

STATE OF OHIO
MICHAEL V. DISALLE, Governor
DEPARTMENT OF NATURAL RESOURCES
HERBERT B. EAGON, Director
DIVISION OF GEOLOGICAL SURVEY
RALPH J. BERNHAGEN, Chief

BULLETIN 58

COAL RESOURCES OF OHIO

BY
RUSSELL A. BRANT
RICHARD M. DeLONG

COLUMBUS
1960

COAL RESOURCES OF OHIO

Ohio Division of Geological Survey Bulletin 58

ERRATA

- Page 53 - Figure 17, stippled pattern should read "area of thin or unknown Pittsburgh coal."
- Page 79 - 5th paragraph from top, 3rd and 4th lines - "see tables 37 and 37" should read "see tables 37 and 38."
- Pages 136-146 - Headings of tables 37 and 38 "(in short tons)" should read "(thousands of short tons; add three zeros)."

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INTRODUCTION

A rapid growth of new industries as well as an expansion of established ones in the United States during recent years has created an ever increasing demand for fuel. Because coal is the major fuel in Ohio, it is imperative to know the extent of the coal reserve in the State before sound estimates can be made of the ability of the State to contribute toward current and anticipated fuel demands.

Since 1952, the Ohio Division of Geological Survey has been in the process of publishing a series of reports dealing with either individual coal beds or groups of coal beds, and estimates of their potential reserve. This report presents a generalized summary of these previous studies.

In addition to summarizing all recently developed estimates of the reserve, this report also summarizes all the face-sample analytical data in the Division's files. Some of this information is now outdated, though still useful in a general way, and some of it is from the most recent and reliable chemical studies of Ohio coal. This bulletin replaces Bulletin 34 of the Geological Survey of Ohio (now out of print) as a source of reference for analytical data on the coal of Ohio.

Where the need for additional information exists, reference can be made to earlier reports of the reserve series, and to original data, including outcrop maps and measured geologic sections in the files of the Division.

The Ohio Division of Geological Survey publications which are extracted and upon which this report is based are the following:

The Meigs Creek (No. 9) coal bed in Ohio, Pt. I; by W. H. Smith, R. A. Brant, and F. Amos: Rept. Inv. 17, 1952.

The Lower Kittanning (No. 5) coal bed in Ohio, by R. A. Brant: Rept. Inv. 21, 1954.

The Pittsburgh (No. 8) and Redstone (No. 8a) coal beds in Ohio, by R. M. DeLong: Rept. Inv. 26, 1955.

Coal resources of the upper part of the Allegheny formation in Ohio, by R. A. Brant: Rept. Inv. 29, 1956.

Coal resources of the lower part of the Allegheny formation in Ohio, by R. M. DeLong: Rept. Inv. 31, 1957.

Coal beds of the Conemaugh formation in Ohio, by T. A. DeBrosse: Rept. Inv. 34, 1957.

Coal resources of the Pottsville formation, by J. A. Granchi: Rept. Inv. 36, 1958.

Coal resources of the upper part of the Monongahela formation and the Dunkard group in Ohio, by G. H. Denton: Rept. Inv. 38, 1960.

ACKNOWLEDGMENTS

The program for determination of the coal reserve of Ohio was begun in 1952, under the direction of William H. Smith, who was then head of the coal section of the Ohio Division of Geological Survey. His efforts solved many problems of the program, especially in correlation of the deeper occurrences of coal. John H. Melvin was chief of the Division of Geological Survey in 1952, when the initial work was begun under a legislative grant for the purpose of making a detailed study of the Meigs Creek (No. 9) coal bed in Ohio.

The cooperation of many mine operators and other individuals who supplied information about their mining operations is gratefully acknowledged.

The U. S. Geological Survey supplied the quantitative information regarding Belmont County, from the work of Henry L. Berryhill, Jr.

Many co-workers on the staff of the Ohio Division of Geological Survey were helpful in the preparation of the various parts of the report and in the work necessary for its publication. Mrs. Marian Klein, who has followed the coal-reserve work at the Division from the beginning, prepared virtually all of the tabular material on the coal reserve. Mrs. Doris Hyde, geologist, formerly with the Division, typed various drafts of the original manuscript. Fletcher Twitty gave freely of his talents in preparing illustrations, and Mrs. Mildred Shipley prepared the final photocopy for the printer.

SUMMARY

The present estimated original coal reserve of Ohio totals 46,488,251,000 short tons. This reserve is found in 24 coal beds in which the known or estimated thickness is 14 inches or greater (lower thickness limit of "minable" coal) (tables 1 and 2). The estimated coal reserve occurs in at least 32 counties located in eastern and southeastern Ohio (fig. 1). Coal is not mined in all of these counties at present; however, it has been mined in all of them at one time or another.

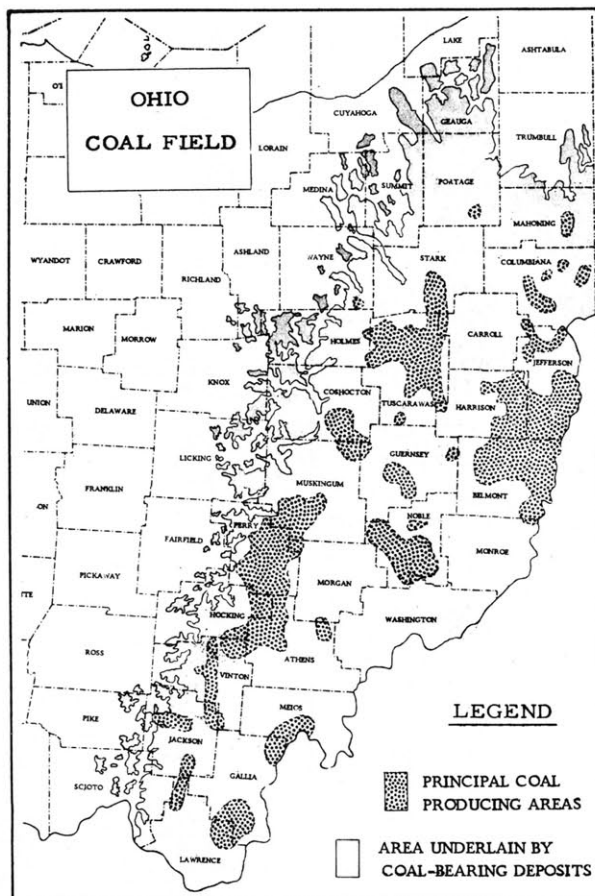


Figure 1 - Map of the coal-producing areas and other areas underlain by coal in Ohio.

TABLE 1 - ESTIMATED ORIGINAL RESERVE OF BITUMINOUS COAL IN OHIO
BY BED AND FORMATION

(Thousands of short tons)

Bed	Original reserves	
	Amount	Percent
Total.....	46,488,251	100.0
Washington	900,042	1.9
Waynesburg "A"	490,686	1.0
Permian.....	1,390,728	2.9
Waynesburg	690,754	1.5
Uniontown	1,380,168	3.0
Meigs Creek	4,020,762	8.6
Fishpot	440,746	.9
Redstone	796,257	1.7
Pittsburgh	5,559,932	12.0
Monongahela.....	12,888,619	27.7
Harlem	34,560	.1
Anderson	837,504	1.8
Wilgus	173,000	.4
Mahoning	284,304	.6
Cone maugh.....	1,329,368	2.9
Upper Freeport	4,180,771	9.0
Lower Freeport	2,446,278	5.3
Middle Kittanning	9,783,598	21.0
Lower Kittanning	9,913,989	21.3
Clarion	715,637	1.5
Brookville	446,215	1.0
Allegheny.....	27,486,488	59.1
Tionesta	180,288	.4
Bedford	308,928	.7
Upper Mercer	321,088	.7
Lower Mercer	328,312	.7
Quakertown	732,792	1.6
Sharon	1,521,640	3.3
Pottsville.....	3,393,048	7.4

Percent by formation

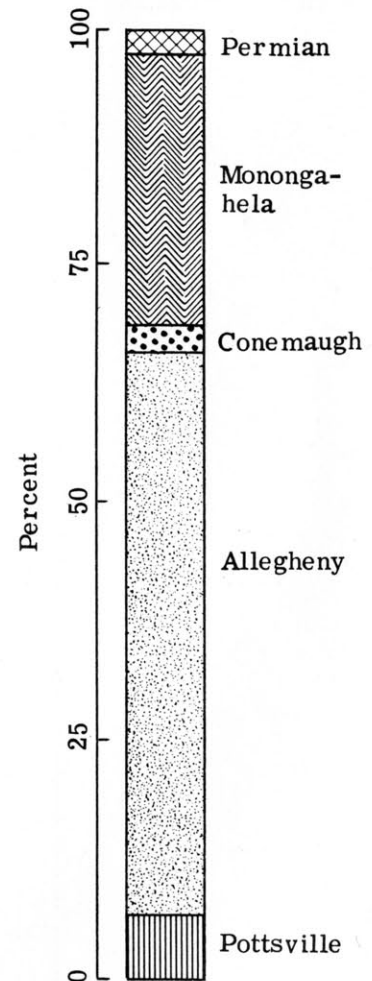
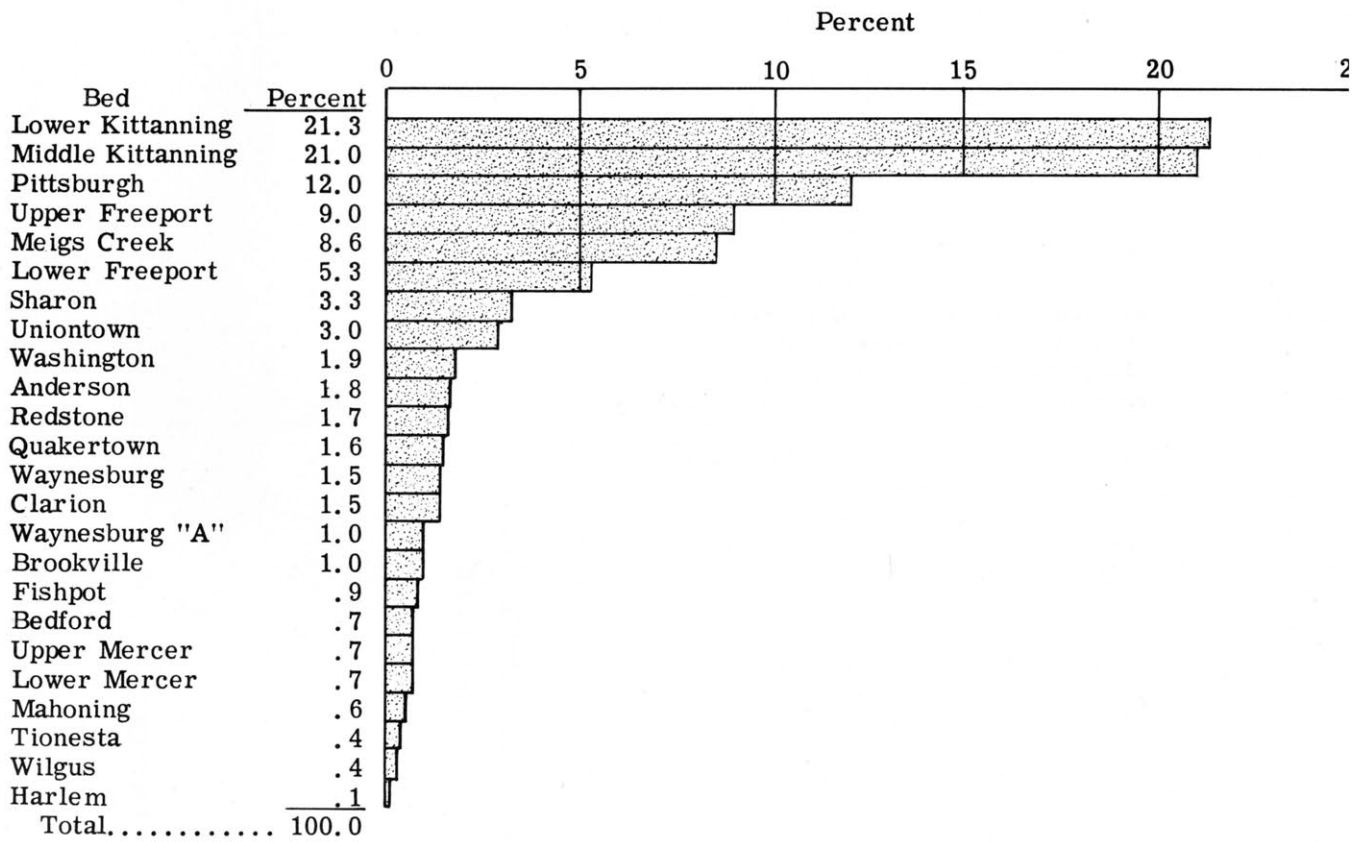


TABLE 2. - ESTIMATED ORIGINAL RESERVE OF BITUMINOUS COAL IN OHIO, BY BED



Coal deposits of minable extent are not distributed equally throughout the coal counties. Those counties which fringe the northern and western portions of the coal area contain fewer coal beds than those which lie to the south and east. For example, such counties as Trumbull, Portage, Summit and Medina, which lie on the north edge of the coal basin, have only one or part of one formation containing minable coal deposits. However, to the south, in such counties as Muskingum, Athens, or Guernsey, there are as many as four coal-bearing formations, (Pottsville, Allegheny, Conemaugh, and Monongahela), each of which may contain several coal members of minable thickness.

In the central part of the coal basin, along the Ohio River in Washington County and the surrounding area, the Washington and the Greene formations, in addition to the four formations mentioned above, contain small amounts of coal. Table 3 summarizes the estimated reserve, by county, and tables 4 and 5 summarize the totals of all classes of the reserve, by coal bed. A detailed report of the coal reserve, by county, coal bed, and township is contained in tables 37 and 38.

