221140	260	2.4	1.0L	1.4	12	93L	6.0	.50	6.0	43	D221140
D221141	320	3.7	15	2.9	32	93L	16	1.4	8.4	160	D221141
D221142	130	5.5	1.7L	4.3	22	93L	20	1.3	24	110	D221142
D221143	270	1.7	.91L	1.0	5.1	93L	4.0	.32	2.8	25	D221143
D221144	360	2.3	1.3L	3.2	17	93L	12	1.1	9.6	75	D221144
D221145	280	2.1	1.3L	1.6	10	93L	5.7	.42	6.1	43	D221145
D196598	420	2.7	N	.69	15	N	6.3	.63	19	32	D196598
D196599	200	4.6	N	1.6	28	N	12	1.2	51	81	D196599
D209953	530	1.9	N	1.4	16	N	7.5	.75	21	21	D209953
D209954	470	1.1	N	.72	14	N	4.7	.47	16	14	D209954
D209955	240	3.0	N	2.5	32	N	8.0	.80	31	48	D209955
D209956	310	3.6	N	2.5	31	N	7.8	.78	24	78	D209956
D209957	260	1.9	N	1.7	26	N	6.5	.65	38	26	D209957
D209958	270	1.5	N	1.1	9.0	N	4.5	.27	15	14	D209958
D209959	320	1.2	N	1.7	54	N	7.6	.76	19	54	D209959
D209960	520	1.0	N	2.1	11	N	11	1.1	22	22	D209960

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	SI (PERCENT)	AL (PERCENT)	CA (PERCENT)	MG (PERCENT)	NA (PERCENT)	K (PERCENT)	FE (PERCENT)	TI (PERCENT)	AG-S (PPM)	AS (PPM)	SAMPLE NUMBER
D209961	1.7	0.99	1.1	0.33	0.73	0.075	0.34	0.038	N	1.2	D209961
D209962	2.3	1.2	1.2	.48	.11	.14	1.3	.042	N	10	D209962
D209963	1.2	.79	1.3	.53	.072	.045	.32	.033	N	2.1	D209963
D209964	1.6	.61	.81	.37	.070	.14	3.1	.035	N	560	D209964
D209965	1.7	1.3	1.3	.46	.065	.095	.25	.042	N	1.7	D209965
D209966	6.6	3.0	1.2	.55	.16	.41	.55	.11	N	5.6	D209966
D209967	7.6	2.8	1.0	.32	.90	.26	1.4	.18	N	24	D209967
D209968	4.5	2.0	1.0	.32	.77	.20	1.0	.074	N	16	D209968
D240927	.75	.58	1.4	.53	.42	.015	.17	.018	.009L	1.6	D240927
D240928	2.2	1.3	1.2	.52	.51	.087	.31	.051	.013L	1.8	D240928
D240929	.48	.36	1.7	.57	.028	.012	.22	.013	.008L	2.4	D240929
D240930	.34	.45	1.6	.59	.10	.012	.13	.012	.007L	.84	D240930
D240931	.88	.71	1.7	.58	.087	.018	.25	.026	.010L	1.6	D240931
D240932	.69	.47	1.7	.61	.032	.019	.50	.019	.010L	1.6	D240932
D240933	.56	.52	1.6	.58	.024	.015	.097	.013	.008L	1.6	D240933
D240934	.67	.51	1.8	.51	.016	.021	.15	.015	.009L	2.1	D240934
D240935	.46	.34	1.4	.52	.10	.014	.38	.013	.008L	3.4	D240935
D240936	3.0	2.3	1.6	.52	.28	.050	.49	.075	.018L	9.4	D240936
D240937	.62	.58	1.6	.54	.23	.023	.63	.015	.010L	1.5	D240937
D240938	.62	.63	1.7	.63	.058	.010	.15	.016	.009L	1.4	D240938
D240939	1.4	.82	1.1	.43	.65	.10	.46	.027	.010L	8.9	D240939
D240940	.69	.45	1.6	.54	.26	.017	.14	.017	.008L	1.2	D240940
D240941	.88	.54	1.6	.42	.54	.027	.27	.019	.012	.90	D240941

