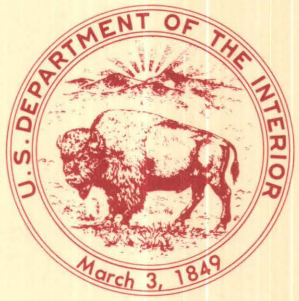
# Resources of Low-Volatile Bituminous Coal and Semianthracite in West-Central Arkansas, 1978

## U.S. GEOLOGICAL SURVEY BULLETIN 1632

Prepared in cooperation with the
Arkansas Geological Commission



# Resources of Low-Volatile Bituminous Coal and Semianthracite in West-central Arkansas, 1978

By BOYD R. HALEY

Prepared in cooperation with the
Arkansas Geological Commission

A supplement to Bulletin 1072–P, describing the extent, thickness, depth, rank, analyses, and resources of coal in west-central Arkansas

U.S. GEOLOGICAL SURVEY BULLETIN 1632

DEPARTMENT OF THE INTERIOR
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Dallas L. Peck, Director


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# CONTENTS



## PLATE

[In pocket]



## FIGURES



## TABLES

# Resources of Low-Volatile Bituminous Coal and Semianthracite in West-Central Arkansas, 1978

*By* Boyd R. Haley

**Abstract**

Formations of Pennsylvanian age in west-central Arkansas contain at least 25 coal beds, but only the Lower Hartshorne, Charleston, and Paris coal beds have been mined to any appreciable extent. The coal ranges in rank from low-volatile bituminous coal in the western part of the area to semianthracite in the eastern part. The original resources of coal in four beds 14 in. or more thick are estimated to have totaled about 2.2 billion short tons; of this amount, 80 percent is low-volatile bituminous coal, 87 percent is less than 1,000 ft deep, 79 percent is in beds 14 to 42 in. thick, 94 percent is in the Lower Hartshorne coal bed, and 48 percent is in Sebastian County. Cumulative production to the end of 1978 is about 105 million short tons, 55 percent of which has been produced in Sebastian County. During 1978, 319,275 short tons of coal were mined in west-central Arkansas, 70 percent of which was produced for the metallurgical industries, 25 percent for steam generation, and 5 percent for home heating, briquet additive, and chemical sources of carbon.

## INTRODUCTION

This report is a modification of the information presented in a previous report, "Coal Resources of Arkansas, 1954" (Haley, 1960). The modification is based on information obtained since 1955 by personnel of the U.S. Geological Survey and the Arkansas Geological Commission. Published detailed geologic reports pertaining to parts of west-central Arkansas are listed in the selected references of this report, and their respective areas are shown on the map of miscellaneous coal beds (pl. 1*E*). Most of the estimates of coal resources listed by various categories in this report were calculated prior to 1955; however, these categories conform to the categories of "identified resources" of the coal resource classification system established in 1976 (U.S. Geological Survey, 1976).

## DISTRIBUTION OF COAL RESOURCES

Formations of Pennsylvanian age in west-central Arkansas contain at least 25 coal beds (fig. 1), but only the Lower Hartshorne, Charleston, and Paris coal beds have been mined to any appreciable extent. The Upper Hartshorne coal bed contains sufficient coal thicker than 14 in. to be of economic importance, but it and other thin coal beds have been mined only to supply local demand.

The distribution of the original resources of coal estimated to have been in west-central Arkansas is shown in table 1 by coal bed, county, rank, thickness of overburden, reliability of data, and thickness.

## RANK OF COAL

The rank of the coal in west-central Arkansas is determined by the percentage of dry mineral-matter-free fixed carbon according to the classification established by the American Society for Testing and Materials (1977). The classification is given in table 2. The percentage of dry mineral-matter-free fixed carbon is determined by using the following approximation formula:

$$\text{dry mineral-matter-free fixed carbon} = \frac{FC}{100-(M+1.1A+0.1S)} \times 100,$$

where FC = percentage of fixed carbon,
M = percentage of moisture,
A = percentage of ash, and
S = percentage of sulfur.

The percentage of dry mineral-matter-free fixed carbon ranges from a low of about 80 percent in the southwestern part of the area near Bates to about 90 percent in the eastern part of the area near Russellville; thus, the rank ranges from low-volatile bituminous coal to semianthracite (Haley, 1960, p. 810).

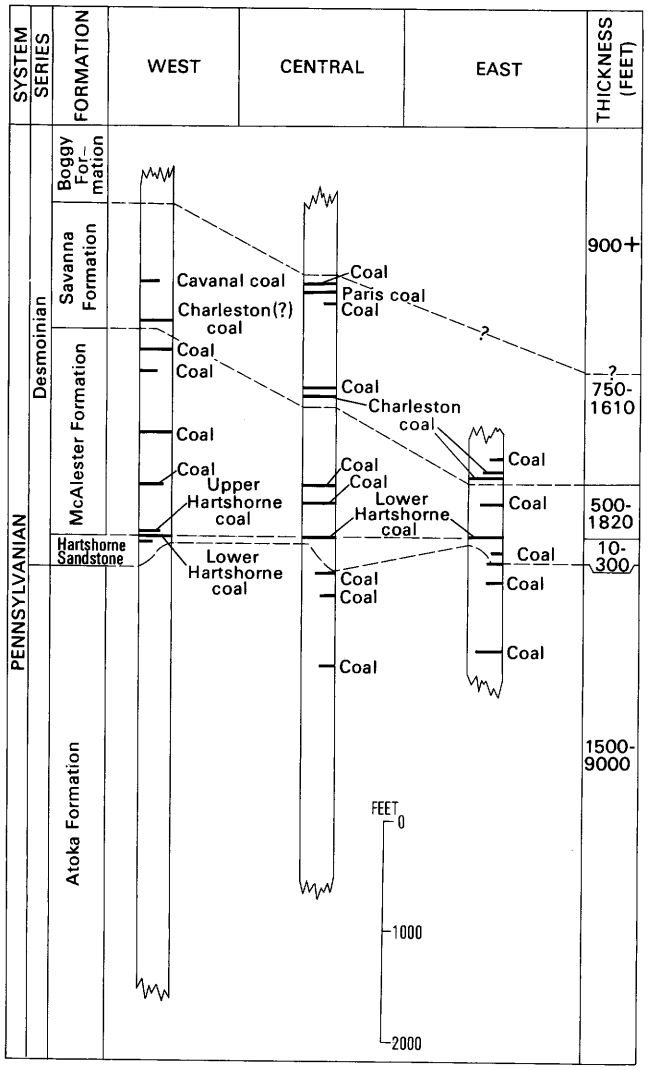


**Figure 1.** Generalized columnar section of the coal-bearing formations and coal beds in west-central Arkansas. Dashed line is a correlation line, queried where uncertain. (From Haley, 1960, fig. 45, p. 817.)

The position of the boundary between low-volatile bituminous coal and semianthracite shown on figure 2 is the approximate position of the 86-percent dry mineral-matter-free fixed carbon line. This line could be shifted a mile or more to either side of the position shown because the percentage of dry mineral-matter-free fixed carbon is dependent upon the freshness of the coal sample; the care with which the coal sample was collected, stored and shipped; and the amount of moisture, ash, and sulfur in the coal. Possibly, the a ytical procedures could cause error, but all proximate and ultimate analyses listed in this report were obtained under rigidly controlled techniques by the U.S. Bureau of Mines Coal Analyses Section in Pittsburgh, Penn.; therefore, analytically caused differences in the percentage of dry mineral-matter-free fixed carbon should be minimal.

## COAL ANALYSES

Proximate and ultimate analyses, air-drying loss, heat of combustion, fusibility of ash, and free-swelling index of coal samples from west-central Arkansas are listed in table 3.

Major-, minor-, and trace-element compositions of coal samples reported on a whole-coal basis are listed in table 4; major- and minor-oxide and trace-element compositions of the ash of coal are listed in table 5; and the content of seven trace elements in air-dried (32°C) coal samples are listed in table 6. The analyses listed in tables 4, 5, and 6 were done by the U.S. Geological Survey Analytical Laboratories in Denver, Colo.

## COAL BEDS

### Atoka Formation

The upper one-third of the Atoka Formation contains coal beds throughout much of west-central Arkansas. (See map of miscellaneous coal beds, pl. 1*E*.) Most of the coal beds are less than 24 in. thick and are thought to contain more sulfur than is indicated in table 3. Coal samples 95 and 96 contain less than 1 percent sulfur (table 3), but sample 95 was collected from a weathered outcrop, and sample 96 was collected from a coal bed within a shale weathered to clay; thus, much of the sulfur may have been leached out of the coal.

Most of the coal beds in the Atoka Formation are local in extent; however, one bed is known to extend from west of Ozark to south of Hagarville, an outcrop distance of 30 mi, and another extends from Dayton to Driggs, an outcrop distance of about 35 mi.

### Hartshorne Sandstone

A coal bed with less than 3 mi of outcrop extent is present in the Hartshorne Sandstone near the community of Elm Park. An attempt was made to strip-mine the coal, but evidently the thinness of the coal (9 in.) made the attempt unsuccessful.

### McAlester Formation

The Lower Hartshorne coal bed near the base of the McAlester Formation is the thickest and the most extensive coal bed known in west-central Arkansas. It has been, and will continue to be, the most economically important coal bed.

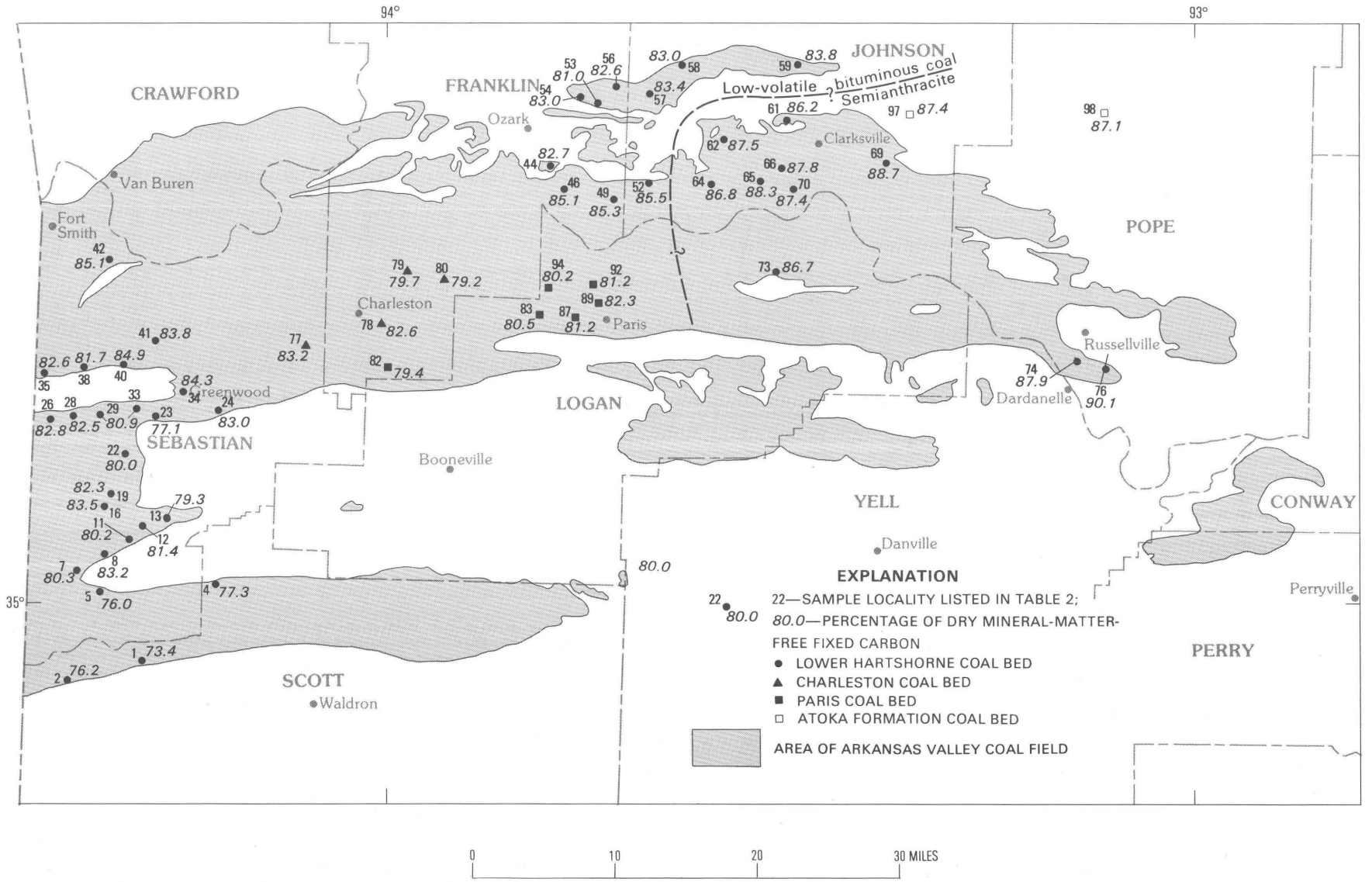


**Figure 2.** Distribution of dry mineral-matter-free fixed carbon in coal in west-central Arkansas. Query on rank line indicates uncertainty.

Its thickness ranges from about 8 ft to a feather edge and is inversely related to the thickness of the underlying Hartshorne Sandstone. Where the sandstone is the thinnest, the coal bed is the thickest; and where the sandstone is more than 180 ft thick, the coal bed is generally very thin or absent. The Lower Hartshorne coal bed has not been found in the areas bounded by the dashed outcrop line on the map of the Lower Hartshorne coal bed (pl. 1*A*). It may not be present in these areas because the underlying Hartshorne Sandstone is everywhere thicker than 200 ft and in some areas it is thicker than 300 ft.

The Upper Hartshorne coal bed ranges from 90 to 60 ft above the Lower Hartshorne coal bed and is known to be present only in Sebastian and northern Scott Counties. (See map of Upper Hartshorne coal bed, pl. 1*B*.) Its thickness ranges from 30 in. to a feather edge. It has been mined in one small area south of Midland, but the quantity or quality of the mined coal is unknown.

Other coal beds are present in the McAlester Formation (see map of miscellaneous coal beds, pl. 1*E*), but only the coal bed south of Kibler is known to have been mined.

### Savanna Formation

The Charleston coal bed is present near the base of the Savanna Formation. In all probability, the coal bed shown on the map as the Charleston coal bed (pl. 1*C*) is not a continuous coal, but is an overlapping series of coal beds that interfinger with beds of sandstone and shale in the basal part of the Savanna Formation; however, in the calculation of coal resources it is treated as a single coal bed. The Charleston coal bed is less than 28 in. thick and its extent is larger than is shown on the map, but it cannot be identified with certainty east of Morrison Bluff or in the area of Hollis Lake.

The Paris coal bed is the other coal bed of economic importance in the Savanna Formation. It is present in two areas (see map of Paris coal bed, pl. 1*D*); one near Paris, where it has been mined extensively, and one south of Charleston, where it has been mined only in the eastern part. The coal bed ranges in thickness from 14 to 32 in.

### Boggy Formation

The remnant of the Boggy Formation present in Arkansas consists mostly of sandstone with subordinate amounts of siltstone and shale. Coal beds have not been found in this sequence of rocks.

## STRUCTURE

The rocks in west-central Arkansas may be divided into two structural parts by a generalized line extending eastward from Bonanza through Charleston, Prairie View, and Gum Log.

South of this line, the rocks have been folded into broad synclines and asymmetrical anticlines, many of which have been broken by reverse faults along their crests. Nearly all of the rocks dip in excess of 10° and some are overturned by as much as 15° on the north limbs of some of the anticlines.

North of this line, the rocks have been folded less severely into broad, gentle synclines and anticlines. South- and north-dipping normal faults are present throughout this area, but they are particularly abundant in the northern part. The rocks generally dip less than 10°, except near some of the normal faults where they may dip as much as 35°.

## RESOURCES

Haley (1960) estimated the original resources of low-volatile bituminous coal, semianthracite, and coals of all ranks in tables 2, 3, and 6, respectively, by county, coal bed, reliability of data, and thicknesses of coal bed and overburden. These tables, modified as follows, are tables 7, 8, and 9 of this report. Geologic mapping since 1960 by Haley and by E. A. Merewether (U.S. Geological Survey) has shown that in the vicinity of Hunt and Harmony, the Charleston (Philpott) coal bed of Haley (1960) is the Lower Hartshorne coal bed, and the next lower coal bed in the immediate area is not the Lower Hartshorne coal, but is a coal bed in the Atoka Formation. Modifications in tonnage have been made in all pertinent tables of this report to reflect these changes in coal bed correlations.

## PRODUCTION OF COAL

The production of coal in Arkansas did not become economically important until the railroads reached the Coal Hill area, Johnson County, in 1873, and the Hackett-Greenwood area, Sebastian County, in 1883 (Haley, 1960, p. 821). The annual recorded production of coal in Arkansas, from 1880–1978, is listed in table 10.

Most of the coal produced in Arkansas was from underground mines until 1958, when surface mining represented more than one half of total production (fig. 3). All of the reported coal produced in 1974 and 1975 was from surface mines. An underground mine southeast of Hartford, Sebastian County, was started early in 1976, but the amount of annual production has not been reported.

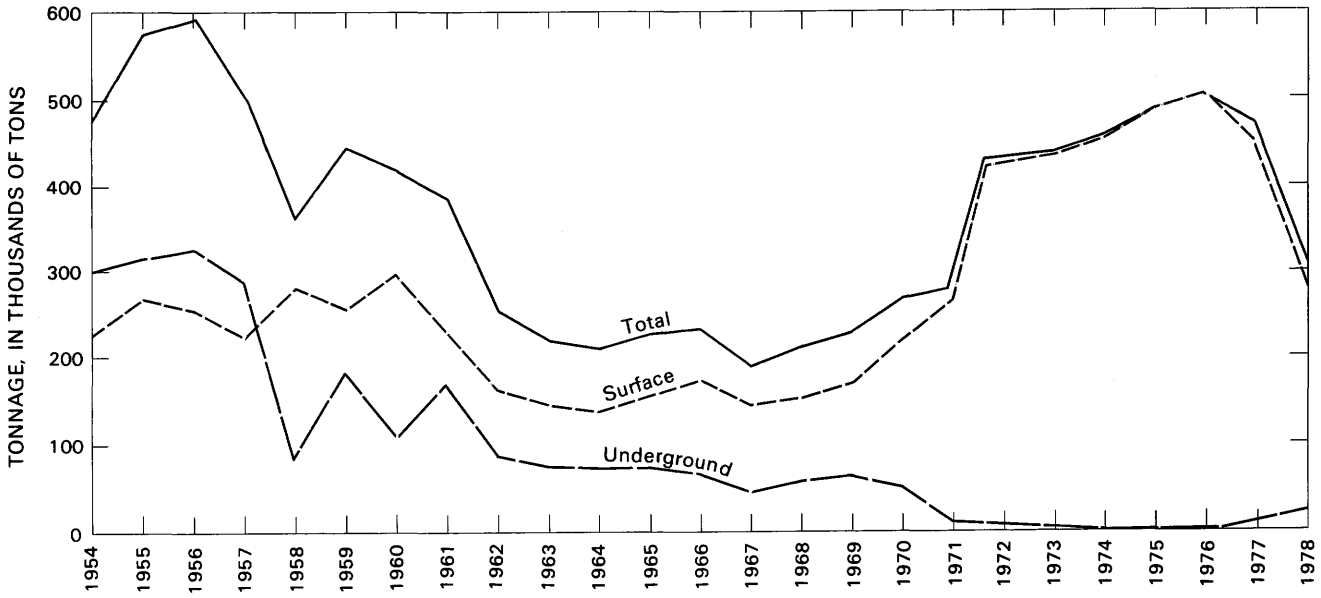


**Figure 3.** Production of coal in west-central Arkansas, 1954 to 1978.

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# TABLES 1–10

**Table 1.** Distribution of estimated original resources of coal in west-central Arkansas by coal bed, county, rank, thickness of overburden, reliability of data, and thickness

[Resources in millions of short tons; numbers in parentheses, percentages of total estimated original resources. Leaders (--), no estimated resources]

| | Low-volatile bituminous coal | Semianthracite |
|---|---|---|
| **Distribution by coal bed** | | |
| Lower Hartshorne | 1,639.7 (74) | 455.8 (20) |
| Upper Hartshorne | 27.9 (1) | -- |
| Charleston | 61.6 (3) | -- |
| Paris | 40.7 (2) | -- |
| **Distribution by county** | | |
| Crawford | 289.9 (13) | -- |
| Franklin | 212.2 (9) | -- |
| Johnson | 59.4 (3) | 274.9 (12) |
| Logan | 41.3 (2) | 157.5 (7) |
| Pope | -- | 23.4 (1) |
| Scott | 104.1 (5) | -- |
| Sebastian | 1,063.0 (48) | -- |
| **Distribution by rank** | | |
| | 1,769.9 (80) | 455.8 (20) |
| **All ranks of coal** | | |
| **Distribution by thickness of overburden** | | |
| <60 ft | 217.9 (10) | |
| 60-500 ft | 1,083.4 (49) | |
| 500-1,000 ft | 629.8 (28) | |
| 1,000-2,000 ft | 222.9 (10) | |
| >2,000 ft | 71.7 (3) | |
| **Distribution by reliability of data** | | |
| Measured | 339.2 (15) | |
| Indicated | 373.4 (17) | |
| Inferred | 1,513.1 (68) | |
| **Distribution by thickness of coal** | | |
| 14-28 in. | 877.1 (39) | |
| 28-42 in. | 884.9 (40) | |
| >42 in. | 463.7 (21) | |

**Table 2.** Classification of coals by rank (modified from American Society for Testing and Materials, 1976)[†] [1]

[Leaders (--), no applicable data]

| Class | Group | Fixed carbon limits, percent (dry, mineral-matter-free basis) | | Volatile matter limits, percent (dry, mineral-matter-free basis) | | Calorific value limits, Btu per pound (moist,[2] mineral-matter-free basis) | | Agglomerating character |
|---|---|---|---|---|---|---|---|---|
| | | Equal or greater than | Less than | Greater than | Equal or less than | Equal or greater than | Less than | |
| I. Anthracitic | 1. Meta-anthracite | 98 | -- | -- | 2 | -- | -- | nonagglomerating |
| | 2. Anthracite | 92 | 98 | 2 | 8 | -- | -- | |
| | 3. Semianthracite[2] | 86 | 92 | 8 | 14 | -- | -- | |
| II. Bituminous | 1. Low-volatile bituminous coal | 78 | 86 | 14 | 22 | -- | -- | commonly agglomerating[3] |
| | 2. Medium-volatile bituminous coal | 69 | 78 | 22 | 31 | -- | -- | |
| | 3. High-volatile A bituminous coal | -- | 69 | 31 | -- | [3]14,000 | -- | |
| | 4. High-volatile B bituminous coal | -- | -- | -- | -- | [4]13,000 | 14,000 | |
| | 5. High-volatile C bituminous coal | -- | -- | -- | -- | 11,500 | 13,000 | |
| | | | | | | 10,500 | 11,500 | agglomerating[5] |
| III. Subbituminous | 1. Subbituminous A coal | -- | -- | -- | -- | 10,500 | 11,500 | nonagglomerating |
| | 2. Subbituminous B coal | -- | -- | -- | -- | 9,500 | 10,500 | |
| | 3. Subbituminous C coal | -- | -- | -- | -- | 8,300 | 9,500 | |
| IV. Lignitic | 1. Lignite A | -- | -- | -- | -- | 6,300 | 8,300 | |
| | 2. Lignite B | -- | -- | -- | -- | -- | 6,300 | |



[1]This classification does not include a few coals, principally nonbanded varieties, that have unusual physical and chemical properties and which come within the limits of fixed carbon or calorific value of the high-volatile bituminous and subbituminous ranks. All of these coals either contain less than 48 percent dry, mineral-matter-free carbon or have more than 15,500 moist, mineral-matter-free Btu per pound.

[2]Moist refers to coal containing its natural inherent moisture but not including visible water on the surface of the coal.

[3]If agglomerating, classify in low-volatile group of the bituminous class.

[4]Coals having 69 percent or more fixed carbon on the dry, mineral-matter-free basis shall be classified according to fixed carbon, regardless of calorific value.

[5]It is recognized that there may be nonagglomerating varieties in these groups of the bituminous class, and that there are notable exceptions in high-volatile C bituminous group.

**Table 3.** Proximate and ultimate analyses, air-drying loss, heat of combustion, fusibility of ash, and free-swelling index of coal in west-central Arkansas

[Locality No.: see plate 1. Site of sample: P, prospect pit; S, strip mine; M, mine; T, tipple; O, outcrop. Condition: 1, as received; 2, moisture free; 3, moisture and ash free. Source of analyses: A, U.S. Bureau of Mines; B, Fieldner and others (1928); C, Hendricks and Parks (1937). Leaders (--), no information available]

| Locality No. | Thickness (in.) | Site of sample | U.S. Bur. Mines lab No. | Condition | Air-drying loss (pct) | Proximate analyses (percent) | | | | Ultimate analyses | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Moisture | Volatile matter | Fixed carbon | Ash | Sulfur | Forms of Sulfur: Sulfate | Pyritic | Organic |
| **Lower Hartshorne coal bed** | | | | | | | | | | | | | |
| Scott County | | | | | | | | | | | | | |
| 1 | 28 | P | E-40768 | 1 | -- | 6.8 | 22.9 | 60.2 | 10.1 | 1.0 | -- | -- | -- |
| | | | | 2 | -- | -- | 24.7 | 64.7 | 10.8 | 1.1 | -- | -- | -- |
| | | | | 3 | -- | -- | 27.5 | 72.5 | -- | 1.2 | -- | -- | -- |
| 2 | 17 | S | K-54030 | 1 | -- | 4.4 | 21.6 | 66.9 | 7.1 | .8 | 0.12 | 0.24 | 0.44 |
| | | | | 2 | -- | -- | 22.6 | 69.9 | 7.5 | .8 | .12 | .25 | .46 |
| | | | | 3 | -- | -- | 24.5 | 75.5 | -- | .9 | .13 | .27 | .49 |
| 3 | -- | M | 3503 | 1 | 5.9 | 6.9 | 25.8 | 43.3 | 24.0 | 2.3 | -- | -- | -- |
| | | | | 2 | -- | -- | 27.6 | 46.6 | 25.8 | 2.5 | -- | -- | -- |
| | -- | -- | 3505 | 1 | 2.5 | 3.4 | 24.4 | 66.4 | 5.8 | .9 | -- | -- | -- |
| | | | | 2 | -- | -- | 25.3 | 68.7 | 6.0 | .9 | -- | -- | -- |
| 4 | 10 | S | K-54029 | 1 | -- | 1.7 | 21.2 | 66.8 | 10.3 | 2.0 | .17 | 1.46 | .40 |
| | | | | 2 | -- | -- | 21.6 | 67.9 | 10.5 | 2.1 | .17 | 1.49 | .41 |
| | | | | 3 | -- | -- | 24.1 | 75.9 | -- | 2.3 | .17 | 1.66 | .45 |
| | 11 | S | K-54028 | 1 | -- | 2.3 | 20.6 | 68.9 | 8.2 | 1.2 | .08 | .58 | .53 |
| | | | | 2 | -- | -- | 21.1 | 70.5 | 8.4 | 1.2 | .08 | .60 | .54 |
| | | | | 3 | -- | -- | 23.1 | 76.9 | -- | 1.3 | .08 | .65 | .59 |
| | 19 | S | K-54027 | 1 | -- | 2.9 | 21.1 | 70.1 | 5.9 | .8 | .04 | .25 | .48 |
| | | | | 2 | -- | -- | 21.8 | 72.1 | 6.1 | .8 | .04 | .25 | .49 |
| | | | | 3 | -- | -- | 23.2 | 76.8 | -- | .8 | .04 | .27 | .53 |
| Sebastian County | | | | | | | | | | | | | |
| 5 | -- | M | 3500 | 1 | -- | 4.1 | 18.2 | 69.9 | 7.8 | 1.0 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.9 | 73.0 | 8.1 | 1.0 | -- | -- | -- |
| | 37 | S | K-54026 | 1 | -- | 9.7 | 24.5 | 61.8 | 4.0 | .6 | .01 | .17 | .38 |
| | | | | 2 | -- | -- | 27.1 | 68.5 | 4.4 | .6 | .01 | .19 | .42 |
| | | | | 3 | -- | -- | 28.4 | 71.6 | -- | .6 | .01 | .19 | .44 |
| 6 | -- | T | B-55082 | 1 | 1.0 | 1.7 | 19.2 | 71.5 | 7.6 | 1.0 | -- | -- | -- |
| | | | | 2 | -- | -- | 19.6 | 72.7 | 7.7 | 1.0 | -- | -- | -- |
| | | | | 3 | -- | -- | 21.2 | 78.8 | -- | 1.0 | -- | -- | -- |
| | | | B-55083 | 1 | 1.3 | 2.1 | 18.5 | 66.6 | 12.8 | 1.1 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.9 | 68.0 | 13.1 | 1.1 | -- | -- | -- |
| | | | | 3 | -- | -- | 21.8 | 78.2 | -- | 1.3 | -- | -- | -- |
| 7 | -- | M | 29835 | 1 | 2.0 | 2.4 | 18.9 | 68.9 | 9.8 | .8 | -- | -- | -- |
| | | | 29836 | 1 | 2.8 | 3.4 | 19.4 | 66.3 | 10.9 | 1.1 | -- | -- | -- |
| | | | 29837 | 1 | 2.4 | 2.9 | 19.6 | 67.0 | 10.5 | 1.4 | -- | -- | -- |
| | | | 29838 | 1 | 2.4 | 2.9 | 19.3 | 67.3 | 10.5 | 1.1 | -- | -- | -- |
| | | | | 2 | -- | -- | 19.9 | 69.3 | 10.8 | 1.1 | -- | -- | -- |
| | | | | 3 | -- | -- | 22.3 | 77.7 | -- | 1.3 | -- | -- | -- |
| | | | 81809 | 1 | 1.9 | 2.5 | 16.5 | 73.2 | 7.8 | .8 | -- | -- | -- |
| | | | 81810 | 1 | 1.8 | 2.3 | 17.0 | 71.6 | 9.1 | 1.0 | -- | -- | -- |
| | | | 81811 | 1 | 2.2 | 2.8 | 17.6 | 72.3 | 7.8 | .9 | -- | -- | -- |
| | | | 81812 | 1 | 2.0 | 2.5 | 16.8 | 72.8 | 7.9 | .9 | -- | -- | -- |