The estimated reserve of coal in Ohio is reported by the classifications of reliability, thickness, and geologic age. By the reliability classification nearly 60 percent of the total, or more than 27 billion tons (table 5), is in proven and probable categories. By thickness classification, 60 percent of the total reserve is found in the greater-than-28 inches category. When the reserve is classified by the geologic age, the Allegheny and Monongahela formations are found to contain most of the estimated reserve of coal, approximately 86.5 percent, or more than 40 billion tons (tables 4 and 5). Furthermore, the portion of the rock column that is of Pennsylvanian age contains 96.7 percent of the estimated reserve,

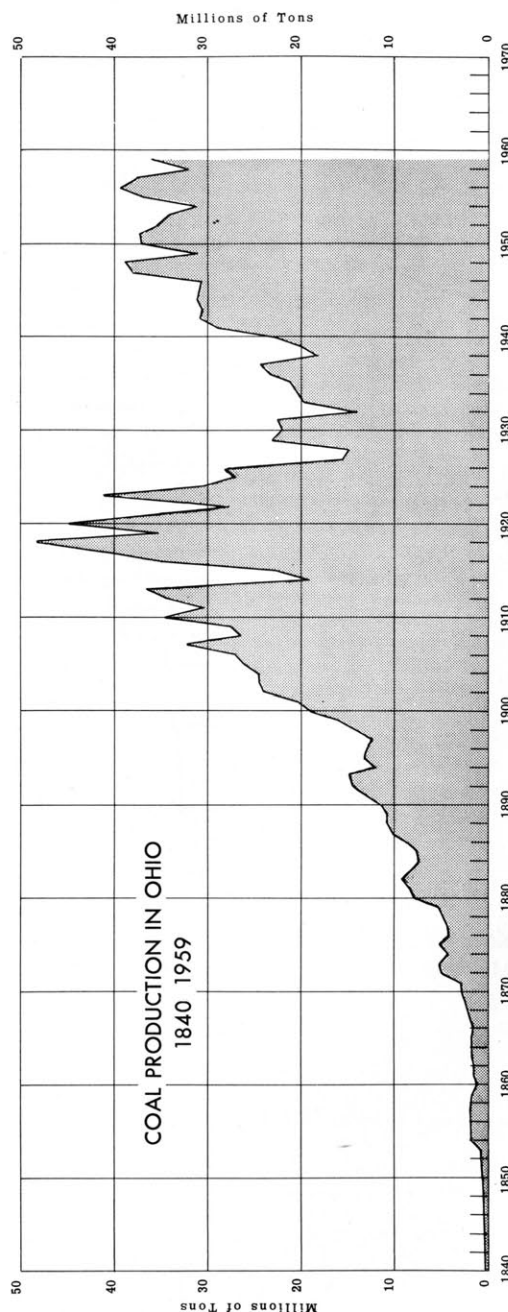


Figure 2 - Coal production in Ohio, 1840-1959.

TABLE 3. - ORIGINAL RESERVE, PRODUCTION, AND RECOVERABLE RESERVE OF BITUMINOUS COAL IN OHIO, BY COUNTY
(Thousands of short tons)

County	Original reserve	Production 1800-1958	Recoverable reserve ¹
Total	46,488,251	2,023,396	21,220,730
Athens	2,225,354	197,280	915,397
Belmont	5,759,456	441,905	2,437,823
Carroll	2,497,412	27,134	1,221,571
Columbiana	2,803,343	58,064	1,343,617
Coshocton	716,478	29,851	328,387
Gallia	1,642,616	9,784	811,523
Geauga	2,880	-	1,440
Guernsey	3,016,904	123,563	1,384,889
Harrison	2,985,459	178,139	1,314,591
Hocking	347,699	75,659	98,190
Holmes	352,083	2,186	173,855
Jackson	1,009,996	62,546	442,452
Jefferson	3,433,759	271,035	1,445,844
Lawrence	1,862,713	14,652	916,704
Licking	28,000	-	14,000
Mahoning	1,049,678	20,531	504,307
Medina	73,000	4,755	31,744
Meigs	942,190	48,272	422,823
Monroe	2,985,416	138	1,492,570
Morgan	1,419,433	19,800	689,916
Muskingum	2,029,340	50,105	964,565
Noble	1,415,084	34,095	673,447
Perry	1,148,247	147,075	427,048
Portage	111,824	6,304	49,608
Scioto	87,252	317	43,309
Stark	1,442,857	54,632	666,796
Summit	228,000	10,346	103,654
Trumbull	149,760	12,990	61,890
Tuscarawas	2,126,110	100,380	912,675
Vinton	1,172,123	11,889	574,172
Washington	1,262,721	2,232	629,128
Wayne	261,064	7,737	122,795

¹ - Based on 50% recovery.

COAL RESOURCES OF OHIO

TABLE 4. - ESTIMATED ORIGINAL RESERVE OF BITUMINOUS COAL IN OHIO,
BY BED AND THICKNESS CATEGORY
(Thousands of short tons)

Bed	Total	Thickness category			
		14-28 inch	28-54 inches	54 inches +	Unclassified
Total	46,488,251	12,301,513	20,595,419	6,225,107	7,366,212
Percent . . .	100.0	26.5	44.3	13.4	15.8
Washington	900,042	42,600	345,000	15,800	496,642
Waynesburg "A"	490,686	17,500	40,400	-	432,786
Permian	1,390,728	60,100	385,400	15,800	929,428
Waynesburg	690,754	242,100	339,100	-	109,554
Uniontown	1,380,168	138,700	77,400	-	1,164,068
Meigs Creek	4,020,762	1,118,884	2,580,301	321,577	-
Fishpot	440,746	-	-	-	440,746
Redstone	746,257	155,571	473,066	167,620	-
Pittsburgh	5,559,932	319,533	2,124,859	3,115,540	-
Monongahela	12,888,619	1,974,788	5,594,726	3,604,737	1,714,368
Harlem	34,560	-	-	-	34,560
Anderson	837,504	-	-	-	837,504
Wilgus	173,000	-	-	-	173,000
Mahoning	284,304	-	-	-	284,304
Conemaugh	1,329,368	-	-	-	1,329,368
Upper Freeport	4,180,771	758,419	2,646,586	775,766	-
Lower Freeport	2,446,278	350,981	1,797,176	298,121	-
Middle Kittanning	9,783,598	2,120,616	6,137,368	1,525,614	-
Lower Kittanning	9,913,989	6,697,968	3,216,021	-	-
Clarion	715,637	150,727	561,800	3,110	-
Brookville	446,215	187,914	256,342	1,959	-
Allegheny					
Tionesta	180,288	-	-	-	180,288
Bedford	308,928	-	-	-	308,928
Upper Mercer	321,088	-	-	-	321,088
Lower Mercer	328,312	-	-	-	328,312
Quakertown	732,792	-	-	-	732,792
Sharon	1,521,640	-	-	-	1,521,640
Pottsville	3,393,048	-	-	-	3,393,048

Percent

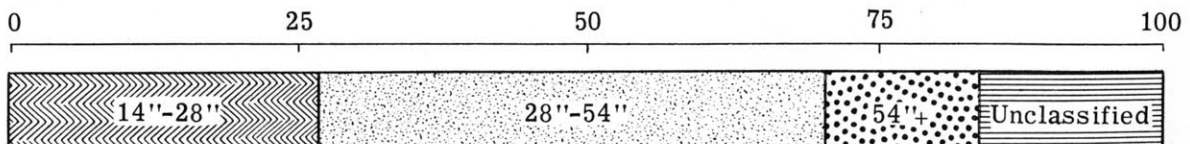


TABLE 5 - ESTIMATED ORIGINAL RESERVE OF BITUMINOUS COAL IN OHIO,
BY BED AND RELIABILITY CATEGORY
(Thousands of short tons)

Bed	Total	Reliability category			
		Proven	Probable	Inferred	Unclassified
Total	46,488,251	9,299,992	17,574,723	12,247,324	7,366,212
Percent	100.0	20.0	37.8	26.3	15.9
Washington	900,042	-	-	403,400	496,642
Waynesburg "A"	490,686	-	-	57,900	432,786
Permian	1,390,728	-	-	461,300	929,428
Waynesburg	690,754	30,600	541,200	9,400	109,554
Uniontown	1,380,168	-	-	216,100	1,164,168
Meigs Creek	4,020,762	1,306,643	2,413,252	300,867	-
Fishpot	440,746	-	-	-	440,746
Redstone	796,257	308,251	411,418	76,588	-
Pittsburgh	5,559,932	2,114,911	3,002,616	442,405	-
Monongahela	12,888,619	3,760,405	6,368,486	1,045,360	1,714,368
Harlem	34,560	-	-	-	34,560
Anderson	837,504	-	-	-	837,504
Wilgus	173,000	-	-	-	173,000
Mahoning	284,304	-	-	-	284,304
Cone maugh	1,329,368	-	-	-	1,329,368
Upper Freeport	4,180,771	1,236,177	2,437,441	507,153	-
Lower Freeport	2,446,278	511,551	982,373	952,354	-
Middle Kittanning	9,783,598	2,772,967	4,415,911	2,594,720	-
Lower Kittanning	9,913,989	658,249	2,623,068	6,632,672	-
Clarion	715,637	255,827	435,011	24,799	-
Brookville	446,215	104,816	312,433	28,966	-
Allegheny	27,486,488	5,539,587	11,206,237	10,740,664	-
Tionesta	180,288	-	-	-	180,288
Bedford	308,928	-	-	-	308,928
Upper Mercer	321,088	-	-	-	321,088
Lower Mercer	328,312	-	-	-	328,312
Quakertown	732,792	-	-	-	732,792
Sharon	1,521,640	-	-	-	1,521,640
Pottsville	3,393,048	-	-	-	3,393,048

Percent

0 25 50 75 100



and the part that is of Permian age contains the remaining 3.3 percent (table 1).

Table 4 shows the relative proportions of the reserve estimated for each of the 24 principal coal beds of Ohio. The most extensive and greatest reserve, according to the present estimate, is in two coal beds, the Lower Kittanning (No. 5) and Middle Kittanning (No. 6). These two beds account for more than 40 percent of the total estimated coal reserve of Ohio.

Production of Ohio coal is known from the year 1800, although a slight, but unrecorded, use of the coal probably was made prior to this date. One hundred tons of coal was reported mined in the year 1800. Production increased until World War I, when a decrease or leveling off of production occurred (fig. 2). Since then, economic rise and decline, strikes, and war have made for a very irregular pattern of production. The trend toward the use of natural gas and oil for heat has displaced much of the coal market during the past few years, particularly for domestic and railroad use. However, in recent years the great increase in demand for electrical power has called for a somewhat compensating increase in coal production.

The alltime coal production in Ohio is reported at slightly less than 2 billion tons (table 3). If an over-all recovery rate of 50 percent is accepted, then 4 billion tons of coal has been mined, or lost in the process of mining. Most losses result from the leaving of support pillars. The remaining reserve then would be the original amount minus mined-out and lost coal, or about 46 billion tons minus 4 billion, or about 42 billion tons. The recoverable reserve, on the basis of a 50 percent recovery rate, may be regarded as 21 billion tons (table 6).

A summary as presented herein should not be taken as a final statement of the ultimate coal reserve of the State, because as new information becomes available from exploratory drill holes, adjustments will be made on the presently inferred extent of the various coal beds. Such changes may be expected, particularly in the more deeply buried deposits, which in all likelihood will be explored more extensively in the future.

TABLE 6. - RESUME OF THE COAL RESERVE OF OHIO
(Short tons)

Estimated original coal reserve of Ohio.....	46,488,251,000
Coal production and loss in mining (Ohio 1800-1957).....	- 3,828,000,000
Remaining reserve.....	42,660,251,000
Recoverable reserve (at 50 percent recovery).....	21,330,125,500

RESUME OF COAL-RESERVE CLASSIFICATION

The coal reserve may be classified by a number of criteria: thickness of overburden, thickness of the coal bed, reliability of the estimate, geologic age, geographic distribution, and chemical characteristics, or rank, of the coal. Classification by most of these criteria has been utilized in the preparation of this appraisal of coal resources. The basic statement of the estimated reserve is found in tables 37 and 38, which show distribution of the reserve by county, by coal-bed thickness, and by reliability of the estimate.

Classification by overburden category is made generally in steps of 1,000 feet, as 0-1,000, 1,000-2,000, and 2,000-3,000 feet. Because virtually all the estimated coal reserve in Ohio occurs within 1,000 feet of the ground surface, no overburden classification has been made in this report.

In the classification by thickness of coal, the minimum minable thickness is established at 14 inches, and thickness categories follow in two 14-inch steps and in 12-inch steps for all those coal-bed thicknesses more than 42 inches. In this summary report the thickness categories are grouped as indicated below:

14-28 inches
28-54 inches
54 inches and greater.

In previous reports on the coal reserve of Ohio, thickness categories of as much as 102 inches were used, as in Report of Investigations 29 (Brant, 1956). However, in the present report, summaries are prepared by the threefold classification indicated above.

In classification by reliability of the estimate, four reliability categories are used to show the relative certainty of the estimate within the area described. The categories are based on the distance from a point of definitely known thickness of the coal bed. The farther away from the point of known thickness, the less certain is the estimate of the quantity of coal. Points of known thickness are the starting places of a series of concentric arcs spaced at half a mile, 2 miles, and 4 miles from the points. The terms that refer to the coal reserve surrounded by the above arcs are "proven," "probable," and "strongly inferred," respectively. The term "weakly inferred" refers to the reserve that lies in the area outside the 4-mile arc. Only coal with a thickness of 14 inches or greater is considered in the reliability categories (fig. 3). Specific definitions of reliability categories are given below, and further information is given in the reports by Averitt (1949, p. 224-228) and Cady (1952b, p. 16-20).

Proven reserve. -- That reserve which lies within half a mile of a point of definite information is interpreted as proven, and the estimate is considered to be within 20 percent of the true tonnage. Points of definite information are outcrops, mines, and core-drill holes. Thus, it is assumed that a zone of coal around any outcrop, mine, or core test for a distance of half a mile constitutes a proven reserve. The term "proven" as used in this report is the equivalent of the term "measured" of the U. S. Geological Survey and the U. S. Bureau of Mines.

Probable reserve. -- The probable reserve occupies an area extending from half a mile from the point of actual measurement to 2 miles from that point; hence, it covers a band $1\frac{1}{2}$ miles wide surrounding the area of proven reserve. The term "probable" is equivalent to the term "indicated" as used by the U. S. Geological Survey and the U. S. Bureau of Mines.

Strongly inferred reserve. -- The strongly inferred reserve is estimated in an area beyond the 2-mile limit of probable reserve, and extends to 4 miles from the point of definitely established data. Coal within this definition lies in a band 2 miles wide surrounding the area of probable reserve. The degree of certainty of the actual tonnage in this area is naturally less than that of either the proven or probable categories. The term "inferred reserve" used by the U. S. Geological Survey and the U. S. Bureau of Mines includes both the strongly and weakly inferred categories of this report.