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	B-S (PPM)	BA-S (PPM)	BE-S (PPM)	CD (PPM)	CE (PPM)	CL (PPM)	CO (PPM)	CR (PPM)	CU (PPM)	DY-S (PPM)	SAMPLE NUMBER
D209961	110	110	0.55	0.22	N	B	0.59	4.2	12	N	D209961
D209962	110	110	1.6	.16	N	B	1.9	7.8	12	N	D209962
D209963	150	200	.30L	.10	N	B	.53	2.7	5.6	B	D209963
D209964	160	47	1.6	.31	N	B	13	.10L	17	N	D209964
D209965	110	57	1.1	.11L	N	B	1.5	3.7	4.9	N	D209965
D209966	140	140	.83	.28L	N	B	1.6	10	18	B	D209966
D209967	160	160	1.6	.32L	N	B	2.0	18	21	B	D209967
D209968	110	160	.68	.23	N	B	1.6	14	24	B	D209968
D240927	47	630	.39	.016	3.9L	B	.40	1.9	3.0	2.0L	D240927
D240928	50	520	.20	.027	5.8L	B	.83	3.9	4.8	2.9L	D240928
D240929	60	520	.28	.021	3.4L	B	.41	1.4	2.6	1.7L	D240929
D240930	50	170	.08	.007L	3.1L	B	.29	.97	1.9	1.6L	D240930
D240931	51	1,200	.31	.010L	4.3L	B	.46	1.6	3.0	2.2L	D240931
D240932	49	1,100	.12	.010L	4.2L	B	.41	1.7	3.4	2.1L	D240932
D240933	42	240	.40	.008L	3.4L	B	.66	1.1	3.2	1.7L	D240933
D240934	67	360	.35	.024	3.9L	B	.63	1.6	3.8	2.0L	D240934
D240935	69	550	.67	.014	3.3L	B	.55	1.3	3.0	1.7L	D240935
D240936	68	98	1.1	.078	7.7L	B	1.2	2.7	10	3.9L	D240936
D240937	88	430	.22	.010L	5.7	B	.64	1.3	3.1	2.2L	D240937
D240938	62	190	.22	.009L	3.8	B	.41	1.0	2.8	1.9L	D240938
D240939	51	34	.66	.071	4.5L	B	2.7	3.6	9.9	2.3L	D240939
D240940	28	180	.23	.008L	3.4L	B	.96	1.7	3.3	1.7L	D240940
D240941	45	320	.17	.009L	3.9L	B	.79	2.0	4.0	2.0L	D240941

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	EU (PPM)	F (PPM)	GA-S (PPM)	GD-S (PPM)	GE-S (PPM)	HF (PPM)	HG (PPM)	LA (PPM)	LI (PPM)	MN (PPM)	SAMPLE NUMBER
D209961	N	40	5.5	N	N	N	0.080	L	5.9	55	D209961
D209962	B	50	8.1	N	L	N	.19	N	4.1	34	D209962
D209963	B	20	3.0	B	N	N	.12	N	5.7	130	D209963
D209964	B	50	23	N	3.1L	N	.070	N	1.6L	33	D209964
D209965	B	20	11	N	N	N	.080	N	7.4	38	D209965
D209966	B	70	8.3	B	N	N	.090	N	19	42	D209966
D209967	B	120	22	B	N	N	.12	N	28	44	D209967
D209968	B	90	6.8	B	N	N	.32	N	20	42	D209968
D240927	.20L	20L	1.2	2.9L	.41L	1.4L	.040	4.5	3.0	65	D240927
D240928	.30L	40	3.1	4.3L	.62L	2.0L	.080	5.2	5.9	43	D240928
D240929	.17L	20L	.58	2.5L	.36L	1.2L	.050	3.8	.79	75	D240929
D240930	.19	30	.94	2.3L	.33L	1.1L	.040	2.4	2.0	70	D240930
D240931	.25	30	1.6	3.2L	.46L	1.5L	.070	6.8	3.3	72	D240931
D240932	.39	20	.94	3.1L	.45L	1.5L	.14	4.6	1.7	81	D240932
D240933	.22	30	.76	2.5L	.36L	1.2L	.040	5.1	1.9	70	D240933
D240934	.20L	20L	.75	2.9L	.42L	1.4L	.060	6.2	1.2	100	D240934
D240935	.17L	20L	1.0	2.5L	.35L	1.2L	.060	6.2	.62	52	D240935
D240936	.39L	30	5.3	5.7L	.82L	2.7L	.38	9.6	9.3	100	D240936
D240937	.22L	50	1.8	3.1L	.45L	1.5L	.080	7.0	1.6	96	D240937
D240938	.19L	50	.95	2.8L	.40L	1.3L	.040	6.7	1.7	86	D240938
D240939	.23L	70	2.1	3.3L	.48L	1.6L	.14	6.1	1.9	33	D240939
D240940	.17L	30	1.1	2.5L	.36L	1.2L	.030	7.1	1.2	57	D240940
D240941	.21	30	1.9	2.9L	.42L	1.4L	.030	7.6	1.3	62	D240941