**Table 3.** Proximate and ultimate analyses, air-drying loss, heat of combustion, fusibility of ash, and free-swelling index of coal in west-central Arkansas—Continued

| (percent) | | | | Heat of combustion (Btu/lb) | Fusibility of ash (°F) | | | Free-swelling index | Source of analyses | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| Hydrogen | Carbon | Nitrogen | Oxygen | | Initial deformation temp. | Softening temp. | Fluid temp. | | | |
| **Lower Hartshorne coal bed--Continued** | | | | | | | | | | |
| Scott County--Continued | | | | | | | | | | |
| 4.1 | 67.6 | 1.5 | 15.7 | 11,350 | 2,670 | 2,750 | 2,850 | -- | A | Coal may be weathered. |
| 3.6 | 72.5 | 1.6 | 10.4 | 12,170 | -- | -- | -- | -- | | |
| 4.1 | 81.3 | 1.8 | 11.6 | 13,650 | -- | -- | -- | -- | | |
| 4.8 | 78.5 | 1.6 | 7.2 | 13,690 | 2,130 | 2,180 | 2,300 | 8 | A | Coal is slightly |
| 4.5 | 82.2 | 1.7 | 3.3 | 14,320 | -- | -- | -- | -- | | weathered; sample is |
| 4.9 | 88.8 | 1.8 | 3.6 | 15,480 | -- | -- | -- | -- | | from upper bed. |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | B | Sample includes the |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | | three upper beds. |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | B | Sample is from |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | | lower bed. |
| 4.5 | 78.2 | 1.6 | 3.4 | 13,680 | 2,090 | 2,140 | 2,240 | 8 | A | Sample is from upper bed. |
| 4.4 | 79.6 | 1.6 | 1.8 | 13,920 | -- | -- | -- | -- | | |
| 4.9 | 88.9 | 1.8 | 2.1 | 15,560 | -- | -- | -- | -- | | |
| 4.4 | 80.0 | 1.6 | 4.6 | 13,980 | 2,070 | 2,110 | 2,150 | 9 | A | Sample is from |
| 4.2 | 81.9 | 1.6 | 2.7 | 14,300 | -- | -- | -- | -- | | middle bed. |
| 4.6 | 89.4 | 1.8 | 2.9 | 15,610 | -- | -- | -- | -- | | |
| 4.8 | 82.0 | 1.6 | 5.2 | 14,160 | 2,140 | 2,190 | 2,240 | 9 | A | Sample is from |
| 4.3 | 84.4 | 1.6 | 2.8 | 14,580 | -- | -- | -- | -- | | lower bed. |
| 4.6 | 89.9 | 1.7 | 3.0 | 15,530 | -- | -- | -- | -- | | |
| Sebastian County--Continued | | | | | | | | | | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | B | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | | |
| 4.2 | 70.4 | 1.4 | 19.4 | 11,530 | 2,190 | 2,250 | 2,370 | 0 | A | |
| 3.5 | 77.9 | 1.6 | 12.0 | 12,770 | -- | -- | -- | -- | | |
| 3.6 | 81.5 | 1.7 | 12.6 | 13,360 | -- | -- | -- | -- | | |
| -- | -- | -- | -- | 14,220 | -- | 2,060 | -- | -- | A | Sample of 2.5-in. coal. |
| -- | -- | -- | -- | 14,460 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,670 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,190 | -- | 2,180 | -- | -- | A | Sample of less than |
| -- | -- | -- | -- | 13,480 | -- | -- | -- | -- | -- | 2.5-in. coal. |
| -- | -- | -- | -- | 15,520 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,430 | -- | 2,000 | -- | -- | B | |
| -- | -- | -- | -- | 13,140 | -- | 2,090 | -- | -- | B | |
| -- | -- | -- | -- | 13,250 | -- | 2,020 | -- | -- | B | |
| 4.1 | 77.4 | 1.6 | 5.3 | 13,270 | -- | -- | -- | -- | B | Composite of samples |
| 3.9 | 79.7 | 1.7 | 2.8 | 13,670 | -- | -- | -- | -- | -- | 29835, 29836, and |
| 4.4 | 89.3 | 1.9 | 3.1 | 15,320 | -- | -- | -- | -- | -- | 29837. |
| -- | -- | -- | -- | 13,880 | -- | 2,130 | -- | -- | B | |
| -- | -- | -- | -- | 13,670 | -- | 2,010 | -- | -- | B | |
| -- | -- | -- | -- | 13,870 | -- | 2,060 | -- | -- | B | |
| 4.4 | 80.2 | 1.6 | 3.0 | 13,820 | -- | -- | -- | -- | B | Composite of samples 81809, 81810, and 81811. |

**Table 3.** Proximate and ultimate analyses, air-drying loss, heat of combustion, fusibility of ash, and free-swelling index of coal in west-central Arkansas—Continued

| Locality No. | Thickness (in.) | Site of sample | U.S. Bur. Mines lab No. | Condition | Air-drying loss (pct) | Proximate analyses (percent) | | | | Ultimate analyses | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Moisture | Volatile matter | Fixed carbon | Ash | Sulfur | Forms of Sulfur | | |
| | | | | | | | | | | | Sulfate | Pyritic | Organic |
| 8 | -- | M | 2594 | 1 | 4.9 | 5.4 | 16.0 | 69.8 | 8.8 | 3.2 | -- | -- | -- |
| | | | | 2 | -- | -- | 16.9 | 73.8 | 9.3 | 3.4 | -- | -- | -- |
| | | | 2593 | 1 | 3.5 | 4.0 | 16.9 | 73.2 | 5.9 | 1.5 | -- | -- | -- |
| | | | | 2 | -- | -- | 17.6 | 76.2 | 6.2 | 1.6 | -- | -- | -- |
| 9 | -- | M | 1068 | 1 | -- | .9 | 18.3 | 71.7 | 9.1 | 1.7 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.5 | 72.3 | 9.2 | 1.8 | -- | -- | -- |
| | | | 1066 | 1 | -- | .8 | 17.8 | 72.7 | 8.7 | 2.0 | -- | -- | -- |
| | | | | 2 | -- | -- | 17.9 | 73.3 | 8.8 | 2.0 | -- | -- | -- |
| 10 | -- | T | B-57205 | 1 | 2.8 | 3.2 | 18.4 | 70.3 | 8.1 | 2.2 | -- | -- | -- |
| | | | | 2 | -- | -- | 19.0 | 72.7 | 8.3 | 2.3 | -- | -- | -- |
| | | | | 3 | -- | -- | 20.8 | 79.2 | -- | 2.5 | -- | -- | -- |
| | | | B-57206 | 1 | 3.5 | 4.1 | 16.5 | 63.8 | 15.6 | 2.3 | -- | -- | -- |
| | | | | 2 | -- | -- | 17.2 | 66.5 | 16.3 | 2.4 | -- | -- | -- |
| | | | | 3 | -- | -- | 20.5 | 79.5 | -- | 2.9 | -- | -- | -- |
| | | | W-69615 | 1 | -- | 3.8 | 18.1 | 70.6 | 7.5 | 1.2 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.8 | 73.4 | 7.8 | 1.2 | -- | -- | -- |
| | | M | W-69620 | 1 | -- | 2.7 | 17.4 | 70.1 | 9.8 | 1.7 | -- | -- | -- |
| | | | | 2 | -- | -- | 17.9 | 72.0 | 10.1 | 1.8 | -- | -- | -- |
| | | | W-69632 | 1 | -- | 3.5 | 17.2 | 69.7 | 9.6 | 2.0 | -- | -- | -- |
| | | | | 2 | -- | -- | 17.8 | 72.3 | 9.9 | 2.1 | -- | -- | -- |
| | | | W-69633 | 1 | -- | 3.1 | 17.2 | 72.4 | 7.3 | 1.8 | -- | -- | -- |
| | | | | 2 | -- | -- | 17.7 | 74.8 | 7.5 | 1.9 | -- | -- | -- |
| 11 | -- | M | 27612 | 1 | 2.3 | 2.7 | 19.1 | 70.3 | 7.9 | 1.6 | -- | -- | -- |
| | | | 27613 | 1 | 3.1 | 3.7 | 18.2 | 67.9 | 10.2 | 1.8 | -- | -- | -- |
| | | | 27614 | 1 | 3.3 | 3.8 | 17.3 | 69.5 | 9.4 | 1.7 | -- | -- | -- |
| | | | 27615 | 1 | 2.8 | 3.3 | 18.2 | 69.7 | 8.8 | 1.8 | -- | -- | -- |
| | | | 27616 | 1 | 2.4 | 2.9 | 18.8 | 69.7 | 8.6 | 2.5 | -- | -- | -- |
| | | | 27617 | 1 | 2.8 | 3.2 | 18.1 | 69.7 | 9.0 | 1.9 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.7 | 72.0 | 9.3 | 1.9 | -- | -- | -- |
| | | | | 3 | -- | -- | 20.6 | 79.4 | -- | 2.1 | -- | -- | -- |
| 12 | -- | M | 1045 | 1 | -- | 1.0 | 17.9 | 73.6 | 7.5 | 1.1 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.1 | 74.3 | 7.6 | 1.1 | -- | -- | -- |
| | | | 1046 | 1 | -- | .8 | 18.5 | 73.7 | 7.0 | 1.2 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.6 | 74.4 | 7.0 | 1.2 | -- | -- | -- |
| | | | 2585 | 1 | 2.9 | 3.5 | 16.7 | 72.0 | 7.8 | 1.3 | -- | -- | -- |
| | | | | 2 | -- | -- | 17.3 | 74.6 | 8.1 | 1.3 | -- | -- | -- |
| | | | 2586 | 1 | 3.5 | 4.0 | 16.8 | 72.1 | 7.1 | 1.3 | -- | -- | -- |
| | | | | 2 | -- | -- | 17.5 | 75.1 | 7.4 | 1.4 | -- | -- | -- |
| 13 | 40 | S | K-54024 | 1 | -- | 3.1 | 18.7 | 72.3 | 5.9 | .6 | 0.01 | 0.09 | 0.48 |
| | | | | 2 | -- | -- | 19.3 | 74.7 | 6.0 | .6 | .01 | .09 | .50 |
| | | | | 3 | -- | -- | 20.6 | 79.4 | -- | .7 | .01 | .10 | .52 |
| | 19 | S | K-54025 | 1 | -- | 2.8 | 20.4 | 72.0 | 4.8 | .8 | .02 | .34 | .48 |
| | | | | 2 | -- | -- | 21.0 | 74.0 | 5.0 | .9 | .02 | .35 | .50 |
| | | | | 3 | -- | -- | 22.1 | 77.9 | -- | .9 | .02 | .37 | .52 |
| 14 | -- | T | B-58752 | 1 | 4.0 | 4.6 | 18.0 | 70.5 | 6.9 | .7 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.9 | 73.8 | 7.3 | .7 | -- | -- | -- |
| | | | | 3 | -- | -- | 20.4 | 79.6 | -- | .8 | -- | -- | -- |

**Table 3.** Proximate and ultimate analyses, air-drying loss, heat of combustion, fusibility of ash, and free-swelling index of coal in west-central Arkansas—Continued

| (percent) | | | | Heat of combustion (Btu/lb) | Fusibility of ash (°F) | | | Free-swelling index | Source of analyses | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| Hydrogen | Carbon | Nitrogen | Oxygen | | Initial deformation temp. | Softening temp. | Fluid temp. | | | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | B | |
| -- | -- | -- | -- | -- | -- | -- | --- | -- | -- | |
| -- | -- | -- | -- | 14,240 | -- | -- | -- | -- | B | |
| -- | -- | -- | -- | 14,820 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | B | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,280 | -- | -- | -- | -- | B | |
| -- | -- | -- | -- | 14,400 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,830 | -- | 2,220 | -- | -- | A | Sample of 2.5-in. coal. |
| -- | -- | -- | -- | 14,290 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,590 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 12,500 | -- | 2,250 | -- | -- | A | Sample of less than |
| -- | -- | -- | -- | 13,030 | -- | -- | -- | -- | -- | 2.5-in. coal. |
| -- | -- | -- | -- | 14,200 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,660 | -- | -- | -- | -- | B | |
| -- | -- | -- | -- | 14,200 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,490 | -- | -- | -- | -- | B | |
| -- | -- | -- | -- | 13,870 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,410 | -- | -- | -- | -- | B | |
| -- | -- | -- | -- | 13,900 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,890 | -- | -- | -- | -- | B | |
| -- | -- | -- | -- | 14,340 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,040 | -- | 2,730 | -- | -- | B | |
| -- | -- | -- | -- | 13,470 | -- | 2,110 | -- | -- | B | |
| -- | -- | -- | -- | 13,560 | -- | 2,060 | -- | -- | B | |
| -- | -- | -- | -- | 13,760 | -- | 2,120 | -- | -- | B | |
| -- | -- | -- | -- | 13,860 | -- | 2,070 | -- | -- | B | |
| 4.4 | 78.7 | 1.6 | 4.4 | 13,700 | -- | -- | -- | -- | B | Composite of samples |
| 4.2 | 81.3 | 1.6 | 1.7 | 14,160 | -- | -- | -- | -- | -- | 27612 to 27616, |
| 4.6 | 89.7 | 1.8 | -- | 15,610 | -- | -- | -- | -- | -- | inclusive. |
| -- | -- | 1.7 | -- | 14,430 | -- | -- | -- | -- | B | |
| -- | -- | 1.7 | -- | 14,580 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | B | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,020 | -- | -- | -- | -- | B | |
| -- | -- | -- | -- | 14,530 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | B | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 4.6 | 82.2 | 1.7 | 5.0 | 14,220 | 2,040 | 2,080 | 2,180 | 9 | A | Sample is from |
| 4.4 | 84.4 | 1.8 | 2.4 | 14,670 | -- | -- | -- | -- | -- | upper bed. |
| 4.7 | 90.2 | 1.9 | 2.6 | 15,610 | -- | -- | -- | -- | -- | |
| 4.7 | 84.0 | 1.7 | 4.0 | 14,450 | 2,250 | 2,300 | 2,380 | 9 | A | Sample is from |
| 4.5 | 86.4 | 1.8 | 1.4 | 14,870 | -- | -- | -- | -- | -- | lower bed. |
| 4.7 | 90.9 | 1.9 | 1.6 | 15,460 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,780 | -- | 2,130 | -- | -- | A | Sample of |
| -- | -- | -- | -- | 14,450 | -- | -- | -- | -- | -- | 2-in. coal. |
| -- | -- | -- | -- | 15,580 | -- | -- | -- | -- | -- | |

**Table 3.** Proximate and ultimate analyses, air-drying loss, heat of combustion, fusibility of ash, and free-swelling index of coal in west-central Arkansas—Continued

| Locality No. | Thickness (in.) | Site of sample | U.S. Bur. Mines lab No. | Condition | Air-drying loss (pct) | Proximate analyses (percent) | | | | Ultimate analyses | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Moisture | Volatile matter | Fixed carbon | Ash | Sulfur | Forms of Sulfur | | |
| | | | | | | | | | | | Sulfate | Pyritic | Organic |
| 14 | | | B-58753 | 1 | 7.2 | 8.1 | 17.3 | 66.3 | 8.3 | 0.6 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.8 | 72.2 | 9.0 | .7 | -- | -- | -- |
| | | | | 3 | -- | -- | 20.7 | 79.3 | -- | .7 | -- | -- | -- |
| 15 | -- | M | 3148 | 1 | 3.7 | 4.5 | 16.5 | 74.1 | 4.9 | 1.8 | -- | -- | -- |
| | | | | 2 | -- | -- | 17.3 | 77.5 | 5.2 | 1.8 | -- | -- | -- |
| 16 | -- | M | 3155 | 1 | 2.7 | 3.5 | 14.9 | 74.9 | 6.7 | 1.2 | -- | -- | -- |
| | | | | 2 | -- | -- | 15.4 | 77.7 | 6.9 | 1.3 | -- | -- | -- |
| | | | 3156 | 1 | 2.0 | 2.8 | 16.9 | 74.1 | 7.2 | .7 | -- | -- | -- |
| | | | | 2 | -- | -- | 16.4 | 76.2 | 7.4 | .8 | -- | -- | -- |
| | | | 3150 | 1 | 2.2 | 3.0 | 15.8 | 75.9 | 5.3 | .9 | -- | -- | -- |
| | | | | 2 | -- | -- | 16.2 | 78.3 | 5.5 | 1.0 | -- | -- | -- |
| 17 | -- | M | 1052 | 1 | -- | 1.0 | 19.7 | 69.6 | 9.7 | 1.1 | -- | -- | -- |
| | | | | 2 | -- | -- | 19.9 | 70.3 | 9.8 | 1.1 | -- | -- | -- |
| | | | 1054 | 1 | -- | 1.0 | 16.9 | 71.8 | 10.3 | .6 | -- | -- | -- |
| | | | | 2 | -- | -- | 17.1 | 72.5 | 10.4 | .6 | -- | -- | -- |
| 18 | -- | M | 3152 | 1 | 1.8 | 2.6 | 15.5 | 76.1 | 5.8 | 2.1 | -- | -- | -- |
| | | | | 2 | -- | -- | 15.9 | 78.2 | 5.9 | 2.1 | -- | -- | -- |
| 19 | -- | M | A-99402 | 1 | 2.8 | 3.5 | 16.2 | 72.1 | 8.2 | .9 | -- | -- | -- |
| | | | A-99403 | 1 | 2.5 | 3.3 | 16.6 | 70.7 | 9.4 | 1.0 | -- | -- | -- |
| | | | A-99404 | 1 | 2.8 | 3.4 | 16.5 | 71.9 | 8.2 | .8 | -- | -- | -- |
| | | | A-99405 | 1 | 2.7 | 3.4 | 16.2 | 71.8 | 8.6 | 1.0 | -- | -- | -- |
| | | | | 2 | -- | -- | 16.7 | 74.4 | 8.9 | 1.0 | -- | -- | -- |
| | | | | 3 | -- | -- | 18.4 | 81.6 | -- | 1.1 | -- | -- | -- |
| 20 | -- | T | B-83115 | 1 | 1.6 | 2.5 | 16.9 | 73.2 | 7.4 | 1.2 | -- | -- | -- |
| | | | | 2 | -- | -- | 17.4 | 75.0 | 7.6 | 1.2 | -- | -- | -- |
| | | | | 3 | -- | -- | 18.8 | 81.2 | -- | 1.3 | -- | -- | -- |
| | | | B-83116 | 1 | 1.2 | 2.0 | 17.8 | 73.0 | 7.2 | 1.2 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.2 | 74.5 | 7.3 | 1.2 | -- | -- | -- |
| | | | | 3 | -- | -- | 19.6 | 80.4 | -- | 1.3 | -- | -- | -- |
| | | | B-83117 | 1 | 1.6 | 2.5 | 17.1 | 69.5 | 10.9 | 1.3 | -- | -- | -- |
| | | | | 2 | -- | -- | 17.5 | 71.3 | 11.2 | 1.4 | -- | -- | -- |
| | | | | 3 | -- | -- | 19.7 | 80.3 | -- | 1.5 | -- | -- | -- |
| 21 | -- | M | A-99414 | 1 | 6.4 | 7.0 | 15.2 | 72.6 | 5.2 | 1.2 | -- | -- | -- |
| | | | A-99415 | 1 | 3.8 | 4.4 | 16.5 | 73.7 | 5.4 | 1.3 | -- | -- | -- |
| | | | A-99416 | 1 | 5.1 | 5.7 | 15.5 | 73.5 | 5.3 | 1.8 | -- | -- | -- |
| | | | A-99417 | 1 | 5.1 | 5.7 | 15.5 | 73.3 | 5.5 | 1.5 | -- | -- | -- |
| | | | | 2 | -- | -- | 16.5 | 77.7 | 5.8 | 1.5 | -- | -- | -- |
| | | | | 3 | -- | -- | 17.3 | 82.5 | -- | 1.6 | -- | -- | -- |
| 22 | 18 | S | K-63742 | 1 | -- | 7.4 | 18.0 | 69.1 | 5.6 | .6 | 0.01 | 0.02 | 0.59 |
| | | | | 2 | -- | -- | 19.5 | 74.5 | 6.0 | .7 | .01 | .02 | .64 |
| | | | | 3 | -- | -- | 20.8 | 79.2 | -- | .7 | .01 | .02 | .68 |
| 23 | 18 | O | K-54023 | 1 | -- | 4.6 | 21.6 | 71.5 | 2.3 | .8 | .01 | .02 | .68 |
| | | | | 2 | -- | -- | 22.7 | 74.9 | 2.4 | .8 | .01 | .07 | .71 |
| | | | | 3 | -- | -- | 23.2 | 76.8 | -- | .8 | .01 | .07 | .72 |
| 24 | -- | M | 3175 | 1 | 1.6 | 2.3 | 15.8 | 71.9 | 10.0 | 1.2 | -- | -- | -- |
| | | | | 2 | -- | -- | 16.2 | 73.5 | 10.5 | 1.2 | -- | -- | -- |

**Table 3.** Proximate and ultimate analyses, air-drying loss, heat of combustion, fusibility of ash, and free-swelling index of coal in west-central Arkansas—Continued

| (percent) | | | | Heat of combustion (Btu/lb) | Fusibility of ash (°F) | | | Free-swelling index | Source of analyses | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| Hydrogen | Carbon | Nitrogen | Oxygen | | Initial deformation temp. | Softening temp. | Fluid temp. | | | |
| -- | -- | -- | -- | 12,990 | -- | 2,230 | -- | -- | A | Sample of less than 2-in. coal. |
| -- | -- | -- | -- | 14,130 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,530 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | B | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | B | Coal is weathered. |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | B | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | B | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,020 | -- | -- | -- | -- | B | |
| -- | -- | -- | -- | 14,160 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | B | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | B | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,740 | -- | 2,090 | -- | -- | C | |
| -- | -- | -- | -- | 13,610 | -- | 2,090 | -- | -- | C | |
| -- | -- | -- | -- | 13,750 | -- | 2,140 | -- | -- | C | |
| 4.3 | 79.6 | 1.7 | 4.8 | 13,700 | -- | -- | -- | -- | C | Composite of samples |
| 4.1 | 82.4 | 1.8 | 1.8 | 14,180 | -- | -- | -- | -- | -- | A-99402, A-99403, |
| 4.5 | 90.5 | 2.0 | 1.9 | 15,580 | -- | -- | -- | -- | -- | and A-99404. |
| -- | -- | -- | -- | 14,040 | -- | 2,270 | -- | -- | A | Sample of 4- to -8 in. coal. |
| -- | -- | -- | -- | 14,390 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,570 | -- | -- | -- | -- | -- | |
| 4.5 | 81.5 | 1.8 | 3.8 | 14,180 | -- | 2,270 | -- | -- | A | Sample of 4- to 8-in. coal. |
| 4.4 | 83.1 | 1.8 | 2.2 | 14,470 | -- | -- | -- | -- | -- | |
| 4.7 | 89.7 | 2.0 | 2.3 | 15,610 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,430 | -- | 2,530 | -- | -- | A | Sample of 4-in. coal. |
| -- | -- | -- | -- | 13,780 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,510 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,720 | -- | 2,360 | -- | -- | C | |
| -- | -- | -- | -- | 14,130 | -- | 2,180 | -- | -- | C | |
| -- | -- | -- | -- | 13,880 | -- | 2,340 | -- | -- | C | |
| 4.7 | 80.1 | 1.7 | 6.5 | 13,930 | -- | -- | -- | -- | C | Composite of samples |
| 4.3 | 85.0 | 1.8 | 1.6 | 14,770 | -- | -- | -- | -- | -- | A-99414, A-99415, |
| 4.6 | 90.2 | 1.9 | 1.7 | 15,680 | -- | -- | -- | -- | -- | and A-99416. |
| 4.4 | 74.4 | 1.6 | 13.1 | 12,630 | 2,300 | 2,360 | 2,560 | 0 | A | |
| 3.9 | 80.7 | 1.8 | 6.9 | 13,640 | -- | -- | -- | -- | -- | |
| 4.1 | 85.9 | 1.9 | 7.4 | 14,520 | -- | -- | -- | -- | -- | |
| 4.6 | 82.6 | 1.7 | 8.0 | 14,150 | 2,200 | 2,250 | 2,360 | .5 | A | Coal is slightly |
| 4.3 | 86.6 | 1.8 | 4.1 | 14,830 | -- | -- | -- | -- | -- | weathered. |
| 4.4 | 88.7 | 1.9 | 4.2 | 15,200 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | B | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |

**Table 3.** Proximate and ultimate analyses, air-drying loss, heat of combustion, fusibility of ash, and free-swelling index of coal in west-central Arkansas—Continued

| Locality No. | Thickness (in.) | Site of sample | U.S. Bur. Mines lab No. | Condition | Air-drying loss (pct) | Proximate analyses (percent) | | | | Ultimate analyses | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Moisture | Volatile matter | Fixed carbon | Ash | Sulfur | Forms of Sulfur | | |
| | | | | | | | | | | | Sulfate | Pyritic | Organic |
| 25 | -- | M | 18062 | 1 | 2.7 | 3.6 | 15.7 | 65.5 | 15.2 | 1.7 | -- | -- | -- |
| | | | | 2 | -- | -- | 16.3 | 68.0 | 15.7 | 1.7 | -- | -- | -- |
| | | | | 3 | -- | -- | 19.4 | 80.6 | -- | 2.1 | -- | -- | -- |
| | | | 18063 | 1 | 2.6 | 3.6 | 17.5 | 60.7 | 18.2 | 1.4 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.1 | 63.0 | 18.9 | 1.4 | -- | -- | -- |
| | | | | 3 | -- | -- | 22.3 | 77.7 | -- | 1.8 | -- | -- | -- |
| 26 | -- | M | A-99418 | 1 | 3.3 | 4.1 | 15.4 | 75.4 | 5.1 | 1.1 | -- | -- | -- |
| | | | A-99419 | 1 | 2.8 | 3.5 | 15.3 | 76.2 | 5.0 | 1.0 | -- | -- | -- |
| | | | A-99420 | 1 | 3.4 | 4.1 | 15.4 | 75.8 | 4.7 | 1.0 | -- | -- | -- |
| | | | A-99421 | 1 | 3.1 | 3.8 | 15.5 | 75.7 | 5.0 | 1.1 | -- | -- | -- |
| | | | | 2 | -- | -- | 16.1 | 78.7 | 5.2 | 1.1 | -- | -- | -- |
| | | | | 3 | -- | -- | 17.0 | 83.0 | -- | 1.2 | -- | -- | -- |
| | -- | T | B-69518 | 1 | 1.9 | 2.4 | 17.8 | 69.5 | 10.3 | .8 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.3 | 71.2 | 10.5 | .8 | -- | -- | -- |
| | | | | 3 | -- | -- | 20.4 | 79.6 | -- | .9 | -- | -- | -- |
| | | T | B-55079 | 1 | 1.3 | 2.0 | 16.9 | 75.5 | 5.6 | 1.1 | -- | -- | -- |
| | | | | 2 | -- | -- | 17.2 | 77.1 | 5.7 | 1.1 | -- | -- | -- |
| | | | | 3 | -- | -- | 18.3 | 81.7 | -- | 1.2 | -- | -- | -- |
| | | | B-55080 | 1 | 1.5 | 2.2 | 16.7 | 75.5 | 5.6 | 1.0 | -- | -- | -- |
| | | | | 2 | -- | -- | 17.1 | 77.2 | 5.7 | 1.1 | -- | -- | -- |
| | | | | 3 | -- | -- | 18.2 | 81.8 | -- | 1.1 | -- | -- | -- |
| | | | B-55081 | 1 | 2.3 | 3.0 | 16.5 | 69.7 | 10.8 | 1.0 | -- | -- | -- |
| | | | | 2 | -- | -- | 17.0 | 71.8 | 11.2 | 1.0 | -- | -- | -- |
| | | | | 3 | -- | -- | 19.1 | 80.9 | -- | 1.2 | -- | -- | -- |
| 27 | | T | B-79724 | 1 | 1.8 | 2.5 | 17.2 | 75.0 | 5.3 | 1.1 | -- | -- | -- |
| | | | | 2 | -- | -- | 17.7 | 76.9 | 5.4 | 1.1 | -- | -- | -- |
| | | | | 3 | -- | -- | 18.7 | 81.3 | -- | 1.2 | -- | -- | -- |
| | | | B-79725 | 1 | 1.7 | 2.3 | 16.7 | 76.0 | 5.0 | 1.2 | -- | -- | -- |
| | | | | 2 | -- | -- | 17.1 | 77.7 | 5.2 | 1.2 | -- | -- | -- |
| | | | | 3 | -- | -- | 18.0 | 82.0 | -- | 2.2 | -- | -- | -- |
| | | | B-79726 | 1 | 3.6 | 4.3 | 16.4 | 71.8 | 7.5 | .9 | -- | -- | -- |
| | | | | 2 | -- | -- | 17.2 | 75.0 | 7.8 | .9 | -- | -- | -- |
| | | | | 3 | -- | -- | 18.6 | 81.4 | -- | 1.0 | -- | -- | -- |
| 28 | | T | B-56719 | 1 | 1.0 | 1.4 | 17.3 | 76.7 | 4.6 | .7 | -- | -- | -- |
| | | | | 2 | -- | -- | 17.5 | 77.8 | 4.7 | .7 | -- | -- | -- |
| | | | | 3 | -- | -- | 18.4 | 81.6 | -- | .7 | -- | -- | -- |
| | | | B-56720 | 1 | 1.2 | 1.7 | 17.2 | 76.3 | 4.8 | .7 | -- | -- | -- |
| | | | | 2 | -- | -- | 17.5 | 77.6 | 4.9 | .7 | -- | -- | -- |
| | | | | 3 | -- | -- | 18.4 | 81.6 | -- | .8 | -- | -- | -- |
| | | | B-56721 | 1 | 1.0 | 1.6 | 17.0 | 75.7 | 5.7 | .1 | -- | -- | -- |
| | | | | 2 | -- | -- | 17.3 | 76.9 | 5.8 | .7 | -- | -- | -- |
| | | | | 3 | -- | -- | 18.4 | 81.6 | -- | .7 | -- | -- | -- |
| | | | B-56722 | 1 | 1.3 | 1.8 | 17.2 | 75.0 | 6.0 | .7 | -- | -- | -- |
| | | | | 2 | -- | -- | 17.6 | 76.3 | 6.1 | .7 | -- | -- | -- |
| | | | | 3 | -- | -- | 18.7 | 81.3 | -- | .7 | -- | -- | -- |
| | | | B-56723 | 1 | 1.8 | 2.3 | 17.4 | 73.5 | 6.8 | .6 | -- | -- | -- |
| | | | | 2 | -- | -- | 17.9 | 75.1 | 7.0 | .7 | -- | -- | -- |
| | | | | 3 | -- | -- | 19.2 | 80.8 | -- | .7 | -- | -- | -- |
| | | M | A-99827 | 1 | 4.3 | 4.9 | 15.7 | 77.0 | 2.4 | .7 | -- | -- | -- |
| | | | A-99836 | 1 | 2.4 | 2.9 | 16.6 | 77.3 | 3.2 | .7 | -- | -- | -- |

**Table 3.** Proximate and ultimate analyses, air-drying loss, heat of combustion, fusibility of ash, and free-swelling index of coal in west-central Arkansas—Continued

| (percent) | | | | Heat of combustion (Btu/lb) | Fusibility of ash (°F) | | | Free-swelling index | Source of analyses | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| Hydrogen | Carbon | Nitrogen | Oxygen | | Initial deformation temp. | Softening temp. | Fluid temp. | | | |
| 4.1 | 72.6 | 1.6 | 4.8 | 12,540 | -- | 2,340 | -- | -- | B | |
| 3.9 | 75.2 | 1.7 | 1.8 | 13,000 | -- | -- | -- | -- | -- | |
| 4.6 | 89.3 | 2.0 | 2.0 | 15,430 | -- | -- | -- | -- | -- | |
| 4.0 | 69.6 | 1.6 | 5.2 | 11,910 | -- | 2,310 | -- | -- | B | |
| 3.7 | 72.2 | 1.6 | 2.2 | 12,350 | -- | -- | -- | -- | -- | |
| 4.5 | 89.0 | 2.0 | 2.7 | 15,230 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,160 | -- | -- | -- | -- | C | |
| -- | -- | -- | -- | 14,310 | -- | -- | -- | -- | C | |
| -- | -- | -- | -- | 14,280 | -- | -- | -- | -- | C | |
| 4.7 | 82.2 | 1.8 | 5.2 | 14,250 | -- | -- | -- | -- | C | |
| 4.4 | 85.5 | 1.9 | 1.9 | 14,820 | -- | -- | -- | -- | -- | |
| 4.7 | 90.2 | 2.0 | 1.9 | 15,630 | -- | -- | -- | -- | -- | |
| 4.2 | 78.4 | 1.7 | 4.6 | 13,470 | -- | -- | -- | -- | A | Sample of less than 1.5-in. coal. |
| 4.1 | 80.4 | 1.7 | 2.5 | 13,880 | -- | -- | -- | -- | -- | |
| 4.6 | 89.9 | 1.9 | 2.8 | 15,420 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,500 | -- | 2,120 | -- | -- | A | Sample of 8-in. coal. |
| -- | -- | -- | -- | 14,790 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,690 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,460 | -- | 2,100 | -- | -- | A | Sample of 2.5- to 8-in. coal. |
| -- | -- | -- | -- | 14,790 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,690 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,450 | -- | 2,310 | -- | -- | A | Sample of less than 2.5-in. coal. |
| -- | -- | -- | -- | 13,860 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,600 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,440 | -- | 2,270 | -- | -- | A | Sample of 8-in. coal. |
| -- | -- | -- | -- | 14,810 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,660 | -- | -- | -- | -- | -- | |
| 4.6 | 83.4 | 1.8 | 4.0 | 14,500 | -- | 2,210 | -- | -- | A | Sample of 4- to 8-in. coal. |
| 4.4 | 85.4 | 1.8 | 2.0 | 14,850 | -- | -- | -- | -- | -- | |
| 4.6 | 90.0 | 1.9 | 2.2 | 15,650 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,710 | -- | 2,190 | -- | -- | A | Sample of less than 4-in. coal. |
| -- | -- | -- | -- | 14,320 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,540 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,460 | -- | 2,400 | -- | -- | A | Sample of 10-in. coal. |
| -- | -- | -- | -- | 14,860 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,590 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,640 | -- | 2,400 | -- | -- | A | Sample of 4- to 10-in. coal. |
| -- | -- | -- | -- | 14,890 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,650 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,470 | -- | 2,330 | -- | -- | A | Sample of 1.25- to 4-in. coal. |
| -- | -- | -- | -- | 14,700 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,600 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,450 | -- | 2,280 | -- | -- | A | Sample of 0.75- to 1.25-in. coal. |
| -- | -- | -- | -- | 14,720 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,670 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,110 | -- | 2,420 | -- | -- | A | Sample of less than 0.75-in. coal. |
| -- | -- | -- | -- | 14,450 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,530 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,510 | -- | 2,230 | -- | -- | C | |
| -- | -- | -- | -- | 14,680 | -- | 2,210 | -- | -- | C | |