Weakly inferred reserve. -- Coal lying beyond the 4-mile limit constitutes the weakly inferred reserve. It rarely happens that sufficient data are available to insure adequate estimates of coal beyond the 4-mile limit, yet the general aspects of the geology may indicate that the coal is present at minable thickness. Therefore, because the reliability is diminished and the confidence placed in the results is lessened, a fourth category, "weakly inferred reserve," is established. In this report the strongly inferred and weakly inferred

categories are combined into simply an inferred category, for the sake of brevity.

Coal beds are classified by geologic age by grouping associated beds into their respective formations. Table 1 indicates the classification of the Ohio coal reserve, by bed and geologic age.

Classification of the coal in Ohio by geographic distribution is given by county and township in the chapter on county descriptions, pages 29-139 and in table 38.

Classification by rank is based on the chemical characteristics of the coal, particularly the fixed-carbon and the Btu content. Because analyses of the Ohio coals show little range in rank, no classification on the basis of this criterion is made. However, the rank of coal in the State ranges from bituminous high volatile "C", to "B", as is indicated from analytical data; this aspect is discussed more fully under chemical characteristics of the coal, pages 17-19.

METHODS OF INVESTIGATION

Several methods embodying the concepts described in the preceding section were applied in making the estimates of the coal reserve. Where the coal bed was widespread, regular in thickness, well known, and documented by a large amount of information, isopachous maps and reliability categories were made. The coal reserve of the Allegheny formation and the Pittsburgh (No. 8), Redstone (No. 8a), and Meigs Creek (No. 9) coal beds of the Monongahela formation was estimated by these moderately detailed methods. Coal beds of the Pottsville and Conemaugh formations were appraised in a very general fashion by study of earlier investigations and by the use of average thicknesses of coal over an estimated area. The data were too sparse to permit construction of accurate isopachous maps. The reserve of the upper part of the Monongahela formation and the Dunkard group was estimated from the average thickness of coal and from determination of area by a dot-counting method.

Allegheny and lower Monongahela coal beds. -- At the outset of the study of the Allegheny and lower Monongahela coal beds a series of work maps of 1 degree longitude by half a degree latitude (O'Neill maps) were drawn from U. S. Geological Survey topographic maps, scale 1:62,500. On these maps were traced all the political subdivisions (sections, townships, and counties) and major streams. The coal outcrop was traced, and all the localities and file numbers from the data were accurately plotted. Several copies of the maps were made in order that the reserve of the upper and lower benches of each coal bed could be estimated separately.

The thickness information relating to each bench and the intervening parting was placed on the respective maps. All partings exceeding three-eighths inch in thickness were excluded from the measurements of coal thickness. After all data were plotted at appropriate locations, isopachous lines were drawn to connect points of equal thickness, as indicated above. The average thickness for the block of coal between two isopachous lines was taken as the simple average between the two lines. Thus the coal between the 14-inch and 28-inch thickness lines averages 21 inches, that between 28 inches and 42 inches averages 35 inches, that between 42 inches and 54 inches averages 48 inches, and that between 54 inches and 66 inches averages 60 inches.

After the thickness lines were established, arcs were made around each point of definite data to determine the different categories of reliability. An arc with a half-mile radius around the point on the area of coal defined the proven coal, an arc with a 2-mile radius limited the probable coal, and the arc with the 4-mile radius limited the strongly inferred coal. The 14-inch thickness line forms the boundary or outer limit of weakly inferred coal, except where the outcrop forms a natural limit. Certain data could not be used,

except to confirm deductions made from other points. Such data include "reported" thickness of coal (thus not seen, and not measured), thickness of coal blossom (not definite, variation possible), and location of mines not reporting coal thickness. These could only be used in a general way, in conjunction with nearby positive data.

Figure 3 is a sample of the map preparation described to this point. This map shows only one township, however, and is only a small part of one of the actual work maps made during the study of the Meigs Creek coal (pattern is added). It will be noted that only proven and probable categories of reliability are shown on this illustration. Over nearly all the Meigs Creek coal area, information is spaced so that most of the coal estimated is either in the proven or probable class. This is because the bed is exposed in outcrop over much of its extent.

After the various lines were plotted on the map, the area of each category of coal was determined by use of the planimeter. The data were recorded on forms, by county and township, by thickness, and by reliability category. The data for the more extensive coal beds were subsequently punched onto I. B. M. tabulation cards, and the calculation and summation of results made on business machines. For data on other coal beds ordinary calculating machines were used. Summaries of the estimates are found in tables 37 and 38.

In order to calculate the amount of coal contained in a given bed in a given area it is necessary to know two factors: the volume of the coal, and the density. In this study the volume was determined by measuring the area and multiplying the result by the average thickness; the density was determined from the specific gravity and is equivalent to 96,000 tons per square-mile-inch (1 inch of coal covering 1 square mile of area).

The volume was multiplied by the density (96,000 tons per square-mile-inch) to determine the tonnage for a given area. In estimating small areas, 1800 tons per acre-foot (1 foot of coal covering 1 acre) was used frequently as a convenient density factor.

Pottsville and Conemaugh coal beds. -- In dealing with the problem of the lesser known coal beds, such as those in the Pottsville and the Conemaugh, a much more general approach was made. The following is quoted from Granchi (1958, p. X) concerning the reserve estimate of the Pottsville coal beds:

"Because of the sporadic occurrence of coal in the Pottsville formation and the general inadequacy of qualitative data, coal estimates presented here are the results of deductive evaluation of available information. Clark's (1917) and Ray's (1929) estimates were used as the basis for appraisal of the coal-bed resources, and in those instances in which recent data tended to confirm a previous estimate, the earlier estimates were accepted. In those areas where more recently acquired data indicated that previous estimates were in error, these previous estimates were adjusted. Some reductions are, out of necessity, drastic but can be justified because: (1) the extent of minable coal is demonstrated or interpreted to be considerably less than original figures; and (2) former correlation is thought to be in error. On the other hand, additions have been made where former estimates show no coal reserves. Verifying these additional tonnages were Survey data indicating the presence of minable coals.

"This study is admittedly not detailed. It reflects a more general and arbitrary approach than is commonly desirable in resources reports. The reasons for this are: (1) the coal beds are so erratic in thickness, data showing these variations are not available; and (2) the present economic value of the Pottsville coals does not justify spending excessive research money in their study."

Upper Monongahela and Dunkard coal beds. -- The method used in appraising the reserve of the upper Monongahela formation and Dunkard group differs from the first two methods described in this section. A different method was used because the amount of data available for the upper Monongahela and Dunkard coal beds was intermediate between that of the Allegheny and lower Monongahela and that of the Pottsville and Conemaugh. The fol-

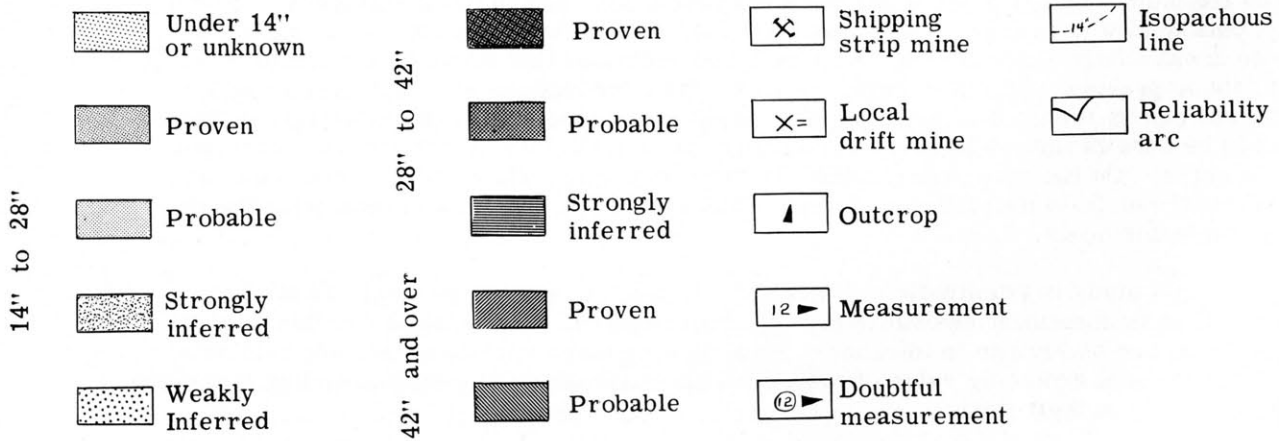
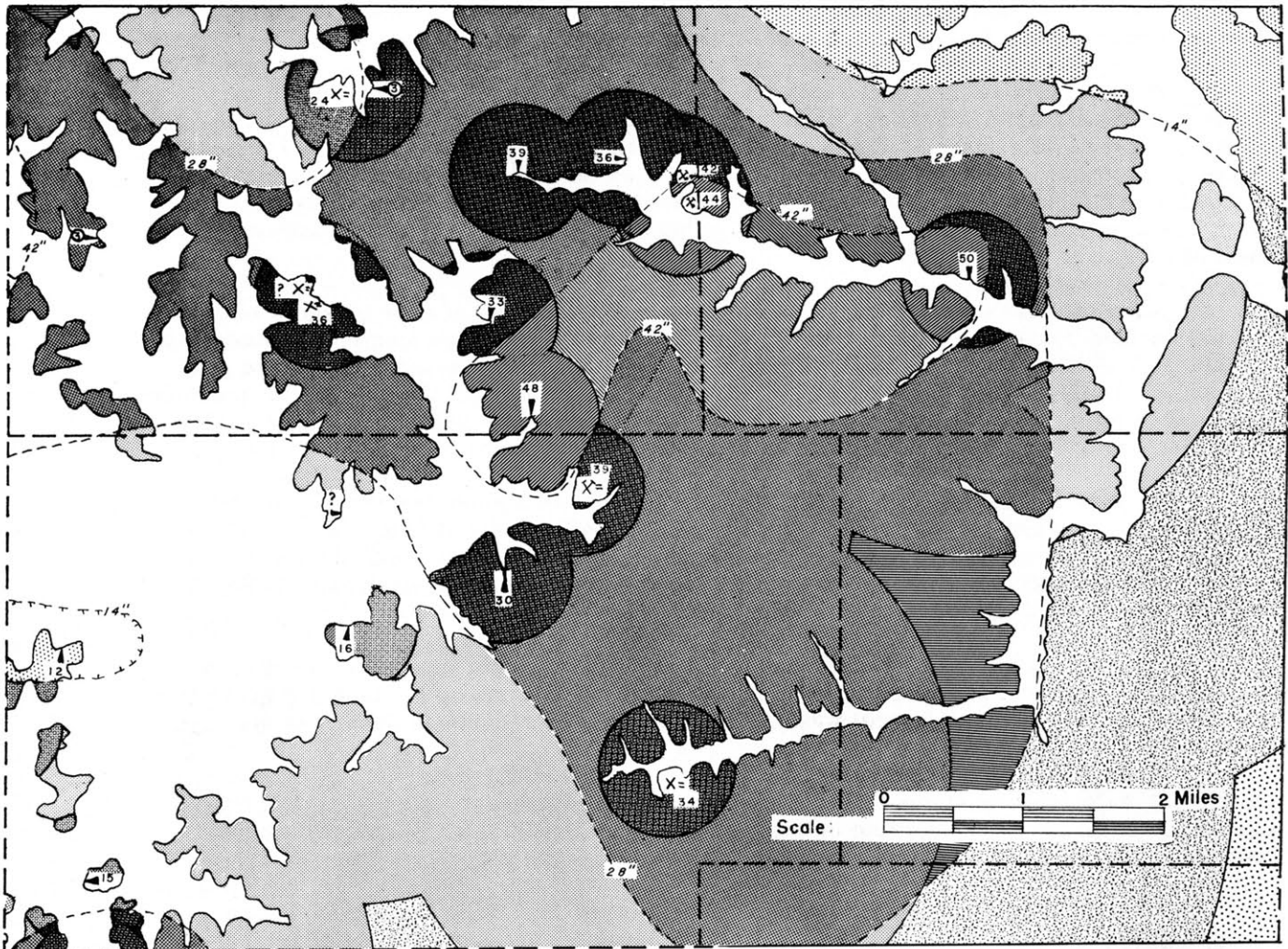


Figure 3 - Type of map used in computing the coal reserve. This map is a copy of a portion of one of the work maps used in computing the coal reserve of Perry County (resources map, area 16). The shading has been added to show the various limits of reliability of the estimate and thickness of the coal as described in the text.

lowing paragraph from Denton (1960) describes the method of estimating the coal reserve of the upper Monongahela and Dunkard coal beds:

"... the total area of the coal was calculated by a dot-count method similar to that used by the U. S. Forest Service in making tree inventories (fig. 4). This method is fairly simple and is an easy way to determine close approximations of areas underlain by coal, especially areas in which measurements of coal thickness are not numerous. In the dot-count method a transparent grid containing 16 dots per square mile is superimposed on a geologic outcrop map (scale: 1 inch - 1 mile) of the coal bed in question. Each dot represents the center of a quarter of a quarter section of land and has a value of 40 acres. The area of coal then is determined by simply counting the number of dots within the area underlain by coal and multiplying the number by 40 to compute the number of acres of coal. The area of the coal in each township then is multiplied by the average thickness of the coal in that township to get the volume, which is multiplied by a coal-density factor to get the total tonnage. Coal-density factors that can be used in this method are 150 tons per acre-inch or 1800 tons per acre-foot. Only coal of average thickness of 14 inches or more was considered as a reserve in these estimates."

COMPARISON WITH PREVIOUS ESTIMATES

There have been two previous attempts to estimate the original coal reserve in Ohio. Both estimates are quite divergent in the results obtained, and neither agrees with the present estimate.

Clark (1917, p. 88) estimated the original coal reserve in Ohio as 87,638,000,000 short tons, and Ray (1929) gave an estimate of 10,399,296,000 tons; these may be compared with the present estimate of 46,448,251,000 short tons of original reserve.