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	MO-S (PPM)	NB-S (PPM)	ND-S (PPM)	NI-S (PPM)	P (PPM)	PB (PPM)	SB (PPM)	SC (PPM)	SE (PPM)	SN-S (PPM)	SAMPLE NUMBER
D209961	1.1	L	N	1.6	87	3.9	0.52	2.2	0.61	N	D209961
D209962	1.6	L	B	4.9	130	4.1L	1.7	3.2	.82	N	D209962
D209963	1.0	L	B	2.0	570	2.5L	.25	1.5	3.0L	N	D209963
D209964	7.8	L	B	47	44	7.3	5.6	7.8	1.3	N	D209964
D209965	1.7	L	B	5.7	44	3.2	.47	1.7	1.1	N	D209965
D209966	5.5	L	B	8.3	44	14	1.4	2.8	2.3	N	D209966
D209967	3.2	L	B	16	44L	15	1.2	6.3	2.3	N	D209967
D209968	3.4	N	B	11	44L	6.3	1.9	3.4	2.3	N	D209968
D240927	.39	.83	2.9L	.74	48	1.8	.21	.99	.49	.41L	D240927
D240928	.52	1.2	4.3L	1.1	44L	3.6	.47	.91	.62	.62L	D240928
D240929	.95	.69	2.5L	.95	87	.63	.14	.77	.40	.36L	D240929
D240930	.20	.51	2.3L	.68	44L	1.1	.14	.48	.27	.52	D240930
D240931	.35	1.2	3.2L	.86	240	2.3	.29	.98	.55	.86	D240931
D240932	.72	.96	3.1L	.71	120	.78	.15	.59	.50	.45L	D240932
D240933	1.2	1.1	2.5L	.87	44L	1.4	.19	.87	B	.36L	D240933
D240934	1.3	1.1	2.9L	1.3	220	1.5	.28	.78	.44	.42L	D240934
D240935	1.1	.85	2.5L	1.0	130	.62	.36	.66	.41	.35L	D240935
D240936	1.6	1.8	5.7L	3.6	87	9.6	.78	1.7	1.0	1.1	D240936
D240937	1.9	.80	3.1L	1.9	350	.69	.24	.71	B	.45L	D240937
D240938	.73	1.2	4.7	1.1	330	1.3	.24	.73	.29	.40L	D240938
D240939	2.7	.71L	3.3L	3.6	44L	1.9	.68	1.0	.40	.48L	D240939
D240940	.65	.79	2.5L	1.7	87	1.0	.19	.77	.56	.36L	D240940
D240941	1.1	.76	2.9L	1.9	220	1.3	.18	.091L	.49	.42L	D240941

Table 1f. (cont'd.) Major-, minor-, and trace-element concentrations of 383 lignite samples from the Fort Union Region.

SAMPLE NUMBER	SR-S (PPM)	TH (PPM)	TL-S (PPM)	U (PPM)	V-S (PPM)	W (PPM)	Y-S (PPM)	YB (PPM)	ZN (PPM)	ZR-S (PPM)	SAMPLE NUMBER
D209961	330	2.2	N	1.1	16	N	7.6	0.55	37	33	D209961
D209962	160	2.8	N	2.9	24	N	16	1.6	19	49	D209962
D209963	200	1.6	N	.92	10	N	5.1	.30	4.4	20	D209963
D209964	160	1.4	N	7.3	78	N	23	2.3	55	78	D209964
D209965	170	2.4	N	1.6	17	N	8.0	.57	9.7	34	D209965
D209966	270	6.1	N	5.0	41	N	14	1.4	23	82	D209966
D209967	480	6.2	N	6.6	63	N	16	2.2	21	95	D209967
D209968	340	3.7	N	4.4	45	N	11	.68	16	34	D209968
D240927	520	1.3	.90L	.72	3.8	15L	3.0	.26	1.4	20	D240927
D240928	310	2.5	1.3L	1.2	5.0	15L	2.4	.28	3.1	20	D240928
D240929	280	.72	.79L	.24	2.0	15L	2.7	.17	1.1	12	D240929
D240930	560	.62	.72L	.30	1.8	15L	.94	.09	1.2	9.4	D240930
D240931	410	1.3	1.0L	.87	2.5	15L	2.6	.18	1.4	25	D240931
D240932	440	.90	.97L	.48	1.9	15L	1.4	.11	1.4	15	D240932
D240933	490	.66	.79L	.52	2.6	15L	2.9	.24	1.2	20	D240933
D240934	500	.75	.91L	.69	3.0	15L	3.0	.25	1.9	18	D240934
D240935	400	.56	.77L	.70	2.3	15L	2.7	.19	1.4	12	D240935
D240936	550	3.7	1.8L	2.5	5.0	15L	7.3	.78	23	44	D240936
D240937	550	.82	.98L	.37	2.5	15L	2.4	.20	1.7	20	D240937
D240938	490	.90	.86L	.60	2.5	15L	2.8	.22	1.6	23	D240938
D240939	400	1.6	1.0L	1.3	6.6	15L	5.1	.50	15	12	D240939
D240940	430	.88	.79L	.74	2.2	15L	2.8	.21	1.8	19	D240940
D240941	1,000	1.3	.91L	.45	2.5	15L	3.0	.19	1.7	16	D240941

Table 2a. Location information for 22 rock samples from the Fort Union Region- North Dakota and Montana.
NDE = no data entered.