**Table 3.** Proximate and ultimate analyses, air-drying loss, heat of combustion, fusibility of ash, and free-swelling index of coal in west-central Arkansas—Continued

| Locality No. | Thickness (in.) | Site of sample | U.S. Bur. Mines lab No. | Condition | Air-drying loss (pct) | Proximate analyses (percent) | | | | Ultimate analyses | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Moisture | Volatile matter | Fixed carbon | Ash | Sulfur | Forms of Sulfur: Sulfate | Pyritic | Organic |
| 28 | | | A-99837 | 1 | 3.3 | 3.8 | 16.4 | 76.8 | 3.0 | 0.7 | -- | -- | -- |
| | | | A-99838 | 1 | 3.3 | 3.9 | 16.0 | 77.1 | 3.0 | .6 | -- | -- | -- |
| | | | | 2 | -- | -- | 16.7 | 80.2 | 3.1 | .7 | -- | -- | -- |
| | | | | 3 | -- | -- | 17.2 | 82.8 | -- | .7 | -- | -- | -- |
| 29 | 28 | M | B-60296 | 1 | 1.6 | 2.0 | 18.1 | 73.7 | 6.2 | .8 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.4 | 75.3 | 6.3 | .8 | -- | -- | -- |
| | | | | 3 | -- | -- | 19.7 | 80.3 | -- | .9 | -- | -- | -- |
| | 30 | | B-60297 | 1 | 1.4 | 1.9 | 18.2 | 73.1 | 6.8 | .9 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.6 | 74.5 | 6.9 | .9 | -- | -- | -- |
| | | | | 3 | -- | -- | 20.0 | 80.0 | -- | .9 | -- | -- | -- |
| | 30 | | B-60298 | 1 | 1.5 | 1.9 | 18.0 | 73.7 | 6.4 | .8 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.5 | 75.1 | 6.5 | .8 | -- | -- | -- |
| | | | | 3 | -- | -- | 19.7 | 80.3 | -- | .8 | -- | -- | -- |
| | -- | | B-60299 | 1 | 1.5 | 1.9 | 18.1 | 73.5 | 6.5 | .8 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.4 | 75.0 | 6.6 | .8 | -- | -- | -- |
| | | | | 3 | -- | -- | 19.8 | 80.2 | -- | .9 | -- | -- | -- |
| 30 | -- | M | A-3299 | 1 | 2.2 | 2.9 | 18.2 | 75.4 | 3.5 | .9 | -- | -- | -- |
| | | | A-3300 | 1 | 2.7 | 3.2 | 18.3 | 75.4 | 3.1 | .9 | -- | -- | -- |
| | | | A-3301 | 1 | 2.5 | 3.1 | 18.0 | 75.8 | 3.1 | .9 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.6 | 78.2 | 3.2 | .9 | -- | -- | -- |
| | | | | 3 | -- | -- | 19.2 | 80.8 | -- | .9 | -- | -- | -- |
| 31 | 27 | M | B-23747 | 1 | 1.6 | 2.1 | 18.4 | 74.3 | 5.2 | .8 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.8 | 75.9 | 5.3 | .8 | -- | -- | -- |
| | | | | 3 | -- | -- | 19.9 | 80.1 | -- | .8 | -- | -- | -- |
| | 30 | | B-23748 | 1 | 4.0 | 4.6 | 17.1 | 74.7 | 3.6 | .9 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.0 | 78.2 | 3.8 | 1.0 | -- | -- | -- |
| | | | | 3 | -- | -- | 18.7 | 81.3 | -- | 1.0 | -- | -- | -- |
| | | | B-23749 | 1 | 2.8 | 3.3 | 17.6 | 74.7 | 4.4 | .9 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.2 | 77.2 | 4.6 | .9 | -- | -- | -- |
| | | | | 3 | -- | -- | 19.1 | 80.9 | -- | .9 | -- | -- | -- |
| 32 | -- | T | B-54866 | 1 | 1.5 | 2.4 | 17.7 | 77.1 | 2.8 | .8 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.2 | 78.9 | 2.9 | .8 | -- | -- | -- |
| | | | | 3 | -- | -- | 18.7 | 81.3 | -- | .9 | -- | -- | -- |
| | | | B-54867 | 1 | 1.4 | 2.3 | 18.1 | 75.3 | 4.3 | .9 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.5 | 77.1 | 4.4 | .9 | -- | -- | -- |
| | | | | 3 | -- | -- | 19.3 | 80.7 | -- | 1.0 | -- | -- | -- |
| | | | B-54868 | 1 | 1.8 | 2.8 | 17.3 | 71.0 | 8.9 | 1.1 | -- | -- | -- |
| | | | | 2 | -- | -- | 17.8 | 73.1 | 9.1 | 1.1 | -- | -- | -- |
| | | | | 3 | -- | -- | 19.6 | 80.4 | -- | 1.2 | -- | -- | -- |
| 33 | -- | T | B-82723 | 1 | .6 | 1.4 | 18.6 | 75.8 | 4.2 | .8 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.9 | 76.8 | 4.3 | .8 | -- | -- | -- |
| | | | | 3 | -- | -- | 19.7 | 80.3 | -- | .9 | -- | -- | -- |
| | | | B-82724 | 1 | 1.1 | 1.7 | 18.7 | 75.4 | 4.2 | 1.0 | -- | -- | -- |
| | | | | 2 | -- | -- | 19.0 | 76.8 | 4.2 | 1.0 | -- | -- | -- |
| | | | | 3 | -- | -- | 19.8 | 80.2 | -- | 1.1 | -- | -- | -- |
| | | | B-82725 | 1 | .6 | 1.4 | 17.7 | 72.6 | 8.3 | .9 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.0 | 73.6 | 8.4 | .9 | -- | -- | -- |
| | | | | 3 | -- | -- | 19.6 | 80.4 | -- | 1.0 | -- | -- | -- |
| | | | B-82726 | 1 | 1.8 | 2.6 | 17.8 | 69.3 | 10.3 | .9 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.3 | 71.1 | 10.6 | 1.0 | -- | -- | -- |
| | | | | 3 | -- | -- | 20.5 | 79.5 | -- | 1.1 | -- | -- | -- |

**Table 3.** Proximate and ultimate analyses, air-drying loss, heat of combustion, fusibility of ash, and free-swelling index of coal in west-central Arkansas—Continued

| (percent) | | | | Heat of combustion (Btu/lb) | Fusibility of ash (°F) | | | Free-swelling index | Source of analyses | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| Hydrogen | Carbon | Nitrogen | Oxygen | | Initial deformation temp. | Softening temp. | Fluid temp. | | | |
| -- | -- | -- | -- | 14,590 | -- | 2,160 | -- | -- | C | |
| 4.7 | 84.3 | 1.8 | 5.6 | 14,610 | -- | -- | -- | -- | C | |
| 4.5 | 87.6 | 1.9 | 2.2 | 15,190 | -- | -- | -- | -- | -- | |
| 4.6 | 90.5 | 2.0 | 2.2 | 15,680 | -- | -- | -- | -- | -- | |
| 4.5 | 82.9 | 1.8 | 3.8 | 14,310 | -- | 2,360 | -- | -- | A | |
| 4.3 | 84.6 | 1.9 | 2.1 | 14,610 | -- | -- | -- | -- | -- | |
| 4.6 | 90.3 | 2.0 | 2.2 | 15,590 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,260 | -- | 2,300 | -- | -- | A | |
| -- | -- | -- | -- | 14,530 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,610 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,270 | -- | 2,300 | -- | -- | A | |
| -- | -- | -- | -- | 14,540 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,560 | -- | -- | -- | -- | -- | |
| 4.4 | 82.5 | 1.7 | 4.1 | 14,250 | -- | -- | -- | -- | A | Composite of samples |
| 4.3 | 84.1 | 1.8 | 2.4 | 14,530 | -- | -- | -- | -- | -- | B-60296, B-60297, |
| 4.6 | 90.1 | 1.9 | 2.5 | 15,560 | -- | -- | -- | -- | -- | and B-60298. |
| -- | -- | -- | -- | 14,650 | -- | 2,180 | -- | -- | B | |
| -- | -- | -- | -- | 14,620 | -- | 2,060 | -- | -- | B | |
| 4.7 | 84.0 | 1.9 | 5.4 | 14,630 | -- | -- | -- | -- | B | Composite of samples |
| 4.5 | 86.6 | 2.0 | 2.8 | 15,090 | -- | -- | -- | -- | -- | A-3299 and A-3300. |
| 4.7 | 89.5 | 2.0 | 2.9 | 15,590 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,500 | -- | 2,480 | -- | -- | A | |
| -- | -- | -- | -- | 14,810 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,630 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,410 | -- | 2,140 | -- | -- | A | |
| -- | -- | -- | -- | 15,090 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,690 | -- | -- | -- | -- | -- | |
| 4.7 | 83.6 | 1.8 | 4.6 | 14,450 | -- | -- | -- | -- | A | Composite of samples |
| 4.5 | 86.5 | 1.8 | 1.7 | 14,950 | -- | -- | -- | -- | -- | B-23747 and B-23748. |
| 4.7 | 90.6 | 1.9 | 1.9 | 15,660 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,920 | -- | 2,050 | -- | -- | A | Sample of 10-in. coal. |
| -- | -- | -- | -- | 15,290 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,740 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,670 | -- | 2,150 | -- | -- | A | Sample of 2.5- to 10-in. |
| -- | -- | -- | -- | 15,020 | -- | -- | -- | -- | -- | coal. |
| -- | -- | -- | -- | 15,720 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,780 | -- | 2,290 | -- | -- | A | Sample of less than |
| -- | -- | -- | -- | 14,180 | -- | -- | -- | -- | -- | 2.5-in. coal. |
| -- | -- | -- | -- | 15,600 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,810 | -- | 2,390 | -- | -- | A | Sample of 10-in. coal. |
| -- | -- | -- | -- | 15,010 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,680 | -- | -- | -- | -- | -- | |
| 4.7 | 84.7 | 1.9 | 3.9 | 14,730 | -- | 2,370 | -- | -- | A | Sample of 2.5- to 10-in. |
| 4.5 | 86.2 | 1.9 | 2.2 | 14,990 | -- | -- | -- | -- | -- | coal. |
| 4.7 | 90.1 | 2.0 | 2.1 | 15,650 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,080 | -- | 2,190 | -- | -- | A | Sample of 1.25- to 2.5-in. |
| -- | -- | -- | -- | 14,280 | -- | -- | -- | -- | -- | coal. |
| -- | -- | -- | -- | 15,580 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,460 | -- | 2,290 | -- | -- | A | Sample of less than |
| -- | -- | -- | -- | 13,820 | -- | -- | -- | -- | -- | 1.25-in. coal. |
| -- | -- | -- | -- | 15,450 | -- | -- | -- | -- | -- | |

**Table 3.** Proximate and ultimate analyses, air-drying loss, heat of combustion, fusibility of ash, and free-swelling index of coal in west-central Arkansas—Continued

| Locality No. | Thickness (in.) | Site of sample | U.S. Bur. Mines lab No. | Condition | Air-drying loss (pct) | Proximate analyses (percent) | | | | Ultimate analyses | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Moisture | Volatile matter | Fixed carbon | Ash | Sulfur | Forms of Sulfur | | |
| | | | | | | | | | | | Sulfate | Pyritic | Organic |
| 34 | -- | M | 3173 | 1 | 2.4 | 3.2 | 14.8 | 72.7 | 9.3 | 3.1 | -- | -- | -- |
| | | | | 2 | -- | -- | 15.3 | 75.1 | 9.6 | 3.2 | -- | -- | -- |
| | | | | 3 | -- | -- | 17.0 | 83.0 | -- | 3.6 | -- | -- | -- |
| 35 | 39 | M | B-60289 | 1 | 1.6 | 2.0 | 18.1 | 70.4 | 9.5 | 1.4 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.5 | 71.8 | 9.7 | 1.4 | -- | -- | -- |
| | | | | 3 | -- | -- | 20.4 | 79.6 | -- | 1.6 | -- | -- | -- |
| | 36 | | B-60290 | 1 | 1.5 | 2.0 | 16.6 | 71.4 | 10.0 | 1.5 | -- | -- | -- |
| | | | | 2 | -- | -- | 16.9 | 72.9 | 10.2 | 1.5 | -- | -- | -- |
| | | | | 3 | -- | -- | 18.8 | 81.2 | -- | 1.7 | -- | -- | -- |
| | 42 | | B-60291 | 1 | 1.5 | 2.0 | 16.4 | 73.1 | 8.5 | 1.3 | -- | -- | -- |
| | | | | 2 | -- | -- | 16.7 | 74.6 | 8.7 | 1.3 | -- | -- | -- |
| | | | | 3 | -- | -- | 18.3 | 81.7 | -- | 1.5 | -- | -- | -- |
| | -- | | B-60292 | 1 | 1.5 | 2.0 | 16.8 | 71.8 | 9.4 | 1.4 | -- | -- | -- |
| | | | | 2 | -- | -- | 17.2 | 73.2 | 9.6 | 1.4 | -- | -- | -- |
| | | | | 3 | -- | -- | 19.0 | 81.0 | -- | 1.6 | -- | -- | -- |
| 36 | -- | M | 2599 | 1 | 1.7 | 2.0 | 15.9 | 75.0 | 7.1 | 1.1 | -- | -- | -- |
| | | | | 2 | -- | -- | 16.2 | 76.6 | 7.2 | 1.1 | -- | -- | -- |
| | | | 2600 | 1 | 1.8 | 2.1 | 16.1 | 75.1 | 6.7 | 1.8 | -- | -- | -- |
| | | | | 2 | -- | -- | 16.5 | 76.6 | 6.8 | 1.8 | -- | -- | -- |
| 37 | -- | M | 1049 | 1 | -- | 1.0 | 18.7 | 73.3 | 7.0 | 2.1 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.9 | 74.1 | 7.0 | 2.1 | -- | -- | -- |
| | | | 1053 | 1 | -- | .8 | 16.6 | 73.5 | 9.1 | 2.5 | -- | -- | -- |
| | | | | 2 | -- | -- | 16.7 | 74.1 | 9.2 | 2.5 | -- | -- | -- |
| 38 | -- | M | W-69378 | 1 | -- | 2.0 | 16.1 | 71.4 | 10.5 | 1.6 | -- | -- | -- |
| | | | | 2 | -- | -- | 16.4 | 72.9 | 10.7 | 1.6 | -- | -- | -- |
| | | | W-69372 | 1 | -- | 1.7 | 16.9 | 73.0 | 8.4 | 1.2 | -- | -- | -- |
| | | | | 2 | -- | -- | 17.2 | 74.3 | 8.5 | 1.3 | -- | -- | -- |
| | | | W-69397 | 1 | -- | 1.6 | 17.0 | 73.4 | 8.0 | 1.2 | -- | -- | -- |
| | | | | 2 | -- | -- | 17.3 | 74.6 | 8.1 | 1.2 | -- | -- | -- |
| 39 | -- | M | A-99398 | 1 | 1.2 | 1.7 | 15.4 | 76.7 | 6.2 | 1.0 | -- | -- | -- |
| | | | A-99399 | 1 | 1.6 | 2.1 | 14.7 | 77.5 | 5.7 | 1.0 | -- | -- | -- |
| | | | A-99400 | 1 | 1.7 | 2.2 | 14.0 | 76.8 | 7.0 | 1.2 | -- | -- | -- |
| | | | A-99401 | 1 | 1.5 | 2.1 | 14.8 | 76.8 | 6.3 | 1.1 | -- | -- | -- |
| | | | | 2 | -- | -- | 15.1 | 78.5 | 6.4 | 1.1 | -- | -- | -- |
| | | | | 3 | -- | -- | 16.2 | 83.8 | -- | 1.2 | -- | -- | -- |
| 40 | -- | M | 3149 | 1 | 2.2 | 3.0 | 14.9 | 74.7 | 7.4 | 1.7 | -- | -- | -- |
| | | | | 2 | -- | -- | 15.4 | 77.0 | 7.6 | 1.8 | -- | -- | -- |
| | | | 1030 | 1 | -- | 1.0 | 17.9 | 71.5 | 9.6 | 2.1 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.1 | 75.2 | 9.7 | 2.1 | -- | -- | -- |
| | | | 1031 | 1 | -- | .8 | 17.2 | 74.3 | 7.7 | 1.6 | -- | -- | -- |
| | | | | 2 | -- | -- | 17.3 | 75.0 | 7.7 | 1.7 | -- | -- | -- |
| | | | 3153 | 1 | 2.4 | 3.2 | 14.6 | 76.1 | 6.1 | 1.5 | -- | -- | -- |
| | | | | 2 | -- | -- | 15.1 | 78.6 | 6.3 | 1.6 | -- | -- | -- |
| 41 | 48 | M | B-55051 | 1 | 1.1 | 1.8 | 15.4 | 75.3 | 7.5 | 1.2 | -- | -- | -- |
| | | | | 2 | -- | -- | 15.7 | 76.6 | 7.7 | 1.3 | -- | -- | -- |
| | | | | 3 | -- | -- | 17.0 | 83.0 | -- | 1.4 | -- | -- | -- |
| | 41 | | B-55052 | 1 | 1.4 | 2.1 | 15.1 | 68.9 | 13.9 | 3.8 | -- | -- | -- |
| | | | | 2 | -- | -- | 15.4 | 70.4 | 14.2 | 3.8 | -- | -- | -- |
| | | | | 3 | -- | -- | 17.9 | 82.1 | -- | 4.5 | -- | -- | -- |

**Table 3.** Proximate and ultimate analyses, air-drying loss, heat of combustion, fusibility of ash, and free-swelling index of coal in west-central Arkansas—Continued

| (percent) | | | | Heat of combustion (Btu/lb) | Fusibility of ash (°F) | | | Free-swelling index | Source of analyses | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| Hydrogen | Carbon | Nitrogen | Oxygen | | Initial deformation temp. | Softening temp. | Fluid temp. | | | |
| 3.8 | 78.4 | 1.5 | 3.9 | 13,590 | -- | -- | -- | -- | B | |
| 3.5 | 81.0 | 1.6 | 1.1 | 14,040 | -- | -- | -- | -- | -- | |
| 3.9 | 89.6 | 1.7 | 1.2 | 15,530 | -- | -- | -- | -- | -- | |
| 4.1 | 79.4 | 1.5 | 4.1 | 13,620 | -- | -- | -- | -- | A | |
| 4.0 | 81.0 | 1.6 | 2.3 | 13,890 | -- | -- | -- | -- | -- | |
| 4.4 | 89.7 | 1.7 | 2.6 | 15,380 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,540 | -- | 2,150 | -- | -- | A | |
| -- | -- | -- | -- | 13,810 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,390 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,830 | -- | 2,230 | -- | -- | A | |
| -- | -- | -- | -- | 14,100 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,440 | -- | -- | -- | -- | -- | |
| 4.1 | 79.5 | 1.6 | 4.0 | 13,630 | -- | -- | -- | -- | A | Composite of samples B-60290 and B-60291. |
| 4.0 | 81.1 | 1.6 | 2.3 | 13,910 | -- | -- | -- | -- | -- | |
| 4.4 | 89.7 | 1.8 | 2.5 | 15,380 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,090 | -- | -- | -- | -- | B | |
| -- | -- | -- | -- | 14,370 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | B | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| -- | -- | 1.7 | -- | 14,390 | -- | -- | -- | -- | B | |
| -- | -- | 1.7 | -- | 14,530 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | B | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,440 | -- | -- | -- | -- | B | |
| -- | -- | -- | -- | 13,720 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,840 | -- | -- | -- | -- | B | |
| -- | -- | -- | -- | 14,080 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,960 | -- | -- | -- | -- | B | |
| -- | -- | -- | -- | 14,180 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,340 | -- | 2,400 | -- | -- | C | |
| -- | -- | -- | -- | 14,350 | -- | 2,420 | -- | -- | C | |
| -- | -- | -- | -- | 14,140 | -- | 2,300 | -- | -- | C | |
| 4.3 | 83.0 | 1.6 | 3.7 | 14,290 | -- | -- | -- | -- | C | Composite of samples A-99398, A-99399, and A-99400. |
| 4.1 | 84.8 | 1.7 | 1.9 | 14,590 | -- | -- | -- | -- | -- | |
| 4.4 | 90.6 | 1.8 | 2.0 | 15,590 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | B | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,100 | -- | -- | -- | -- | B | |
| -- | -- | -- | -- | 14,230 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | B | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | B | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,120 | -- | 2,260 | -- | -- | A | |
| -- | -- | -- | -- | 14,380 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,570 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 12,990 | -- | 2,050 | -- | -- | A | |
| -- | -- | -- | -- | 13,260 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,460 | -- | -- | -- | -- | -- | |

**Table 3.** Proximate and ultimate analyses, air-drying loss, heat of combustion, fusibility of ash, and free-swelling index of coal in west-central Arkansas—Continued

| Locality No. | Thickness (in.) | Site of sample | U.S. Bur. Mines lab No. | Condition | Air-drying loss (pct) | Proximate analyses (percent) | | | | Ultimate analyses | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Moisture | Volatile matter | Fixed carbon | Ash | Sulfur | Forms of Sulfur | | |
| | | | | | | | | | | | Sulfate | Pyritic | Organic |
| 41 | 43 | | B-55053 | 1 | 1.8 | 2.4 | 15.5 | 74.2 | 7.9 | 1.2 | -- | -- | -- |
| | | | | 2 | -- | -- | 15.9 | 76.0 | 8.1 | 1.2 | -- | -- | -- |
| | | | | 3 | -- | -- | 17.3 | 82.7 | -- | 1.3 | -- | -- | -- |
| | -- | | B-55054 | 1 | 1.4 | 2.1 | 15.4 | 72.8 | 9.7 | 2.1 | -- | -- | -- |
| | | | | 2 | -- | -- | 15.8 | 74.3 | 9.9 | 2.2 | -- | -- | -- |
| | | | | 3 | -- | -- | 17.5 | 82.5 | -- | 2.4 | -- | -- | -- |
| | -- | T | B-54869 | 1 | .5 | 1.3 | 15.3 | 74.5 | 8.9 | 2.8 | -- | -- | -- |
| | | | | 2 | -- | -- | 15.5 | 75.5 | 9.0 | 2.9 | -- | -- | -- |
| | | | | 3 | -- | -- | 17.0 | 83.0 | -- | 3.1 | -- | -- | -- |
| | | | B-54870 | 1 | .5 | 1.4 | 15.7 | 73.8 | 9.1 | 2.6 | -- | -- | -- |
| | | | | 2 | -- | -- | 15.9 | 74.9 | 9.2 | 2.6 | -- | -- | -- |
| | | | | 3 | -- | -- | 17.6 | 82.4 | -- | 2.9 | -- | -- | -- |
| | | | B-54871 | 1 | .5 | 1.4 | 15.3 | 72.1 | 11.2 | 2.7 | -- | -- | -- |
| | | | | 2 | -- | -- | 15.5 | 73.2 | 11.3 | 2.8 | -- | -- | -- |
| | | | | 3 | -- | -- | 17.4 | 82.6 | -- | 3.1 | -- | -- | -- |
| | | | B-54872 | 1 | 1.8 | 2.7 | 14.8 | 70.6 | 11.9 | 2.4 | -- | -- | -- |
| | | | | 2 | -- | -- | 15.2 | 72.6 | 12.2 | 2.4 | -- | -- | -- |
| | | | | 3 | -- | -- | 17.3 | 82.7 | -- | 2.8 | -- | -- | -- |
| 42 | -- | M | 3372 | 1 | 1.4 | 2.2 | 14.0 | 72.1 | 11.7 | 2.1 | -- | -- | -- |
| | | | | 2 | -- | -- | 14.3 | 73.8 | 11.9 | 2.1 | -- | -- | -- |
| | | | | | | Franklin County | | | | | | | |
| 43 | 22 | O | E-40766 | 1 | -- | 30.9 | 23.7 | 33.7 | 11.7 | 0.4 | -- | -- | -- |
| | | | | 2 | -- | -- | 34.2 | 48.9 | 16.9 | .6 | -- | -- | -- |
| | | | | 3 | -- | -- | 41.2 | 58.8 | -- | .7 | -- | -- | -- |
| 44 | -- | T | B-55747 | 1 | 3.1 | 3.9 | 16.2 | 74.4 | 5.5 | .7 | -- | -- | -- |
| | | | | 2 | -- | -- | 16.8 | 77.5 | 5.7 | .7 | -- | -- | -- |
| | | | | 3 | -- | -- | 17.9 | 82.1 | -- | .7 | -- | -- | -- |
| | | | B-55748 | 1 | 1.2 | 1.9 | 16.7 | 75.7 | 5.7 | .6 | -- | -- | -- |
| | | | | 2 | -- | -- | 17.0 | 77.2 | 5.8 | .6 | -- | -- | -- |
| | | | | 3 | -- | -- | 18.1 | 81.9 | -- | .7 | -- | -- | -- |
| | | | B-55749 | 1 | 1.5 | 2.2 | 16.4 | 73.7 | 7.7 | .7 | -- | -- | -- |
| | | | | 2 | -- | -- | 16.8 | 75.4 | 7.8 | .7 | -- | -- | -- |
| | | | | 3 | -- | -- | 18.2 | 81.8 | -- | .8 | -- | -- | -- |
| | | | B-55750 | 1 | 5.5 | 6.3 | 16.1 | 70.0 | 7.6 | .7 | -- | -- | -- |
| | | | | 2 | -- | -- | 17.2 | 74.7 | 8.1 | .7 | -- | -- | -- |
| | | | | 3 | -- | -- | 18.7 | 81.3 | -- | .8 | -- | -- | -- |
| | | | B-55751 | 1 | 1.7 | 2.6 | 15.9 | 76.1 | 5.4 | .6 | -- | -- | -- |
| | | | | 2 | -- | -- | 16.4 | 78.1 | 5.5 | .6 | -- | -- | -- |
| | | | | 3 | -- | -- | 17.3 | 82.7 | -- | .6 | -- | -- | -- |
| | | | B-55752 | 1 | 5.8 | 6.5 | 15.3 | 70.1 | 8.1 | .7 | -- | -- | -- |
| | | | | 2 | -- | -- | 16.4 | 74.9 | 8.7 | .7 | -- | -- | -- |
| | | | | 3 | -- | -- | 17.9 | 82.1 | -- | .8 | -- | -- | -- |
| 45 | 28 | S | K-54019 | 1 | -- | 3.5 | 15.4 | 74.1 | 7.0 | 1.3 | 0.14 | 0.75 | 0.44 |
| | | | | 2 | -- | -- | 15.9 | 76.8 | 7.3 | 1.4 | .14 | .78 | .45 |
| | | | | 3 | -- | -- | 17.2 | 82.8 | -- | 1.5 | .15 | .84 | .49 |
| 46 | -- | T | B-55789 | 1 | 1.9 | 2.6 | 14.5 | 77.6 | 5.3 | 1.8 | -- | -- | -- |
| | | | | 2 | -- | -- | 14.9 | 79.7 | 5.4 | 1.8 | -- | -- | -- |
| | | | | 3 | -- | -- | 15.8 | 84.2 | -- | 1.9 | -- | -- | -- |
| | | | B-55790 | 1 | 1.9 | 2.7 | 14.3 | 77.3 | 5.7 | 1.9 | -- | -- | -- |
| | | | | 2 | -- | -- | 14.7 | 79.5 | 5.8 | 1.9 | -- | -- | -- |
| | | | | 3 | -- | -- | 15.6 | 84.4 | -- | 2.1 | -- | -- | -- |

**Table 3.** Proximate and ultimate analyses, air-drying loss, heat of combustion, fusibility of ash, and free-swelling index of coal in west-central Arkansas—Continued

| (percent) | | | | Heat of combustion (Btu/lb) | Fusibility of ash (°F) | | | Free-swelling index | Source of analyses | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| Hydrogen | Carbon | Nitrogen | Oxygen | | Initial deformation temp. | Softening temp. | Fluid temp. | | | |
| -- | -- | -- | -- | 13,960 | -- | 2,160 | -- | -- | A | |
| -- | -- | -- | -- | 14,300 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,560 | -- | -- | -- | -- | -- | |
| 4.2 | 78.7 | 1.3 | 4.0 | 13,700 | -- | -- | - | -- | A | Composite of samples |
| 4.1 | 80.4 | 1.3 | 2.1 | 13,990 | -- | -- | -- | -- | -- | B-55051, B-55052, |
| 4.5 | 89.2 | 1.5 | 2.4 | 15,540 | -- | -- | -- | -- | -- | and B-55053. |
| -- | -- | -- | -- | 13,930 | -- | 2,380 | -- | -- | A | Sample of 10-in. coal. |
| -- | -- | -- | -- | 14,110 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,510 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,910 | -- | 2,380 | -- | -- | A | Sample of 3- to 10-in. |
| -- | -- | -- | -- | 14,100 | -- | -- | -- | -- | -- | coal. |
| -- | -- | -- | -- | 15,530 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,520 | -- | 2,100 | -- | -- | A | Sample of 1.25- to 3-in. |
| -- | -- | -- | -- | 13,720 | -- | -- | -- | -- | -- | coal. |
| -- | -- | -- | -- | 15,470 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,230 | -- | 2,060 | -- | -- | A | Sample of less than |
| -- | -- | -- | -- | 13,590 | -- | -- | -- | -- | -- | 1.25-in. coal. |
| -- | -- | -- | -- | 15,480 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | B | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Franklin County--Continued | | | | | | | | | | |
| 5.0 | 39.8 | 0.8 | 42.3 | 5,910 | 2,480 | 2,720 | 2,910 | -- | A | Coal is weathered. |
| 2.2 | 57.6 | 1.2 | 21.5 | 8,550 | -- | -- | -- | -- | -- | |
| 2.6 | 69.2 | 1.5 | 25.8 | 10,290 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,090 | -- | 2,410 | -- | -- | A | Sample of 8-in. coal. |
| -- | -- | -- | -- | 14,660 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,550 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,350 | -- | 2,450 | -- | -- | A | Sample of 2.5- to 8-in. |
| -- | -- | -- | -- | 14,630 | -- | -- | -- | -- | -- | coal. |
| -- | -- | -- | -- | 15,530 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,010 | -- | 2,180 | -- | -- | -- | Sample of 1.25- to 2.5-in. |
| -- | -- | -- | -- | 14,330 | -- | -- | -- | -- | -- | coal. |
| -- | -- | -- | -- | 15,550 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,350 | -- | 2,330 | -- | -- | A | Sample of less than |
| -- | -- | -- | -- | 14,250 | -- | -- | -- | -- | -- | 1.25-in. coal. |
| -- | -- | -- | -- | 15,510 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,300 | -- | 2,500 | -- | -- | A | Sample of 2.5-in. coal. |
| -- | -- | -- | -- | 14,680 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,540 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,250 | -- | 2,230 | -- | -- | A | Sample of less than |
| -- | -- | -- | -- | 14,170 | -- | -- | -- | -- | -- | 2.5-in. coal. |
| -- | -- | -- | -- | 15,520 | -- | -- | -- | -- | -- | |
| 4.3 | 79.9 | 1.6 | 5.9 | 13,850 | 2,300 | 2,420 | 2,610 | 7 | A | |
| 4.0 | 82.8 | 1.7 | 2.8 | 14,360 | -- | -- | -- | -- | -- | |
| 4.3 | 89.3 | 1.8 | 3.1 | 15,480 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,400 | -- | 2,230 | -- | -- | A | Sample of 8-in. coal. |
| -- | -- | -- | -- | 14,790 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,630 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,350 | -- | 2,230 | -- | -- | A | Sample of 3- to 8-in. |
| -- | -- | -- | -- | 14,740 | -- | -- | -- | -- | -- | coal. |
| -- | -- | -- | -- | 15,650 | -- | -- | -- | -- | -- | |