Clark (1917, p. 88) based his estimates on known extent of the coal, on field and mine data in areas for which outcrop maps were available, and in those areas where coal outcrops had not been mapped, he based his estimates on mine data and a general knowledge of the extent of the coal fields. His report reflects the attitude that many individual coal beds are widespread and continuous, although he did not consider all portions of a particular coal bed to be necessarily of minable thickness. His work also reflects the conclusion that the thickness variations are gentle and generally regular, and thus the thickness of a coal bed as determined from measurements was representative of the average thickness.

Ray's (1929, p. 339) estimate of 10,399,296,000 tons is reported as "estimated original tonnage." His estimate, when reviewed, shows that it represents a general equivalence to the "proven reserve" of the present report.

The present detailed appraisal for the principal coal beds shows that the distribution of the beds is not necessarily one of gentle variation, that many irregularities in thickness occur, and that these thickness variations may not be well or easily accounted for by using an average thickness. The isopachous map is probably the best means of evaluating thickness for purposes of determination of the reserve.

For many areas information is sparse, and for that part of the reserve estimate which is considered under the category of "unclassified", average values are used, as was done by Clark. In fact, many of the estimates of the "unclassified" category are values taken from Clark (1917).

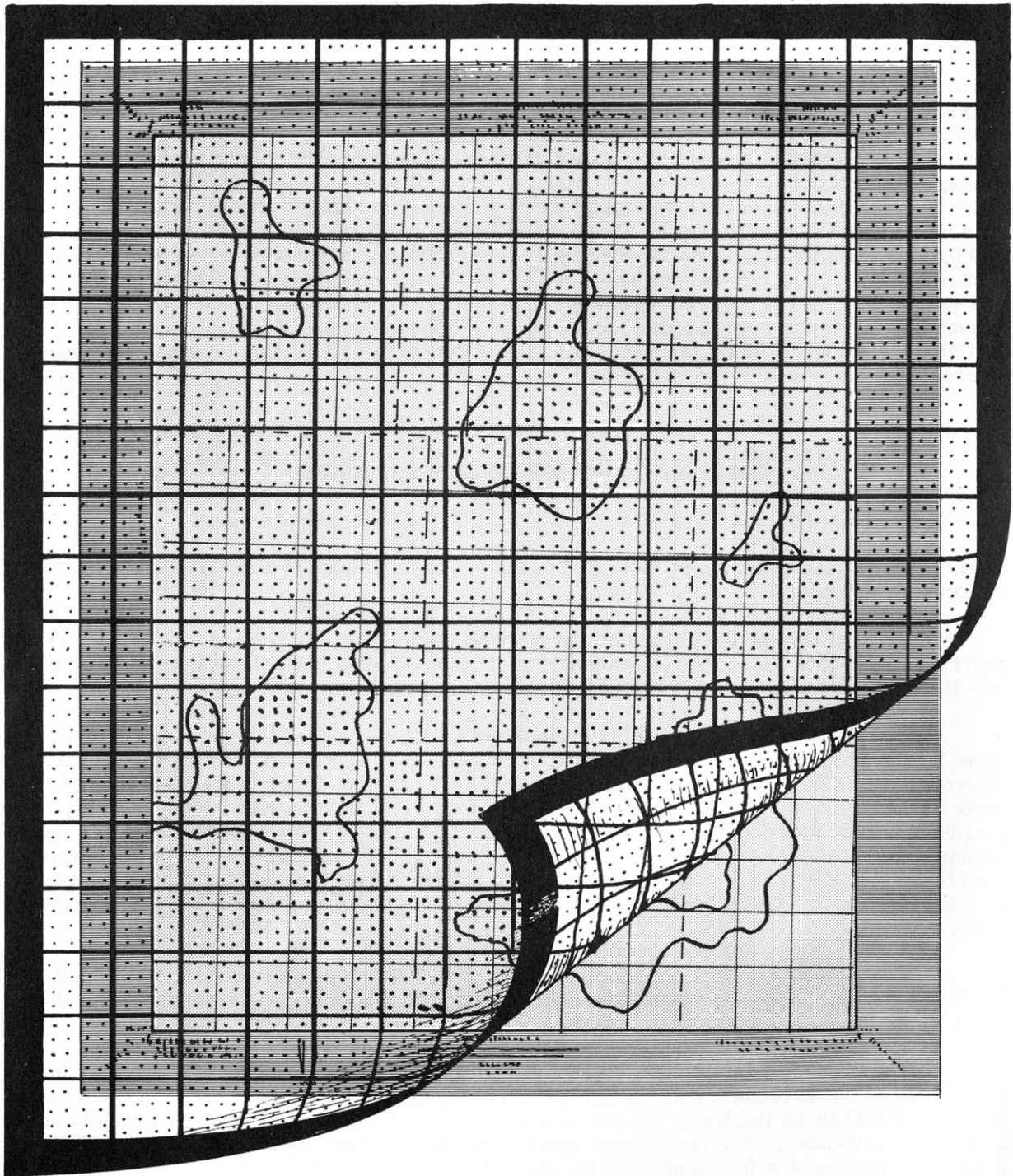


Figure 4 - Transparent grid and underlying map used in the dot-count method of determining total area of coal. The heavy lines on the grid enclose squares 1 mile on a side. The 16 dots in each square represent 40 acres each in computing the total area of the coal. Irregularly shaped areas shown on the map are areas underlain by coal. Explanation of the dot-count method is given in text.

Limitations of the estimates. - The present estimates may not be considered as a final or ultimate statement of fact, because as additional information is collected, estimates in the inferred categories and in the various thickness categories will change. The authors believe, however, that changes will generally increase rather than decrease the present estimates.

In the study of each bed there is too little data to show accurately the extent of minable coal under deep cover. Few core holes penetrate the area of deeper coal near the Ohio River, and as a result, little is actually known about the coal in this area. However, in the name of caution, coal in much of the area is considered as thin coal or coal of unknown thickness. For some beds, such as the Lower and Middle Kittanning coal beds, there are indications of regional thinning under large areas of the southern portion of the coal field.

Some of the coal-bed reserve in the Pottsville, Conemaugh, Upper Monongahela, and Washington formations has been appraised and appears in the estimates as unclassified reserve. Estimates of these particular beds (tables 4, 5, and 37) are rather generalized because data are considered too sparse to make an otherwise reasonably accurate estimate by isopachous-map methods. Thus, no classification of reliability is made, and a general average thickness over the appropriate area is determined but not classified. Such estimates as these indicate the need for more information and also demonstrate the more erratic nature of the thickness of some coal beds.

CHEMICAL CHARACTERISTICS OF THE COAL

The chemical and physical qualities of Ohio coal are important in any consideration of coal use. In this report (appendixes A and B), 607 chemical analyses of mine-face and core samples are given. Of these, the 512 analyses selected for their completeness indicate that, generally, for the 26 coal beds tested the ash value ranges from 5 to 20 percent, the sulfur value ranges from 1 to 6 percent, and the heating value ranges from 10,000 to 13,000 Btu.

Coal is classified in many ways, according to the needs of the consumer, producer, or researcher. One widely used classification is that of the American Society of Testing Materials (table 7), in which coal is classified by rank. The lower rank coals are classified according to heating value (Btu) of the moist coal. The higher rank coals are classified on the basis of the amount of dry fixed carbon present. For determination of coal rank, Btu values are reported on a moist-mineral-matter-free basis, and fixed-carbon content on a dry-mineral-matter-free basis. Most Ohio coal is of high volatile "C" or "B" rank. See appendixes A and B for detailed chemical analyses and chemical classification of coal.

Table 8 summarizes, by coal bed, the ash and sulfur content of Ohio coal. Comparisons are valid only in a general way, because for some of the coal beds only one sample is listed, and for others there are as many as 121 samples. The samples listed in the table are mine-face samples, that is, samples of fresh coal sampled in a prescribed manner at the active working face of the mine (see the report by Fieldner and Selvig (1938) for a detailed discussion of samples and sampling). The data also show that there have been more samples taken in the more extensively mined coal beds.

COAL-RESERVE CLASSIFICATION

TABLE 7. - CLASSIFICATION OF COALS, BY RANK ^a
(A. S. T. M., D 388-38, 1939)

Symbols: F. C., fixed carbon; V. M., volatile matter; Btu. British thermal units

Class	Group	Limits of fixed carbon or Btu. (mineral-matter-free basis)	Requisite Physical properties
I Anthracitic	1. Meta-anthracite.....	Dry F. C., 98 percent or more (dry V. M., 2 percent or less)	Nonagglomerating ^b
	2. Anthracite.....	Dry F. C., 92 percent or more and less than 98 percent (dry V. M., 8 percent or less and more than 2 percent)	
	3. Semianthracite.....	Dry F. C., 86 percent or more and less than 92 percent (dry V. M., 14 percent or less and more than 8 percent)	
II Bituminous ^d	1. Low-volatile bituminous coal.....	Dry F. C., 78 percent or more and less than 86 percent (dry V. M., 22 percent or less and more than 14 percent)	Either agglomerating or nonweathering ^f
	2. Medium-volatile bituminous coal.....	Dry F. C., 69 percent or more and less than 78 percent (dry V. M., 31 percent or less and more than 22 percent)	
	3. High-volatile A bituminous coal.....	Dry F. C., less than 69 percent (dry V. M., more than 31 percent); and moist ^c Btu., 14,000 ^e or more	
	4. High-volatile B bituminous coal.....	Moist ^c Btu., 13,000 or more and less than 14,000 ^e	
	5. High-volatile C bituminous coal.....	Moist Btu., 11,000 or more and less than 13,000 ^e	
III Subbituminous	1. Subbituminous A coal.	Moist Btu., 11,000 or more and less than 13,000 ^e	Both weathering and nonagglomerating
	2. Subbituminous B coal.	Moist Btu., 9,500 or more and less than 11,000 ^e	
	3. Subbituminous C coal.	Moist Btu., 8,300 or more and less than 9,500 ^e	
IV Lignitic	1. Lignite.....	Moist Btu., less than 8,300	Consolidated Unconsolidated
	2. Brown coal.....	Moist Btu., less than 8,300	

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

b - If agglomerating, classify in low-volatile group of the bituminous class.

c - Moist Btu. refers to coal containing its natural bed moisture but not including visible water on the surface of the coal.

d - It is recognized that there may be noncaking varieties in each group of the bituminous class.

e - Coals having 69 percent or more fixed carbon on the dry mineral-matter-free basis shall be classified according to fixed carbon, regardless of Btu.

f - There are three varieties of coal in the high-volatile C bituminous coal group, namely, variety 1, agglomerating and nonweathering; variety 2, agglomerating and weathering; variety 3, nonagglomerating and nonweathering.

TABLE 8. - SELECTED ANALYSES OF OHIO COAL, SHOWING CONTENT OF SULFUR AND ASH, BY SEAM¹

Coal bed	Number of analyses	Percent sulfur				Percent ash				
		0-2.00	2.01-4.00	4.01-6.00	6.01+	0-5.00	5.01-10.00	10.01-15.00	15.01-20.00	20.01+
Total	512	102	257	135	18	32	286	161	27	6
Percent of total	100.0	19.9	50.2	26.4	3.5	6.2	55.9	31.4	5.3	1.2
Washington (No. 12)	1	-	1	-	-	-	-	-	-	1
Waynesburg "A"	1	-	-	1	-	-	1	-	-	-
Waynesburg (No. 11)	11	1	10	-	-	-	-	6	5	-
Uniontown (No. 10)	4	-	4	-	-	-	-	2	2	-
Meigs Creek (No. 9)	64	1	24	36	3	-	5	49	9	1
Fishpot	2	-	-	2	-	-	-	-	2	-
Redstone (No. 8a)(Pomeroy)	8	2	4	1	1	-	3	5	-	-
Pittsburgh (No. 8)	104	11	45	41	7	1	75	28	-	-
Harlem	1	1	-	-	-	-	1	-	-	-
Anderson	4	-	3	1	-	-	2	2	-	-
Wilgus	1	-	1	-	-	-	1	-	-	-
Mahoning	5	2	3	-	-	-	4	1	-	-
Upper Freeport (No. 7)	73	23	42	8	-	1	56	16	-	-
Lower Freeport (No. 6a)	20	3	16	1	-	-	3	17	-	-
Middle Kittanning (No. 6)	121	34	65	20	2	17	84	13	3	4
Lower Kittanning (No. 5)	28	1	14	10	3	2	21	5	-	-
Clarion (No. 4a)	27	-	14	11	2	-	15	10	2	-
Winters	3	-	-	3	-	-	2	1	-	-
Brookville (No. 4)	8	4	4	-	-	-	3	4	1	-
Tionesta	1	-	1	-	-	-	-	-	1	-
Bedford	3	-	3	-	-	-	1	1	1	-
Upper Mercer (No. 3a)	3	2	1	-	-	2	-	1	-	-
Middle Mercer	1	-	1	-	-	-	-	-	1	-
Bear Run	1	1	-	-	-	-	1	-	-	-
Quakertown (No. 2)	8	7	1	-	-	4	4	-	-	-
Sharon (No. 1)	9	9	-	-	-	5	4	-	-	-

¹ - "As received" values.

USES OF OHIO COAL

Ohio coal is used mostly for steam generation, despite its relatively high ash and sulfur content. In many places, however, the sulfur content is well below 2 percent in the raw coal (table 8).

Although coal from Ohio has been used generally in its native form for steam generation and other heating, it has also been used to produce coke for heating and for metallurgical use by the iron and steel industry. Bownocker (1908) briefly described the beehive coking ovens at Utley and Lathrop in Athens County. These ovens were built in the 1880's, but were used for only a short period of time. The short-lived use of the ovens might have been due to an unfortunate sequence of events, such as economic depression, strikes, and market problems, as well as to the not exceptionally high quality of the product itself. The Pittsburgh (No. 8) coal, which in the Athens County area is rather high in sulfur and ash content, is surmised to be the source material for the coke.

Newberry (1871, p. 26) mentions that at the time of his report, fully half the pig iron produced in Ohio was reduced by the Sharon (No. 1) coal, which he noted was of high purity (low ash and sulfur content). Bownocker and Dean (1929, p. 55) state that the Lower Kittanning (No. 5) coal was formerly coked in the Leetonia area of Columbiana County. The coke produced was used in the local blast furnaces.

Because of the generally inferior quality of the coal (in respect to ash and sulfur) the demand for Ohio coking coal dwindled after a supply of coking coal with low sulfur content became available from Pennsylvania, West Virginia, and Kentucky. Virtually no research has been done on the coking characteristics of Ohio coal, but in view of the apparently rapidly diminishing supplies of coking coal it would seem plausible for the coal industry to review the physical and chemical character of the known coal reserve in a search for additional coking coal. Discovery of coal with low sulfur content and favorable reaction to washing and separation-plant practices to yield either a coking-grade material or a satisfactory blending ingredient would greatly extend known coking supplies of Ohio.