SAMPLE NUMBER	STATE	COUNTY	QUADRANGLE	LATITUDE	LONGITUDE	LOCATION NAME
D178513	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471733N	1023454W	NDE
D178514	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471733N	1023454W	NDE
D178515	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471733N	1023454W	NDE
D178516	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471733N	1023454W	NDE
D178517	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471733N	1023454W	NDE
D178518	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471733N	1023454W	NDE
D178519	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471733N	1023454W	NDE
D178520	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471733N	1023454W	NDE
D178521	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471733N	1023454W	NDE
D178522	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471733N	1023454W	NDE
D178523	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471708N	1023311W	NDE
D178524	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471708N	1023311W	NDE
D178525	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471708N	1023311W	NDE
D178526	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471708N	1023311W	NDE
D178527	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471708N	1023311W	NDE
D178528	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471708N	1023311W	NDE
D178529	NORTH DAKOTA	DUNN	DUNN CENTER (7.5')	471708N	1023311W	NDE
D188139	MONTANA	RICHLAND	SKAAR NE (7.5')	473000N	1040730W	NDE
D178940	MONTANA	MCCONE	BUG CREEK (7.5')	474032N	1061008W	NDE
D178941	MONTANA	MCCONE	NELSON CREEK BAY (7.5')	473302N	1061202W	NDE
D178942	MONTANA	MCCONE	NELSON CREEK BAY (7.5')	473302N	1061202W	NDE
D178943	MONTANA	MCCONE	FRANK COULEE (7.5')	472830N	1061740W	NDE

Table 2b. Geologic information for 22 rock samples from the Fort Union Region- North Dakota and Montana.
NDE = no data entered. Data for associated coal shown in Table 1 for samples marked with *.

SAMPLE NUMBER	GROUP/FORMATION	BED NAME	LITHOLOGY	FIELD ID NO.	COLLECTOR
D178513	FORT UNION GP	NDE	SANDSTONE	DH75-102-A	USGD-SWANSON V E
D178514	FORT UNION GP	NDE	SANDSTONE	DH75-102-B	USGD-SWANSON V E
D178515	FORT UNION GP	NDE	SHALE	DH75-102-C	USGD-SWANSON V E
D178516	FORT UNION GP	NDE	SANDSTONE	DH75-102-D	USGD-SWANSON V E
D178517	FORT UNION GP	NDE	ROCK	DH75-102-E	USGD-SWANSON V E
D178518	FORT UNION GP	NDE	SHALE	DH75-102-F	USGD-SWANSON V E
D178519	FORT UNION GP	NDE	SANDSTONE	DH75-102-G	USGD-SWANSON V E
D178520	FORT UNION GP	NDE	SHALE	DH75-102-H	USGD-SWANSON V E
D178521	FORT UNION GP	NDE	SANDSTONE	DH75-102-I	USGD-SWANSON V E
D178522	FORT UNION GP	NDE	SHALE	DH75-102-J	USGD-SWANSON V E
D178523	FORT UNION GP	NDE	SANDSTONE	DH75-101-A	USGD-SWANSON V E
D178524	FORT UNION GP	NDE	SILTSTONE	DH75-101-B	USGD-SWANSON V E
D178525	FORT UNION GP	NDE	SANDSTONE	DH75-101-C	USGD-SWANSON V E
D178526	FORT UNION GP	NDE	SANDSTONE	DH75-101-D	USGD-SWANSON V E
D178527	FORT UNION GP	NDE	SHALE	DH75-101-E	USGD-SWANSON V E
D178528	FORT UNION GP	NDE	SANDSTONE	DH75-101-F	USGD-SWANSON V E
D178529	FORT UNION GP	NDE	SHALE	DH75-101-G	USGD-SWANSON V E
D188139*	FORT UNION GP	NDE	CLAY	76C-010B	USGD-SWANSON V E
D178940	FORT UNION GP	NDE	CLAYSTONE	CRWR-1	USGD-SWANSON V E
D178941	FORT UNION GP	NDE	CLAYSTONE	CRWR-2	USGD-SWANSON V E
D178942	FORT UNION GP	NDE	CLAYSTONE	CRWR-3	USGD-SWANSON V E
D178943	FORT UNION GP	NDE	SILTSTONE	CRWR-4	USGD-SWANSON V E

Table 2c. Sample information for 22 rock samples from the Fort Union Region- North Dakota and Montana.