**Table 3.** Proximate and ultimate analyses, air-drying loss, heat of combustion, fusibility of ash, and free-swelling index of coal in west-central Arkansas—Continued

| Locality No. | Thickness (in.) | Site of sample | U.S. Bur. Mines lab No. | Condition | Air-drying loss (pct) | Proximate analyses (percent) | | | | Ultimate analyses | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Moisture | Volatile matter | Fixed carbon | Ash | Sulfur | Forms of Sulfur | | |
| | | | | | | | | | | | Sulfate | Pyritic | Organic |
| 46 | | | B-55791 | 1 | 1.7 | 2.6 | 14.4 | 76.3 | 6.7 | 1.9 | -- | -- | -- |
| | | | | 2 | -- | -- | 14.8 | 78.3 | 6.9 | 1.9 | -- | -- | -- |
| | | | | 3 | -- | -- | 15.9 | 84.1 | -- | 2.1 | -- | -- | -- |
| | | | B-55792 | 1 | 2.9 | 3.9 | 13.9 | 71.5 | 10.7 | 2.0 | -- | -- | -- |
| | | | | 2 | -- | -- | 14.5 | 74.4 | 11.1 | 2.1 | -- | -- | -- |
| | | | | 3 | -- | -- | 16.3 | 83.7 | -- | 2.4 | -- | -- | -- |
| 47 | -- | M | A-99376 | 1 | 2.1 | 2.8 | 13.9 | 75.3 | 8.0 | 2.6 | -- | -- | -- |
| | | | A-99375 | 1 | 1.8 | 2.6 | 14.0 | 71.1 | 11.7 | 3.9 | -- | -- | -- |
| | | | A-99377 | 1 | 2.0 | 2.6 | 14.0 | 73.7 | 9.7 | 3.2 | -- | -- | -- |
| | | | | 2 | -- | -- | 14.4 | 75.6 | 10.0 | 3.3 | -- | -- | -- |
| | | | | 3 | -- | -- | 16.0 | 84.0 | -- | 3.6 | -- | -- | -- |
| 48 | -- | T | B-55786 | 1 | 1.6 | 2.5 | 15.1 | 76.5 | 5.9 | 1.0 | -- | -- | -- |
| | | | | 2 | -- | -- | 15.4 | 78.5 | 6.1 | 1.0 | -- | -- | -- |
| | | | | 3 | -- | -- | 16.4 | 83.6 | -- | 1.1 | -- | -- | -- |
| | | | B-55787 | 1 | 1.6 | 2.4 | 15.2 | 77.1 | 5.3 | .9 | -- | -- | -- |
| | | | | 2 | -- | -- | 15.6 | 78.9 | 5.5 | 1.0 | -- | -- | -- |
| | | | | 3 | -- | -- | 16.5 | 83.5 | -- | 1.0 | -- | -- | -- |
| | | | B-55788 | 1 | 2.8 | 3.7 | 14.7 | 71.9 | 9.7 | 1.5 | -- | -- | -- |
| | | | | 2 | -- | -- | 15.2 | 74.7 | 10.1 | 1.5 | -- | -- | -- |
| | | | | 3 | -- | -- | 16.9 | 83.1 | -- | 1.7 | -- | -- | -- |
| 49 | -- | M | A-99378 | 1 | 2.1 | 2.5 | 14.2 | 75.4 | 7.9 | 2.0 | -- | -- | -- |
| | | | A-99379 | 1 | 2.3 | 2.8 | 13.9 | 76.1 | 7.2 | 1.9 | -- | -- | -- |
| | | | A-99380 | 1 | 1.9 | 2.4 | 13.8 | 77.7 | 6.1 | 1.7 | -- | -- | -- |
| | | | A-99381 | 1 | 2.1 | 2.6 | 14.3 | 76.0 | 7.1 | 1.9 | -- | -- | -- |
| | | | | 2 | -- | -- | 14.7 | 78.0 | 7.3 | 1.9 | -- | -- | -- |
| | | | | 3 | -- | -- | 15.8 | 84.2 | -- | 2.1 | -- | -- | -- |
| 50 | -- | M | A-99367 | 1 | 1.9 | 2.4 | 15.7 | 76.3 | 5.6 | .7 | -- | -- | -- |
| | | | A-99368 | 1 | 2.8 | 3.3 | 13.6 | 80.3 | 2.8 | .7 | -- | -- | -- |
| | | | A-99369 | 1 | 3.0 | 3.4 | 14.3 | 78.6 | 3.7 | .7 | -- | -- | -- |
| | | | A-99370 | 1 | 2.6 | 3.1 | 14.6 | 78.2 | 4.1 | .7 | -- | -- | -- |
| | | | | 2 | -- | -- | 15.0 | 80.7 | 4.3 | .8 | -- | -- | -- |
| | | | | 3 | -- | -- | 15.7 | 84.3 | -- | .8 | -- | -- | -- |
| 51 | -- | M | 3370 | 1 | 2.4 | 3.4 | 12.1 | 78.4 | 6.1 | 4.1 | -- | -- | -- |
| | | | | 2 | -- | -- | 12.5 | 81.2 | 6.3 | 4.2 | -- | -- | -- |
| 52 | -- | M | 1130 | 1 | .7 | 1.4 | 14.8 | 76.8 | 7.0 | 1.5 | -- | -- | -- |
| | | | | 2 | -- | -- | 15.0 | 77.9 | 7.1 | 1.5 | -- | -- | -- |
| | | | 1131 | 1 | 1.3 | 1.8 | 15.0 | 75.9 | 7.3 | 1.9 | -- | -- | -- |
| | | | | 2 | -- | -- | 15.3 | 77.3 | 7.4 | 2.0 | -- | -- | -- |
| 53 | 19 | S | K-54017 | 1 | -- | 2.7 | 18.8 | 75.6 | 2.9 | .8 | 0.01 | 0.22 | 0.55 |
| | | | | 2 | -- | -- | 19.4 | 77.6 | 3.0 | .8 | .01 | .22 | .56 |
| | | | | 3 | -- | -- | 19.9 | 80.1 | -- | .8 | .01 | .23 | .58 |
| 54 | -- | T | B-57592 | 1 | 2.2 | 2.6 | 16.2 | 76.9 | 4.3 | .7 | -- | -- | -- |
| | | | | 2 | -- | -- | 16.7 | 78.9 | 4.4 | .7 | -- | -- | -- |
| | | | | 3 | -- | -- | 17.4 | 82.6 | -- | .8 | -- | -- | -- |
| 55 | 18 | S | K-63743 | 1 | -- | 1.3 | 16.1 | 66.7 | 15.9 | 1.4 | .01 | .74 | .67 |
| | | | | 2 | -- | -- | 16.3 | 67.6 | 16.1 | 1.4 | .01 | .75 | .68 |
| | | | | 3 | -- | -- | 19.4 | 80.6 | -- | 1.7 | .01 | .89 | .81 |
| 56 | -- | T | B-57591 | 1 | 1.9 | 2.3 | 16.6 | 77.1 | 4.0 | .8 | -- | -- | -- |
| | | | | 2 | -- | -- | 17.0 | 78.9 | 4.1 | .9 | -- | -- | -- |
| | | | | 3 | -- | -- | 17.7 | 82.3 | -- | .9 | -- | -- | -- |

**Table 3.** Proximate and ultimate analyses, air-drying loss, heat of combustion, fusibility of ash, and free-swelling index of coal in west-central Arkansas—Continued

| (percent) | | | | Heat of combustion (Btu/lb) | Fusibility of ash (°F) | | | Free-swelling index | Source of analyses | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| Hydrogen | Carbon | Nitrogen | Oxygen | | Initial deformation temp. | Softening temp. | Fluid temp. | | | |
| -- | -- | -- | -- | 14,160 | -- | 2,230 | -- | -- | A | Sample of 1.25- to 3-in. |
| -- | -- | -- | -- | 14,530 | -- | -- | -- | -- | -- | coal. |
| -- | -- | -- | -- | 15,600 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,290 | -- | 2,450 | -- | -- | A | Sample of less than |
| -- | -- | -- | -- | 13,830 | -- | -- | -- | -- | -- | 1.25-in. coal. |
| -- | -- | -- | -- | 15,560 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,850 | -- | 2,570 | -- | -- | C | |
| -- | -- | -- | -- | 13,260 | -- | 2,310 | -- | -- | C | |
| 4.0 | 78.2 | 1.5 | 3.4 | 13,560 | -- | -- | -- | -- | C | Composite of samples |
| 3.8 | 80.3 | 1.5 | 1.1 | 13,920 | -- | -- | -- | -- | -- | A-99376 and A-99375. |
| 4.2 | 89.3 | 1.7 | 1.2 | 15,470 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,260 | -- | 2,460 | -- | -- | A | Sample of 6-in. coal. |
| -- | -- | -- | -- | 14,620 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,570 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,370 | -- | 2,410 | -- | -- | A | Sample of 2.5- to 6-in. |
| -- | -- | -- | -- | 14,730 | -- | -- | -- | -- | -- | coal. |
| -- | -- | -- | -- | 15,580 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,420 | -- | 2,050 | -- | -- | A | Sample of less than |
| -- | -- | -- | -- | 13,930 | -- | -- | -- | -- | -- | 0.75-in. coal. |
| -- | -- | -- | -- | 15,490 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,890 | -- | 2,400 | -- | -- | C | |
| -- | -- | -- | -- | 13,950 | -- | 2,430 | -- | -- | C | |
| -- | -- | -- | -- | 14,190 | -- | 2,440 | -- | -- | C | |
| 4.2 | 81.5 | 1.6 | 3.7 | 14,050 | -- | -- | -- | -- | C | Composite of samples |
| 4.0 | 83.7 | 1.7 | 1.4 | 14,430 | -- | -- | -- | -- | -- | B-99378, B-99379, |
| 4.3 | 90.3 | 1.8 | 1.5 | 15,560 | -- | -- | -- | -- | -- | and B-99380. |
| -- | -- | -- | -- | 14,370 | -- | 2,400 | -- | -- | C | |
| -- | -- | -- | -- | 14,710 | -- | 2,220 | -- | -- | C | |
| -- | -- | -- | -- | 14,500 | -- | 2,360 | -- | -- | C | |
| 4.5 | 84.5 | 1.7 | 4.5 | 14,540 | -- | -- | -- | -- | C | Composite of samples |
| 4.3 | 87.2 | 1.7 | 1.7 | 15,000 | -- | -- | -- | -- | -- | A-99367, A-99368, |
| 4.5 | 91.1 | 1.8 | 1.8 | 15,660 | -- | -- | -- | -- | -- | and A-99369. |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | B | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| -- | -- | 1.4 | -- | 14,330 | -- | -- | -- | -- | B | |
| -- | -- | 1.4 | -- | 14,530 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | B | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 4.6 | 85.7 | 1.9 | 4.1 | 14,770 | 2,250 | 2,360 | 2,570 | 9 | A | |
| 4.4 | 88.1 | 1.9 | 1.8 | 15,180 | -- | -- | -- | -- | -- | |
| 4.6 | 90.8 | 2.0 | 1.8 | 15,650 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,620 | -- | 2,290 | -- | -- | A | Sample of mine-run coal. |
| -- | -- | -- | -- | 15,020 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,720 | -- | -- | -- | -- | -- | |
| 3.9 | 73.1 | 1.5 | 4.2 | 12,740 | -- | 2,910 | -- | 4 | A | |
| 3.8 | 74.0 | 1.6 | 3.1 | 12,900 | -- | -- | -- | -- | -- | |
| 4.6 | 88.2 | 1.9 | 1.7 | 15,370 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,780 | -- | 2,270 | -- | -- | A | |
| -- | -- | -- | -- | 15,130 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,780 | -- | -- | -- | -- | -- | |

**Table 3.** Proximate and ultimate analyses, air-drying loss, heat of combustion, fusibility of ash, and free-swelling index of coal in west-central Arkansas—Continued

| Locality No. | Thickness (in.) | Site of sample | U.S. Bur. Mines lab No. | Condition | Air-drying loss (pct) | Proximate analyses (percent) | | | | Ultimate analyses | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Moisture | Volatile matter | Fixed carbon | Ash | Sulfur | Forms of Sulfur | | |
| | | | | | | | | | | | Sulfate | Pyritic | Organic |
| | | | | | Johnson County | | | | | | | | |
| 57 | 22 | S | K-63741 | 1 | -- | 1.6 | 16.0 | 78.1 | 4.3 | 0.6 | 0.01 | 0.07 | 0.52 |
| | | | | 2 | -- | -- | 16.3 | 79.3 | 4.4 | .6 | .01 | .07 | .52 |
| | | | | 3 | -- | -- | 17.0 | 83.0 | -- | .6 | .01 | .07 | .52 |
| 58 | 22 | M | E-40762 | 1 | -- | 1.1 | 16.1 | 73.6 | 9.2 | 5.5 | -- | -- | -- |
| | | | | 2 | -- | -- | 16.3 | 74.4 | 9.3 | 5.6 | -- | -- | -- |
| | | | | 3 | -- | -- | 18.0 | 82.0 | -- | 6.1 | -- | -- | -- |
| | | | K-54016 | 1 | -- | 3.4 | 17.7 | 75.7 | 3.2 | .6 | .01 | .14 | .43 |
| | | | | 2 | -- | -- | 18.3 | 78.4 | 3.3 | .6 | .01 | .14 | .45 |
| | | | | 3 | -- | -- | 18.9 | 81.1 | -- | .6 | .01 | .15 | .46 |
| 59 | 14 | S | K-54015 | 1 | -- | 9.6 | 14.2 | 69.8 | 6.4 | .7 | .05 | .16 | .52 |
| | | | | 2 | -- | -- | 15.7 | 77.2 | 7.1 | .8 | .06 | .17 | .58 |
| | | | | 3 | -- | -- | 16.9 | 83.1 | -- | .9 | .07 | .19 | .62 |
| 60 | 14 | S | E-40761 | 1 | -- | 1.4 | 14.4 | 79.8 | 4.4 | 1.0 | -- | -- | -- |
| | | | | 2 | -- | -- | 14.6 | 81.0 | 4.4 | 1.0 | -- | -- | -- |
| | | | | 3 | -- | -- | 15.3 | 84.7 | -- | 1.0 | -- | -- | -- |
| 61 | 12 | S | G-49866 | 1 | -- | 2.0 | 11.7 | 81.9 | 4.4 | .6 | -- | -- | -- |
| | | | | 2 | -- | -- | 11.9 | 83.7 | 4.4 | .7 | -- | -- | -- |
| | | | | 3 | -- | -- | 12.5 | 87.5 | -- | .7 | -- | -- | -- |
| | | | G-49867 | 1 | -- | 1.1 | 15.4 | 79.6 | 3.9 | .8 | -- | -- | -- |
| | | | | 2 | -- | -- | 15.6 | 80.4 | 4.0 | .8 | -- | -- | -- |
| | | | | 3 | -- | -- | 16.2 | 83.8 | -- | .8 | -- | -- | -- |
| 62 | 18 | M | B-84599 | 1 | 3.7 | 4.8 | 12.0 | 79.5 | 3.7 | .6 | -- | -- | -- |
| | | | | 2 | -- | -- | 12.6 | 83.5 | 3.9 | .7 | -- | -- | -- |
| | | | | 3 | -- | -- | 13.1 | 86.9 | -- | .7 | -- | -- | -- |
| | | | B-84600 | 1 | 5.6 | 6.5 | 11.9 | 77.5 | 4.1 | .6 | -- | -- | -- |
| | | | | 2 | -- | -- | 12.7 | 82.9 | 4.4 | .7 | -- | -- | -- |
| | | | | 3 | -- | -- | 13.3 | 86.7 | -- | .7 | -- | -- | -- |
| | 19 | | B-84601 | 1 | 7.7 | 8.5 | 11.6 | 76.1 | 3.8 | .7 | -- | -- | -- |
| | | | | 2 | -- | -- | 12.7 | 83.1 | 4.2 | .7 | -- | -- | -- |
| | | | | 3 | -- | -- | 13.2 | 86.8 | -- | .7 | -- | -- | -- |
| | 19 | | B-84602 | 1 | 5.9 | 6.8 | 11.4 | 78.3 | 3.5 | .7 | -- | -- | -- |
| | | | | 2 | -- | -- | 12.3 | 83.9 | 3.8 | .7 | -- | -- | -- |
| | | | | 3 | -- | -- | 12.7 | 87.3 | -- | .7 | -- | -- | -- |
| | | | B-84603 | 1 | 5.7 | 6.7 | 11.6 | 77.9 | 3.8 | .6 | -- | -- | -- |
| | | | | 2 | -- | -- | 12.4 | 83.5 | 4.1 | .7 | -- | -- | -- |
| | | | | 3 | -- | -- | 12.9 | 87.1 | -- | .7 | -- | -- | -- |
| 63 | 20 | S | K-54018 | 1 | -- | 3.3 | 13.9 | 79.8 | 3.0 | .6 | .01 | .12 | .47 |
| | | | | 2 | -- | -- | 14.4 | 82.5 | 3.1 | .6 | .01 | .12 | .48 |
| | | | | 3 | -- | -- | 14.8 | 85.2 | -- | .6 | .01 | .13 | .50 |
| 64 | -- | T | B-56000 | 1 | 1.4 | 2.1 | 12.4 | 75.3 | 10.2 | 3.2 | -- | -- | -- |
| | | | | 2 | -- | -- | 12.7 | 76.9 | 10.4 | 3.2 | -- | -- | -- |
| | | | | 3 | -- | -- | 14.2 | 85.5 | -- | 3.6 | -- | -- | -- |
| | | | B-56001 | 1 | 1.3 | 2.0 | 12.8 | 75.7 | 9.5 | 2.7 | -- | -- | -- |
| | | | | 2 | -- | -- | 13.1 | 77.2 | 9.7 | 2.8 | -- | -- | -- |
| | | | | 3 | -- | -- | 14.5 | 85.5 | -- | 3.1 | -- | -- | -- |
| | | | B-56002 | 1 | 1.7 | 2.4 | 12.5 | 75.2 | 9.9 | 2.5 | -- | -- | -- |
| | | | | 2 | -- | -- | 12.8 | 77.0 | 10.2 | 2.5 | -- | -- | -- |
| | | | | 3 | -- | -- | 14.3 | 85.7 | -- | 2.8 | -- | -- | -- |
| | | | B-56003 | 1 | 3.0 | 4.0 | 12.6 | 70.8 | 12.6 | 2.5 | -- | -- | -- |
| | | | | 2 | -- | -- | 13.2 | 73.7 | 13.1 | 2.6 | -- | -- | -- |
| | | | | 3 | -- | -- | 15.1 | 84.9 | -- | 3.0 | -- | -- | -- |

**Table 3.** Proximate and ultimate analyses, air-drying loss, heat of combustion, fusibility of ash, and free-swelling index of coal in west-central Arkansas—Continued

| (percent) | | | | Heat of combustion (Btu/lb) | Fusibility of ash (°F) | | | Free-swelling index | Source of analyses | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| Hydrogen | Carbon | Nitrogen | Oxygen | | Initial deformation temp. | Softening temp. | Fluid temp. | | | |
| | | | | | Johnson County--Continued | | | | | |
| 4.3 | 85.4 | 1.7 | 3.7 | 14,700 | 2,070 | 2,120 | 2,220 | 7 | A | |
| 4.2 | 86.8 | 1.7 | 2.3 | 14,930 | -- | -- | -- | -- | -- | |
| 4.4 | 90.8 | 1.8 | 2.4 | 15,620 | -- | -- | -- | -- | -- | |
| 3.9 | 78.6 | 1.5 | 1.3 | 13,860 | 2,300 | 2,440 | 2,520 | 8 | A | |
| 3.9 | 79.5 | 1.6 | 0.1 | 14,010 | -- | -- | -- | -- | -- | |
| 4.3 | 87.7 | 1.7 | .2 | 15,540 | -- | -- | -- | -- | -- | |
| 4.5 | 84.0 | 1.8 | 5.9 | 14,480 | 2,090 | 2,140 | 2,190 | 5 | A | Sample collected 21 years after Sample E-40762. |
| 4.3 | 87.0 | 1.9 | 2.9 | 14,990 | -- | -- | -- | -- | -- | |
| 4.4 | 90.0 | 1.9 | 3.1 | 15,500 | -- | -- | -- | -- | -- | |
| 4.8 | 75.9 | 1.6 | 10.6 | 12,990 | 2,140 | 2,250 | 2,570 | 4 | A | |
| 4.1 | 84.0 | 1.8 | 2.2 | 14,370 | -- | -- | -- | -- | -- | |
| 4.4 | 90.4 | 1.9 | 2.4 | 15,470 | -- | -- | -- | -- | -- | |
| 4.2 | 85.8 | 1.6 | 3.0 | 14,750 | 2,020 | 2,220 | 2,440 | 5.5 | A | |
| 4.1 | 87.0 | 1.7 | 1.8 | 14,960 | -- | -- | -- | -- | -- | |
| 4.3 | 91.0 | 1.7 | 2.0 | 15,660 | -- | -- | -- | -- | -- | |
| 3.9 | 84.8 | 1.6 | 4.7 | 14,280 | 2,080 | 2,230 | 2,620 | 0 | A | Hardgrove grindability index 86. |
| 3.8 | 86.6 | 1.7 | 2.8 | 14,580 | -- | -- | -- | -- | -- | |
| 3.9 | 90.6 | 1.7 | 3.1 | 15,260 | -- | -- | -- | -- | -- | |
| 4.3 | 86.0 | 1.8 | 3.2 | 14,810 | 2,170 | 2,300 | 2,500 | 5.5 | A | Hardgrove grindability index 100. |
| 4.2 | 86.9 | 1.8 | 2.3 | 14,970 | -- | -- | -- | -- | -- | |
| 4.4 | 90.6 | 1.9 | 2.3 | 15,600 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,320 | -- | 2,290 | -- | -- | A | |
| -- | -- | -- | -- | 15,040 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,650 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,930 | -- | 2,290 | -- | -- | A | |
| -- | -- | -- | -- | 14,900 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,590 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,620 | -- | 2,290 | -- | -- | A | |
| -- | -- | -- | -- | 14,880 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,520 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,990 | -- | 2,290 | -- | -- | A | |
| -- | -- | -- | -- | 15,010 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,590 | -- | -- | -- | -- | -- | |
| 4.5 | 81.9 | 1.6 | 7.6 | 13,960 | -- | -- | -- | -- | A | Composite of samples B-84599 to B-84602, inclusive. |
| 4.0 | 87.9 | 1.7 | 1.6 | 14,970 | -- | -- | -- | -- | -- | |
| 4.2 | 91.6 | 1.8 | 1.7 | 15,600 | -- | -- | -- | -- | -- | |
| 4.2 | 86.0 | 1.7 | 4.5 | 14,570 | 2,140 | 2,190 | 2,250 | .5 | A | |
| 4.0 | 89.0 | 1.8 | 1.5 | 15,070 | -- | -- | -- | -- | -- | |
| 4.1 | 91.8 | 1.8 | 1.7 | 15,550 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,500 | -- | 2,330 | -- | -- | A | Sample of 5.5- to 7.5-in. coal. |
| -- | -- | -- | -- | 13,790 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,390 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,620 | -- | 2,400 | -- | -- | A | Sample of 2.5- to 5.5-in. coal. |
| -- | -- | -- | -- | 13,890 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,390 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,520 | -- | 2,260 | -- | -- | A | Sample of 1.5- to 2.5-in. coal. |
| -- | -- | -- | -- | 13,860 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,430 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 12,740 | -- | 2,190 | -- | -- | A | Sample of less than 0.5-in. coal. |
| -- | -- | -- | -- | 13,270 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,260 | -- | -- | -- | -- | -- | |

**Table 3.** Proximate and ultimate analyses, air-drying loss, heat of combustion, fusibility of ash, and free-swelling index of coal in west-central Arkansas—Continued

| Locality No. | Thickness (in.) | Site of sample | U.S. Bur. Mines lab No. | Condition | Air-drying loss (pct) | Proximate analyses (percent) | | | | Ultimate analyses | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Moisture | Volatile matter | Fixed carbon | Ash | Sulfur | Forms of Sulfur | | |
| | | | | | | | | | | | Sulfate | Pyritic | Organic |
| 65 | -- | M | 3368 | 1 | 1.0 | 2.1 | 11.4 | 77.9 | 8.6 | 2.0 | -- | -- | -- |
| | | | | 2 | -- | -- | 11.7 | 79.5 | 8.8 | 2.0 | -- | -- | -- |
| 66 | -- | T | B-56005 | 1 | 1.2 | 1.8 | 12.0 | 75.1 | 11.1 | 3.9 | -- | -- | -- |
| | | | | 2 | -- | -- | 12.2 | 76.5 | 11.3 | 3.9 | -- | -- | -- |
| | | | | 3 | -- | -- | 13.8 | 86.2 | -- | 4.4 | -- | -- | -- |
| | | | B-56006 | 1 | 1.3 | 1.8 | 11.9 | 75.0 | 11.3 | 4.0 | -- | -- | -- |
| | | | | 2 | -- | -- | 12.2 | 76.3 | 11.5 | 4.1 | -- | -- | -- |
| | | | | 3 | -- | -- | 13.7 | 86.3 | -- | 4.6 | -- | -- | -- |
| | | | B-56007 | 1 | 1.1 | 1.8 | 11.8 | 75.9 | 10.5 | 3.4 | -- | -- | -- |
| | | | | 2 | -- | -- | 12.0 | 77.3 | 10.7 | 3.4 | -- | -- | -- |
| | | | | 3 | -- | -- | 13.4 | 86.6 | -- | 3.8 | -- | -- | -- |
| | | | B-56008 | 1 | 1.2 | 1.9 | 11.6 | 74.4 | 12.1 | 3.5 | -- | -- | -- |
| | | | | 2 | -- | -- | 11.8 | 75.9 | 12.3 | 3.6 | -- | -- | -- |
| | | | | 3 | -- | -- | 13.4 | 86.6 | -- | 4.1 | -- | -- | -- |
| | | | B-56009 | 1 | 1.6 | 2.4 | 12.4 | 69.4 | 15.8 | 2.6 | -- | -- | -- |
| | | | | 2 | -- | -- | 12.7 | 71.1 | 16.2 | 2.6 | -- | -- | -- |
| | | | | 3 | -- | -- | 15.1 | 84.9 | -- | 3.1 | -- | -- | -- |
| 67 | -- | T | B-57787 | 1 | 1.5 | 2.1 | 12.4 | 77.2 | 8.3 | 2.4 | -- | -- | -- |
| | | | | 2 | -- | -- | 12.6 | 79.0 | 8.4 | 2.5 | -- | -- | -- |
| | | | | 3 | -- | -- | 13.8 | 86.2 | -- | 2.7 | -- | -- | -- |
| | | | B-57788 | 1 | 1.8 | 2.3 | 12.2 | 77.8 | 7.7 | 2.2 | -- | -- | -- |
| | | | | 2 | -- | -- | 12.5 | 79.6 | 7.9 | 2.3 | -- | -- | -- |
| | | | | 3 | -- | -- | 13.5 | 86.5 | -- | 2.5 | -- | -- | -- |
| | | | B-57789 | 1 | 1.7 | 2.3 | 12.1 | 78.0 | 7.6 | 1.8 | -- | -- | -- |
| | | | | 2 | -- | -- | 12.4 | 79.8 | 7.8 | 1.9 | -- | -- | -- |
| | | | | 3 | -- | -- | 13.4 | 86.6 | -- | 2.1 | -- | -- | -- |
| | | | B-57790 | 1 | 1.8 | 2.5 | 11.6 | 75.9 | 10.0 | 1.9 | -- | -- | -- |
| | | | | 2 | -- | -- | 11.9 | 77.8 | 10.3 | 1.9 | -- | -- | -- |
| | | | | 3 | -- | -- | 13.3 | 86.7 | -- | 2.2 | -- | -- | -- |
| | | | B-57791 | 1 | 2.5 | 3.3 | 11.7 | 71.9 | 13.1 | 1.6 | -- | -- | -- |
| | | | | 2 | -- | -- | 12.1 | 74.3 | 13.6 | 1.7 | -- | -- | -- |
| | | | | 3 | -- | -- | 14.0 | 86.0 | -- | 2.0 | -- | -- | -- |
| 68 | -- | M | A-99386 | 1 | 2.5 | 3.1 | 10.3 | 79.5 | 7.1 | 1.5 | -- | -- | -- |
| | | | A-99387 | 1 | 1.7 | 2.3 | 10.9 | 78.2 | 8.6 | 2.0 | -- | -- | -- |
| | | | A-99388 | 1 | 1.7 | 2.3 | 10.3 | 80.6 | 6.8 | 1.5 | -- | -- | -- |
| | | | A-99389 | 1 | 2.0 | 2.6 | 10.6 | 79.3 | 7.5 | 1.7 | -- | -- | -- |
| | | | | 2 | -- | -- | 10.8 | 81.5 | 7.7 | 1.8 | -- | -- | -- |
| | | | | 3 | -- | -- | 11.7 | 88.3 | -- | 1.9 | -- | -- | -- |
| 69 | 19 | S | K-63744 | 1 | -- | 2.0 | 11.0 | 79.3 | 7.7 | 1.1 | 0.01 | 0.27 | 0.79 |
| | | | | 2 | -- | -- | 11.2 | 81.0 | 7.8 | 1.1 | .01 | .27 | .81 |
| | | | | 3 | -- | -- | 12.2 | 87.8 | -- | 1.2 | .01 | .30 | .88 |
| 70 | -- | T | B-56026 | 1 | 2.5 | 3.1 | 12.2 | 76.1 | 8.6 | 3.9 | -- | -- | -- |
| | | | | 2 | -- | -- | 12.6 | 78.5 | 8.9 | 4.0 | -- | -- | -- |
| | | | | 3 | -- | -- | 13.9 | 86.1 | -- | 4.4 | -- | -- | -- |
| | | | B-56027 | 1 | 2.5 | 3.1 | 12.1 | 75.8 | 9.0 | 4.0 | -- | -- | -- |
| | | | | 2 | -- | -- | 12.5 | 78.2 | 9.3 | 4.1 | -- | -- | -- |
| | | | | 3 | -- | -- | 13.8 | 86.2 | -- | 4.5 | -- | -- | -- |
| | | | B-56028 | 1 | 2.0 | 2.8 | 11.8 | 76.5 | 8.9 | 4.0 | -- | -- | -- |
| | | | | 2 | -- | -- | 12.2 | 78.6 | 9.2 | 4.1 | -- | -- | -- |
| | | | | 3 | -- | -- | 13.4 | 86.6 | -- | 4.5 | -- | -- | -- |