In most coking plants, coal from more than one source is used to form the coking blend. It is entirely possible that some Ohio coal could be used as blend without further processing, or that with proper preparation a fraction of the coal could be used for satisfactory blending for metallurgical coke.



GEOGRAPHY AND GEOLOGY OF THE COAL REGION

GEOGRAPHY

Ohio is the most eastern of the Middle Western States. It is bounded by Pennsylvania, West Virginia, Kentucky, Indiana, Michigan, and the Canadian province of Ontario. More than 60 percent of the boundary consists of important navigable bodies of water.

The Ohio coal field lies in the southeastern part of the State and is associated with similar coal producing regions of Pennsylvania, West Virginia, and Kentucky. The coal field in Ohio is fringed by heavy industry in the northern portion of the State, where such cities as Canton, Massillon, Youngstown, Warren, and Cleveland constitute centers of industry. Industry has also been developed along the northern portions of the Ohio River in Ohio and more intensely in adjacent West Virginia. Recently, industrial development in Ohio has been increased greatly in the Ohio Valley. Of major importance in this development have been the electric power plants built to take advantage of the resources of coal (fig. 1), water, and manpower offered by the area. Users of electric power are similarly attracted by these natural advantages as well as by the availability of large quantities of electric power.

Many cities of intermediate size dot the coal-field area and form centers of trade and transportation within its boundaries. The coal field is served by a network of highways, railroads, and, in part, by the Ohio River. All of these avenues have been used in the past and are at present important agents in transporting the coal to the markets. A recent development is the use of conveyor-belt transportation in both the mine and for short surface hauls from mines or tipping points to points of ultimate use. Greater distances are now served by a coal pipeline which stretches from Cadiz to Cleveland, on Lake Erie.

The coal reserve of the State, as well as the good communication network and other natural and economic advantages, should provide a sound basis for continued industrial development in the Ohio coal-field area.

GEOLOGY

The coal-bearing rocks in Ohio underlie about 10,000 square miles of the eastern part of the State. Most of the estimated reserve occurs in the four geologic formations that constitute the Pennsylvanian system; a small amount of coal occurs in the Washington formation of the Permian system, but no minable coal is known in the Greene formation of the Per-

mian. The outcrops of the coal-bearing strata form bands of varying width extending across the State from the northeastern to the south-central portions (fig. 5). The rocks dip generally to the south and east at an approximate rate of 30 feet per mile; however, in the northern part of the State the dip is to the south, and in the southern part of the State the dip is to the east. This dip carries the rock to depth in the southeastern part of the State and also gives a concentric pattern to the outcrop.

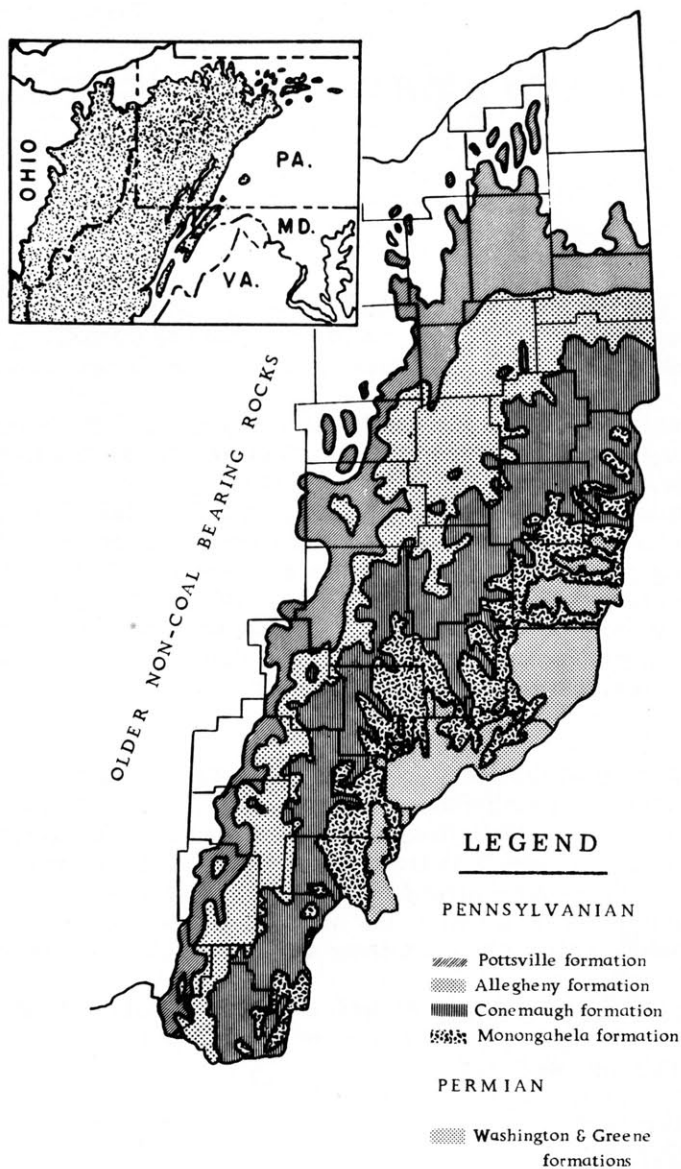


Figure 5 - Generalized geologic map of the coal-producing areas of Ohio.

The rocks that compose the Pennsylvanian and Permian systems in Ohio consist of a series of alternating clay, coal, shale, limestone, and sandstone beds. In terms of thickness, coal is of minor importance, but geologically and economically it is one of the most important members of all the rocks found. Coal beds, zones, and horizons; clay beds; and some of the limestone beds are the most persistent, traceable, and identifiable of the rocks and are useful as references in mapping and in stratigraphic identification.

The various rock types occur in characteristic sequences which are repeated many times throughout the stratigraphic section. In similar sequences of cyclic deposition described in Illinois and named "cyclothem" by Weller (1931), each sequence consists of as many as 10 rock types. In Illinois, the order of the rock types, starting at the bottom, is as follows: sandstone, sandy shale, nonmarine limestone, underclay, coal, black fissile shale, marine limestone or shale, and massive gray shale. Observation has shown that the cyclical repetition of this sequence of strata is basically the same from place to place. Each cycle, or cyclothem, in Illinois is described as beginning with a basal sandstone, whereas in Ohio it has been found more satisfactory to describe each cyclic series as a coal-to-coal interval, beginning at the base of a coal bed. A cycle of one ideal series of beds typical of cyclic deposition in Ohio is shown in figure 6.

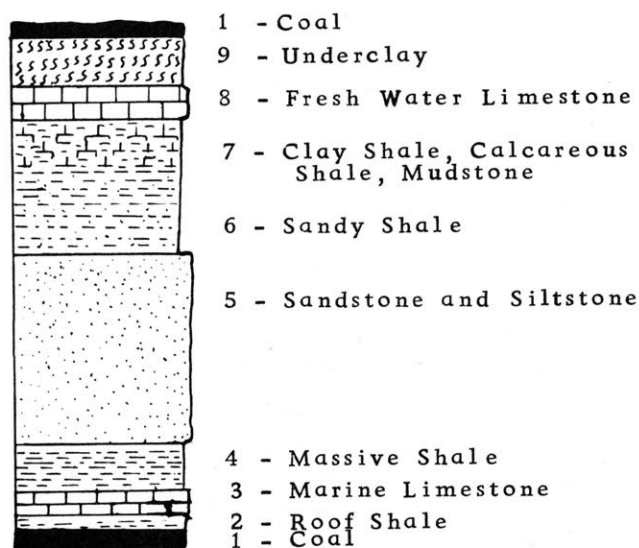


Figure 6 - Idealized composite sequence of beds in a coal-to-coal interval. Coal rather than sandstone or other rock type is considered to be the basal member of a cycle of deposition in Ohio.

In the known Pennsylvanian geologic section of Ohio, there are 58 named coal beds, and in the overlying Permian there are 9 named coal beds. Many additional coal zones and horizons have been recognized in the Permian system, but most of these are of no economic value.

The rocks of the Pennsylvanian system are classified into four major divisions, which will be called formations for the purpose of this report, and the rocks of the Permian system are divided into two major divisions, which also will be called formations. The formations of the Pennsylvanian system are as follows: Pottsville formation, with 12 named coal beds, 6 of which contain an estimated coal reserve; Allegheny formation, with 13 known coal beds, 6 of which contain an estimated reserve; Conemaugh formation, with 13 named coal beds, 4 of which contain an estimated reserve; and Monongahela formation, with 8 named coal beds, 6 of which contain an estimated reserve. The formations of the Permian system are: the Washington formation, with 4 named coal beds, 2 of which contain coal reserve; and the Greene formation, with 5 named coal beds, none of which contains an estimated coal reserve (fig. 7 and table 9). Many additional coal zones and horizons have been discovered in the Permian series, so that the total number is more than 30. Locally, the coal along one of these thin zones or horizons becomes sufficiently thick to be minable; however, no reserve is estimated for these very minor occurrences.

COAL RESOURCES OF OHIO

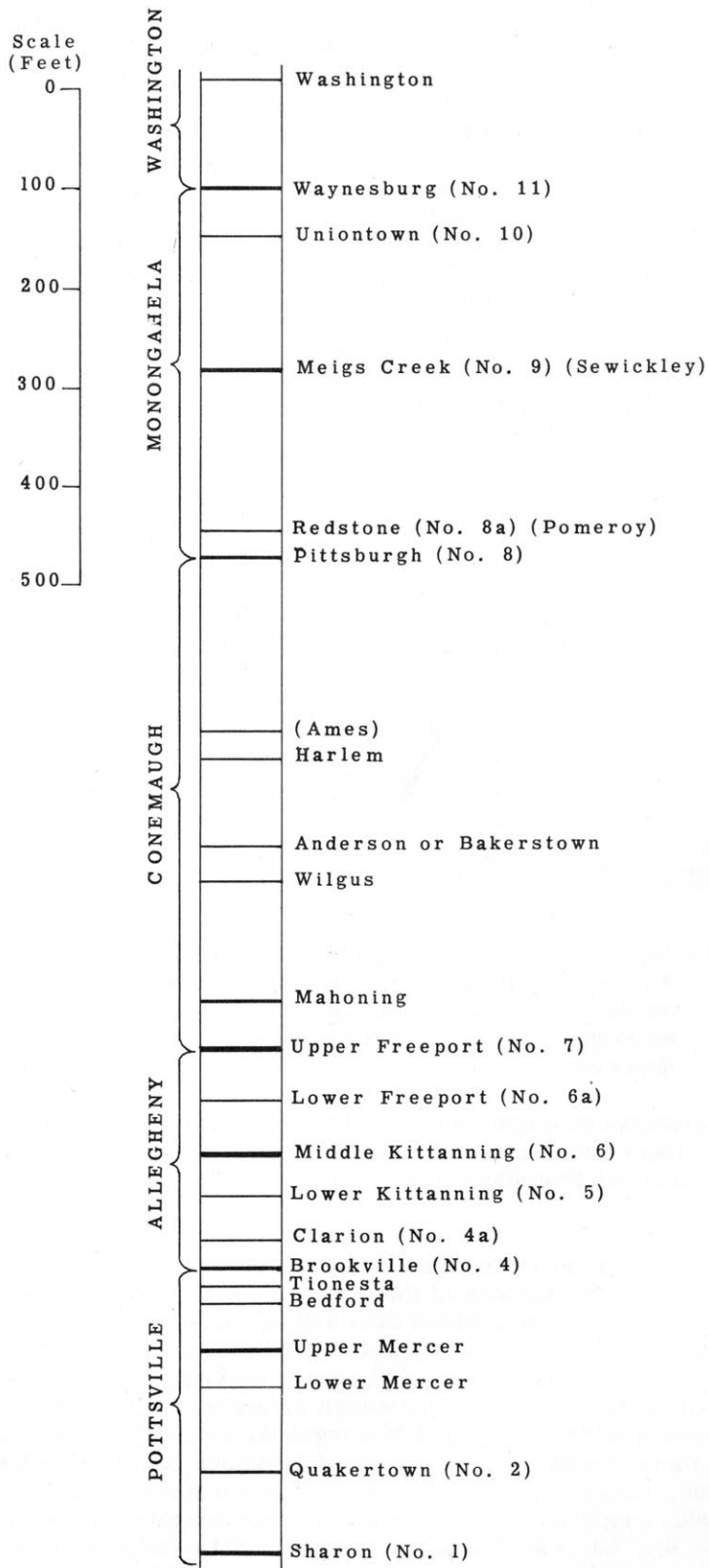


Figure 7 - Generalized geologic section of the Pennsylvanian and Lower Permian systems in Ohio, showing coal-bed intervals.

COAL RESOURCES OF OHIO

TABLE 9. - GENERALIZED STRATIGRAPHIC COLUMN OF OHIO (CON.)