SAMPLE NUMBER	DEPTH CM	DEPTH IN	SAMPLE THICKNESS CM	SAMPLE THICKNESS IN	SAMPLE TYPE	ANALYTICAL LABS	DATA VALUES REPRESENT	DATE YR/MO/DY
D178513	243.8	(96.0)	15.2	(6.0)	DRILL CORE	US GEOLOGICAL SURVEY	SINGLE SAMPLE	751113
D178514	670.5	(264.0)	15.2	(6.0)	DRILL CORE	US GEOLOGICAL SURVEY	SINGLE SAMPLE	751113
D178515	883.9	(348.0)	15.2	(6.0)	DRILL CORE	US GEOLOGICAL SURVEY	SINGLE SAMPLE	751113
D178516	1188.7	(468.0)	15.2	(6.0)	DRILL CORE	US GEOLOGICAL SURVEY	SINGLE SAMPLE	751113
D178517	1920.2	(756.0)	15.2	(6.0)	DRILL CORE	US GEOLOGICAL SURVEY	SINGLE SAMPLE	751113
D178518	2286.0	(900.0)	15.2	(6.0)	DRILL CORE	US GEOLOGICAL SURVEY	SINGLE SAMPLE	751113
D178519	2773.6	(1092.0)	15.2	(6.0)	DRILL CORE	US GEOLOGICAL SURVEY	SINGLE SAMPLE	751113
D178520	3657.5	(1440.0)	15.2	(6.0)	DRILL CORE	US GEOLOGICAL SURVEY	SINGLE SAMPLE	751113
D178521	4419.5	(1740.0)	15.2	(6.0)	DRILL CORE	US GEOLOGICAL SURVEY	SINGLE SAMPLE	751113
D178522	4937.7	(1944.0)	15.2	(6.0)	DRILL CORE	US GEOLOGICAL SURVEY	SINGLE SAMPLE	751113
D178523	762.0	(300.0)	15.2	(6.0)	DRILL CORE	US GEOLOGICAL SURVEY	SINGLE SAMPLE	751113
D178524	1524.0	(600.0)	15.2	(6.0)	DRILL CORE	US GEOLOGICAL SURVEY	SINGLE SAMPLE	751113
D178525	2499.3	(984.0)	15.2	(6.0)	DRILL CORE	US GEOLOGICAL SURVEY	SINGLE SAMPLE	751113
D178526	3047.9	(1200.0)	15.2	(6.0)	DRILL CORE	US GEOLOGICAL SURVEY	SINGLE SAMPLE	751113
D178527	3657.5	(1440.0)	15.2	(6.0)	DRILL CORE	US GEOLOGICAL SURVEY	SINGLE SAMPLE	751113
D178528	4282.4	(1686.0)	15.2	(6.0)	DRILL CORE	US GEOLOGICAL SURVEY	SINGLE SAMPLE	751113
D178529	4739.6	(1866.0)	15.2	(6.0)	DRILL CORE	US GEOLOGICAL SURVEY	SINGLE SAMPLE	751113
D188139	4602.4	(1812.0)	15.2	(6.0)	DRILL CORE	US GEOLOGICAL SURVEY	SINGLE SAMPLE	770201
D178940	0.0	(0.0)	3.0	(1.2)	CHANNEL	US GEOLOGICAL SURVEY	SINGLE SAMPLE	751231
D178941	0.0	(0.0)	15.2	(6.0)	CHANNEL	US GEOLOGICAL SURVEY	SINGLE SAMPLE	751231
D178942	15.2	(6.0)	111.7	(44.0)	CHANNEL	US GEOLOGICAL SURVEY	SINGLE SAMPLE	751231
D178943	0.0	(0.0)	335.2	(132.0)	CHANNEL	US GEOLOGICAL SURVEY	SINGLE SAMPLE	751231

Table 2d. Major- and minor- oxides concentrations in the laboratory ash (525 degrees C) of 22 rock samples from the Fort Union Region- North Dakota and Montana. Values in percent. L = less than the value shown.

SAMPLE NUMBER	ASH (PERCENT)	SIO2 (PERCENT)	AL2O3 (PERCENT)	CAO (PERCENT)	MGO (PERCENT)	NA2O (PERCENT)	K2O (PERCENT)	FE2O3 (PERCENT)	TIO2 (PERCENT)	SO3 (PERCENT)	SAMPLE NUMBER
D178513	97.8	84	8.4	.37	.76	1.1	1.4	2.0	.65	.48	D178513
D178514	99.3	94	5.3	.29	.48	1.0	1.2	1.1	.31	.20L	D178514
D178515	94.8	65	14	.63	1.4	1.4	2.4	5.3	.68	1.2	D178515
D178516	97.1	73	11	.75	1.6	1.9	1.9	2.1	.58	.20L	D178516
D178517	95.3	70	12	1.6	2.4	1.4	2.3	3.0	.56	.42	D178517
D178518	94.2	69	16	.44	1.2	1.1	2.0	2.8	.61	.20L	D178518
D178519	97.4	75	11	2.4	2.6	1.4	2.0	2.0	.57	.20L	D178519
D178520	96.6	76	12	.28	1.9	.89	3.1	2.6	.57	.20L	D178520
D178521	97.9	62	7.1	7.7	5.6	.77	1.9	1.6	.34	.20L	D178521
D178522	95.7	59	12	4.0	5.0	.50	3.2	2.8	.53	.20L	D178522
D178523	97.4	76	12	1.2	1.3	2.1	2.0	2.1	.50	.50	D178523
D178524	97.6	70	12	1.7	2.6	1.7	2.3	2.9	.58	.21	D178524
D178525	94.8	65	15	1.6	3.0	1.6	2.8	3.5	.68	.20	D178525
D178526	96.6	66	10	3.7	2.9	1.5	1.9	4.8	.52	.81	D178526
D178527	96.6	66	11	4.0	3.0	1.5	2.0	3.0	.50	.20L	D178527
D178528	98.0	71	8.8	3.9	2.9	1.4	1.8	2.1	.54	.20L	D178528
D178529	94.1	70	18	.28	1.2	.46	2.6	2.3	.70	.20L	D178529
D188139	46.6	54	28	7.3	1.4	1.9	.57	.6	.88	1.3	D188139
D178940	87.5	57	33	.52	.19	1.0	2.9	.3	.69	.20L	D178940
D178941	95.8	73	15	.22	1.9	1.2	3.6	3.3	.55	.38	D178941
D178942	96.6	71	15	.17	2.1	.85	3.4	3.5	.61	.20L	D178942
D178943	97.1	75	13	.31	1.4	.87	2.9	3.7	.62	.20L	D178943

Table 2e. Major-, minor-, and trace-element concentrations of 22 rock samples from the Fort Union Region- North Dakota and Montana.