**Table 3.** Proximate and ultimate analyses, air-drying loss, heat of combustion, fusibility of ash, and free-swelling index of coal in west-central Arkansas—Continued

| (percent) | | | | Heat of combustion (Btu/lb) | Fusibility of ash (°F) | | | Free-swelling index | Source of analyses | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| Hydrogen | Carbon | Nitrogen | Oxygen | | Initial deformation temp. | Softening temp. | Fluid temp. | | | |
| -- | -- | -- | -- | 13,710 | -- | -- | -- | -- | B | |
| -- | -- | -- | -- | 14,010 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,370 | -- | 2,450 | -- | -- | A | Sample of 5.75- to 7.5-in. coal |
| -- | -- | -- | -- | 13,620 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,360 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,350 | -- | 2,450 | -- | -- | A | Sample of 2.5- to 5.75-in. coal. |
| -- | -- | -- | -- | 13,600 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,370 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,530 | -- | 2,450 | -- | -- | A | Sample of 1.5- to 2.5-in. coal. |
| -- | -- | -- | -- | 13,770 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,410 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,240 | -- | 2,290 | -- | -- | A | Sample of 1- to 1.5-in. coal. |
| -- | -- | -- | -- | 13,490 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,390 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 12,440 | -- | 2,210 | -- | -- | A | Sample from less than 0.5-in. coal. |
| -- | -- | -- | -- | 12,750 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,210 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,860 | -- | 2,400 | -- | -- | A | Sample of 6- to 7.5-in. coal. |
| -- | -- | -- | -- | 14,160 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,470 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,910 | -- | 2,360 | -- | -- | A | Sample of 3- to 6-in. coal. |
| -- | -- | -- | -- | 14,230 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,440 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,890 | -- | 2,290 | -- | -- | A | Sample of 1.5- to 3-in. coal. |
| -- | -- | -- | -- | 14,210 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,420 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,520 | -- | 2,120 | -- | -- | A | Sample of 0.625- to 1.5-in. coal. |
| -- | -- | -- | -- | 13,870 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,460 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 12,800 | -- | 2,190 | -- | -- | A | Sample of less than 0.625-in. coal. |
| -- | -- | -- | -- | 13,230 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,310 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,910 | -- | 2,370 | -- | -- | C | |
| -- | -- | -- | -- | 13,690 | -- | 2,380 | -- | -- | C | |
| -- | -- | -- | -- | 14,080 | -- | 2,390 | -- | -- | C | |
| 3.8 | 81.4 | 1.6 | 4.0 | 13,880 | -- | -- | -- | -- | C | Composite of samples A-99386, A-99387, and A-99388. |
| 3.6 | 83.6 | 1.6 | 1.7 | 14,240 | -- | -- | -- | -- | -- | |
| 3.9 | 90.6 | 1.8 | 1.8 | 15,430 | -- | -- | -- | -- | -- | |
| 3.8 | 81.6 | 1.6 | 4.2 | 13,940 | 2,420 | 2,470 | 2,690 | 0.5 | A | |
| 3.7 | 83.3 | 1.6 | 2.5 | 14,230 | -- | -- | -- | -- | -- | |
| 4.0 | 90.4 | 1.7 | 2.7 | 15,440 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,590 | -- | 2,510 | -- | -- | A | Sample of 10-in. coal. |
| -- | -- | -- | -- | 14,030 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,390 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,540 | -- | 2,510 | -- | -- | A | Sample of 5- to 10-in. coal. |
| -- | -- | -- | -- | 13,980 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,410 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,630 | -- | 2,510 | -- | -- | A | Sample of 3- to 5-in. coal. |
| -- | -- | -- | -- | 14,020 | -- | -- | -- | -- | -- | |
| -- | - | -- | -- | 15,440 | -- | -- | -- | -- | -- | |

**Table 3.** Proximate and ultimate analyses, air-drying loss, heat of combustion, fusibility of ash, and free-swelling index of coal in west-central Arkansas—Continued

| Locality No. | Thickness (in.) | Site of sample | U.S. Bur. Mines lab No. | Condition | Air-drying loss (pct) | Proximate analyses (percent) | | | | Ultimate analyses | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Moisture | Volatile matter | Fixed carbon | Ash | Sulfur | Forms of Sulfur | | |
| | | | | | | | | | | | Sulfate | Pyritic | Organic |
| 70 | | | B-56029 | 1 | 1.7 | 2.5 | 12.2 | 73.5 | 11.8 | 3.3 | -- | -- | -- |
| | | | | 2 | -- | -- | 12.5 | 75.4 | 12.1 | 3.3 | -- | -- | -- |
| | | | | 3 | -- | -- | 14.3 | 85.7 | -- | 3.8 | -- | -- | -- |
| | | | B-56030 | 1 | 3.4 | 4.3 | 11.7 | 67.8 | 16.2 | 3.1 | -- | -- | -- |
| | | | | 2 | -- | -- | 12.3 | 70.7 | 17.0 | 3.3 | -- | -- | -- |
| | | | | 3 | -- | -- | 14.8 | 85.2 | -- | 3.9 | -- | -- | -- |
| 71 | -- | M | A-99390 | 1 | 1.8 | 2.6 | 11.4 | 78.1 | 7.9 | 1.7 | -- | -- | -- |
| | | | A-99391 | 1 | 1.7 | 2.5 | 10.6 | 79.8 | 7.1 | 2.0 | -- | -- | -- |
| | | | A-99392 | 1 | 1.7 | 2.5 | 11.3 | 79.1 | 7.1 | 1.7 | -- | -- | -- |
| | | | A-99393 | 1 | 1.8 | 2.5 | 10.9 | 79.2 | 7.4 | 1.9 | -- | -- | -- |
| | | | | 2 | -- | -- | 11.2 | 81.2 | 7.6 | 1.9 | -- | -- | -- |
| | | | | 3 | -- | -- | 12.1 | 87.9 | -- | 2.1 | -- | -- | -- |
| Logan County | | | | | | | | | | | | | |
| 72 | 40 | S | K-54020 | 1 | -- | 3.6 | 14.5 | 71.3 | 10.6 | 1.3 | 0.11 | 0.75 | 0.46 |
| | | | | 2 | -- | -- | 15.1 | 74.0 | 10.9 | 1.4 | .11 | .78 | .48 |
| | | | | 3 | -- | -- | 16.9 | 83.1 | -- | 1.5 | .11 | .88 | .54 |
| 73 | 37 | M | B-23744 | 1 | 3.0 | 3.5 | 12.2 | 76.6 | 7.7 | 1.4 | -- | -- | -- |
| | | | | 2 | -- | -- | 12.7 | 79.3 | 8.0 | 1.4 | -- | -- | -- |
| | | | | 3 | -- | -- | 13.8 | 86.2 | -- | 1.6 | -- | -- | -- |
| | 37 | | B-23745 | 1 | 3.2 | 3.8 | 12.8 | 75.1 | 8.3 | 1.1 | -- | -- | -- |
| | | | | 2 | -- | -- | 13.3 | 78.1 | 8.6 | 1.1 | -- | -- | -- |
| | | | | 3 | -- | -- | 14.5 | 85.5 | -- | 1.2 | -- | -- | -- |
| | | | B-23746 | 1 | 3.1 | 3.6 | 12.6 | 75.8 | 8.0 | 1.2 | -- | -- | -- |
| | | | | 2 | -- | -- | 13.1 | 78.6 | 8.3 | 1.3 | -- | -- | -- |
| | | | | 3 | -- | -- | 14.3 | 85.7 | -- | 1.4 | -- | -- | -- |
| Pope County | | | | | | | | | | | | | |
| 74 | -- | T | B-57441 | 1 | 1.7 | 2.3 | 12.2 | 76.1 | 9.4 | 1.5 | -- | -- | -- |
| | | | | 2 | -- | -- | 12.5 | 77.9 | 9.6 | 1.5 | -- | -- | -- |
| | | | | 3 | -- | -- | 13.9 | 86.1 | -- | 1.7 | -- | -- | -- |
| | | | B-57442 | 1 | 1.7 | 2.3 | 12.1 | 75.9 | 9.7 | 1.7 | -- | -- | -- |
| | | | | 2 | -- | -- | 12.4 | 77.7 | 9.9 | 1.7 | -- | -- | -- |
| | | | | 3 | -- | -- | 13.7 | 86.3 | -- | 1.9 | -- | -- | -- |
| | | | B-57443 | 1 | 1.8 | 2.2 | 12.2 | 74.7 | 10.9 | 2.1 | -- | -- | -- |
| | | | | 2 | -- | -- | 12.5 | 76.3 | 11.2 | 2.2 | -- | -- | -- |
| | | | | 3 | -- | -- | 14.0 | 86.0 | -- | 2.4 | -- | -- | -- |
| | | | B-57444 | 1 | 1.8 | 2.2 | 11.9 | 74.8 | 11.1 | 1.9 | -- | -- | -- |
| | | | | 2 | -- | -- | 12.2 | 76.4 | 11.4 | 2.0 | -- | -- | -- |
| | | | | 3 | -- | -- | 13.8 | 86.2 | -- | 2.2 | -- | -- | -- |
| | | | B-57445 | 1 | 1.8 | 2.2 | 12.7 | 72.9 | 12.2 | 1.8 | -- | -- | -- |
| | | | | 2 | -- | -- | 13.0 | 74.6 | 12.4 | 1.9 | -- | -- | -- |
| | | | | 3 | -- | -- | 14.8 | 85.2 | -- | 2.2 | -- | -- | -- |
| | | M | 18755 | 1 | 2.2 | 2.8 | 11.9 | 75.2 | 10.1 | 2.2 | -- | -- | -- |
| | | | | 2 | -- | -- | 12.2 | 77.4 | 10.4 | 2.2 | -- | -- | -- |
| | | | | 3 | -- | -- | 13.7 | 86.3 | -- | 2.5 | -- | -- | -- |
| 75 | -- | M | A-99410 | 1 | 1.7 | 2.5 | 11.3 | 77.4 | 8.8 | 1.7 | -- | -- | -- |
| | | | A-99411 | 1 | 2.0 | 2.9 | 10.7 | 77.7 | 8.7 | 1.8 | -- | -- | -- |
| | | | A-99412 | 1 | 1.5 | 2.6 | 10.7 | 77.6 | 9.1 | 2.2 | -- | -- | -- |

**Table 3.** Proximate and ultimate analyses, air-drying loss, heat of combustion, fusibility of ash, and free-swelling index of coal in west-central Arkansas—Continued

| (percent) | | | | Heat of combustion (Btu/lb) | Fusibility of ash (°F) | | | Free-swelling index | Source of analyses | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| Hydrogen | Carbon | Nitrogen | Oxygen | | Initial deformation temp. | Softening temp. | Fluid temp. | | | |
| -- | -- | -- | -- | 13,200 | -- | 2,230 | -- | -- | A | Sample of 0.875- to 3-in. |
| -- | -- | -- | -- | 13,540 | -- | -- | -- | -- | -- | coal. |
| -- | -- | -- | -- | 15,410 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 12,110 | -- | 2,430 | -- | -- | A | Sample of less than |
| -- | -- | -- | -- | 12,650 | -- | -- | -- | -- | -- | 0.875-in. coal. |
| -- | -- | -- | -- | 15,240 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,780 | -- | 2,310 | -- | -- | C | |
| -- | -- | -- | -- | 13,990 | -- | 2,570 | -- | -- | C | |
| -- | -- | -- | -- | 13,980 | -- | 2,430 | -- | -- | C | |
| 3.9 | 82.2 | 1.6 | 3.0 | 13,930 | -- | -- | -- | -- | C | Composite of samples |
| 3.7 | 84.3 | 1.6 | .9 | 14,290 | -- | -- | -- | -- | -- | A-99390, A-99391, and |
| 4.1 | 91.2 | 1.7 | .9 | 15,470 | -- | -- | -- | -- | -- | A-99392. |
| | | | | | Logan County--Continued | | | | | |
| 3.8 | 77.4 | 1.6 | 5.3 | 13,150 | 2,080 | 2,130 | 2,180 | .5 | A | |
| 3.5 | 80.3 | 1.6 | 2.3 | 13,646 | -- | -- | -- | -- | -- | |
| 4.0 | 90.2 | 1.8 | 2.5 | 15,310 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,750 | -- | 2,210 | -- | -- | A | |
| -- | -- | -- | -- | 14,240 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,480 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,540 | -- | 2,140 | -- | -- | A | |
| -- | -- | -- | -- | 14,080 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,410 | -- | -- | -- | -- | -- | |
| 4.1 | 80.4 | 1.6 | 4.7 | 13,610 | -- | -- | -- | -- | A | Composite of samples |
| 3.8 | 83.4 | 1.6 | 1.6 | 14,120 | -- | -- | -- | -- | -- | B-23744 and B-23745. |
| 4.2 | 91.0 | 1.8 | 1.6 | 15,410 | -- | -- | -- | -- | -- | |
| | | | | | Pope County--Continued | | | | | |
| -- | -- | -- | -- | 13,620 | -- | 2,320 | -- | -- | A | Sample of 5.5- to 7.5-in. |
| -- | -- | -- | -- | 13,940 | -- | -- | -- | -- | -- | coal. |
| -- | -- | -- | -- | 15,420 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,580 | -- | 2,300 | -- | -- | -- | Sample of 2.25- to 5.5-in. |
| -- | -- | -- | -- | 13,900 | -- | -- | -- | -- | -- | coal. |
| -- | -- | -- | -- | 15,420 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,370 | -- | 2,220 | -- | -- | A | Sample of 1.5- to 2.25-in. |
| -- | -- | -- | -- | 13,670 | -- | -- | -- | -- | -- | coal. |
| -- | -- | -- | -- | 15,390 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,320 | -- | 2,170 | -- | -- | A | Sample of 0.875- to 1.5-in. |
| -- | -- | -- | -- | 13,620 | -- | -- | -- | -- | -- | coal. |
| -- | -- | -- | -- | 15,370 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,130 | -- | 2,220 | -- | -- | A | Sample of less than |
| -- | -- | -- | -- | 13,430 | -- | -- | -- | -- | -- | 0.875-in. coal. |
| -- | -- | -- | -- | 15,340 | -- | -- | -- | -- | -- | |
| 3.7 | 78.3 | 1.7 | 4.0 | 13,360 | -- | 2,180 | -- | -- | B | |
| 3.5 | 80.5 | 1.7 | 1.7 | 13,740 | -- | -- | -- | -- | -- | |
| 3.9 | 89.8 | 1.9 | 1.9 | 15,330 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,660 | -- | 2,450 | -- | -- | C | |
| -- | -- | -- | -- | 13,580 | -- | 2,360 | -- | -- | C | |
| -- | -- | -- | -- | 13,610 | -- | 2,330 | -- | -- | C | |

**Table 3.** Proximate and ultimate analyses, air-drying loss, heat of combustion, fusibility of ash, and free-swelling index of coal in west-central Arkansas—Continued

| Locality No. | Thickness (in.) | Site of sample | U.S. Bur. Mines lab No. | Condition | Air-drying loss (pct) | Proximate analyses (percent) | | | | Ultimate analyses | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Moisture | Volatile matter | Fixed carbon | Ash | Sulfur | Forms of Sulfur: Sulfate | Pyritic | Organic |
| 75 | | | A-99413 | 1 | 1.7 | 2.7 | 10.9 | 77.6 | 8.8 | 2.0 | -- | -- | -- |
| | | | | 2 | -- | -- | 11.2 | 79.7 | 9.1 | 2.0 | -- | -- | -- |
| | | | | 3 | -- | -- | 12.4 | 87.6 | -- | 2.2 | -- | -- | -- |
| 76 | -- | M | 3176 | 1 | 1.4 | 2.1 | 9.8 | 78.8 | 9.3 | 1.7 | -- | -- | -- |
| | | | | 2 | -- | -- | 10.0 | 80.5 | 9.5 | 1.8 | -- | -- | -- |
| | | | | 3 | -- | -- | 11.1 | 88.9 | -- | 2.0 | -- | -- | -- |
| **Charleston coal bed** | | | | | | | | | | | | | |
| Sebastian County | | | | | | | | | | | | | |
| 77 | -- | M | 3218 | 1 | 2.6 | 3.8 | 16.0 | 75.8 | 4.4 | 2.2 | -- | -- | -- |
| | | | | 2 | -- | -- | 16.6 | 78.8 | 4.6 | 2.3 | -- | -- | -- |
| Franklin County | | | | | | | | | | | | | |
| 78 | 16 | S | K-63746 | 1 | -- | 3.1 | 16.8 | 78.5 | 1.6 | 0.9 | 0.01 | 0.05 | 0.81 |
| | | | | 2 | -- | -- | 17.3 | 81.0 | 1.7 | .9 | .01 | .05 | .84 |
| | | | | 3 | -- | -- | 17.6 | 82.4 | -- | .9 | .01 | .05 | .85 |
| 79 | -- | T | B-56102 | 1 | 1.6 | 2.2 | 19.3 | 71.7 | 6.8 | 3.1 | -- | -- | -- |
| | | | | 2 | -- | -- | 19.7 | 73.4 | 6.9 | 3.2 | -- | -- | -- |
| | | | | 3 | -- | -- | 21.2 | 78.8 | -- | 3.4 | -- | -- | -- |
| 80 | 16 | S | K-54022 | 1 | -- | 1.3 | 20.4 | 71.2 | 7.7 | 3.5 | .13 | 2.94 | .40 |
| | | | | 2 | -- | -- | 20.7 | 72.2 | 7.1 | 3.5 | .13 | 2.98 | .40 |
| | | | | 3 | -- | -- | 22.3 | 77.7 | -- | 3.8 | .14 | 3.21 | .44 |
| 81 | 16 | S | K-63745 | 1 | -- | 1.8 | 18.6 | 72.8 | 6.8 | 3.4 | .01 | 2.51 | .89 |
| | | | | 2 | -- | -- | 18.9 | 74.2 | 6.9 | 3.5 | .01 | 2.56 | .91 |
| | | | | 3 | -- | -- | 20.3 | 79.7 | -- | 3.7 | .01 | 2.75 | .98 |
| **Paris coal bed** | | | | | | | | | | | | | |
| Franklin County | | | | | | | | | | | | | |
| 82 | 27 | M | E-40767 | 1 | -- | 1.0 | 20.0 | 74.3 | 4.7 | 2.4 | -- | -- | -- |
| | | | | 2 | -- | -- | 20.2 | 75.1 | 4.7 | 2.4 | -- | -- | -- |
| | | | | 3 | -- | -- | 21.2 | 78.8 | -- | 2.4 | -- | -- | -- |
| Logan County | | | | | | | | | | | | | |
| 83 | -- | T | B-56172 | 1 | 0.8 | 1.3 | 18.6 | 71.5 | 8.6 | 2.1 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.8 | 72.5 | 8.7 | 2.1 | -- | -- | -- |
| | | | | 3 | -- | -- | 20.6 | 79.4 | -- | 2.3 | -- | -- | -- |
| | | | B-56173 | 1 | .8 | 1.3 | 18.9 | 71.4 | 8.4 | 2.1 | -- | -- | -- |
| | | | | 2 | -- | -- | 19.2 | 72.3 | 8.5 | 2.1 | -- | -- | -- |
| | | | | 3 | -- | -- | 21.0 | 79.0 | -- | 2.3 | -- | -- | -- |
| | | | B-56174 | 1 | .7 | 1.3 | 18.4 | 72.0 | 8.3 | 2.0 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.6 | 73.0 | 8.4 | 2.1 | -- | -- | -- |
| | | | | 3 | -- | -- | 20.3 | 79.7 | -- | 2.3 | -- | -- | -- |
| | | | B-56175 | 1 | .9 | 1.5 | 18.5 | 71.2 | 8.8 | 2.0 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.8 | 72.3 | 8.9 | 2.0 | -- | -- | -- |
| | | | | 3 | -- | -- | 20.7 | 79.3 | -- | 2.2 | -- | -- | -- |
| | | | B-56176 | 1 | .9 | 1.6 | 17.8 | 66.0 | 14.6 | 2.0 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.1 | 67.1 | 14.8 | 2.0 | -- | -- | -- |
| | | | | 3 | -- | -- | 21.3 | 78.7 | -- | 2.4 | -- | -- | -- |
| | | | B-56177 | 1 | 1.4 | 2.0 | 17.9 | 62.7 | 17.4 | -- | -- | -- | -- |
| | | | | 2 | -- | -- | 18.3 | 64.0 | 17.7 | -- | -- | -- | -- |
| | | | | 3 | -- | -- | 22.2 | 77.8 | -- | -- | -- | -- | -- |
| | | | A-99828 | 1 | 1.0 | 1.6 | 18.6 | 71.4 | 8.4 | 2.4 | -- | -- | -- |

**Table 3.** Proximate and ultimate analyses, air-drying loss, heat of combustion, fusibility of ash, and free-swelling index of coal in west-central Arkansas—Continued

| (percent) | | | | Heat of combustion (Btu/lb) | Fusibility of ash (°F) | | | Free-swelling index | Source of analyses | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| Hydrogen | Carbon | Nitrogen | Oxygen | | Initial deformation temp. | Softening temp. | Fluid temp. | | | |
| 3.7 | 80.7 | 1.5 | 3.3 | 13,600 | -- | -- | -- | -- | C | Composite of samples |
| 3.5 | 83.0 | 1.6 | .8 | 13,980 | -- | -- | -- | -- | -- | A-99410, A-99411, and |
| 3.9 | 91.3 | 1.7 | .9 | 15,380 | -- | -- | -- | -- | -- | A-99412. |
| 3.6 | 80.3 | 1.5 | 3.6 | 13,700 | -- | -- | -- | -- | B | |
| 3.5 | 82.0 | 1.5 | 1.7 | 13,990 | -- | -- | -- | -- | -- | |
| 3.8 | 90.6 | 1.7 | 1.9 | 15,460 | -- | -- | -- | -- | -- | |
| **Charleston coal bed--Continued** | | | | | | | | | | |
| Sebastian County--Continued | | | | | | | | | | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | B | Coal is weathered. |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Franklin County--Continued | | | | | | | | | | |
| 4.7 | 85.1 | 1.8 | 5.9 | 14,740 | 2,140 | 2,190 | 2,250 | 2 | A | Coal is slightly |
| 4.4 | 87.8 | 1.8 | 3.4 | 15,210 | -- | -- | -- | -- | -- | weathered. |
| 4.5 | 89.3 | 1.9 | 3.4 | 15,470 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,220 | -- | 2,330 | -- | -- | A | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 4.4 | 81.7 | 1.6 | 1.7 | 14,290 | 2,200 | 2,250 | 2,300 | 9 | A | |
| 4.3 | 82.8 | 1.6 | .7 | 14,480 | -- | -- | -- | -- | -- | |
| 4.6 | 89.2 | 1.7 | .7 | 15,590 | -- | -- | -- | -- | -- | |
| 4.4 | 81.0 | 1.6 | 2.8 | 14,200 | 2,480 | 2,530 | 2,590 | 9 | A | |
| 4.3 | 82.5 | 1.6 | 1.2 | 14,450 | -- | -- | -- | -- | -- | |
| 4.6 | 88.6 | 1.8 | 1.3 | 15,530 | -- | -- | -- | -- | -- | |
| **Paris coal bed--Continued** | | | | | | | | | | |
| Franklin County--Continued | | | | | | | | | | |
| 4.6 | 83.8 | 1.5 | 3.0 | 14,750 | 2,090 | 2,190 | 2,380 | 9 | A | |
| 4.5 | 84.6 | 1.5 | 2.3 | 14,900 | -- | -- | -- | -- | -- | |
| 4.7 | 88.8 | 1.6 | 2.4 | 15,640 | -- | -- | -- | -- | -- | |
| Logan County--Continued | | | | | | | | | | |
| -- | -- | -- | -- | 14,050 | -- | 2,420 | -- | -- | A | Sample of 9-in. coal. |
| -- | -- | -- | -- | 14,230 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,590 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,070 | -- | 2,430 | -- | -- | A | Sample of 5- to 9-in. |
| -- | -- | -- | -- | 14,250 | -- | -- | -- | -- | -- | coal. |
| -- | -- | -- | -- | 15,580 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,130 | -- | 2,410 | -- | -- | A | Sample of 3- to 5-in. |
| -- | -- | -- | -- | 14,320 | -- | -- | -- | -- | -- | coal. |
| -- | -- | -- | -- | 15,640 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,970 | -- | 2,410 | -- | -- | A | Sample of 1.25- to |
| -- | -- | -- | -- | 14,180 | -- | -- | -- | -- | -- | 3-in. coal. |
| -- | -- | -- | -- | 15,580 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,000 | -- | 2,070 | -- | -- | A | Sample of 9.875- to |
| -- | -- | -- | -- | 13,200 | -- | -- | -- | -- | -- | 1.25-in. coal. |
| -- | -- | -- | -- | 15,500 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 12,380 | -- | 2,130 | -- | -- | A | Sample of less than |
| -- | -- | -- | -- | 12,630 | -- | -- | -- | -- | -- | 0.875-in. coal. |
| -- | -- | -- | -- | 15,360 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,100 | -- | 2,370 | -- | -- | C | |

**Table 3.** Proximate and ultimate analyses, air-drying loss, heat of combustion, fusibility of ash, and free-swelling index of coal in west-central Arkansas—Continued

| Locality No. | Thickness (in.) | Site of sample | U.S. Bur. Mines lab No. | Condition | Air-drying loss (pct) | Proximate analyses (percent) | | | | Ultimate analyses | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Moisture | Volatile matter | Fixed carbon | Ash | Sulfur | Forms of Sulfur | | |
| | | | | | | | | | | | Sulfate | Pyritic | Organic |
| 83 | | | A-99829 | 1 | 1.3 | 1.8 | 17.7 | 70.9 | 9.6 | 3.1 | -- | -- | -- |
| | | | A-99384 | 1 | 1.5 | 2.0 | 18.2 | 71.3 | 8.5 | 2.3 | -- | -- | -- |
| | | | A-99830 | 1 | 1.3 | 1.8 | 18.2 | 71.1 | 8.9 | 2.4 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.5 | 72.5 | 9.0 | 2.5 | -- | -- | -- |
| | | | | 3 | -- | -- | 20.3 | 79.7 | -- | 2.7 | -- | -- | -- |
| 84 | -- | T | B-57593 | 1 | 1.5 | 1.5 | 19.0 | 71.6 | 7.9 | 2.0 | -- | -- | -- |
| | | | | 2 | -- | -- | 19.3 | 72.6 | 8.1 | 2.1 | -- | -- | -- |
| | | | | 3 | -- | -- | 21.0 | 79.0 | -- | 2.3 | -- | -- | -- |
| | | | B-57594 | 1 | 1.2 | 1.5 | 19.0 | 71.3 | 8.2 | 2.0 | -- | -- | -- |
| | | | | 2 | -- | -- | 19.3 | 72.4 | 8.3 | 2.0 | -- | -- | -- |
| | | | | 3 | -- | -- | 21.0 | 79.0 | -- | 2.2 | -- | -- | -- |
| | | | B-57595 | 1 | 2.0 | 2.5 | 17.4 | 58.5 | 21.6 | 1.7 | -- | -- | -- |
| | | | | 2 | -- | -- | 17.9 | 59.9 | 22.2 | 1.8 | -- | -- | -- |
| | | | | 3 | -- | -- | 23.0 | 77.0 | -- | 2.2 | -- | -- | -- |
| 85 | -- | T | B-56335 | 1 | 1.3 | 1.7 | 18.6 | 72.3 | 7.4 | 2.1 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.9 | 73.6 | 7.5 | 2.2 | -- | -- | -- |
| | | | | 3 | -- | -- | 20.5 | 79.5 | -- | 2.3 | -- | -- | -- |
| | | | B-56336 | 1 | 1.1 | 1.5 | 18.2 | 72.3 | 8.0 | 2.3 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.4 | 73.5 | 8.1 | 2.4 | -- | -- | -- |
| | | | | 3 | -- | -- | 20.1 | 79.9 | -- | 2.6 | -- | -- | -- |
| | | | B-56337 | 1 | 1.3 | 1.7 | 17.8 | 69.3 | 11.2 | 2.4 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.1 | 70.5 | 11.4 | 2.4 | -- | -- | -- |
| | | | | 3 | -- | -- | 20.4 | 79.6 | -- | 2.7 | -- | -- | -- |
| | | | B-56338 | 1 | 1.5 | 2.1 | 17.3 | 59.9 | 20.7 | 1.9 | -- | -- | -- |
| | | | | 2 | -- | -- | 17.7 | 61.1 | 21.2 | 2.0 | -- | -- | -- |
| | | | | 3 | -- | -- | 22.5 | 77.5 | -- | 2.5 | -- | -- | -- |
| 86 | -- | M | A-99406 | 1 | 1.1 | 1.7 | 17.9 | 71.1 | 9.3 | 2.6 | -- | -- | -- |
| | | | A-99407 | 1 | 1.2 | 1.8 | 17.1 | 70.7 | 10.4 | 2.9 | -- | -- | -- |
| | | | A-99408 | 1 | 1.0 | 1.5 | 17.5 | 72.4 | 8.6 | 2.4 | -- | -- | -- |
| | | | A-99409 | 1 | 1.1 | 1.6 | 17.6 | 71.3 | 9.5 | 2.7 | -- | -- | -- |
| | | | | 2 | -- | -- | 17.9 | 72.4 | 9.7 | 2.7 | -- | -- | -- |
| | | | | 3 | -- | -- | 19.8 | 80.2 | -- | 3.0 | -- | -- | -- |
| 87 | -- | T | B-56359 | 1 | 1.4 | 1.8 | 18.0 | 71.4 | 8.8 | 2.4 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.3 | 72.7 | 9.0 | 2.5 | -- | -- | -- |
| | | | | 3 | -- | -- | 20.1 | 79.9 | -- | 2.7 | -- | -- | -- |
| | | | B-56360 | 1 | 1.3 | 1.7 | 17.7 | 72.1 | 8.5 | 2.3 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.0 | 73.3 | 8.7 | 2.3 | -- | -- | -- |
| | | | | 3 | -- | -- | 19.7 | 80.3 | -- | 2.5 | -- | -- | -- |
| | | | B-56361 | 1 | 1.3 | 1.8 | 17.4 | 71.1 | 9.7 | 2.5 | -- | -- | -- |
| | | | | 2 | -- | -- | 17.7 | 72.4 | 9.9 | 2.6 | -- | -- | -- |
| | | | | 3 | -- | -- | 19.6 | 80.4 | -- | 2.8 | -- | -- | -- |
| | | | B-56362 | 1 | 1.6 | 2.1 | 17.2 | 67.3 | 13.4 | 2.3 | -- | -- | -- |
| | | | | 2 | -- | -- | 17.6 | 68.7 | 13.7 | 2.4 | -- | -- | -- |
| | | | | 3 | -- | -- | 20.4 | 79.6 | -- | 2.7 | -- | -- | -- |
| 88 | -- | M | 18750 | 1 | 1.8 | 2.5 | 17.1 | 70.6 | 9.8 | 3.3 | -- | -- | -- |
| | | | 18751 | 1 | 1.8 | 2.4 | 17.3 | 70.4 | 9.9 | 3.1 | -- | -- | -- |
| | | | 18752 | 1 | 1.9 | 2.5 | 17.1 | 70.5 | 9.9 | 3.2 | -- | -- | -- |