Monongahela	Waynesburg No. 11	Coal, fair purity	1	4			
	Gilboy	Shale and sandstone	14	6	16	0	
	Little Waynesburg	Coal, persistent		2			
	Waynesburg	Limestone and marly shale	10	0			
	Uniontown	Shale or sandstone	28	7	39	5	
	Uniontown No. 10	Coal		10			
	Uniontown	Shale, siliceous, and limestone	5	0			
	Arnoldsburg	Sandstone	8	0			
	Arnoldsburg	Coal wanting					
	Arnoldsburg	Limestone and calcareous shale	37	0			
	Fulton	Shale, green, or shaly sandstone	4	0	110	2	
	Benwood	Limestone and calcareous shale	34	4			
	Upper Sewickley	Sandstone, local	20	0			
	Sewickley						
	Mapletown						
	Meigs Creek No. 9	Coal	1	10			
	Lower Sewickley	Clay shale, calcareous	3	0			
	Fishpot	Sandstone	19	6	23	1	
	Fishpot	Coal, persistent, thin		7			
	Fishpot	Limestone and marly shale	20	1			
	Fishpot or Pomeroy	Sandstone	12	0	33	5	
	Redstone						
	Pomeroy	Coal, unsteady	1	4			
	Redstone	Limestone and marly shale	13	0			
	Upper Pittsburgh	Sandstone, local	9	0	25	7	
	Pittsburgh No. 8	Coal, persistent	3	7			
					247	8	
	Conemaugh	Upper Pittsburgh	Clay shale		6		
			Limestone, irregular	5	0	19	0
			Clay shale	13	5		
		Upper Little Pittsburgh	Coal, very local		1		
		Bellaire	Clay shale	4	0		
			Sandstone, local	10	6		
		Shale, siliceous	2	5	17	0	
Lower Little Pittsburgh		Coal, seldom present		1			
Summerfield		Shale, variable	8	0			
Lower Pittsburgh		Limestone	12	0			
		Shales, variable	26	0	69	0	
Coanellsville		Sandstone, local	20	0			
		Clay shale	2	10			
Clarksburg		Coal, local		2			
Clarksburg		Limestone and marly shale	4	0			
Morgantown		Sandstone, local	30	0	34	1	
Elk Lick		Coal, usually wanting		1			
Elk Lick		Limestone and marly shale	5	0			
		Shale, variable	5	0			
Birmingham		Shale, siliceous	10	0	20	5	
Skelley		Limestone, local, marine		4			
Duquesne		Coal, seldom evident		1			
		Shale, variable	9	0			
		Shale, siliceous	11	0			
Gaysport		Limestone, siliceous, marine	1	0			
		Shale, siliceous	16	0	54	6	
Ames		Limestone, marine	1	6			
		Shale, siliceous	15	0			
Harlem		Coal, persistent	1	0			
Round Knob Pittsburgh		Clay, calcareous	2	0			
		Clay shale, red	12	0			
Saltzburg		Sandstone, local	8	0	26	0	
		Shale, siliceous	3	0			
Barton		Coal, local	1	0			
Ewing		Clay shale	4	0			
		Limestone, ferruginous	1	0			
		Shale, siliceous	3	0			
Cow Run		Sandstone, local	15	4	29	0	
		Shale, siliceous	2	0			
Portersville		Limestone, marine	2	0			
Anderson		Coal, persistent	1	8			
Bloomfield		Clay shale	3	7			
		Limestone, local	1	5			
	Shales, variable	19	0	30	0		
Cambridge	Limestone, marine	4	0				
Wilgus	Coal, unsteady	2	0				
Buffalo	Clay shale	3	8				
Brush Creek	Shale or sandstone	23	0				
Brush Creek	Limestone, marine	20	0	47	0		
Brush Creek	Coal, local, thin		4				
Mason	Shales, variable	10	6	11	0		
	Coal, local		6				
Upper Mahoning	Shale or sandstone	10	0	11	0		
Mahoning, Groff	Coal	1	0				
Thornton	Clay, irregular	5	0				
Mahoning	Limestone, local	2	0	32	0		
Lower Mahoning	Shale or sandstone	25	0				
				400	0		

TABLE 9. - GENERALIZED STRATIGRAPHIC COLUMN OF OHIO (CON.)

Mississippian	Maxville		Limestone, hard, with some shale	?	0-200	
	Logan	Vinton	Sandstone and shale, bluish gray	80	30-150	
		Allensville	Conglomerate, fine, with sandstone and shale	16	10-30	
		Byer	Sandstone and sandy shale	70	50-100	
	Cuyahoga	Berne	Conglomerate, coarse, local	4	0-10	
		Black Hand	Conglomerate or sandstone, massive	120	50-200	
		Portsmouth	Shale with thin sandstone lenses	95	70-120	
		Buena Vista	Sandstones, gray to brown, with some shale	80	60-100	
		Henley	Shale, gray, with thin sandstone lenses	40	30-50	
	Sunbury		Shale, brown to black, fissile	20	15-35	
Berea		Sandstones with shale partings	20	15-50		
		Shale, gray, siliceous, local	3	1-8		
		Sandstone, with shale partings	12	5-20		
Bedford	Sagamore	Shale, soft, pinkish, ferruginous, not persistent	40	0-80		
	Euclid	Shale, firm, gray, siliceous	45	30-40		
Devonian	Ohio	Cleveland	Shale, carbonaceous, brown to black, fissile	120	80-150	
		Chagrin	Shale, gray, siliceous	70	10-2,000	
		Huron	Shale, carbonaceous, brown to black, fissile	410	250-500	
	Olentangy		Shale, light, soft, with some nodular and occasional bedded limestone	20	15-30	
	Delaware		Limestone, dark to bluish gray, hard, with some flint and shale	45	30-70	
	Marcellus		Shale, black, fissile	?	0-50	
	Columbus	Venice	Limestone, light gray, massive, very fossiliferous. Bone-bed at top	35	30-40	
		Marblehead	Limestone, dolomite, earthy, massive	45	30-50	
		Bellepoint	Dolomite, limy, brownish, massive, few fossils	25	20-35	
	Detroit River group	Lucas		Dolomite, medium bedded, gray to drab, few fossils	?	0-140
Amherstburg			Dolomite, drab to brown, massive layers, few fossils	?	0-75	
	Oriskany		Sandstone, local, except in southeastern Ohio	?	0-40	
Bass Island group	Raisin River		Dolomite, thin bedded, drab, few fossils		0-50	
	Put-in-Bay		Dolomite, thin to massive bedded, gray to brown		200-250	
	Tymochtee		Dolomite, thin to massive bedded, gray to brown	570	125-175	
	Greenfield		Dolomite, thin to massive bedded, gray to brown		175-225	
	Silurian	Niagara group	Guelph	Dolomite, light, massive, very pure	80	50-100
Cedarville			Dolomite, light to drab, massive, pure	70	50-100	
Springfield			Dolomite, drab to bluish gray, medium bedded	10	6-16	
Euphemia			Dolomite, drab to bluish gray, massive	6	2-11	
Alger		Massie	Shale, bluish gray, calcareous	5	5-6	
		Laurel	Dolomite, limy, hard, medium bedded	6	5-9	
		Osgood	Shale, bluish gray, calcareous	45	10-80	
Dayton				Dolomite, limy, gray to drab, medium bedded	8	7-13
		Clinton	Brassfield	Limestone, light to pink, irregularly bedded	67	20-80
Medina				Shale, soft, variable, gray to pink	10	1-20
	Clinton		Sandstone, light to pink, fine grained	20	0-100	
Ordovician	Elkhorn		Shale, soft, red to variegated	63	10-200	
		Whitewater	Upper Whitewater. Saluda. Lower Whitewater.	Calcareous shales with thin roughly bedded limestones Calcareous shales with thin bedded limestones Calcareous shales with thin bedded limestones	75	60-100
		Liberty		Calcareous shales with some thin bedded limestones	35	30-40
	Waynesville	Blanchester		Calcareous shales with thin bedded limestones		
		Clarksville		Calcareous shales with thin bedded limestones	95	85-140
		Ft. Ancient		Calcareous shales with thin bedded limestones		
	Arnheim	Oregonia		Calcareous shales with thin bedded limestones		
		Sunset		Calcareous shales with nodular limestones	60	50-75
	McMillan	Mt. Auburn		Calcareous shales with thin bedded limestones		
		Corryville		Calcareous shales with thin bedded limestones	90	80-120
		Bellevue		Calcareous shales with thin bedded limestones		
	Maysville	Fairview	Fairmont. Mt. Hope	Calcareous shales with thin bedded limestones Calcareous shales with thin bedded limestones	115	100-150
		Eden	McMicken. Southgate. Economy	Calcareous shales with nodular limestones Calcareous shales with nodular limestones Calcareous shales with nodular limestones	245	225-275
	Utica	Fulton		Calcareous variegated shales with small quantities of shaly limestones	170	50-400
	Trenton	Point Pleasant		Limestone or dolomite, dark, parts shaly	185	155-225
			Covered, reached only by the drill. Limestone or dolomite, massive, dark			
Black River			Limestone or dolomite	425	375-475	
Glenwood			Dolomites with green shales	20	10-40	
St. Peter			Sandstone, local	?	0-50	
Lower Magnesian			Dolomites with some sandstone formations	450?	?-?	
Cambrian			Dolomites with some massive sandstones	720?	?-?	
Pre-Cambrian			Crystalline rocks, mainly gneisses and schists			

COUNTY DESCRIPTIONS

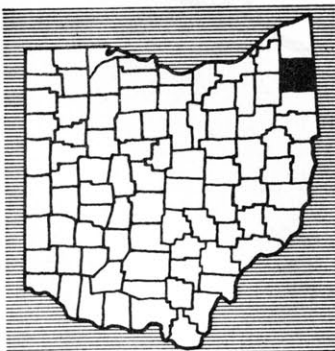
The order of presentation of county descriptions was selected to give the greatest possible linear continuity, both geographically and geologically. Descriptions begin with the northeastern counties of the State and continue with counties westward and southward along the west margin of the coal basin, to the Ohio River; these counties for the most part contain the older, or stratigraphically lower, parts of the coal measures. The river counties of eastern Ohio, which are discussed last, are nearer the axis of the Appalachian coal basin, and the rocks exposed at the surface of these counties are younger in age, or stratigraphically higher in the rock sequence.

Figure 8 is an index map showing the geographical location of counties discussed in this bulletin. The page number indicated on the map for each county refers to the page on which discussion begins for that county.

The estimate of the coal reserve presented herein is based mainly on coal thicknesses measured in inches. Therefore, most thickness values are given in inches and indicate an extensive knowledge of the coal bed. However, some coal beds are known only in a general way, and the meager thickness data of these coals are indicated by measurements in feet and fractions of feet. Estimates of the coal reserve of these beds are gross figures and are less accurate than estimates for beds with a better known thickness.

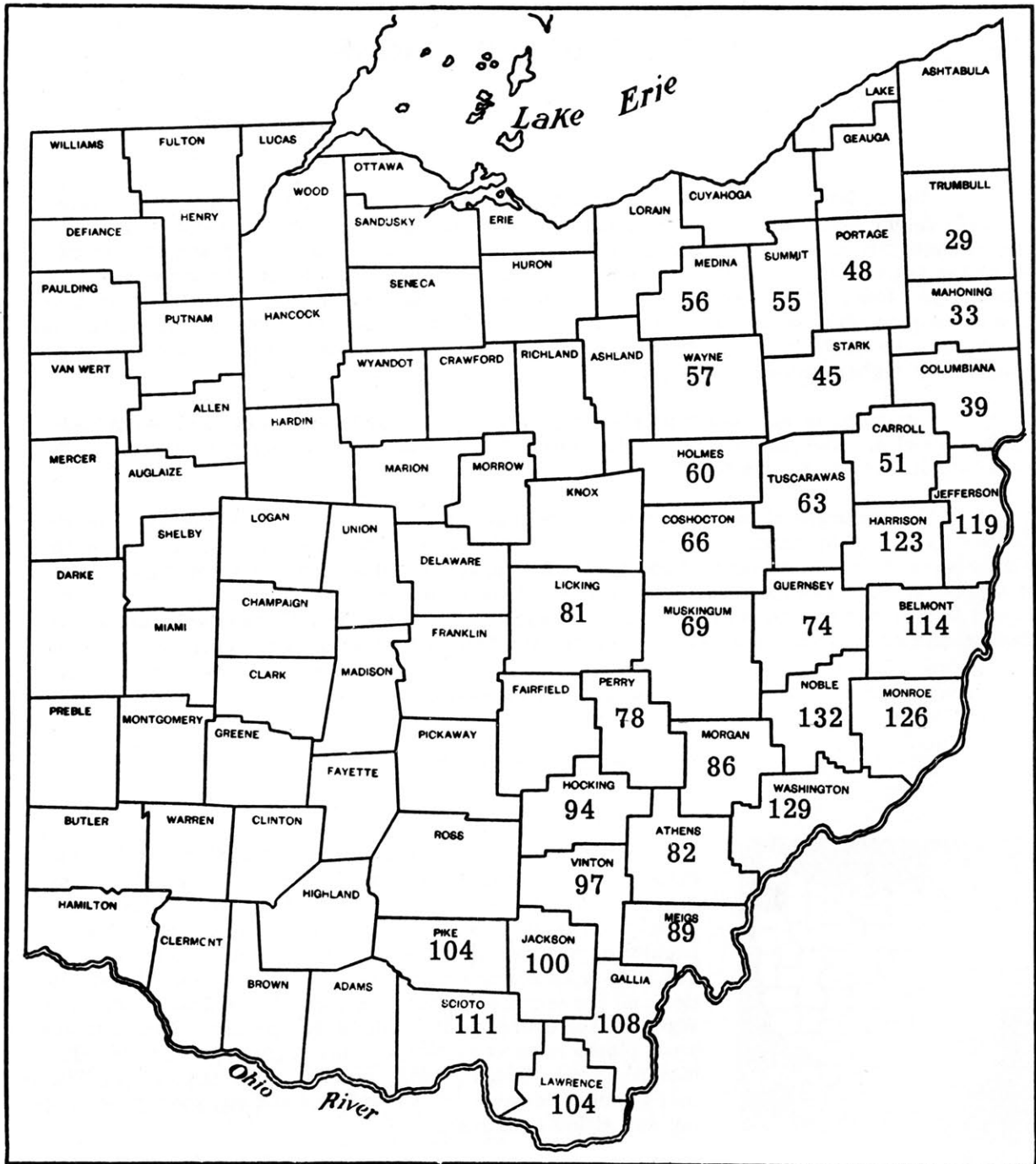
TRUMBULL COUNTY

Geography and Geology



Trumbull County lies in the northeastern part of the State, north of Youngstown, the center of a large steel-producing area. A small part of Youngstown lies in Trumbull County, but most of the city is in Mahoning County. The population of Trumbull County, by the 1950 census, is 158,915, a 20 percent increase in 10 years. Of this population, 60 percent live in urban areas, the largest of which is Warren, the county seat, with 49,856 people. Two primary steel plants located at Warren have a capacity of 6,294,000 tons per year (Wright, 1957, p. 151). The industry of Trumbull County, however, is diversified and includes steel casting and allied industries.

Figure 8. - Index map of counties in the coal bearing region of Ohio. The number shown for each county indicates the page of this report on which the description of the county begins.



Trumbull County is serviced by several major railroads and by an excellent network of State highways. The Ohio Turnpike crosses the southwestern part of the county and a four-lane highway is planned from Youngstown to Ashtabula.