[Values in percent or parts-per-million. Elements not from direct determinations on whole coal (figure 3) have been calculated from analyses of ash. S = analysis by emission spectography; L, less than the value shown; N, not detected.]

SAMPLE NUMBER	SI (PERCENT)	AL (PERCENT)	CA (PERCENT)	MG (PERCENT)	NA (PERCENT)	K (PERCENT)	FE (PERCENT)	TI (PERCENT)	AS (PPM)	B-S (PPM)	SAMPLE NUMBER
D178513	39	4.3	.26	.45	.80	1.1	1.4	.38	11	N	D178513
D178514	44	2.8	.21	.29	.74	1.0	.76	.18	8.5	N	D178514
D178515	29	6.9	.43	.80	.98	1.9	3.5	.39	5.0	47	D178515
D178516	33	5.7	.52	.92	1.3	1.5	1.4	.34	5.5	N	D178516
D178517	31	6.2	1.1	1.4	1.0	1.8	2.0	.32	6.5	48	D178517
D178518	30	7.8	.30	.67	.75	1.6	1.9	.34	4.0	47	D178518
D178519	34	5.5	1.7	1.5	1.0	1.6	1.4	.33	3.5	49	D178519
D178520	34	6.2	.19	1.1	.64	2.5	1.7	.33	5.5	68	D178520
D178521	28	3.7	5.4	3.3	.56	1.5	1.1	.20	2.5	49	D178521
D178522	26	6.3	2.7	2.9	.35	2.5	1.9	.30	2.5	67	D178522
D178523	35	6.1	.81	.75	1.5	1.7	1.4	.29	4.5	N	D178523
D178524	32	6.2	1.2	1.5	1.2	1.8	2.0	.34	4.0	49	D178524
D178525	29	7.3	1.1	1.7	1.1	2.2	2.3	.39	6.0	47	D178525
D178526	30	5.3	2.5	1.7	1.1	1.6	3.2	.30	38	N	D178526
D178527	30	5.4	2.8	1.7	1.1	1.6	2.0	.29	8.0	48	D178527
D178528	32	4.6	2.7	1.7	1.0	1.5	1.5	.32	3.0	49	D178528
D178529	31	9.2	.19	.70	.32	2.0	1.5	.39	6.5	66	D178529
D188139	12	6.9	2.4	.39	.67	.22	.21	.25	.10L	70	D188139
D178940	23	15	.32	.10	.67	2.1	.20	.36	.50	61	D178940
D178941	33	7.6	.15	1.1	.82	2.9	2.2	.32	6.5	140	D178941
D178942	32	7.7	.12	1.2	.61	2.7	2.4	.35	2.5	140	D178942
D178943	34	6.7	.21	.84	.63	2.3	2.5	.36	3.0	150	D178943

Table 2e. (cont'd.) Major-, minor-, and trace-element concentrations of 22 rock samples from the Fort Union Region.

SAMPLE NUMBER	BA-S (PPM)	BE-S (PPM)	CO (PPM)	CR (PPM)	CU (PPM)	F (PPM)	GA-S (PPM)	HG (PPM)	LI (PPM)	MN (PPM)	SAMPLE NUMBER
D178513	680	N	N	68	20L	150	15	.020	16	170	D178513
D178514	700	N	5.0	20	20L	160	N	.020	9.9	94	D178514
D178515	660	N	4.7	95	37	430	28	.10	23	170	D178515
D178516	680	N	15	68	19L	430	29	.020	17	220	D178516
D178517	670	N	9.5	67	33	490	29	.060	27	350	D178517
D178518	470	N	4.7	66	32	430	28	.060	26	75	D178518
D178519	490	N	6.8	97	19L	330	19	.030	22	230	D178519
D178520	480	N	9.7	48	22	660	29	.080	43	120	D178520
D178521	290	N	4.9	29	20L	380	15	.020	23	310	D178521
D178522	670	N	6.7	67	25	910	29	.040	39	250	D178522
D178523	970	N	6.8	49	19L	280	19	.010	22	320	D178523
D178524	680	N	6.8	98	28	460	29	.050	27	310	D178524
D178525	660	N	9.5	95	46	700	28	.070	37	390	D178525
D178526	680	N	4.8	68	22	490	19	.070	23	700	D178526
D178527	480	N	6.8	68	30	490	19	.060	24	460	D178527
D178528	490	N	N	69	20L	420	20	.020	20	310	D178528
D178529	470	N	N	94	27	580	28	.11	47	42	D178529
D188139	700	3.3	N	3.6	15	90	14	0.030	55	51	D188139
D178940	1,700	N	N	6.1	18L	150	61	.16	110	39	D178940
D178941	960	2.9	9.6L	96	23	850	29	.11	36	86	D178941
D178942	680	2.9	9.7	97	28	710	29	.060	45	120	D178942
D178943	680	2.9	15	97	25	710	29	.030	39	330	D178943

Table 2e. (cont'd.) Major-, minor-, and trace-element concentrations of 22 rock samples from the Fort Union Region.