**Table 3.** Proximate and ultimate analyses, air-drying loss, heat of combustion, fusibility of ash, and free-swelling index of coal in west-central Arkansas—Continued

| (percent) | | | | Heat of combustion (Btu/lb) | Fusibility of ash (°F) | | | Free-swelling index | Source of analyses | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| Hydrogen | Carbon | Nitrogen | Oxygen | | Initial deformation temp. | Softening temp. | Fluid temp. | | | |
| -- | -- | -- | -- | 13,900 | -- | 2,370 | -- | -- | C | |
| -- | -- | -- | -- | 14,070 | -- | 2,390 | -- | -- | C | |
| 4.4 | 80.6 | 1.6 | 2.1 | 13,990 | -- | -- | -- | -- | C | Composite of samples |
| 4.2 | 82.0 | 1.6 | .7 | 14,240 | -- | -- | -- | -- | -- | A-99828, A-99829, |
| 4.7 | 90.1 | 1.8 | .7 | 15,660 | -- | -- | -- | -- | -- | and A-99384. |
| -- | -- | -- | -- | 14,160 | -- | 2,320 | -- | -- | A | Sample of 8-in. coal. |
| -- | -- | -- | -- | 14,370 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,630 | -- | -- | -- | - | -- | |
| -- | -- | -- | -- | 14,170 | -- | 2,320 | -- | -- | A | Sample of 3- to 8-in. |
| -- | -- | -- | -- | 14,390 | -- | -- | -- | -- | -- | coal. |
| -- | -- | -- | -- | 15,690 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 11,670 | -- | 2,210 | -- | -- | A | Sample of less than |
| -- | -- | -- | -- | 11,970 | -- | -- | -- | -- | -- | 3-in. coal. |
| -- | -- | -- | -- | 15,380 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,160 | -- | 2,400 | -- | -- | A | Sample of 8-in. coal. |
| -- | -- | -- | -- | 14,410 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,570 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,070 | -- | 2,410 | -- | -- | A | Sample of 3- to 8-in. |
| -- | -- | -- | -- | 14,280 | -- | -- | -- | -- | -- | coal. |
| -- | -- | -- | -- | 15,540 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,510 | -- | 2,150 | -- | -- | A | Sample of 1.25- to |
| -- | -- | -- | -- | 13,750 | -- | -- | -- | -- | -- | 3-in. coal. |
| -- | -- | -- | -- | 15,520 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 11,730 | -- | 2,180 | -- | -- | A | Sample of less than |
| -- | -- | -- | -- | 11,990 | -- | -- | -- | -- | -- | 1.25-in. coal. |
| -- | -- | -- | -- | 15,210 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,950 | -- | 2,340 | -- | -- | C | |
| -- | -- | -- | -- | 13,730 | -- | 2,390 | -- | -- | C | |
| -- | -- | -- | -- | 14,070 | -- | 2,340 | -- | -- | C | |
| 4.3 | 80.0 | 1.5 | 2.0 | 13,930 | -- | -- | -- | -- | C | Composite of samples |
| 4.2 | 81.3 | 1.6 | .5 | 14,160 | -- | -- | -- | -- | -- | A-99406, A-99407, |
| 4.6 | 90.9 | 1.7 | .7 | 15,670 | -- | -- | -- | -- | -- | and A-99408. |
| -- | -- | -- | -- | 13,890 | -- | 2,410 | -- | -- | A | Sample of 8-in. coal. |
| -- | -- | -- | -- | 14,140 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,530 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,910 | -- | 2,360 | -- | -- | A | Sample of 4- to 8-in. |
| -- | -- | -- | -- | 14,150 | -- | -- | -- | -- | -- | coal. |
| -- | -- | -- | -- | 15,490 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,760 | -- | 2,310 | -- | -- | A | Sample of 2- to 4-in. |
| -- | -- | -- | -- | 14,010 | -- | -- | -- | -- | -- | coal. |
| -- | -- | -- | -- | 15,550 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 12,970 | -- | 2,130 | -- | -- | A | Sample of less than |
| -- | -- | -- | -- | 13,250 | -- | -- | -- | -- | -- | 2-in. coal. |
| -- | -- | -- | -- | 15,340 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,500 | -- | 2,130 | -- | -- | B | |
| -- | -- | -- | -- | 13,570 | -- | 2,140 | -- | -- | B | |
| -- | -- | -- | -- | 13,570 | -- | 2,160 | -- | -- | B | |

**Table 3.** Proximate and ultimate analyses, air-drying loss, heat of combustion, fusibility of ash, and free-swelling index of coal in west-central Arkansas—Continued

| Locality No. | Thickness (in.) | Site of sample | U.S. Bur. Mines lab No. | Condition | Air-drying loss (pct) | Proximate analyses (percent) | | | | Ultimate analyses | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Moisture | Volatile matter | Fixed carbon | Ash | Sulfur | Forms of Sulfur: Sulfate | Pyritic | Organic |
| 88 | | | 18753 | 1 | 1.8 | 2.4 | 17.2 | 70.4 | 10.0 | 3.2 | -- | -- | -- |
| | | | | 2 | -- | -- | 17.7 | 72.0 | 10.3 | 3.3 | -- | -- | -- |
| | | | | 3 | -- | -- | 19.7 | 80.3 | -- | 3.7 | -- | -- | -- |
| 89 | -- | M | A-99833 | 1 | 1.4 | 1.9 | 16.5 | 73.5 | 8.1 | 2.0 | -- | -- | -- |
| | | | A-99824 | 1 | 2.0 | 2.5 | 16.7 | 70.9 | 9.9 | 2.5 | -- | -- | -- |
| | | | A-99826 | 1 | 1.7 | 2.2 | 16.6 | 72.0 | 9.2 | 2.1 | -- | -- | -- |
| | | | | 2 | -- | -- | 16.9 | 73.7 | 9.4 | 2.2 | -- | -- | -- |
| | | | | 3 | -- | -- | 18.7 | 81.3 | -- | 2.4 | -- | -- | -- |
| 90 | 14 | S | K-54021 | 1 | -- | 4.3 | 17.5 | 75.4 | 2.8 | .6 | 0.02 | 0.07 | 0.46 |
| | | | | 2 | -- | -- | 18.3 | 78.8 | 2.9 | .6 | .02 | .07 | .48 |
| | | | | 3 | -- | -- | 18.9 | 81.1 | -- | .6 | .02 | .07 | .50 |
| 91 | 19 | S | K-63747 | 1 | -- | 3.5 | 16.2 | 76.0 | 4.3 | 1.6 | .06 | .52 | .98 |
| | | | | 2 | -- | -- | 16.8 | 78.7 | 4.5 | 1.6 | .06 | .54 | 1.02 |
| | | | | 3 | -- | -- | 17.6 | 82.4 | -- | 1.7 | .06 | .57 | 1.07 |
| 92 | -- | T | B-56395 | 1 | 1.1 | 1.5 | 18.0 | 73.5 | 7.0 | 1.4 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.3 | 74.6 | 7.1 | 1.4 | -- | -- | -- |
| | | | | 3 | -- | -- | 19.7 | 80.3 | -- | 1.5 | -- | -- | -- |
| | | | B-56396 | 1 | 1.0 | 1.4 | 17.8 | 73.5 | 7.3 | 1.6 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.1 | 74.5 | 7.4 | 1.6 | -- | -- | -- |
| | | | | 3 | -- | -- | 19.5 | 80.5 | -- | 1.7 | -- | -- | -- |
| | | | B-56397 | 1 | 1.0 | 1.4 | 17.7 | 71.0 | 9.9 | 1.7 | -- | -- | -- |
| | | | | 2 | -- | -- | 17.9 | 72.0 | 10.1 | 1.7 | -- | -- | -- |
| | | | | 3 | -- | -- | 19.9 | 80.1 | -- | 1.9 | -- | -- | -- |
| 93 | -- | T | B-56449 | 1 | .7 | 1.2 | 18.5 | 72.2 | 8.1 | 2.1 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.7 | 73.1 | 8.2 | 2.1 | -- | -- | -- |
| | | | | 3 | -- | -- | 20.4 | 79.6 | -- | 2.3 | -- | -- | -- |
| | | | B-56450 | 1 | .7 | 1.1 | 18.3 | 72.2 | 8.4 | 1.9 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.5 | 73.0 | 8.5 | 1.9 | -- | -- | -- |
| | | | | 3 | -- | -- | 20.3 | 79.7 | -- | 2.1 | -- | -- | -- |
| | | | B-56451 | 1 | .7 | 1.2 | 18.3 | 72.5 | 8.0 | 1.9 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.5 | 73.4 | 8.1 | 1.9 | -- | -- | -- |
| | | | | 3 | -- | -- | 20.1 | 79.9 | -- | 2.1 | -- | -- | -- |
| | | | B-56452 | 1 | .8 | 1.4 | 17.8 | 68.8 | 12.0 | 2.0 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.0 | 69.9 | 12.1 | 2.0 | -- | -- | -- |
| | | | | 3 | -- | -- | 20.5 | 79.5 | -- | 2.3 | -- | -- | -- |
| | | | B-56453 | 1 | .7 | 1.3 | 17.8 | 69.7 | 11.2 | 1.9 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.1 | 70.5 | 11.4 | 1.9 | -- | -- | -- |
| | | | | 3 | -- | -- | 20.4 | 79.6 | -- | 2.1 | -- | -- | -- |
| | | | B-56454 | 1 | .8 | 1.3 | 18.1 | 67.6 | 13.0 | 1.6 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.3 | 68.6 | 13.1 | 1.6 | -- | -- | -- |
| | | | | 3 | -- | -- | 21.1 | 78.9 | -- | 1.9 | -- | -- | -- |
| 94 | -- | T | B-56398 | 1 | 1.2 | 1.6 | 18.7 | 70.5 | 9.2 | 2.3 | -- | -- | -- |
| | | | | 2 | -- | -- | 19.0 | 71.6 | 9.4 | 2.4 | -- | -- | -- |
| | | | | 3 | -- | -- | 20.9 | 79.1 | -- | 2.6 | -- | -- | -- |
| | | | B-56399 | 1 | 1.1 | 1.5 | 18.7 | 70.8 | 9.0 | 2.1 | -- | -- | -- |
| | | | | 2 | -- | -- | 19.0 | 71.9 | 9.1 | 2.2 | -- | -- | -- |
| | | | | 3 | -- | -- | 20.9 | 79.1 | -- | 2.4 | -- | -- | -- |
| | | | B-56400 | 1 | 1.2 | 1.6 | 18.2 | 69.9 | 10.3 | 2.0 | -- | -- | -- |
| | | | | 2 | -- | -- | 18.5 | 71.1 | 10.4 | 2.1 | -- | -- | -- |
| | | | | 3 | -- | -- | 20.7 | 79.3 | -- | 2.3 | -- | -- | -- |

**Table 3.** Proximate and ultimate analyses, air-drying loss, heat of combustion, fusibility of ash, and free-swelling index of coal in west-central Arkansas—Continued

| (percent) | | | | Heat of combustion (Btu/lb) | Fusibility of ash (°F) | | | Free-swelling index | Source of analyses | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| Hydrogen | Carbon | Nitrogen | Oxygen | | Initial deformation temp. | Softening temp. | Fluid temp. | | | |
| 4.2 | 78.0 | 1.5 | 3.1 | 13,520 | -- | -- | -- | -- | B | Composite of samples |
| 4.0 | 79.9 | 1.6 | .9 | 13,860 | -- | -- | -- | -- | -- | 18750, 18751, and |
| 4.5 | 89.0 | 1.7 | 1.1 | 15,440 | -- | -- | -- | -- | -- | 18752. |
| -- | -- | -- | -- | 14,130 | -- | 2,360 | -- | -- | C | |
| -- | -- | -- | -- | 13,730 | -- | 2,280 | -- | -- | C | |
| 4.5 | 79.9 | 1.6 | 2.7 | 13,930 | -- | -- | -- | -- | C | Composite of samples |
| 4.3 | 81.7 | 1.6 | .8 | 14,240 | -- | -- | -- | -- | -- | A-99833 and A-99824. |
| 4.7 | 90.2 | 1.8 | .9 | 15,710 | -- | -- | -- | -- | -- | |
| 4.6 | 83.4 | 1.7 | 6.9 | 14,310 | 2,090 | 2,140 | 2,190 | 0.5 | A | Coal is weathered. |
| 4.3 | 87.1 | 1.7 | 3.4 | 14,960 | -- | -- | -- | -- | -- | |
| 4.4 | 89.7 | 1.8 | 3.5 | 15,400 | -- | -- | -- | -- | -- | |
| 4.5 | 82.5 | 1.5 | 5.6 | 14,340 | 2,190 | 2,250 | 2,350 | 9 | A | |
| 4.3 | 85.5 | 1.6 | 2.5 | 14,860 | -- | -- | -- | -- | -- | |
| 4.5 | 89.5 | 1.7 | 2.6 | 15,570 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,180 | -- | 2,500 | -- | -- | A | Sample of 9- to 12-in. |
| -- | -- | -- | -- | 14,390 | -- | -- | -- | -- | -- | coal. |
| -- | -- | -- | -- | 15,500 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,150 | -- | 2,500 | -- | -- | A | Sample of 3- to 9-in. |
| -- | -- | -- | -- | 14,350 | -- | -- | -- | -- | -- | coal. |
| -- | -- | -- | -- | 15,500 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,750 | -- | 2,380 | -- | -- | A | Sample of 0.188- to |
| -- | -- | -- | -- | 13,940 | -- | -- | -- | -- | -- | 3-in. coal. |
| -- | -- | -- | -- | 15,510 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,200 | -- | 2,430 | -- | -- | A | Sample of 8-in. coal. |
| -- | -- | -- | -- | 14,370 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,660 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,160 | -- | 2,330 | -- | -- | A | Sample of 4- to 8-in. |
| -- | -- | -- | -- | 14,330 | -- | -- | -- | -- | -- | coal. |
| -- | -- | -- | -- | 15,660 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 14,200 | -- | 2,400 | -- | -- | A | Sample of 2- to 4-in. |
| -- | -- | -- | -- | 14,370 | -- | -- | -- | -- | -- | coal. |
| -- | -- | -- | -- | 15,650 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,510 | -- | 2,170 | -- | -- | A | Sample of 1- to 2-in. |
| -- | -- | -- | -- | 13,690 | -- | -- | -- | -- | -- | coal. |
| -- | -- | -- | -- | 15,590 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,680 | -- | 2,230 | -- | -- | A | Sample of 0.25 to 1-in. |
| -- | -- | -- | -- | 13,850 | -- | -- | -- | -- | -- | coal. |
| -- | -- | -- | -- | 15,630 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,310 | -- | 2,150 | -- | -- | A | Sample of less than |
| -- | -- | -- | -- | 13,490 | -- | -- | -- | -- | -- | 0.25-in. coal. |
| -- | -- | -- | -- | 15,530 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,850 | -- | 2,410 | -- | -- | A | Sample of 8-in. coal. |
| -- | -- | -- | -- | 14,070 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 15,530 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,890 | -- | 2,380 | -- | -- | A | Sample of 3- to 8-in. |
| -- | -- | -- | -- | 14,110 | -- | -- | -- | -- | -- | coal. |
| -- | -- | -- | -- | 15,530 | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | 13,680 | -- | 2,270 | -- | -- | A | Sample of less than 3-in. |
| -- | -- | -- | -- | 13,910 | -- | -- | -- | -- | -- | coal. |
| -- | -- | -- | -- | 15,530 | -- | -- | -- | -- | -- | |

**Table 3.** Proximate and ultimate analyses, air-drying loss, heat of combustion, fusibility of ash, and free-swelling index of coal in west-central Arkansas—Continued

| Locality No. | Thickness (in.) | Site of sample | U.S. Bur. Mines lab No. | Condition | Air-drying loss (pct) | Proximate analyses (percent) | | | | Ultimate analyses | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Moisture | Volatile matter | Fixed carbon | Ash | Sulfur | Forms of Sulfur | | |
| | | | | | | | | | | | Sulfate | Pyritic | Organic |
| **Atoka Formation** | | | | | | | | | | | | | |
| Logan County | | | | | | | | | | | | | |
| 95 | 8 | O | E-40765 | 1 | -- | 15.6 | 26.2 | 50.7 | 7.5 | 0.6 | -- | -- | -- |
| | | | | 2 | -- | -- | 31.1 | 60.0 | 8.9 | .7 | -- | -- | -- |
| | | | | 3 | -- | -- | 34.1 | 65.9 | -- | .8 | -- | -- | -- |
| Johnson County | | | | | | | | | | | | | |
| 96 | 10 | S | E-40763 | 1 | -- | 1.3 | 16.2 | 79.0 | 3.5 | 0.7 | -- | -- | -- |
| | | | | 2 | -- | -- | 16.4 | 80.1 | 3.5 | .7 | -- | -- | -- |
| | | | | 3 | -- | -- | 17.0 | 83.0 | -- | .7 | -- | -- | -- |
| 97 | 14 | S | K-63748 | 1 | -- | 1.7 | 12.4 | 76.7 | 9.2 | 4.3 | 0.1 | 3.41 | 0.92 |
| | | | | 2 | -- | -- | 12.6 | 78.0 | 9.4 | 3.5 | .1 | 3.47 | .94 |
| | | | | 3 | -- | -- | 14.0 | 86.0 | -- | 4.9 | .1 | 3.83 | 1.04 |
| Pope County | | | | | | | | | | | | | |
| 98 | 12 | O | E-40764 | 1 | -- | 1.2 | 12.8 | 75.9 | 10.1 | 5.1 | -- | -- | -- |
| | | | | 2 | -- | -- | 12.9 | 76.8 | 10.3 | 5.2 | -- | -- | -- |
| | | | | 3 | -- | -- | 14.4 | 85.6 | -- | 5.7 | -- | -- | -- |

**Table 3.** Proximate and ultimate analyses, air-drying loss, heat of combustion, fusibility of ash, and free-swelling index of coal in west-central Arkansas—Continued

| (percent) | | | | Heat of combustion (Btu/lb) | Fusibility of ash (°F) | | | Free-swelling index | Source of analyses | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| Hydrogen | Carbon | Nitrogen | Oxygen | | Initial deformation temp. | Softening temp. | Fluid temp. | | | |
| **Atoka Formation--Continued** | | | | | | | | | | |
| Logan County--Continued | | | | | | | | | | |
| 3.9 | 58.8 | 1.2 | 28.0 | 9,110 | 2,140 | 2,240 | 2,440 | -- | A | Coal is weathered. |
| 2.6 | 69.7 | 1.4 | 16.6 | 10,790 | -- | -- | -- | -- | -- | |
| 2.9 | 76.5 | 1.6 | 18.2 | 11,850 | -- | -- | -- | -- | -- | |
| Johnson County--Continued | | | | | | | | | | |
| 4.3 | 86.3 | 1.8 | 3.4 | 14,840 | 2,070 | 2,210 | 2,520 | 7.5 | A | Coal is slightly weathered. |
| 4.2 | 87.5 | 1.8 | 2.3 | 15,040 | -- | -- | -- | -- | -- | |
| 4.3 | 90.7 | 1.9 | 2.4 | 15,590 | -- | -- | -- | -- | -- | |
| 3.7 | 79.7 | 1.5 | 1.6 | 13,760 | 2,430 | 2,480 | 2,530 | .5 | A | Removed two 0.25-in.-thick |
| 3.5 | 81.1 | 1.5 | .1 | 13,990 | -- | -- | -- | -- | -- | layers of pyrite |
| 3.9 | 89.4 | 1.7 | .1 | 15,440 | -- | -- | -- | -- | -- | from sample. |
| Pope County--Continued | | | | | | | | | | |
| 3.6 | 78.3 | 1.5 | 1.4 | 13,610 | 2,100 | 2,290 | 2,380 | -- | A | Coal is slightly |
| 3.5 | 79.3 | 1.5 | .2 | 13,780 | -- | -- | -- | -- | -- | weathered. |
| 3.9 | 88.3 | 1.7 | .4 | 15,350 | -- | -- | -- | -- | -- | |

**Table 4.** Major-, minor-, and trace-element compositions of coal samples from Arkansas, reported on whole-coal basis

[Star (*), values calculated from analysis of ash. Dagger (†), values calculated from direct determinations on air-dried (32°C) coal. S, values calculated from semiquantitative spectrographic determinations on ash. N, not detected; B, not determined. (a), bottom bed; (b), middle bed; (c), top bed. Analysts: Claude Huffman, Jr., J. W. Baker, A. J. Bartel, E. Brandt, G. T. Burrow, N. M. Conklin, J. G. Crock, J. Gardner, M. L. Goff, P. Guest, J. P. Hemming, R. J. Knight, R. E. McGregor, V. Merritt, H. T. Millard, G. O. Riddle, G. D. Shipley, J. A. Thomas, R. J. Vinnola, J. S. Wahlberg, R. J. White, and R. J. Young]

| | | Lower Hartshorne coal | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Locality No.--- | | 2 | 4 | | | 5 | 13 | | 22 | 23 | 45 | 53 |
| USGS lab No.--- | | D175925 | D175926 (a) | D175927 (b) | D176062 (c) | D175924 | D175923 (a) | D175922 (c) | D179988 | D176061 | D175921 | D175919 |
| *Si | pct--- | 1.3 | 0.43 | 1.4 | 1.7 | 0.59 | 0.24 | 0.94 | 0.99 | 0.14 | 1.2 | 0.21 |
| *Al | pct--- | .87 | .33 | .90 | 1.1 | .48 | .25 | .51 | .97 | .21 | .96 | .38 |
| *C | pct--- | .097 | .22 | .19 | .23 | .14 | .57 | .47 | .098 | .22 | .19 | .15 |
| *Mg | pct--- | .085 | .194 | .157 | .167 | .069 | .288 | .195 | .14 | .141 | .093 | .094 |
| *Na | pct--- | .169 | .027 | .080 | .028 | .033 | .032 | .104 | .144 | .081 | .043 | .029 |
| *K | pct--- | .20 | .044 | .19 | .21 | .087 | .017 | .098 | .088 | .017 | .11 | .011 |
| *Fe | pct--- | .43 | 2.4 | .70 | 1.7 | .36 | 1.7 | 1.1 | .48 | .32 | 1.3 | .52 |
| *Mn | ppm--- | 10. | 130 | 15. | 14. | 150. | 90. | 98. | 20. | 76. | 26. | 29. |
| *Ti | pct--- | .050 | .016 | .048 | .56 | .024 | .010 | .025 | .035 | .009 | .039 | .018 |
| *P | ppm--- | 52. | 48. | 110. | 46. | 35. | 120. | 120. | <270. | 19. | 46. | 49. |
| *Cl | pct--- | <0.007 | <0.007 | <0.008 | <0.011 | <0.004 | <0.007 | <0.007 | <0.12 | <0.003 | <0.008 | <0.003 |
| †As | ppm--- | 5. | 20. | 15. | 5. | 4. | 8. | 15. | 10. | 3. | 30. | 5. |
| *Cd | ppm--- | <0.1 | .1 | .2 | <0.1 | .2 | .1 | <0.1 | <0.06 | .1 | <0.1 | .1 |
| *Cu | ppm--- | 6.1 | 20.2 | 11.6 | 14.0 | 5.3 | 21.5 | 9.3 | 8.1 | 7.7 | 13.1 | 5.4 |
| †F | ppm--- | 80. | 30. | 100. | 60. | 55. | 25. | 45. | 120. | 60. | 90. | <20.0 |
| †Hg | ppm--- | .14 | .02 | .13 | .51 | .03 | .04 | .02 | .12 | .01 | .20 | .08 |
| *Li | ppm--- | 6.6 | 4.9 | 6.3 | 13.0 | 2.2 | 3.2 | 2.7 | 3.2 | .4 | 7.5 | 1.8 |
| *Pb | ppm--- | 2.2 | 6.8 | 2.5 | 7.4 | 1.3 | 2.7 | 2.2 | 2.8 | .8 | 3.2 | 1.0 |
| †Sb | ppm--- | .2 | .2 | .2 | .5 | .1 | .1 | .1 | .2 | .1 | .3 | .1 |
| †Se | ppm--- | .9 | 2.4 | .3 | 1.8 | .8 | .7 | .6 | .8 | .7 | 1.5 | 2.4 |
| †Th | ppm--- | <3.0 | <3.0 | <3.0 | <3.0 | <3.0 | <3.0 | <3.0 | <3.0 | <3.0 | <3.0 | <3.0 |
| †U | ppm--- | .8 | <0.2 | .4 | .8 | <0.2 | <0.2 | .3 | 1.4 | <0.2 | 1.1 | .4 |
| *Zn | ppm--- | 9.5 | 101. | 89.6 | 42.0 | 33.6 | 61.2 | 33.2 | 13.6 | 5.0 | 10.9 | 1.2 |
| Ag | ppm-S--- | N | N | N | .1 | N | N | N | N | N | N | N |
| B | ppm-S--- | 15. | .5 | 15. | 7. | 7. | 5. | 10. | 20. | 5. | 10. | 5. |
| Ba | ppm-S--- | 70. | 20. | 150. | 70. | 50. | 15. | 30. | 100. | 50. | 50. | 50. |
| Be | ppm-S--- | .5 | .2 | .7 | .7 | .3 | .5 | .2 | 1. | .15 | .5 | .15 |
| Ce | ppm-S--- | <30. | N | <50. | <50. | N | <30. | <30. | 20. | N | <50. | <15. |
| Co | ppm-S--- | 1. | 7. | 5. | .7 | 5. | 3. | 2. | 2. | 2. | 5. | 5. |
| Cr | ppm-S--- | 10. | 5. | 7. | 15. | 7. | 5. | 5. | 20. | 5. | 10. | 5. |
| Ga | ppm-S--- | 2. | B | 2. | 3. | 1.5 | 1. | 1.5 | 5. | .7 | 5. | 1. |
| La | ppm-S--- | 7. | N | 5. | 10. | <5. | <7. | N | 10. | <2. | 7. | <3. |
| Mo | ppm-S--- | 1. | 3. | .7 | 5. | .7 | 2. | 1. | 5. | .7 | 2. | 1. |
| Nb | ppm-S--- | <1.5 | <1.5 | 1.5 | <2. | <0.7 | <1.5 | <1.5 | 1.5 | .5 | <1.5 | <0.7 |
| Nd | ppm-S--- | 10. | B | 15. | 15. | N | <10. | B | 10. | N | <10. | <5. |
| Ni | ppm-S--- | 5. | 15. | 15. | 30. | 15. | 10. | 5. | 20. | 7. | 10. | 5. |
| Sc | ppm-S--- | 2. | 1. | 2. | 3. | 1.5 | 1. | 1. | 2. | .5 | 2. | .7 |
| Sr | ppm-S--- | 20. | 5. | 50. | 10. | 15. | 5. | 10. | 50. | 15. | 50. | 50. |
| V | ppm-S--- | 10. | 10. | 15. | 30. | 7. | 10. | 7. | 20. | 5. | 20. | 5. |
| Y | ppm-S--- | 5. | 5. | 7. | 10. | 3. | 7. | 2. | 5. | 1.5 | 5. | 2. |
| Yb | ppm-S--- | .5 | B | .7 | B | .3 | .7 | .2 | .5 | B | .5 | .2 |
| Zr | ppm-S--- | 10. | 5. | 15. | 15. | 7. | 5. | 7. | 10. | 5. | 10. | 5. |

**Table 4.** Major-, minor-, and trace-element compositions of coal samples from Arkansas, reported on whole-coal basis—Continued

| Lower Hartshorne coal--Continued | | | | | | | Charleston coal | | | Paris coal | | Atoka Formation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 55 D179989 | 57 D179990 | 58 D176059 | 59 D175918 | 63 D175920 | 69 D179991 | 72 D176060 | 78 D179994 | 80 D175929 | 81 D179993 | 90 D175928 | 91 D179995 | 97 D179992 |
| 3.0 | 0.40 | 0.37 | 0.64 | 0.27 | 1.3 | 1.3 | 0.17 | 0.16 | 0.26 | 0.18 | 0.46 | 0.60 |
| 2.6 | .56 | .46 | .57 | .36 | 1.3 | 1.3 | .12 | .15 | .17 | .19 | .36 | .59 |
| .14 | .32 | .19 | .22 | .21 | .16 | .61 | .90 | .78 | .74 | .19 | .23 | .33 |
| .147 | .186 | .091 | .099 | .130 | .168 | .437 | .70 | .172 | .214 | .139 | .165 | .147 |
| .157 | .100 | .090 | .016 | .031 | .108 | .151 | .003 | .005 | .006 | .027 | .29 | .39 |
| .21 | .026 | .038 | .045 | .022 | .092 | .13 | .011 | .012 | .014 | .022 | .044 | .060 |
| .85 | .52 | .38 | .98 | .35 | .047 | 1.7 | .44 | 2.5 | 1.9 | .40 | 1.0 | 3.0 |
| 11. | <21. | 5.4 | 21. | 5.4 | 11. | 85. | <8.5 | 78. | 110. | 32. | <20. | 25. |
| .098 | .032 | .023 | .023 | .019 | .041 | .066 | .006 | .010 | .008 | .011 | .20 | .29 |
| <680. | 260. | 98. | 71. | 130. | 340. | 210. | <96. | 120. | <360. | 39. | <230. | <460. |
| <0.031 | .011 | .004 | <0.006 | <0.004 | <0.016 | <0.012 | <0.004 | <0.008 | <0.016 | <0.003 | <0.10 | <0.021 |
| 30. | 4. | 3. | 8. | 4. | 11. | 5. | 15. | 120. | 63. | 15. | 24. | 46. |
| <0.15 | .05 | <0.0 | .1 | .1 | <0.08 | <0.1 | <0.02 | .1 | <0.08 | 0.0 | <0.05 | .11 |
| 31. | 6.7 | 6.8 | 18.1 | 10.6 | 15.8 | 15.7 | 4.2 | 11.1 | 5.6 | 3.7 | 11.8 | 15.8 |
| 100. | 35. | 50. | 35. | 65. | 40. | 120. | 25. | 25. | <20. | 40. | <20. | <20. |
| .27 | .06 | .02 | .06 | .02 | .13 | .23 | .09 | .59 | .48 | .13 | .12 | .86 |
| 22.5 | 3.0 | 3.5 | 6.7 | 1.9 | 12.1 | 13.7 | .6 | 1.3 | 1.4 | .5 | 2.0 | 1.8 |
| 10.8 | 1.6 | 1.3 | 3.1 | 1.4 | 4.7 | 4.2 | <0.5 | <1.9 | <2.1 | <0.7 | 1.3 | <2.6 |
| .7 | .1 | .2 | .3 | <0.1 | .5 | .5 | .2 | .4 | .2 | <0.1 | .2 | .2 |
| 3.5 | 1.2 | 1.0 | 1.6 | 1.3 | 1.6 | 3.3 | 1.1 | 2.2 | 1.6 | 3.2 | 1.7 | 1.9 |
| <3.0 | <3.0 | <3.0 | <3.0 | <3.0 | 3.5 | <3.0 | <3.0 | <3.0 | <3.0 | <3.0 | <3.0 | <3.0 |
| 3.2 | .5 | <0.2 | .3 | .3 | 2.2 | 1.3 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | .9 |
| 17.8 | 9.7 | 2.0 | 35.8 | 6.3 | 20.5 | 8.1 | 5.3 | 28.7 | 17.2 | 4.9 | 7.8 | 8.9 |
| .15 | .05 | N | .07 | .05 | N | N | .02 | N | N | N | .05 | N |
| 20. | 7. | 7. | 3. | 7. | 20. | 30. | 1. | <5. | N | 5. | 2. | 5. |
| 100. | 150. | 15. | 70. | 100. | 50. | 150. | 15. | 20. | 20. | 50. | 50. | 70. |
| 2. | .7 | .5 | .7 | .2 | 1. | .7 | .2 | .5 | N | .1 | .3 | 1.5 |
| 50. | 15. | 20. | 50. | <15. | 20. | <70. | N | N | N | N | N | N |
| 10. | 10. | 15. | 7. | 5. | 5. | 7. | .7 | 5. | 5. | 2. | 3. | 3. |
| 50. | 10. | 5. | 15. | 5. | 50. | 20. | 3. | 2. | 2. | 2. | 7. | 15. |
| 10. | 3. | 1. | 5. | 1.5 | 5. | 3. | .7 | B | 1.5 | .5 | 1.5 | 5. |
| 30. | 5. | 10. | 15. | 5. | 15. | 15. | N | N | N | <3. | N | 7. |
| 7. | 1.5 | 1. | 1.5 | 1. | 7. | 2. | .2 | 1.5 | 1.5 | 2. | 2. | 2. |
| 3. | 1. | .7 | <1. | .7 | 1.5 | <2. | N | <1.5 | N | <0.7 | 1. | N |
| 50. | 7. | 10. | 15. | 5. | 20. | 20. | B | N | B | N | B | N |
| 20. | 7. | 10. | 10. | 7. | 5. | 20. | 1.5 | 5. | 7. | 1. | 7. | 7. |
| 5. | 1.5 | 1. | 5. | 1. | 2. | 3. | .3 | <0.7 | N | .5 | .7 | 2. |
| 200. | 150. | 70. | 50. | 150. | 50. | 70. | 30. | 20. | 70. | 50. | 50. | 70. |
| 70. | 10. | 10. | 50. | 7. | 50. | 20. | 3. | 5. | 5. | 5. | 7. | 15. |
| 20. | 5. | 7. | 10. | 3. | 10. | 7. | 3. | 2. | 2. | 2. | 5. | 10. |
| 2. | .5 | .2 | 1. | .3 | 1. | 2. | .2 | B | .7 | .2 | .5 | 1. |
| 20. | 7. | 7. | 7. | 5. | 10. | 20. | 2. | 2. | 1.5 | 3. | 3. | 7. |