Trumbull County lies in the glaciated section of the Appalachian Plateau, an area of moderate relief largely covered with glacial deposits. The Mahoning River and its tributaries, which flow to the Ohio River, drain most of the area, but the Grand River, which flows to Lake Erie, drains the northwestern corner of the county.

There is a gentle southerly dip of the rock in Trumbull County. This direction of dip results in an outcrop pattern of east-west bands across the county, with the younger rocks exposed to the south.

Rocks of Mississippian and Devonian age are extensive in the northern and central parts of Trumbull County. The occurrence of rocks of Pennsylvanian age is restricted to the interfluves of the tributaries to the Mahoning River in the southern and southeastern parts of the county.

Only one Pennsylvanian formation, the Pottsville, occurs in Trumbull County (fig. 9). In this area the Pottsville lies unconformably upon the Mississippian rocks, and as a result the Sharon conglomerate, the lowest member of this formation, varies in thickness from a few feet to about 60 feet. The highest recognizable member of this formation is the Boggs limestone, which overlies the Lower Mercer (No. 3) coal bed.

Because of the thick and extensive glacial cover, exposures of the bedrock are few, correlation is difficult, and knowledge of the coal reserve is scant. However, one coal bed, the Sharon (No. 1), is known to be of economic importance and has been mined extensively.

Coal Beds

The Sharon (No. 1) coal bed, which lies close above the Sharon conglomerate, is the only coal of known importance in Trumbull County. It is restricted mainly to the southeastern part of the county (fig. 9), being present in Vienna, Liberty, Brookfield, and Hubbard Townships. This coal bed is variable in thickness and ranges from a few inches to approximately 4 feet; in places it is cut out entirely and replaced with shale. Variability in thickness is due partly to deposition on the uneven floor of Sharon conglomerate and partly to later channeling and refilling by ancient stream action.

Coal from this bed has been one of the more prized coals found in Ohio. Its chief attributes are low sulphur and low ash content, qualities which made possible its use in the older blast furnaces, and which resulted in the development of the steel industry in the Youngstown area.

Reserve and Production

Geologic data on the coal-bearing strata in the glaciated region are sparse, and any figures on the reserve are necessarily only tentative. At present, half the 130-square-mile area underlain by the Sharon coal bed is considered to contain coal of minable thickness. The total estimated original reserve is 149,760,000 tons.

The earliest report of production from the Sharon coal bed in Trumbull County was in 1835, when 100 tons was reported mined. When the early blast furnace operators

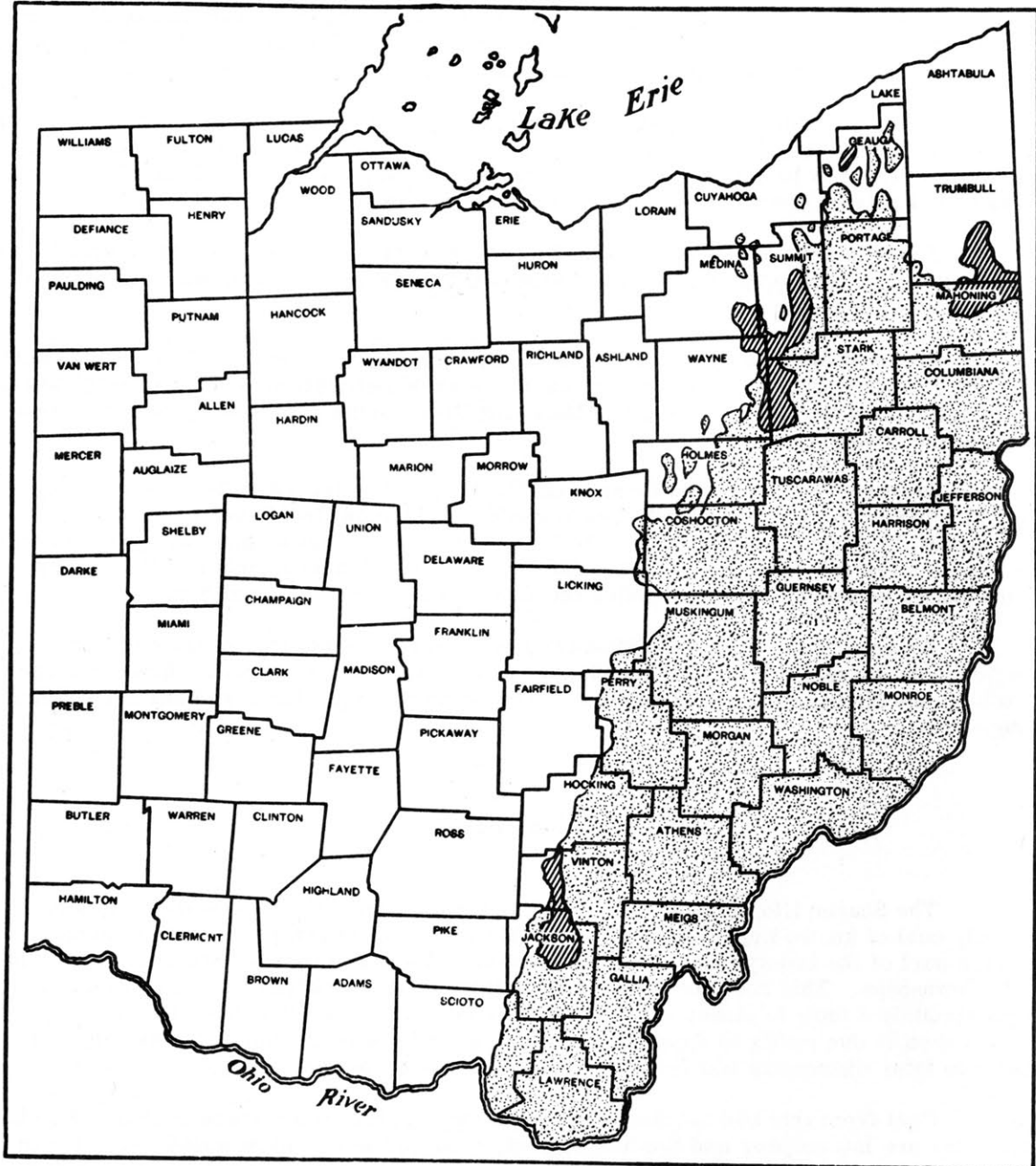


Figure 9 - Area underlain by the Pottsville formation in Ohio. Diagonal pattern, area of minable Sharon (No. 1) coal; stippled pattern, area of remainder of the Pottsville formation.

of Ohio learned that the Sharon coal could be used raw in the blast furnace, coal from this bed was in great demand. A total of 9,164,574 tons was produced between 1868 and 1883, with a maximum yearly production of 1,064,737 tons in 1879. During this period, as many as 30 mines were operating simultaneously. The great concentration of mining activity depleted the thicker and better known deposits of the Sharon coal field in Trumbull County. By 1891, only 64,173 tons of this coal was produced annually; since that time production has steadily declined, and the last reported yearly production, in 1942, was 56 tons. A

total of 12,990,000 tons of coal has been reported mined from this coal bed in Trumbull County.

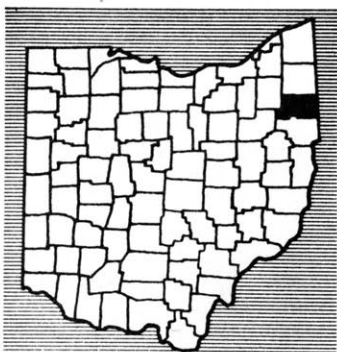
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Granchi, J. A., 1958, Coal resources of the Pottsville formation: Ohio Div. Geol. Survey Rept. Inv. 36, p. 12-13.

Read, M. C., 1873b, Geology of Trumbull County, in Geol. Survey of Ohio Vol. 1, pt. 1, p. 493-509.

MAHONING COUNTY

Geography and geology



Mahoning County, which lies south of Trumbull County, and contains the city of Youngstown, is the center of the primary steel industry of northeastern Ohio. Of the 257,629 people who live in this county, 199,000, or 75 percent, are in the urban areas along the Mahoning River in the northeastern part of Mahoning County. The manufacture of primary steel is the main industry of the Mahoning River area, where steel-production capacity exceeds 30 million tons per year. Some coke for steel manufacturing is imported from Pennsylvania, and much coal for generating steam is brought into the area from eastern Ohio.

The Youngstown area is serviced by the mainline railroads and three specialized lines which transport iron ore. An excellent network of highways, including the Ohio Turnpike, crosses the county in north-south and east-west directions.

Mahoning County lies entirely in the glaciated section of the Appalachian Plateau, and as a result of the glaciation this county has a rolling land surface of low relief. Glacial deposits mask the bedrock and permit few outcrops.

The rocks in Mahoning County dip gently to the south and impart an east-west orientation to the pattern of rock outcrops. Strata of Mississippian age are restricted to the north-central part of the county and to the valley of the Mahoning River. Strata of Pennsylvanian age occur in the rest of the county and belong to two formations, the Pottsville and the Allegheny. The full thickness of the Pottsville formation is present, but only the lowermost members of the overlying Allegheny are present; the upper members have been removed by erosion. The Pottsville formation underlies the surface of the northern and much of the central part of the county (fig. 9) and crops out in valley bottoms to the south. The Allegheny formation is found in the southern part of Mahoning County, where it overlies the Pottsville rocks and occupies the divide areas.

Not all of the coal beds of the Pottsville formation are recognized in Mahoning County, but several attain a sufficient thickness to be economically important. The Allegheny formation coal beds are well represented from the Brookville (No. 4) to the Middle Kittanning (No. 6) although they are restricted to the southern portion of the county.

Coal Beds

Pottsville formation coal beds of known economic importance include the Sharon

(No. 1), Lower Mercer (No. 3), Middle Mercer, Upper Mercer (No. 3a), and Bedford coal beds.

The Sharon (No. 1) coal bed, at one time the principal source of fuel in Mahoning County, constitutes a part of the Mahoning valley coal field, which extends along the Mahoning and Shenango Rivers and which was important to the blast furnaces during the 19th century. However, coal mining in this county, as in Trumbull County, was abandoned at an early date, and at the present time there is no mining activity. Past production from the Sharon coal bed in Mahoning County is not known.

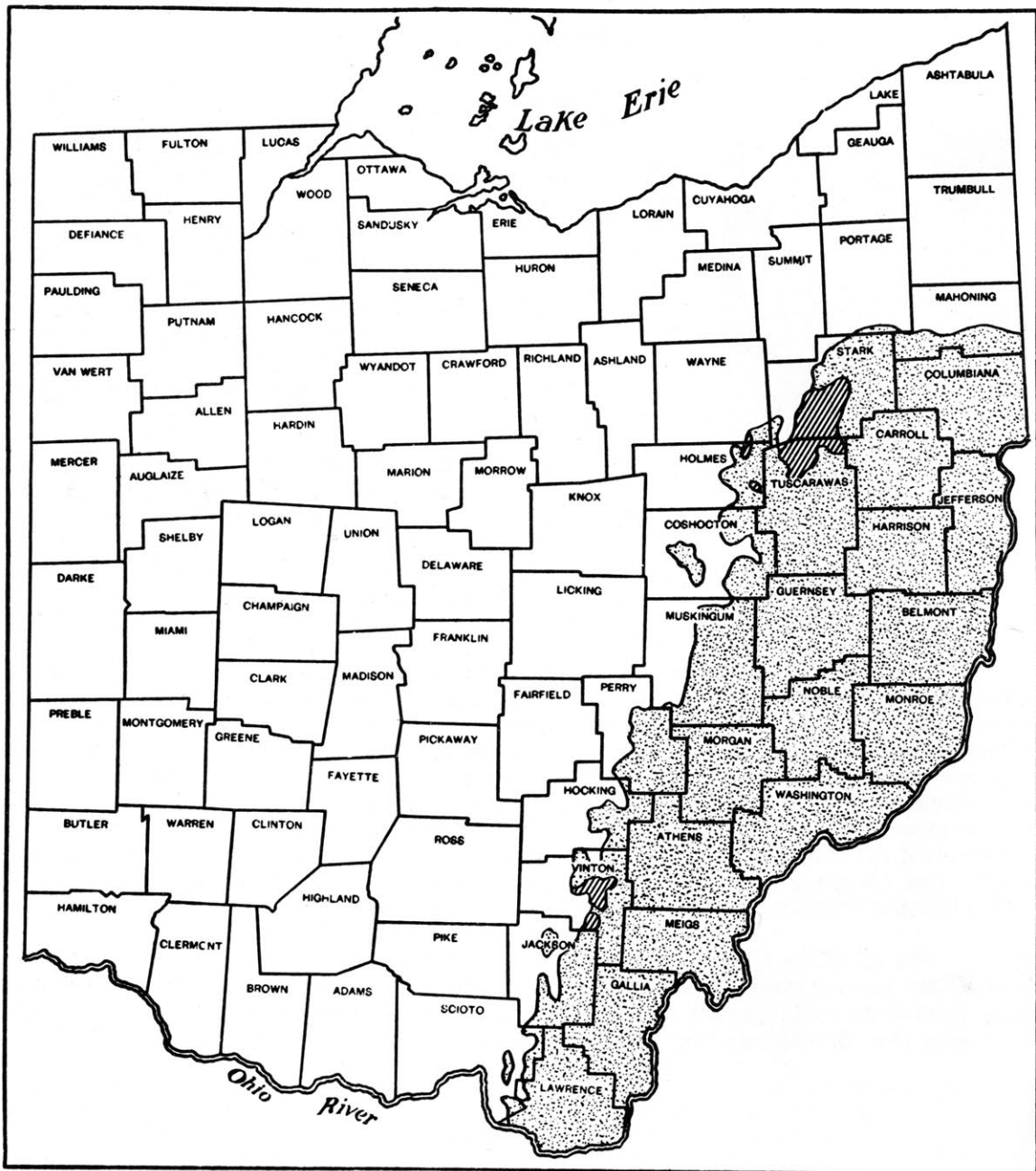


Figure 10 - Area underlain by the Brookville (No. 4) coal bed of the Allegheny formation in Ohio. Diagonal pattern, area of minable Brookville coal; stippled pattern, area of other Brookville coal.