SAMPLE NUMBER	MO-S (PPM)	NB-S (PPM)	NI-S (PPM)	PB (PPM)	SB (PPM)	SC (PPM)	SE (PPM)	SR-S (PPM)	TH (PPM)	U (PPM)	SAMPLE NUMBER
D178513	N	N	6.8	24L	.30	6.8	.10L	98	5.2	1.7	D178513
D178514	20	N	7.0	25L	.20	N	.10L	70	N	1.5	D178514
D178515	N	19	14	24L	.60	9.5	.41	190	8.9	2.9	D178515
D178516	9.7	19	49	24L	.40	9.7	.10L	190	8.2	2.5	D178516
D178517	N	19	29	24L	.60	9.5	.29	190	6.6	2.9	D178517
D178518	N	19	14	24L	.80	14	.40	190	10	5.1	D178518
D178519	15	N	19	24L	.50	6.8	.13	150	2.8	3.1	D178519
D178520	N	19	19	24L	.80	6.8	.16	68	13	3.3	D178520
D178521	N	N	9.8	24L	.40	N	.20	29	6.4	2.4	D178521
D178522	N	19	19	24L	.60	9.6	.46	140	12	5.0	D178522
D178523	N	N	19	24L	.30	6.8	.10L	290	5.7	2.5	D178523
D178524	9.8	N	29	24L	.60	9.8	.28	200	7.3	3.0	D178524
D178525	9.5	19	47	24L	1.0	9.5	.78	190	8.0	3.9	D178525
D178526	N	N	19	24L	1.5	6.8	.16	190	9.3	2.9	D178526
D178527	9.7	N	29	24L	.70	6.8	.10L	190	8.1	2.9	D178527
D178528	N	N	9.8	25L	.50	4.9	.10L	290	10	2.9	D178528
D178529	N	19	9.4	24L	1.1	14	1.3	470	11	5.6	D178529
D188139	N	9.3	2.3	14	.10L	7.0	2.4	330	14	5.1	D188139
D178940	N	26	N	22L	.40	N	.40	610	12	4.1	D178940
D178941	N	29	29	24L	.60	14	.60	67	6.2	4.2	D178941
D178942	N	29	29	24L	.60	14	.30	68	6.9	3.8	D178942
D178943	15	29	49	24L	.80	15	.60	150	8.9	4.0	D178943

Table 2e. (cont'd.) Major-, minor-, and trace-element concentrations of 22 rock samples from the Fort Union Region.

SAMPLE NUMBER	V-S (PPM)	Y-S (PPM)	YB (PPM)	ZN (PPM)	ZR-S (PPM)
D178513	68	20	2.0	31	68
D178514	50	20	2.0	37	99
D178515	95	N	1.9	120	95
D178516	68	29	2.9	130	97
D178517	95	29	2.9	100	95
D178518	140	47	4.7	57	140
D178519	68	19	2.9	77	190
D178520	68	29	4.8	84	140
D178521	49	29	2.9	65	98
D178522	96	29	2.9	110	96
D178523	68	19	1.9	98	68
D178524	98	20	2.9	93	98
D178525	140	28	2.8	130	95
D178526	68	19	2.9	79	97
D178527	68	19	2.9	92	140
D178528	69	20	2.9	64	200
D178529	140	19	2.8	71	66
D188139	14	14	2.3	10	70
D178940	61	26	2.6	18L	130
D178941	190	48	4.8	54	140
D178942	190	48	6.8	110	140
D178943	150	49	6.8	99	190

Table 3. Statistics for lignite beds in the Fort Union region. [Values are in percent, except heat of combustion values, and are reported on an as-received basis. N is number of samples.]

	North Dakota N=216			Montana N=88			Regional N=304
	Arithmetic mean	Range Min	Range Max	Arithmetic mean	Range Min	Range Max	Arithmetic mean
Proximate and ultimate analyses							
Moisture	38.35	26.20	57.20	35.86	20.40	43.44	37.67
Volatile matter	25.93	20.50	40.00	25.55	14.06	34.20	25.82
Fixed carbon	26.96	7.80	36.30	29.07	20.50	42.86	27.53
Ash	8.76	3.50	30.70	9.54	3.89	23.60	8.97
Hydrogen	6.81	5.00	7.70	6.55	5.20	7.29	6.74
Carbon	37.24	18.80	47.70	38.89	28.60	49.90	37.67
Nitrogen	0.60	0.20	1.00	0.63	0.40	1.00	0.61
Oxygen	45.53	32.20	59.80	43.22	29.50	49.35	44.94
Sulfur	1.00	0.20	4.00	0.98	0.16	8.40	1.00
Heat of combustion							
Kcal/kg	3463	1460	4415	3586	2689	4608	3497
Btu/lb	6229	2625	7980	6450	4836	8287	6290

Table 4. Statistics for lignite beds in North Dakota and Montana.
[Values are in parts per million on a whole coal basis.
N is number of samples. Analytical methods are listed
below. Values less than detection limits were not used.]