**Table 5.** Major- and minor-oxide and trace-element compositions of the laboratory ash of coal samples from Arkansas

[Coals were ashed at 525°C. S, values determined by semiquantitative spectrographic analysis. The spectrographic results are to be identified with geometric brackets whose boundaries are 1.2, 0.83, 0.56, 0.38, 0.26, 0.18, 0.12, etc. The precision of the spectrographic data is approximately one bracket at 68-percent confidence, or two brackets at 95-percent confidence. N, not detected; B, not determined. (a), bottom bed; (b), middle bed; (c), top bed. Analysts: Claude Huffman, Jr., J. W. Baker, A. J. Bartel, E. Brandt, G. T. Burrow, N. M. Conklin, J. G. Crock, J. Gardner, M. L. Goff, P. Guest, J. P. Hemming, R. J. Knight, R. E. McGregor, V. Merritt, H. T. Millard, G. O. Riddle, G. D. Shipley, J. A. Thomas, R. J. Vinnola, J. S. Wahlberg, R. J. White, and R. J. Young]

| | | Lower Hartshorne coal | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Locality No.--- | | 2 | 4 | | | 5 | 13 | | 22 | 23 | 45 | 53 |
| USGS lab No.--- | | D175925 | D175926 (a) | D175927 (b) | D176062 (c) | D175924 | D175923 (a) | D175922 (c) | D179988 | D176061 | D175921 | D175919 |
| Ash | pct----- | 7.4 | 7.2 | 8.3 | 10.5 | 4.2 | 6.8 | 7.4 | 6.2 | 2.6 | 8.0 | 3.2 |
| $SiO_2$ | pct----- | 39. | 13. | 37. | 35. | 30. | 7.4 | 27. | 34. | 11. | 33. | 1.4 |
| $Al_2O_3$ | pct----- | 22. | 8.8 | 20. | 20. | 22. | 7.0 | 13. | 30. | 15. | 23. | 22. |
| CaO | pct----- | 1.8 | 4.3 | 3.2 | 3.0 | 4.7 | 12. | 9.0 | 2.2 | 12. | 3.2 | 6.7 |
| MgO | pct----- | 1.91 | 4.48 | 3.14 | 2.64 | 2.74 | 7.02 | 4.37 | 1.39 | 9.03 | 1.93 | 4.86 |
| $Na_2O$ | pct----- | 3.08 | .50 | 1.30 | .36 | 1.05 | .63 | 1.90 | 3.13 | .92 | .73 | 1.23 |
| $K_2O$ | pct----- | 3.2 | .73 | 2.7 | 2.4 | 2.5 | .30 | 1.6 | 1.7 | .77 | 1.7 | .42 |
| $Fe_2O_3$ | pct----- | 8.3 | 48. | 12. | 23. | 12. | 36. | 22. | 11. | 17. | 23. | 8.23 |
| MnO | pct----- | .18 | .23 | .024 | .017 | .47 | .17 | .17 | .041 | .38 | .42 | .12 |
| $TiO_2$ | pct----- | 1.1 | .37 | .97 | .89 | .96 | .25 | .57 | .94 | .61 | .82 | .94 |
| $P_2O_5$ | pct----- | .16 | .15 | .30 | <10. | .19 | .14 | .37 | 1.0 | .17 | .13 | .35 |
| $SO_3$ | pct----- | 2.7 | 10. | 4.4 | 7.1 | 9.7 | .19 | 14. | 4.9 | 29. | 5.1 | 14. |
| Cl | pct----- | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.20 | <0.10 | <0.10 | <0.10 |
| Cd | ppm----- | <1.0 | 2.0 | 2.5 | <1.0 | 4.0 | 1.0 | <1.0 | <1.0 | 2.5 | <1.0 | 2.0 |
| Cu | ppm----- | 82. | 280. | 140. | 133. | 126. | 316. | 126. | 130. | 296. | 164. | 170. |
| Li | ppm----- | 89. | 68. | 76. | 124. | 53. | 47. | 36. | 52. | 17. | 94. | 55. |
| Pb | ppm----- | 30. | 95. | 30. | 70. | 30. | 40. | 30. | 45. | 30. | 40. | 30. |
| Zn | ppm----- | 128. | 1,400. | 1,080. | 400. | 800. | 900. | 448. | 220. | 191. | 136. | 36. |
| Ag | ppm-S--- | N | N | N | 1. | N | N | N | N | N | N | N |
| B | ppm-S--- | 200. | 70. | 150. | 70. | 150. | 70. | 150. | 300. | 200. | 150. | 150. |
| Ba | ppm-S--- | 1,000. | 300. | 1,500. | 700. | 1,000. | 200. | 500. | 1,500. | 2,000. | 700. | 1,500. |
| Be | ppm-S--- | 7. | 3. | 7. | 7. | 7. | 7. | 3. | 15. | 5. | 7. | 5. |
| Ce | ppm-S--- | <500. | N | <500. | <500. | N | <500. | <500. | 300. | N | <500. | <500. |
| Co | ppm-S--- | 15. | 100. | 50. | 70. | 100. | 50. | 30. | 30. | 100. | 50. | 150. |
| Cr | ppm-S--- | 150. | 70. | 100. | 150. | 150. | 70. | 70. | 300. | 150. | 150. | 150. |
| Ga | ppm-S--- | 30. | B | 30. | 30. | 30. | 15. | 20. | 70. | 30. | 50. | 30. |
| La | ppm-S--- | 100. | N | 50. | 100. | <100. | <100. | N | 150. | <100. | 100. | <100. |
| Mo | ppm-S--- | 15. | 50. | 10. | 50. | 15. | 30. | 15. | 70. | 30. | 30. | 30. |
| Nb | ppm-S--- | <20. | <20. | 20. | <20. | <20. | <20. | <20. | 20. | 20. | <20. | <20. |
| Nd | ppm-S--- | 150. | B | 150. | 150. | N | <150. | B | 150. | N | <150. | <150. |
| Ni | ppm-S--- | 70. | 200. | 150. | 300. | 300. | 150. | 70. | 300. | 300. | 150. | 150. |
| Sc | ppm-S--- | 30. | 15. | 30. | 30. | 30. | 15. | 15. | 30. | 30. | 30. | 20. |
| Sr | ppm-S--- | 300. | 70. | 500. | 100. | 300. | 70. | 150. | 700. | 100. | 700. | 1,500. |
| V | ppm-S--- | 150. | 150. | 150. | 300. | 150. | 150. | 100. | 300. | 300. | 300. | 150. |
| Y | ppm-S--- | 70. | 70. | 70. | 100. | 70. | 100. | 30. | 70. | 100. | 70. | 70. |
| Yb | ppm-S--- | 7. | B | 7. | B | 7. | 10. | 3. | 7. | B | 7. | 7. |
| Zr | ppm-S--- | 150. | 70. | 150. | 150. | 150. | 70. | 100. | 150. | 150. | 150. | 150. |

**Table 5.** Major- and minor-oxide and trace-element compositions of the laboratory ash of coal samples from Arkansas—Continued

| Lower Hartshorne coal--Continued | | | | | | | Charleston coal | | | Paris coal | | Atoka Formation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 55 D179989 | 57 D179990 | 58 D176059 | 59 D175918 | 63 D175920 | 69 D179991 | 72 D176060 | 78 D179994 | 80 D175929 | 81 D179993 | 90 D175928 | 91 D179995 | 97 D179992 |
| 15.5 | 5.4 | 3.6 | 5.6 | 3.5 | 7.9 | 12.1 | 2.2 | 7.8 | 8.2 | 2.9 | 5.2 | 10.5 |
| 42. | 16. | 22. | 24. | 16. | 36. | 23. | 16. | 4.5 | 6.7 | 13. | 19. | 12. |
| 32. | 19. | 24. | 19. | 19. | 30. | 20. | 10. | 3.6 | 4.0 | 12. | 13. | 11. |
| 1.3 | 8.2 | 7.4 | 5.4 | 8.5 | 2.8 | 7.1 | 5.7 | 14. | 13. | 9.1 | 6.1 | 4.4 |
| 1.58 | 5.71 | 4.20 | 2.94 | 6.14 | 2.69 | 5.99 | 5.26 | 3.67 | 4.33 | 7.93 | 5.26 | 2.32 |
| 1.36 | 2.50 | 3.37 | 6.39 | 1.19 | 1.85 | 1.69 | .19 | .09 | .09 | 1.27 | .76 | .50 |
| 1.6 | .58 | 1.3 | .96 | .75 | 1.4 | 1.3 | .61 | .18 | .20 | .89 | 1.0 | .68 |
| 7.8 | 14. | 15. | 25. | 14. | 8.5 | 20. | 28. | 46. | 34. | 20. | 29. | 4.1 |
| .009 | <0.050 | .019 | .048 | .20 | .017 | .091 | <0.050 | .13 | .17 | .14 | <0.50 | .030 |
| 1.1 | .97 | 1.1 | .68 | .93 | .86 | .91 | .43 | .21 | .15 | .65 | .64 | .47 |
| <1.0 | 1.1 | .62 | .29 | .83 | <1.0 | .39 | <1.0 | .36 | <1.0 | .31 | <1.0 | <1.0 |
| 2.4 | 17. | 17. | 8.7 | 19. | 5.3 | 15. | 15. | 15. | 12. | 18. | 17. | 8.9 |
| <0.20 | <0.20 | <0.10 | <0.10 | .10 | <0.20 | <0.10 | <0.20 | <0.10 | <0.20 | <0.10 | <0.20 | <0.20 |
| <1.0 | 1.0 | <1.0 | 1.0 | 2.0 | <1.0 | <1.0 | <1.0 | 1.0 | <1.0 | 1.0 | <1.0 | <1.0 |
| 200. | 124. | 188. | 324. | 304. | 200. | 130. | 190. | 142. | 68. | 126. | 227. | 150. |
| 145. | 55. | 96. | 120. | 55. | 153. | 113. | 26. | 17. | 17. | 16. | 39. | 17. |
| 70. | 30. | 35. | 55. | 40. | 60. | 35. | <25. | <25. | <25. | <25. | 25. | <25. |
| 115. | 180. | 55. | 640. | 180. | 260. | 67. | 240. | 368. | 210. | 170. | 150. | 85. |
| 1. | 1. | N | 1. | 1.5 | N | N | 1. | N | N | N | 1. | N |
| 150. | 150. | 200. | 50. | 200. | 300. | 300. | 50. | <50. | N | 150. | 50. | 50. |
| 700. | 3,000. | 500. | 1,500. | 3,000.0 | 700. | 1,000. | 700. | 300. | 300. | 1,500. | 1,000. | 700. |
| 15. | 15. | 15. | 15. | 7. | 15. | 7. | 10. | 5. | N | 3. | 7. | 15. |
| 300. | 300. | 700. | 700. | <500. | 300. | <500. | N | N | N | N | N | N |
| 70. | 200. | 500. | 150. | 150. | 70. | 70. | 30. | 70. | 50. | 70. | 70. | 30. |
| 300. | 200. | 150. | 300. | 150. | 500. | 150. | 150. | 30. | 30. | 70. | 150. | 150. |
| 70. | 50. | 30. | 70. | 50. | 70. | 30. | 30. | B | 15. | 15. | 30. | 50. |
| 200. | 100. | 300. | 300. | 150. | 200. | 100. | N | N | N | <100. | N | 70. |
| 50. | 30. | 30. | 30. | 30. | 100. | 15. | 100. | 20. | 20. | 70. | 50. | 20. |
| 20. | 20. | 20. | <20. | <20. | 20. | <20. | N | <20. | N | <20. | 20. | N |
| 300. | 150. | 300. | 300. | 150. | 300. | 150. | B | N | B | N | B | N |
| 300. | 200. | 300. | 150. | 150. | 300. | 150. | 70. | 70. | 300. | 30. | 150. | 70. |
| 30. | 30. | 30. | 70. | 30. | 30. | 30. | 15. | <10. | 30. | 15. | 15. | 30. |
| 700. | 3,000. | 2,000. | 1,000. | 5,000. | 700. | 700. | 1,500. | 300. | 700. | 1,500. | 1,000. | 700. |
| 300. | 200. | 300. | 700. | 200. | 700. | 200. | 150. | 70. | 300. | 150. | 150. | 150. |
| 70. | 100. | 200. | 200. | 100. | 150. | 70. | 150. | 30. | 70. | 70. | 100. | 100. |
| 7. | 10. | 7. | 20. | 10. | 15. | 15. | 10. | B | 7. | 7. | 10. | 10. |
| 150. | 150. | 200. | 150. | 150. | 50. | 150. | 100. | 30. | 150. | 100. | 70. | 70. |

## Table 6. Content of seven trace elements in coal samples from Arkansas

[Analyses on air-dried (32°C) coal. All values in ppm. (a), bottom bed; (b), middle bed; (c), top bed. Analysts: Claude Huffman, Jr., J. W. Baker, A. J. Bartel, E. Brandt, G. T. Burrow, N. M. Conklin, J. G. Crock, J. Gardner, M. L. Goff, P. Guest, J. P. Hemming, R. J. Knight, R. E. McGregor, V. Merritt, H. T. Millard, G. O. Riddle, G. D. Shipley, J. A. Thomas, R. J. Vinnola, J. S. Wahlberg, R. J. White, and R. J. Young]

| | Lower Hartshorne coal | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Locality No.--- | 2 | 4 | | | 5 | 13 | | 22 | 23 | 45 | 53 | 55 |
| USGS lab No.--- | D175925 | D175926 (a) | D175927 (b) | D176062 (c) | D175924 | D175923 (a) | D175922 (c) | D179988 | D176061 | D175921 | D175919 | D179989 |
| As---------- | 5. | 20. | 15.0 | 5.0 | 4. | 8. | 15. | 10. | 3. | 30. | 5. | 10. |
| F---------- | 80. | 30. | 100. | 60. | 55. | 25. | 45. | 120. | 60. | 90. | <20. | 120. |
| Hg---------- | .14 | .02 | .13 | .51 | .03 | .04 | .02 | .12 | .01 | .20 | .08 | .27 |
| Sb---------- | .2 | .2 | .2 | .5 | .1 | .1 | .1 | .2 | .1 | .3 | .1 | .7 |
| Se---------- | .9 | 2.4 | .3 | 1.8 | .8 | .7 | .6 | .8 | .7 | 1.5 | 2.4 | 3.5 |
| Th---------- | <3.0 | <3.0 | <3.0 | <3.0 | <3.0 | <3.0 | <3.0 | <3.0 | <3.0 | <3.0 | 3.0 | <3.0 |
| U---------- | .8 | <0.2 | .4 | .8 | <0.2 | <0.2 | .3 | <1.4 | <0.2 | 1.1 | .4 | 3.2 |

| | Lower Hartshorne coal--Continued | | | | | | Charleston coal | | | Paris coal | | Atoka Formation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Locality No.--- | 57 | 58 | 59 | 63 | 69 | 72 | 78 | 80 | 81 | 90 | 91 | 97 |
| USGS lab No.--- | D179990 | D176059 | D175918 | D175920 | D179991 | D176060 | D179994 | D175929 | D179993 | D175928 | D179995 | D179992 |
| As---------- | 4. | 3.0 | 8. | 4. | 11. | 5. | 15. | 120. | 63. | 15. | 24. | 46. |
| F---------- | 35. | 50. | 35. | 65. | 40. | 120. | 23. | 25. | <20. | 40. | <20. | <20. |
| Hg---------- | .06 | .02 | .06 | .02 | .13 | .23 | .09 | .59 | .48 | .13 | .12 | .86 |
| Sb---------- | .1 | .2 | .3 | <0.1 | .5 | .5 | .2 | .4 | .2 | <0.1 | .2 | .2 |
| Se---------- | 1.2 | 1.0 | 1.6 | 1.3 | 1.6 | 3.3 | 1.1 | 2.2 | 1.6 | 3.2 | 1.7 | 1.9 |
| Th---------- | <3.0 | <3.0 | <3.0 | <3.0 | <3.0 | 3.0 | <3.0 | <3.0 | <3.0 | <3.0 | <3.02 | <3.0 |
| U---------- | .5 | <0.2 | .3 | .3 | 2.2 | 1.3 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | .9 |

**Table 7.** Estimated original resources of low-volatile bituminous coal, west-central Arkansas (modified from Haley (1960), table 1, p. 801–807)

[Resources, in millions of short tons, in beds of thickness stated. Leaders (--), no estimated resources]

| Overburden (ft) | Measured | | | | Indicated | | | | Inferred | | | | Total resources | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 14-28 in. | 28-42 in. | 42+ in. | Total | 14-28 in. | 28-42 in. | 42+ in. | Total | 14-28 in. | 28-42 in. | 42+ in. | Total | 14-28 in. | 28-42 in. | 42+ in. | Total |
| **Crawford County** | | | | | | | | | | | | | | | | |
| Lower Hartshorne coal bed | | | | | | | | | | | | | | | | |
| 0-60------- | -- | -- | -- | -- | 0.1 | -- | -- | 0.1 | 7.8 | 1.4 | -- | 9.2 | 7.9 | 1.4 | -- | 9.3 |
| 60-500----- | 1.2 | 2.2 | 4.8 | 8.2 | 4.4 | 5.7 | 8.2 | 18.3 | 102.6 | 44.7 | 11.8 | 159.1 | 108.2 | 52.6 | 24.8 | 185.6 |
| 500-1,000-- | -- | -- | 2.7 | 2.7 | -- | -- | 4.8 | 4.8 | 22.3 | 22.8 | 9.8 | 54.9 | 22.3 | 22.8 | 17.3 | 62.4 |
| 1,000-2,000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 28.1 | 4.5 | 32.6 | -- | 28.1 | 4.5 | 32.6 |
| 2,000-3,000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 1.2 | 2.2 | 7.5 | 10.9 | 4.5 | 5.7 | 13.0 | 23.2 | 132.7 | 97.0 | 26.1 | 255.8 | 138.4 | 104.9 | 46.6 | 289.9 |
| **Franklin County** | | | | | | | | | | | | | | | | |
| Lower Hartshorne coal bed | | | | | | | | | | | | | | | | |
| 0-60------- | 3.1 | 2.6 | 6.9 | 12.6 | 1.7 | 0.3 | 0.2 | 2.2 | 13.2 | 0.4 | -- | 13.6 | 18.0 | 3.3 | 7.1 | 28.4 |
| 60-500----- | 3.5 | 7.3 | 16.9 | 27.7 | 2.5 | 2.4 | 1.1 | 6.0 | 55.7 | 1.5 | -- | 57.2 | 61.7 | 11.2 | 18.0 | 90.9 |
| 500-1,000-- | -- | -- | -- | -- | -- | -- | -- | -- | 28.9 | -- | -- | 28.9 | 28.9 | -- | -- | 28.9 |
| 1,000-2,000 | -- | -- | -- | -- | -- | -- | -- | -- | 10.5 | -- | -- | 10.5 | 10.5 | -- | -- | 10.5 |
| 2,000-3,000 | -- | -- | -- | -- | -- | -- | -- | -- | 4.4 | -- | -- | 4.4 | 4.4 | -- | -- | 4.4 |
| Total | 6.6 | 9.9 | 23.8 | 40.3 | 4.2 | 2.7 | 1.3 | 8.2 | 112.7 | 1.9 | -- | 114.6 | 123.5 | 14.5 | 25.1 | 163.1 |
| Charleston coal bed | | | | | | | | | | | | | | | | |
| 0-60------- | 5.5 | -- | -- | 5.5 | 3.0 | -- | -- | 3.0 | 4.6 | -- | -- | 4.6 | 13.1 | -- | -- | 13.1 |
| 60-500----- | 1.7 | -- | -- | 1.7 | 3.0 | -- | -- | 3.0 | 5.0 | -- | -- | 5.0 | 9.7 | -- | -- | 9.7 |
| 500-1,000-- | -- | -- | -- | -- | 1.0 | -- | -- | 1.0 | 8.0 | -- | -- | 8.0 | 9.0 | -- | -- | 9.0 |
| 1,000-2,000 | -- | -- | -- | -- | -- | -- | -- | -- | 8.5 | -- | -- | 8.5 | 8.5 | -- | -- | 8.5 |
| 2,000-3,000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 7.2 | -- | -- | 7.2 | 7.0 | -- | -- | 7.0 | 26.1 | -- | -- | 26.1 | 40.3 | -- | -- | 40.3 |
| Paris coal bed | | | | | | | | | | | | | | | | |
| 0-60------- | 1.5 | -- | -- | 1.5 | 2.7 | -- | -- | 2.7 | 0.7 | -- | -- | 0.7 | 4.9 | -- | -- | 4.9 |
| 60-500----- | 1.3 | -- | -- | 1.3 | 1.3 | -- | -- | 1.3 | .7 | -- | -- | .7 | 3.3 | -- | -- | 3.3 |
| 500-1,000-- | -- | -- | -- | -- | .6 | -- | -- | .6 | -- | -- | -- | -- | .6 | -- | -- | .6 |
| 1,000-2,000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 2,000-3,000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 2.8 | -- | -- | 2.8 | 4.6 | -- | -- | 4.6 | 1.4 | -- | -- | 1.4 | 8.8 | -- | -- | 8.8 |

**Table 7.** Estimated original resources of low-volatile bituminous coal, west-central Arkansas (modified from Haley (1960), table 1, p. 801–807)—Continued

| Overburden (ft) | Measured | | | | Indicated | | | | Inferred | | | | Total resources | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 14–28 in. | 28–42 in. | 42+ in. | Total | 14–28 in. | 28–42 in. | 42+ in. | Total | 14–28 in. | 28–42 in. | 42+ in. | Total | 14–28 in. | 28–42 in. | 42+ in. | Total |
| **Lower Hartshorne, Charleston, and Paris coal beds** | | | | | | | | | | | | | | | | |
| 0–60 | 10.1 | 2.6 | 6.9 | 19.6 | 7.4 | 0.3 | 0.2 | 7.9 | 18.5 | 0.4 | -- | 18.9 | 36.0 | 3.3 | 7.1 | 46.4 |
| 60–500 | 6.5 | 7.3 | 16.9 | 30.7 | 6.8 | 2.4 | 1.1 | 10.3 | 61.4 | 1.5 | -- | 62.9 | 74.7 | 11.2 | 18.0 | 103.9 |
| 500–1,000 | -- | -- | -- | -- | 1.6 | -- | -- | 1.6 | 36.9 | -- | -- | 36.9 | 38.5 | -- | -- | 38.5 |
| 1,000–2,000 | -- | -- | -- | -- | -- | -- | -- | -- | 19.0 | -- | -- | 19.0 | 19.0 | -- | -- | 19.0 |
| 2,000–3,000 | -- | -- | -- | -- | -- | -- | -- | -- | 4.4 | -- | -- | 4.4 | 4.4 | -- | -- | 4.4 |
| Total | 16.6 | 9.9 | 23.8 | 50.3 | 15.8 | 2.7 | 1.3 | 19.8 | 140.2 | 1.9 | -- | 142.1 | 172.6 | 14.5 | 25.1 | 212.2 |
| **Johnson County** | | | | | | | | | | | | | | | | |
| **Lower Hartshorne coal bed** | | | | | | | | | | | | | | | | |
| 0–60 | 9.8 | 4.5 | 2.7 | 17.0 | 6.7 | 0.8 | -- | 7.5 | 1.2 | 1.9 | -- | 3.1 | 17.7 | 7.2 | 2.7 | 27.6 |
| 60–500 | .7 | 2.7 | .1 | 3.5 | 4.7 | 2.7 | -- | 7.4 | 8.4 | 6.5 | -- | 14.9 | 13.8 | 11.9 | .1 | 25.8 |
| 500–1,000 | -- | -- | -- | -- | .2 | -- | -- | .2 | 5.8 | -- | -- | 5.8 | 6.0 | -- | -- | 6.0 |
| 1,000–2,000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 2,000–3,000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 10.5 | 7.2 | 2.8 | 20.5 | 11.6 | 3.5 | -- | 15.1 | 15.4 | 8.4 | -- | 23.8 | 37.5 | 19.1 | 2.8 | 59.4 |
| **Logan County** | | | | | | | | | | | | | | | | |
| **Lower Hartshorne coal bed** | | | | | | | | | | | | | | | | |
| 0–60 | -- | -- | -- | -- | -- | -- | -- | -- | 2.1 | -- | -- | 2.1 | 2.1 | -- | -- | 2.1 |
| 60–500 | -- | -- | -- | -- | -- | -- | -- | -- | 3.2 | 3.7 | -- | 6.9 | 3.2 | 3.7 | -- | 6.9 |
| 500–1,000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 1,000–2,000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 2,000–3,000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | -- | -- | -- | -- | -- | -- | -- | -- | 5.3 | 3.7 | -- | 9.0 | 5.3 | 3.7 | -- | 9.0 |
| **Charleston coal bed** | | | | | | | | | | | | | | | | |
| 0–60 | (1) | -- | -- | (1) | (2) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 60–500 | 0.1 | -- | -- | 0.1 | 0.1 | -- | -- | 0.1 | 0.2 | -- | -- | 0.2 | 0.4 | -- | -- | 0.4 |
| 500–1,000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 1,000–2,000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 2,000–3,000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 0.1 | -- | -- | 0.1 | 0.1 | -- | -- | 0.1 | 0.2 | -- | -- | 0.2 | 0.4 | -- | -- | 0.4 |

**Table 7.** Estimated original resources of low-volatile bituminous coal, west-central Arkansas (modified from Haley (1960), table 1, p. 801–807)—Continued

| Overburden (ft) | Measured | | | | Indicated | | | | Inferred | | | | Total resources | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 14-28 in. | 28-42 in. | 42+ in. | Total | 14-28 in. | 28-42 in. | 42+ in. | Total | 14-28 in. | 28-42 in. | 42+ in. | Total | 14-28 in. | 28-42 in. | 42+ in. | Total |
| **Paris coal bed** | | | | | | | | | | | | | | | | |
| 0-60------- | 6.9 | 1.7 | -- | 8.6 | 0.5 | 0.4 | -- | 0.9 | -- | 0.6 | -- | 0.6 | 7.4 | 2.7 | -- | 10.1 |
| 60-500----- | 4.3 | 1.2 | -- | 5.5 | 6.1 | 1.7 | -- | 7.8 | 4.2 | 1.8 | -- | 6.0 | 14.6 | 4.7 | -- | 19.3 |
| 500-1,000-- | -- | (3) | -- | (3) | .4 | .6 | -- | 1.0 | 1.0 | .5 | -- | 1.5 | 1.4 | 1.1 | -- | 2.5 |
| 1,000-2,000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 2,000-3,000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 11.2 | 2.9 | -- | 14.1 | 7.0 | 2.7 | -- | 9.7 | 5.2 | 2.9 | -- | 8.1 | 23.4 | 8.5 | -- | 31.9 |
| **Lower Hartshorne, Charleston, and Paris coal beds** | | | | | | | | | | | | | | | | |
| 0-60------- | 6.9 | 1.7 | -- | 8.6 | 0.5 | 0.4 | -- | 0.9 | 2.1 | 0.6 | -- | 2.7 | 9.5 | 2.7 | -- | 12.2 |
| 60-500----- | 4.4 | 1.2 | -- | 5.6 | 6.2 | 1.7 | -- | 7.9 | 7.6 | 5.5 | -- | 13.1 | 18.2 | 8.4 | -- | 26.6 |
| 500-1,000-- | -- | (3) | -- | (3) | .4 | .6 | -- | 1.0 | 1.0 | .5 | -- | 1.5 | 1.4 | 1.1 | -- | 2.5 |
| 1,000-2,000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 2,000-3,000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 11.3 | 2.9 | -- | 14.2 | 7.1 | 2.7 | -- | 9.8 | 10.7 | 6.6 | -- | 17.3 | 29.1 | 12.2 | -- | 41.3 |
| **Scott County** | | | | | | | | | | | | | | | | |
| **Lower Hartshorne coal bed** | | | | | | | | | | | | | | | | |
| 0-60------- | 0.7 | 0.1 | 0.7 | 1.5 | 0.2 | 0.1 | 1.3 | 1.6 | 0.9 | 0.8 | 0.3 | 2.0 | 1.8 | 1.0 | 2.3 | 5.1 |
| 60-500----- | .9 | .2 | 2.9 | 4.0 | 2.6 | 1.0 | 7.7 | 11.3 | 4.7 | 1.6 | 4.0 | 10.3 | 8.2 | 2.8 | 14.6 | 25.6 |
| 500-1,000-- | .2 | -- | -- | .2 | .8 | 1.7 | 1.9 | 4.4 | 7.9 | 6.6 | 7.7 | 22.2 | 8.9 | 8.3 | 9.6 | 26.8 |
| 1,000-2,000 | -- | .9 | -- | .9 | -- | 1.4 | .1 | 1.5 | 17.8 | 8.1 | 6.3 | 32.3 | 17.8 | 10.4 | 6.4 | 34.6 |
| 2,000-3,000 | -- | .6 | -- | .6 | -- | .7 | -- | .7 | 4.2 | 5.8 | .7 | 10.7 | 4.2 | 7.1 | .7 | 12.0 |
| Total | 1.8 | 1.8 | 3.6 | 7.2 | 3.6 | 4.9 | 11.0 | 19.5 | 35.5 | 22.9 | 19.0 | 77.5 | 40.9 | 29.6 | 33.6 | 104.1 |
| **Sebastian County** | | | | | | | | | | | | | | | | |
| **Lower Hartshorne coal bed** | | | | | | | | | | | | | | | | |
| 0-60------- | 4.9 | 9.1 | 22.7 | 36.7 | 2.0 | 4.2 | 6.2 | 12.4 | 6.5 | 2.4 | 0.4 | 9.3 | 13.4 | 15.7 | 29.3 | 58.4 |
| 60-500----- | 2.1 | 32.7 | 63.8 | 98.6 | 7.2 | 60.3 | 42.2 | 109.7 | 117.3 | 100.6 | 8.5 | 226.4 | 126.6 | 193.6 | 111.4 | 434.7 |
| 500-1,000-- | .3 | 8.1 | 17.1 | 25.5 | 2.3 | 21.2 | 39.1 | 62.6 | 94.9 | 137.2 | 25.0 | 257.1 | 97.5 | 166.5 | 81.2 | 345.2 |
| 1,000-2,000 | -- | 1.0 | 3.3 | 4.3 | -- | 8.2 | 6.5 | 14.7 | 22.6 | 66.2 | 12.8 | 101.6 | 22.6 | 75.4 | 22.6 | 120.6 |
| 2,000-3,000 | -- | (3) | -- | (3) | -- | .7 | .1 | .8 | 10.5 | 23.7 | *20.3 | *54.5 | 10.5 | 24.4 | *20.4 | *55.3 |
| Total | 7.3 | 50.9 | 106.9 | 165.1 | 11.5 | 94.6 | 94.1 | 200.2 | 251.8 | 330.1 | *67.0 | *648.9 | 270.6 | 475.6 | *268.0 | *1,014.2 |