	North Dakota			Montana			Regional	
	Geometric mean	Range Min	Max	Geometric mean	Range Min	Max	Geometric mean	(N)
				Trace element analyses				
As	5.9	1.0	63	5.8	0.8	564	5.9	(284)
Ba	407	13	5760	349	34	2690	389	(303)
Cd	0.16	0.01	2.6	0.12	0.01	0.39	0.14	(61)
Ge	2.2	0.12	13	1.4	0.41	8.2	1.9	(69)
Hg	0.11	0.01	1.2	0.09	0.02	0.56	0.11	(304)
Li	2.9	0.33	33	5.4	0.38	32	3.5	(297)
Mn	65	8.7	668	65	31	203	65	(304)
Na	2700	230	11000	1400	64	10000	2200	(304)
Pb	3.6	0.35	13	4.3	0.61	22	3.8	(253)
Se	0.72	0.15	3.3	0.67	0.20	2.3	0.71	(281)
U	1.1	0.20	13	1.7	0.37	14	1.3	(286)
Zr	16.0	1.9	158	26	3.6	305	18	(304)

As determined by heteropoly blue spectrophotometric method, or graphite furnace-atomic absorption method, or INAA.
Ba,Ge,Zr determined by six-step spectrographic method, or plate-reader spectrographic method.
Mn determined by six-step spectrographic method or atomic absorption.
Se determined by x-ray fluorescence or INAA.
U determined by delayed neutron activation.
All other elements determined by colorimetric methods.

REFERENCES

Affolter, R.H. and Hatch, J.R., 1980, Chemical analyses of lignite from the Fort Union Formation, McCone, Richland, Dawson, and Wibaux Counties, Montana and Golden Valley County, North Dakota: U.S. Geological Survey Open-File Report 80-179, 40 p.

Affolter, R.H. and Kirschbaum, M.A., 1982, Chemical analyses of lignite from the Sentinel Butte Member of the Paleocene Fort Union Formation, North Beulah EMRIA study site, Mercer County, North Dakota: U.S. Geological Survey Open-File Report 82-131, 21 p.

American Society for Testing and Materials (ASTM), 1981, Annual book of ASTM standards, Part 26- Gaseous fuels, coal, and coke, atmospheric analysis: ASTM, 920 p.

Daly, D.J., Groenewold, G.H., and Schmit, C.R., 1985, Paleoenvironments of the Paleocene Sentinel Butte Formation, Knife River area, west-central North Dakota: in Cenozoic Paleogeography of west-central United States, Flores, R.M. and Kaplan, S.S., eds., SEPM Rocky Mountain Symposium 3, Denver, CO, p. 171-185.

Golightly, D.W., and Simon, F.O., eds., 1989, Methods for sampling and inorganic analysis of coal: U.S. Geological Survey Bulletin 1823, 72 p.

Hatch, J.R. and Affolter, R.H., 1978, Chemical analyses of lignite from the Sentinel Butte Member of the Fort Union Formation, Dunn Center Field, Dunn County, North Dakota: U.S. Geological Survey Open-File Report 78-1078, 42 p.

Swanson, V.E., and Huffman, C., 1976, Guidelines for sample collection and analytical methods used in the U.S. Geological Survey for determining composition of coal: U.S. Geological Circular 735, 11 p.

Swanson, V.E., Medlin, J.H., Hatch, J.R., Coleman, S.L., Wood, Jr., G.H., Woodruff, S.D., and Hildebrand, R.T., 1976, Collection, chemical analysis, and evaluation of coal samples in 1975: U.S. Geological Survey Open-File Report 76-468, 503 p.

Tewalt, S.J., Finkelman, R.B., and Hildebrand, R.T., in press, Lignite chemical characteristics and trends in the Fort Union Region, North Dakota and Montana, in Finkelman, R.B., Daly, D.J., and Tewalt, S.J., eds., Geology and Utilization of Fort Union Lignites: Environmental and Coal Associates, 15 p.

U.S. Geological Survey and Montana Bureau of Mines and Geology, 1976, Preliminary report of coal drill-hole data and chemical analyses of coal beds in Campbell, Converse, and Sheridan Counties, Wyoming; and Big Horn, Richland, and Dawson Counties, Montana: U.S. Geological Survey Open-File Report 76-450, 382 p.

U.S. Geological Survey and Montana Bureau of Mines and Geology, 1977, Preliminary report on 1976 drilling of coals in Campbell and Sheridan Counties, Wyoming; and Big Horn, Dawson, McCone, Richland, Roosevelt, Rosebud, Sheridan, and Wibaux Counties, Montana: U.S. Geological Survey Open-File Report 77-283, 403 p.