**Table 7.** Estimated original resources of low-volatile bituminous coal, west-central Arkansas (modified from Haley (1960), table 1, p. 801–807)—Continued

| Overburden (ft) | Measured | | | | Indicated | | | | Inferred | | | | Total resources | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 14-28 in. | 28-42 in. | 42+ in. | Total | 14-28 in. | 28-42 in. | 42+ in. | Total | 14-28 in. | 28-42 in. | 42+ in. | Total | 14-28 in. | 28-42 in. | 42+ in. | Total |
| **Upper Hartshorne coal bed** | | | | | | | | | | | | | | | | |
| 0-60------- | 1.4 | (3) | -- | 1.4 | 1.3 | -- | -- | 1.3 | 1.8 | -- | -- | 1.8 | 4.5 | (3) | -- | 4.5 |
| 60-500----- | 3.6 | 0.1 | -- | 3.7 | 4.9 | -- | -- | 4.9 | 11.5 | -- | -- | 11.5 | 20.0 | 0.1 | -- | 20.1 |
| 500-1,000-- | (1) | -- | -- | (1) | .2 | -- | -- | .2 | 2.7 | -- | -- | 2.7 | 2.9 | -- | -- | 2.9 |
| 1,000-2,000 | -- | -- | -- | -- | -- | -- | -- | -- | .4 | -- | -- | .4 | .4 | -- | -- | .4 |
| 2,000-3,000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 5.0 | 0.1 | -- | 5.1 | 6.4 | -- | -- | 6.4 | 16.4 | -- | -- | 16.4 | 27.8 | 0.1 | -- | 27.9 |
| **Charleston coal bed** | | | | | | | | | | | | | | | | |
| 0-60------- | 1.9 | -- | -- | 1.9 | 3.0 | -- | -- | 3.0 | 4.0 | -- | -- | 4.0 | 8.9 | -- | -- | 8.9 |
| 60-500----- | 1.9 | -- | -- | 1.9 | 3.8 | -- | -- | 3.8 | 3.4 | -- | -- | 3.4 | 9.1 | -- | -- | 9.1 |
| 500-1,000-- | -- | -- | -- | -- | .4 | -- | -- | .4 | 2.0 | -- | -- | 2.0 | 2.4 | -- | -- | 2.4 |
| 1,000-2,000 | -- | -- | -- | -- | -- | -- | -- | -- | .5 | -- | -- | .5 | .5 | -- | -- | .5 |
| 2,000-3,000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 3.8 | -- | -- | 3.8 | 7.2 | -- | -- | 7.2 | 9.9 | -- | -- | 9.9 | 20.9 | -- | -- | 20.9 |
| **Lower and Upper Hartshorne, Charleston, and Paris coal beds** | | | | | | | | | | | | | | | | |
| 0-60------- | 8.2 | 9.1 | 22.7 | 40.0 | 6.3 | 4.2 | 6.2 | 16.7 | 12.3 | 2.4 | 0.4 | 15.1 | 26.8 | 15.7 | 29.3 | 71.8 |
| 60-500----- | 7.6 | 32.8 | 63.8 | 104.2 | 15.9 | 60.3 | 42.2 | 118.4 | 132.2 | 100.6 | 8.5 | 241.3 | 155.7 | 193.7 | 114.5 | 463.9 |
| 500-1,000-- | .3 | 8.1 | 17.1 | 25.5 | 2.9 | 21.2 | 39.1 | 63.2 | 99.6 | 137.2 | 25.0 | 261.8 | 102.8 | 166.5 | 81.2 | 350.5 |
| 1,000-2,000 | -- | 1.0 | 3.3 | 4.3 | -- | 8.2 | 6.5 | 14.7 | 23.5 | 66.2 | 12.8 | 102.5 | 23.5 | 75.4 | 22.6 | 121.5 |
| 2,000-3,000 | -- | (3) | -- | (3) | -- | .7 | .1 | .8 | 10.5 | 23.7 | *20.3 | *54.5 | 10.5 | 24.4 | *20.4 | *55.3 |
| Total | 16.1 | 51.0 | 106.9 | 174.0 | 25.1 | 94.6 | 94.1 | 213.8 | 278.1 | 330.1 | *67.0 | *675.2 | 319.3 | 475.7 | *268.0 | *1,063.0 |
| **Crawford, Franklin, Johnson, Logan, Scott, and Sebastian Counties** | | | | | | | | | | | | | | | | |
| **Lower Hartshorne coal bed** | | | | | | | | | | | | | | | | |
| 0-60------- | 18.5 | 16.3 | 33.0 | 67.8 | 10.7 | 5.4 | 7.7 | 23.8 | 31.7 | 6.9 | 0.7 | 39.3 | 60.9 | 28.6 | 41.4 | 130.9 |
| 60-500----- | 8.4 | 45.1 | 88.5 | 142.0 | 21.4 | 72.1 | 59.2 | 152.7 | 291.7 | 158.6 | 24.3 | 474.6 | 321.5 | 275.8 | 172.0 | 769.5 |
| 500-1,000-- | .5 | 8.1 | 19.8 | 28.4 | 3.3 | 22.9 | 45.8 | 72.0 | 159.8 | 166.6 | 42.5 | 368.9 | 163.6 | 197.6 | 108.1 | 469.3 |
| 1,000-2,000 | -- | 1.9 | 3.3 | 5.2 | -- | 9.6 | 6.6 | 16.2 | 50.9 | 102.5 | 23.6 | 177.0 | 50.9 | 114.0 | 33.5 | 198.3 |
| 2,000-3,000 | -- | .6 | -- | .6 | -- | 1.4 | .1 | 1.5 | 19.1 | 29.5 | *21.0 | *69.6 | 19.1 | 31.5 | *21.1 | *71.7 |
| Total | 27.4 | 72.0 | 144.6 | 244.0 | 35.4 | 111.4 | 119.4 | 266.2 | 553.2 | 464.1 | *112.1 | *1,129.4 | 616.0 | 647.5 | *376.1 | *1,639.7 |

**Table 7.** Estimated original resources of low-volatile bituminous coal, west-central Arkansas (modified from Haley (1960), table 1, p. 801–807)—Continued

| Overburden (ft) | Measured | | | | Indicated | | | | Inferred | | | | Total resources | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 14-28 in. | 28-42 in. | 42+ in. | Total | 14-28 in. | 28-42 in. | 42+ in. | Total | 14-28 in. | 28-42 in. | 42+ in. | Total | 14-28 in. | 28-42 in. | 42+ in. | Total |
| **Upper Hartshorne coal bed** | | | | | | | | | | | | | | | | |
| 0-60------- | 1.4 | (3) | -- | 1.4 | 1.3 | -- | -- | 1.3 | 1.8 | -- | -- | 1.8 | 4.5 | (3) | -- | 4.5 |
| 60-500------ | 3.6 | 0.1 | -- | 3.7 | 4.9 | -- | -- | 4.9 | 11.5 | -- | -- | 11.5 | 20.0 | 0.1 | -- | 20.1 |
| 500-1,000--- | (1) | -- | -- | (1) | .2 | -- | -- | .2 | 2.7 | -- | -- | 2.7 | 2.9 | -- | -- | 2.9 |
| 1,000-2,000 | -- | -- | -- | -- | -- | -- | -- | -- | .4 | -- | -- | .4 | .4 | -- | -- | .4 |
| 2,000-3,000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 5.0 | 0.1 | -- | 5.1 | 6.4 | -- | -- | 6.4 | 16.4 | -- | -- | 16.4 | 27.8 | 0.1 | -- | 27.9 |
| **Charleston coal bed** | | | | | | | | | | | | | | | | |
| 0-60------- | 7.4 | -- | -- | 7.4 | 6.0 | -- | -- | 6.0 | 8.6 | -- | -- | 8.6 | 22.0 | -- | -- | 22.0 |
| 60-500------ | 3.7 | -- | -- | 3.7 | 6.9 | -- | -- | 6.9 | 8.6 | -- | -- | 8.6 | 19.2 | -- | -- | 19.2 |
| 1,000-2,000 | -- | -- | -- | -- | 1.4 | -- | -- | 1.4 | 10.0 | -- | -- | 10.0 | 11.4 | -- | -- | 11.4 |
| 2,000-3,000 | -- | -- | -- | -- | -- | -- | -- | -- | 9.0 | -- | -- | 9.0 | 9.0 | -- | -- | 9.0 |
| Total | 11.1 | -- | -- | 11.1 | 14.3 | -- | -- | 14.3 | 36.2 | -- | -- | 36.2 | 61.6 | -- | -- | 61.6 |
| **Paris coal bed** | | | | | | | | | | | | | | | | |
| 0-60------- | 8.4 | 1.7 | -- | 10.1 | 3.2 | 0.4 | -- | 3.6 | 0.7 | 0.6 | -- | 1.3 | 12.3 | 2.7 | -- | 15.0 |
| 60-500------ | 5.6 | 1.2 | -- | 6.8 | 7.4 | 1.7 | -- | 9.1 | 4.9 | 1.8 | -- | 6.7 | 17.9 | 4.7 | -- | 22.6 |
| 500-1,000--- | -- | (3) | -- | (3) | 1.0 | .6 | -- | 1.6 | 1.0 | .5 | -- | 1.5 | 2.0 | 1.1 | -- | 3.1 |
| 1,000-2,000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 2,000-3,000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 14.0 | 2.9 | -- | 16.9 | 11.6 | 2.7 | -- | 14.3 | 6.6 | 2.9 | -- | 9.5 | 32.2 | 8.5 | -- | 40.7 |
| **Lower and Upper Hartshorne, Charleston, and Paris coal beds** | | | | | | | | | | | | | | | | |
| 0-60------- | 35.7 | 18.0 | 33.0 | 86.7 | 21.2 | 5.8 | 7.7 | 34.7 | 42.8 | 7.5 | 0.7 | 51.0 | 99.7 | 31.3 | 41.4 | 172.4 |
| 60-500------ | 21.3 | 46.4 | 88.5 | 156.2 | 40.6 | 73.8 | 59.2 | 173.6 | 316.9 | 160.4 | 24.3 | 501.6 | 378.8 | 280.6 | 172.0 | 831.4 |
| 500-1,000--- | .5 | 8.1 | 19.8 | 28.4 | 5.9 | 23.5 | 45.8 | 75.2 | 173.5 | 167.1 | 42.5 | 383.1 | 179.9 | 198.7 | 108.1 | 486.7 |
| 1,000-2,000 | -- | 1.9 | 3.3 | 5.2 | -- | 9.6 | 6.6 | 16.2 | 60.3 | 102.4 | 23.6 | 186.4 | 60.3 | 113.9 | 33.5 | 207.7 |
| 2,000-3,000 | -- | .6 | -- | .6 | -- | 1.4 | .1 | 1.5 | 19.1 | 29.5 | 4)21.0 | 4)69.6 | 19.1 | 31.5 | 4)21.1 | 4)71.7 |
| Total | 57.5 | 75.0 | 144.6 | 277.1 | 67.7 | 114.1 | 119.4 | 301.2 | 612.6 | 466.9 | 4)112.1 | 4)1,191.7 | 737.8 | 656.0 | 4)376.1 | 4)1,769.9 |

[1]Between 31,000 and 40,000 short tons.
[2]Between 11,000 and 20,000 short tons.
[3]Between 41,000 and 50,000 short tons.
[4]417,000 short tons overlain by 3,000 ft or more of overburden.

**Table 8.** Estimated original resources of semianthracite in the Lower Hartshorne coal bed, west-central Arkansas (modified from Haley (1960), table 2, p. 808–9)

[Resources, in millions of short tons, in beds of thickness stated. Leaders (--), no estimated resources]

| Overburden (ft) | Measured | | | | Indicated | | | | Inferred | | | | Total resources | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 14–28 in. | 28–42 in. | 42+ in. | Total | 14–28 in. | 28–42 in. | 42+ in. | Total | 14–28 in. | 28–42 in. | 42+ in. | Total | 14–28 in. | 28–42 in. | 42+ in. | Total |
| **Johnson County** | | | | | | | | | | | | | | | | |
| 0–60------- | 3.1 | 2.0 | 0.4 | 5.5 | 2.6 | 1.3 | -- | 3.9 | 3.5 | 23.8 | -- | 27.3 | 9.2 | 27.1 | 0.4 | 36.7 |
| 60–500----- | 2.0 | 22.9 | 4.7 | 29.6 | 7.0 | 25.4 | 4.4 | 36.8 | 22.7 | 58.6 | 37.7 | 119.0 | 31.7 | 106.9 | 46.8 | 185.4 |
| 500–1,000-- | .8 | .8 | -- | 1.6 | 1.6 | 2.0 | .5 | 4.1 | 12.7 | 24.7 | 9.7 | 47.1 | 15.1 | 27.5 | 10.2 | 52.8 |
| 1,000–2,000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 2,000–3,000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 5.9 | 25.7 | 5.1 | 36.7 | 11.2 | 28.7 | 4.9 | 44.8 | 38.9 | 107.1 | 47.4 | 193.4 | 56.0 | 161.5 | 57.4 | 274.9 |
| **Logan County** | | | | | | | | | | | | | | | | |
| 0–60------- | 0.1 | 2.3 | -- | 2.4 | 0.1 | -- | -- | 0.1 | 1.0 | -- | -- | 1.0 | 1.2 | 2.3 | -- | 3.5 |
| 60–500----- | 1.5 | 6.2 | 0.6 | 8.3 | 2.3 | 1.3 | 0.5 | 4.1 | 17.6 | 13.0 | 6.9 | 37.5 | 21.4 | 20.5 | 8.0 | 49.9 |
| 500–1,000-- | 3.2 | 1.4 | 2.0 | 6.6 | 1.4 | 8.2 | 4.7 | 14.3 | 32.9 | 21.3 | 13.8 | 68.0 | 37.5 | 30.9 | 20.5 | 88.9 |
| 1,000–2,000 | -- | .7 | -- | .7 | -- | 1.9 | -- | 1.9 | 4.6 | 8.0 | -- | 12.6 | 4.6 | 10.6 | -- | 15.2 |
| 2,000–3,000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 4.8 | 10.6 | 2.6 | 18.0 | 3.8 | 11.4 | 5.2 | 20.4 | 56.1 | 42.3 | 20.7 | 119.1 | 64.7 | 64.3 | 28.5 | 157.5 |
| **Pope County** | | | | | | | | | | | | | | | | |
| 0–60------- | 0.6 | 0.2 | 1.0 | 1.8 | 1.4 | 0.3 | 0.3 | 2.0 | 1.5 | -- | -- | 1.5 | 3.5 | 0.5 | 1.3 | 5.3 |
| 60–500----- | 3.5 | .8 | .4 | 4.7 | 3.3 | 1.2 | -- | 4.5 | 7.5 | -- | -- | 7.5 | 14.3 | 2.0 | .4 | 16.7 |
| 500–1,000-- | .6 | .3 | -- | .9 | .2 | .3 | -- | .5 | -- | -- | -- | -- | .8 | .6 | -- | 1.4 |
| 1,000–2,000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 2,000–3,000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 4.7 | 1.3 | 1.4 | 7.4 | 4.9 | 1.8 | 0.3 | 7.0 | 9.0 | -- | -- | 9.0 | 18.6 | 3.1 | 1.7 | 23.4 |
| **Johnson, Logan, and Pope Counties** | | | | | | | | | | | | | | | | |
| 0–60------- | 3.8 | 4.5 | 1.4 | 9.7 | 4.1 | 1.6 | 0.3 | 6.0 | 6.0 | 23.8 | -- | 29.8 | 13.9 | 29.9 | 1.7 | 45.5 |
| 60–500----- | 7.0 | 29.9 | 5.7 | 42.6 | 12.6 | 27.9 | 4.9 | 45.4 | 47.8 | 71.6 | 44.6 | 164.0 | 67.4 | 129.4 | 55.2 | 252.0 |
| 500–1,000-- | 4.6 | 2.5 | 2.0 | 9.1 | 3.2 | 10.5 | 5.2 | 18.9 | 45.6 | 46.0 | 23.5 | 115.1 | 53.4 | 59.0 | 30.7 | 143.1 |
| 1,000–2,000 | -- | .7 | -- | .7 | -- | 1.9 | -- | 1.9 | 4.6 | 8.0 | -- | 12.6 | 4.6 | 10.6 | -- | 15.2 |
| 2,000–3,000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 15.4 | 37.6 | 9.1 | 62.1 | 19.9 | 41.9 | 10.4 | 72.2 | 104.0 | 149.4 | 68.1 | 321.5 | 139.3 | 228.9 | 87.6 | 455.8 |

**Table 9.** Estimated original resources of coal of all rank in all coal beds, west-central Arkansas (modified from Haley (1960), table 5, p. 814)

[Resources, in millions of short tons, in beds of thickness stated. Leaders (--), no estimated resources]

| Overburden (ft) | Measured | | | | Indicated | | | | Inferred | | | | Total resources | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 14-28 in. | 28-42 in. | 42+ in. | Total | 14-28 in. | 28-42 in. | 42+ in. | Total | 14-28 in. | 28-42 in. | 42+ in. | Total | 14-28 in. | 28-42 in. | 42+ in. | Total |
| 0-60------- | 39.5 | 22.5 | 34.4 | 96.4 | 25.3 | 7.4 | 8.0 | 40.7 | 48.8 | 31.3 | 0.7 | 80.8 | 113.6 | 61.2 | 43.1 | 217.9 |
| 60-500----- | 28.3 | 76.3 | 94.2 | 198.8 | 53.2 | 101.7 | 64.1 | 219.0 | 364.7 | 232.0 | 68.9 | 665.6 | 446.2 | 410.0 | 227.2 | 1,083.4 |
| 500-1,000-- | 5.1 | 10.6 | 21.8 | 37.5 | 9.1 | 34.0 | 51.0 | 94.1 | 219.1 | 213.1 | 66.0 | 498.2 | 233.3 | 257.7 | 138.8 | 629.8 |
| 1,000-2,000 | -- | 2.6 | 3.3 | 5.9 | -- | 11.5 | 6.6 | 18.1 | 64.9 | 110.4 | 23.6 | 199.0 | 64.9 | 124.5 | 33.5 | 222.9 |
| 2,000-3,000 | -- | .6 | -- | .6 | -- | 1.4 | .1 | 1.5 | 19.1 | 29.5 | [1]21.0 | [1]69.6 | 19.1 | 31.5 | [1]21.1 | [1]71.7 |
| Total | 72.9 | 112.6 | 153.7 | 339.2 | 87.6 | 156.0 | 129.8 | 373.4 | 716.6 | 616.3 | [1]180.2 | 1,513.1 | 877.1 | 884.9 | [1]463.7 | 2,225.7 |

[1]417,000 short tons overlain by 3,000 ft or more of overburden.

**Table 10.** Recorded production of coal in short tons in Arkansas, 1880–1978 (modified from Haley (1960), table 7, p. 822)

[Source of data, except as noted: U.S. Geological Survey (1885, 1888–1918, 1921–1923) for 1880–1923; U.S. Bureau of Mines (1924–1933, 1934–1975) for 1924–1975; Arkansas Geological Commission (1976–1978) for 1976–1978. Producing county unknown for 1880–1886. The totals for "county", except Sebastian, and for "other counties and (or) small mines in Arkansas" include a proportion, according to total production, of production reported as combined in some years for two or more counties. Leaders (--), no reported production. Values centered between counties represent combined production from counties]

| Year | County | | | | | | Other counties and (or) small mines in Arkansas | Total |
|---|---|---|---|---|---|---|---|---|
| | Franklin | Johnson | Logan | Pope | Scott | Sebastian | | |
| 1880 | -- | -- | -- | -- | -- | -- | -- | 14,778 |
| 1881 | -- | -- | -- | -- | -- | -- | -- | [1]20,000 |
| 1882 | -- | -- | -- | -- | -- | -- | -- | [1]25,000 |
| 1883 | -- | -- | -- | -- | -- | -- | -- | 50,000 |
| 1884 | -- | -- | -- | -- | -- | -- | -- | 75,000 |
| 1885 | -- | -- | -- | -- | -- | -- | -- | 100,000 |
| 1886 | -- | -- | -- | -- | -- | -- | -- | 125,000 |
| 1887 | -- | 81,900 | -- | 8,200 | -- | 39,500 | -- | 129,600 |
| 1888 | -- | 106,037 | -- | 10,240 | -- | 160,594 | -- | 276,871 |
| 1889 | 1,688 | 105,998 | -- | 6,014 | -- | 165,884 | -- | 279,584 |
| 1890 | [1]3,000 | 89,000 | -- | 4,000 | -- | 300,888 | [2]3,000 | 399,888 |
| 1891 | [1]5,000 | 80,000 | -- | 5,000 | -- | 451,379 | [2]1,000 | 542,379 |
| 1892 | [1]7,000 | 91,960 | -- | 17,500 | -- | 420,098 | -- | 536,558 |
| 1893 | 9,879 | 97,733 | -- | 12,250 | -- | 448,901 | 6,000 | 574,763 |
| 1894 | 147,728 | | -- | 17,788 | -- | 341,110 | 6,000 | 512,626 |
| 1895 | [3]125,012 | 127,926 | -- | ([4]) | -- | 339,384 | 6,000 | 598,322 |
| 1896 | 115,380 | [3]107,331 | -- | ([5]) | -- | 446,662 | 6,000 | 675,374 |
| 1897 | 164,297 | [3]117,002 | -- | ([5]) | -- | 568,891 | 6,000 | 856,190 |
| 1898 | [3]328,412 | | -- | ([6]) | -- | 871,067 | 6,000 | 1,205,479 |
| 1899 | [2]234,496 | | [1]5,000 | 17,700 | -- | 580,358 | 6,000 | 843,554 |
| 1900 | [2] [3]293,330 | 139,136 | [1]10,000 | ([4]) | -- | 999,479 | 6,000 | 1,447,945 |
| 1901 | [2] [3]343,721 | 146,225 | [1]15,000 | ([4]) | -- | 1,305,190 | 6,000 | 1,816,136 |
| 1902 | 338,013 | 193,258 | 21,751 | 34,966 | [7]30,763 | 1,325,181 | -- | 1,943,932 |
| 1903 | 394,884 | 198,999 | 27,286 | 48,836 | [8]30,279 | 1,528,888 | -- | 2,229,172 |
| 1904 | 408,494 | 217,667 | 35,300 | 51,488 | [9]61,708 | 1,234,794 | -- | 2,009,451 |
| 1905 | 420,384 | 214,234 | 26,090 | 39,685 | [9]44,825 | 1,189,455 | -- | 1,934,673 |
| 1906 | [1]330,000 | [2]159,434 | 26,647 | 34,776 | [9]34,914 | 1,278,497 | -- | 1,864,268 |
| 1907 | 423,452 | 243,283 | 29,970 | 47,753 | [9]50,594 | 1,875,386 | -- | 2,670,438 |
| 1908 | 203,312 | 197,683 | 30,723 | 35,481 | ([10]) | 1,580,778 | [11]30,380 | 2,078,357 |
| 1909 | 281,399 | 171,102 | 25,169 | 56,344 | ([10]) | 1,818,781 | [11]24,362 | 2,377,157 |
| 1910 | 296,725 | 133,365 | 15,492 | 13,240 | ([10]) | 1,425,347 | [11]21,789 | 1,905,958 |
| 1911 | 421,591 | 137,081 | 11,974 | 45,935 | ([10]) | 1,484,532 | [11]5,676 | 2,106,789 |
| 1912 | 373,314 | 192,326 | 15,272 | 64,216 | ([10]) | 1,454,128 | [11]1,563 | 2,100,819 |
| 1913 | 346,682 | 166,208 | 5,028 | 79,608 | ([10]) | 1,635,379 | [11]1,202 | 2,234,107 |
| 1914 | 168,746 | 148,845 | 7,172 | 75,938 | ([10]) | 1,423,202 | [12]12,637 | 1,836,540 |

**Table 10.** Recorded production of coal in short tons in Arkansas, 1880–1978 (modified from Haley (1960), table 7, p. 822)—Continued

| Year | County | | | | | | Other counties and (or) small mines in Arkansas | Total |
|---|---|---|---|---|---|---|---|---|
| | Franklin | Johnson | Logan | Pope | Scott | Sebastian | | |
| 1915 | 190,237 | 176,457 | 29,505 | [9]93,517 | | 1,153,494 | 8,896 | 1,652,106 |
| 1916 | 243,118 | 243,774 | 42,128 | [9]103,773 | | 1,352,402 | 9,720 | 1,994,915 |
| 1917 | 210,152 | 306,948 | 46,950 | [13]127,544 | | 1,433,355 | 18,630 | 2,143,579 |
| 1918 | 240,149 | 371,704 | 49,368 | 112,692 | | 1,447,268 | 6,188 | 2,227,369 |
| 1919 | 144,541 | 211,036 | 42,937 | 118,061 | | 903,414 | 9,031 | 1,429,020 |
| 1920 | 278,450 | 247,517 | 66,636 | [9]126,528 | | 1,321,465 | 53,000 | 2,103,596 |
| 1921 | 164,046 | 58,792 | 74,962 | [9]103,156 | -- | 826,821 | -- | 1,227,777 |
| 1922 | 168,564 | 132,331 | 59,861 | [9]32,599 | | 692,691 | 24,000 | 1,110,046 |
| 1923 | 254,041 | 179,791 | [14]101,364 | [14]51,883 | [2] [9]20,284 | 642,717 | 63,650 | 1,313,730 |
| 1924 | 229,404 | 290,952 | 159,519 | [14]62,059 | [2]6,383 | [14]737,588 | -- | 1,485,905 |
| 1925 | 191,014 | 318,380 | [14]222,850 | [14]22,355 | [2]14,028 | 468,125 | -- | 1,236,752 |
| 1926 | [14]229,969 | 337,141 | [14]224,081 | 57,945 | [9]14,428 | 600,559 | -- | 1,464,123 |
| 1927 | [14]359,963 | 287,818 | 179,625 | 88,261 | | 710,305 | -- | 1,625,972 |
| 1928 | [14]286,988 | 298,008 | [14]212,789 | 104,329 | | 792,021 | -- | 1,694,135 |
| 1929 | 263,370 | 325,876 | [14]277,413 | [9]107,773 | [2]13,827 | [14]839,851 | -- | 1,828,110 |
| 1930 | 226,737 | 262,759 | 318,567 | 96,809 | | 628,562 | -- | 1,533,434 |
| 1931 | [14]125,222 | 177,319 | 263,319 | 86,393 | | [14]506,560 | [14] [15]338 | 1,159,151 |
| 1932 | [14]155,023 | 136,245 | [14]232,577 | [14]54,961 | [2]15,038 | [14]451,350 | [14] [15]100 | 1,045,294 |
| 1933 | [14]145,981 | [14]120,176 | [14]259,818 | [14]41,297 | [14]1,042 | [14]402,714 | [14] [16]1,074 | 972,102 |
| 1934 | [14]162,195 | 94,262 | 283,815 | [14]47,033 | [14]607 | 322,908 | [14] [16]248 | 911,068 |
| 1935 | [14]163,684 | 148,776 | [14]340,462 | 49,016 | [14]12 | 460,459 | [14] [16]112 | 1,162,521 |
| 1936 | 191,273 | 228,941 | 466,718 | 62,520 | | 673,335 | -- | 1,622,787 |
| 1937 | 172,252 | 209,417 | 451,155 | 51,817 | | 626,112 | -- | 1,510,753 |
| 1938 | 158,703 | 154,766 | 396,433 | 38,675 | -- | 448,470 | -- | 1,197,047 |
| 1939 | 112,644 | 194,007 | 359,363 | 57,786 | | 428,238 | -- | 1,152,038 |
| 1940 | 125,469 | 184,506 | 448,564 | 85,321 | | 609,751 | -- | 1,453,611 |
| 1941 | 77,118 | 256,679 | 466,094 | 34,599 | | 739,682 | -- | 1,574,172 |
| 1942 | [3]152,027 | 304,386 | 572,680 | ([4]) | -- | 956,300 | -- | 1,985,393 |
| 1943 | 139,529 | 335,831 | 465,244 | -- | -- | 777,331 | -- | 1,717,935 |
| 1944 | 162,309 | 435,131 | 419,865 | 59,127 | -- | 896,009 | -- | 1,972,441 |
| 1945 | 156,546 | 432,788 | 354,267 | 157,753 | | 752,572 | -- | 1,853,926 |
| 1946 | 161,144 | 344,210 | 310,650 | 61,299 | 153,345 | 600,826 | -- | 1,631,474 |
| 1947 | 118,261 | 444,586 | 287,271 | 48,380 | 86,430 | 886,021 | -- | 1,870,949 |
| 1948 | 140,924 | 406,821 | 259,918 | 57,613 | 84,825 | 712,086 | -- | 1,662,187 |
| 1949 | 82,956 | 202,247 | 186,894 | 35,733 | -- | 453,681 | -- | 961,511 |
| 1950 | 68,298 | 485,103 | 185,882 | 41,666 | 70,000 | 318,119 | -- | 1,169,068 |
| 1951 | 80,350 | 422,353 | 165,565 | 23,459 | -- | 414,978 | -- | 1,106,705 |
| 1952 | 18,393 | 330,270 | 108,163 | 13,246 | -- | 403,016 | -- | 873,088 |
| 1953 | 14,196 | 355,983 | 65,565 | -- | -- | 339,463 | -- | 775,207 |
| 1954 | ([10]) | 213,406 | ([10]) | -- | -- | 226,907 | [17]36,955 | 477,268 |

**Table 10.** Recorded production of coal in short tons in Arkansas, 1880–1978 (modified from Haley (1960), table 7, p. 822)—Continued

| Year | County | | | | | | Other counties and (or) small mines in Arkansas | Total |
|---|---|---|---|---|---|---|---|---|
| | Franklin | Johnson | Logan | Pope | Scott | Sebastian | | |
| 1955 | 8,791 | 286,152 | 28,191 | -- | -- | 254,592 | -- | 577,726 |
| 1956 | 6,873 | 249,943 | 25,223 | -- | -- | 308,052 | -- | 590,091 |
| 1957 | ([10]) | 195,600 | ([10]) | 1,390 | -- | 259,110 | 51,631 | 507,731 |
| 1958 | ([10]) | 186,564 | 19,110 | ([10]) | -- | 91,499 | 66,965 | 364,138 |
| 1959 | 35,528 | 148,694 | 9,728 | 66,708 | -- | 180,650 | -- | 441,308 |
| 1960 | 117,127 | 112,805 | ([10]) | ([10]) | -- | 101,754 | 77,513 | 409,199 |
| 1961 | 99,386 | 99,375 | ([10]) | ([10]) | -- | 125,545 | 70,630 | 394,936 |
| 1962 | 87,180 | 112,239 | ([10]) | ([10]) | -- | 41,453 | 14,867 | 255,739 |
| 1963 | 80,686 | 108,326 | 6,492 | -- | -- | 25,146 | -- | 220,650 |
| 1964 | 86,880 | 114,885 | -- | -- | -- | 10,550 | -- | 212,315 |
| 1965 | 87,492 | 128,662 | -- | -- | -- | 9,734 | -- | 225,888 |
| 1966 | 113,357 | 114,871 | -- | -- | -- | 7,528 | -- | 235,748 |
| 1967 | 73,000 | ([10]) | ([10]) | ([10]) | ([10]) | ([10]) | 116,000 | 189,000 |
| 1968 | 66,000 | 140,000 | -- | -- | -- | 5,000 | -- | 211,000 |
| 1969 | 93,000 | 128,000 | -- | -- | -- | 7,000 | -- | 228,000 |
| 1970 | 104,000 | 133,000 | 8,000 | -- | -- | 23,000 | -- | 268,000 |
| 1971 | 89,000 | 157,000 | 13,000 | -- | -- | 18,000 | -- | 276,000 |
| 1972 | 84,000 | 192,000 | 4,000 | -- | -- | 148,000 | -- | 428,000 |
| 1973 | 72,000 | 169,000 | 19,000 | -- | -- | 174,000 | -- | 434,000 |
| 1974 | 100,889 | 161,035 | 7,001 | -- | -- | 175,000 | -- | 453,925 |
| 1975 | 108,496 | 134,306 | 34,584 | -- | -- | 211,052 | -- | 488,438 |
| 1976 | 110,477 | 146,945 | 10,441 | -- | -- | 237,874 | -- | 505,737 |
| 1977 | 106,229 | 142,588 | 498 | -- | -- | 217,380 | -- | 466,695 |
| 1978 | 133,451 | 46,349 | 472 | -- | -- | 139,003 | -- | 319,275 |
| Total | 13,859,684 | 18,328,695 | 9,922,450 | 3,313,459 | 958,057 | 57,422,130 | [18]1,114,992 | 104,988,512 |

[1]Hendricks and Parks (1937, p. 204).
[2]U.S. Geological Survey or U.S. Bureau of Mines figure for two or more counties combined, minus Hendricks and Parks (1937) or Gibson (1936) figure for other county.
[3]Includes an indeterminate amount of bituminous coal from Pope County.
[4]Included with Franklin County.
[5]Included with Johnson County.
[6]Included with Franklin and Johnson Counties.
[7]Includes an indeterminate amount of lignite from Ouachita County.
[8]Includes an indeterminate amount of lignite from Ouachita County and bituminous coal from Perry County.
[9]Includes an indeterminate amount of bituminous coal from Washington County.
[10]Included with "Other counties and (or) small mines in Arkansas."
[11]Includes an indeterminate amount of bituminous coal from Scott and Washington Counties.
[12]Includes an indeterminate amount of lignite from Ouachita County and bituminous coal from Scott and Washington Counties.
[13]Includes an indeterminate amount of lignite from Ouachita County and bituminous coal from Washington County.
[14]Gibson (1936, table 9).
[15]White County.
[16]Washington County.
[17]Includes an indeterminate amount of bituminous coal from Franklin and Logan Counties.
[18]Includes total production for State for years 1880-86.



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