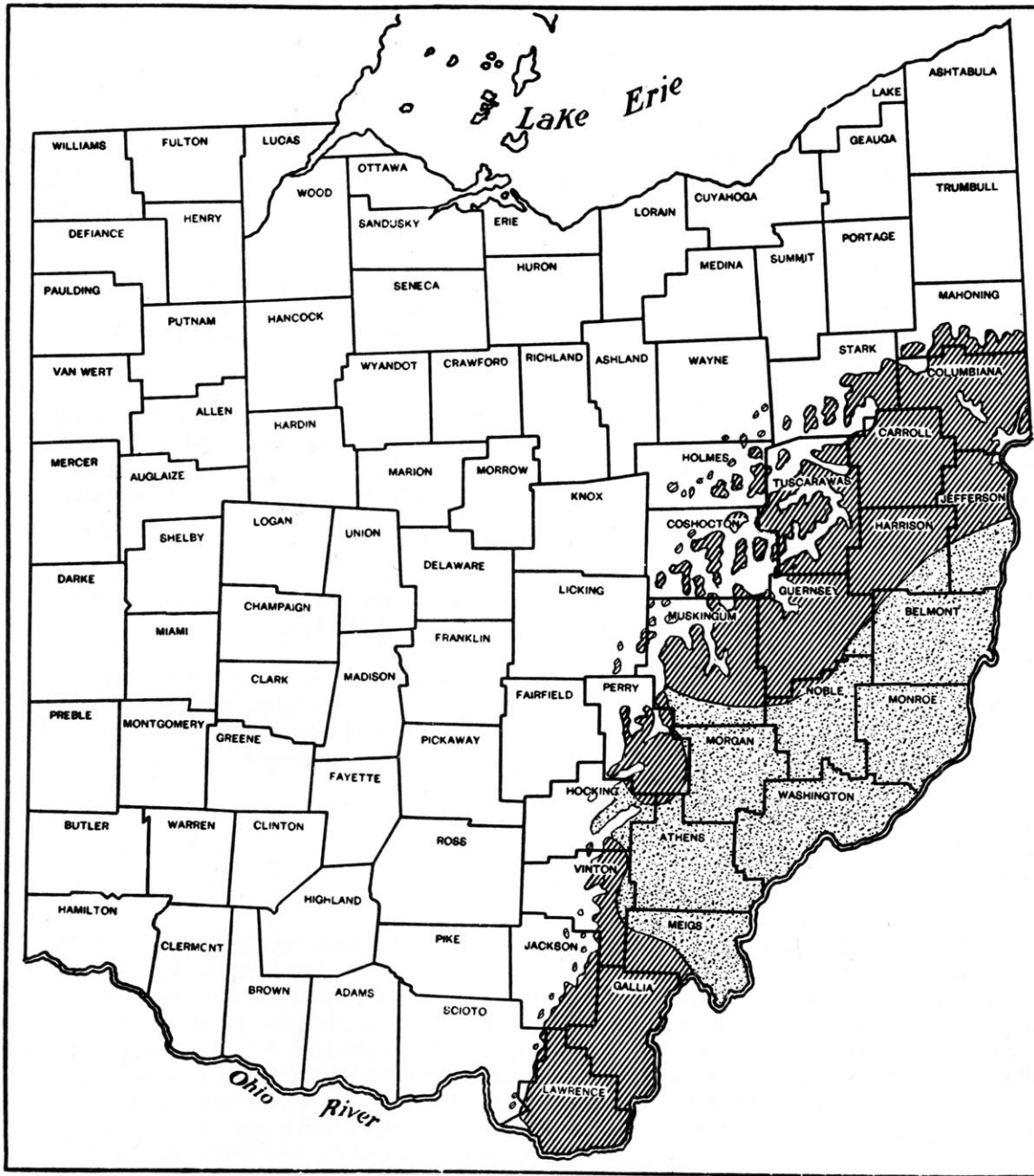


Figure 11 - Area underlain by the Lower Kittanning (No. 5) coal bed of the Allegheny formation in Ohio. Diagonal pattern, area of minable coal; stippled pattern, area of other Lower Kittanning coal.

Other Pottsville coal beds are more accessible, but are of less value than the Sharon coal bed. These other minor coal beds in Mahoning County are the Lower Mercer (No. 3), which occurs 100 to 150 feet above the Sharon coal bed; the Middle Mercer; the Upper Mercer (No. 3a), which lies 40 to 50 feet above the Lower Mercer; and the Bedford coal bed. Of these, the Lower Mercer and Upper Mercer coal beds appear to be the most valuable, although they, as well as the Middle Mercer and Bedford coal beds, are variable in thickness.

These coal beds are bituminous, except for the Lower Mercer (No. 3) which has been observed to be partly cannel along the Mahoning River.

The Brookville (No. 4) coal bed is found in the central and southern parts of Mahoning County (fig. 10), but is seldom seen in natural outcrops because of the glacial cover. Most of the observations made of this coal bed have been in Green and Poland Townships, where the bed is a seam consisting of bony to bituminous coal, approximately 2 feet thick. Because of the lack of reliable data, no estimate is made for this coal bed in Mahoning County.

In the Mahoning County area, the No. 5 (Lower Kittanning) is usually mistakenly called the No. 4 (Brookville), and the No. 6 (Middle Kittanning) is called the No. 5 (Lower Kittanning) by the coal producers. In this report, however, figures for coal production and reserve have been based on corrected nomenclature.

The Lower Kittanning (No. 5) coal bed occurs extensively in southern Mahoning County (fig. 11) and is better known than the lower coal beds. The bed is extensive and continuous, with a known minimum thickness of about 14 inches. Coal of more than 28 inches thickness is extensive in the south-central and southwestern parts of the county, and a small area in the south-central part of the county contains coal more than 42 inches thick.

In Mahoning County, the Lower Kittanning (No. 5) coal is a bright blocky high-volatile bituminous coal that is locally composed of cannel at the top.

The Middle Kittanning (No. 6) coal bed is restricted to the stream interfluvies in the southern tier of townships in Mahoning County (fig. 12). The original reserve of the Middle Kittanning is smaller than for the Lower Kittanning, not only because the coal bed underlies a smaller area, but also because the coal is generally thinner.

Reserve and Production

The difficulties of ascertaining the coal reserve of Mahoning County are caused by the paucity of exposures and the uncertainty of correlations. Production, by seam, reported by coal operators to the Ohio Department of Industrial Relations and published in the Annual Coal and Nonmetallic Mineral Report for Ohio is misleading because of the local nomenclature of coal beds. Most of the Mahoning County production is reported to be from the Brookville (No. 4), Upper Mercer (No. 3a), and Lower Mercer (No. 3) coal beds. However, several mines with coal of these reported designations are known actually to be in the Lower Kittanning (No. 5) coal bed. Until the time when further work can be done in this county, the early reports by Newberry (1878f, p. 781-814) and Orton (1884c, p. 1-128), and the recent evaluations of the Pottsville coal beds by Granchi (1958) are the best references.

The total estimated original coal reserve of Mahoning County is 1,049,678,000 short tons. This reserve is distributed through the seven coal beds described above; the largest reserve is in the Lower Kittanning (No. 5), which contains nearly half the coal reserve, or more than 458 million tons. The Middle Kittanning (No. 6) coal bed contributes an estimated original reserve of more than 113 million tons and the reserve of the Lower Freeport (No. 6a) is estimated at 437 thousand tons. Pottsville coal beds, though largely thin and discontinuous, contribute somewhat over 477 million tons to the estimate. Table 37 lists the reserve estimated for the coal beds in Mahoning County by thickness and reliability category, and table 38 lists the estimates by township. The chemical analyses of some of the coals are given in appendixes A and B.

The alltime county coal production stands at 20,531,000 tons (table 3). Approximately one-third of this amount has been produced during the past ten years (table 10).

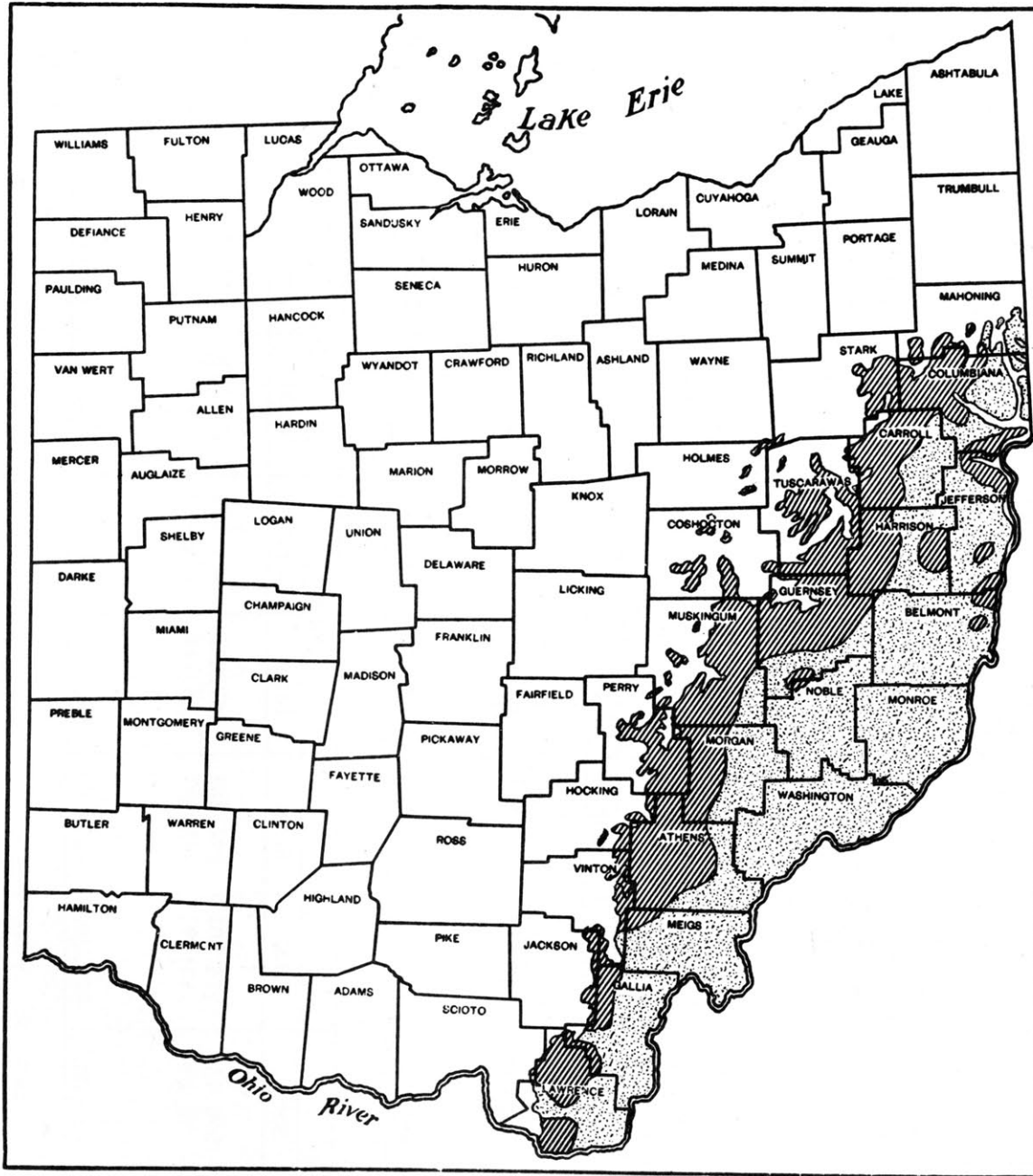


Figure 12 - Area underlain by the Middle Kittanning (No. 6) coal bed of the Allegheny formation in Ohio. Diagonal pattern, area of estimated coal reserve; stippled pattern, area of other Middle Kittanning coal.

Most of the older mining was by underground methods, but since 1938, production has been carried on predominantly by stripping. The earliest strip mining in the county is recorded for the year 1920.

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Brant, R. A., 1956, Coal resources of the upper part of the Allegheny formation in Ohio: Ohio Div. Geol. Survey Rept. Inv. 29, p. 20-21, figs. 5, 6.

Newberry, J. S., 1878f, Report on the geology of Mahoning County: Geol. Survey of Ohio Vol. 3, pt. 1, p. 781-814.

TABLE 10. - COAL PRODUCTION, BY FORMATION OR BED, FOR MAHONING COUNTY, 1946-57
(Short tons)

Formation or coal bed ¹	1946		1947		1948		1949	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	-	-	553	-	-	-	1,907	1,100
No. 5	57,020	51,310	122,908	117,511	449,382	444,504	500,295	496,863
No. 6	47,952	47,952	61,837	61,837	58,125	58,125	33,630	33,630
Total	104,970	99,262	185,298	179,348	507,507	502,629	535,832	531,593

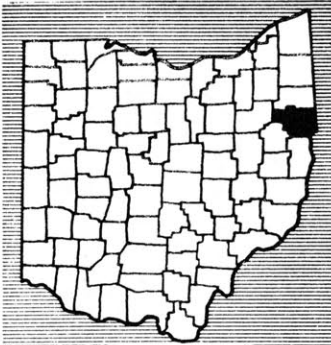
Formation or coal bed ¹	1950		1951		1952		1953	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	601	-	-	-	-	-	-	-
No. 5	594,786	592,518	737,725	737,725	669,225	669,225	554,999	554,999
No. 6	38,647	38,647	15,949	15,949	53,503	53,503	44,969	44,969
Total	634,034	631,165	753,674	753,674	722,728	722,728	599,968	599,968

Formation or coal bed ¹	1954		1955		1956		1957	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	-	-	-	-	-	-	-	-
No. 5	590,740	590,740	574,263	574,263	467,632	467,632	470,575	570,575
No. 6	72,260	72,260	113,497	113,497	134,719	134,719	234,186	234,186
Total	663,000	663,000	687,760	687,760	602,351	602,351	704,761	704,761

1 - Names of coal beds: No. 5, Lower Kittanning; No. 6, Middle Kittanning.

COLUMBIANA COUNTY

Geography and Geology



Columbiana County lies south of Mahoning County and is the northernmost county in Ohio to be bounded by the Ohio River. The population is 98,920, of which half lives in urban districts. East Liverpool is the largest city, with a population of 24,217. The principal industry of East Liverpool is the manufacture of ceramics, for which the clay and shale associated with the coal beds are utilized as raw material.

The glacial boundary crosses Columbiana County in an east-west direction a few miles south of Lisbon and divides Columbiana County into two physiographic sections. The northern two thirds of the county lies in the glaciated part of the Appalachian Plateau province, and the surface is characterized by gently rolling hills; the southern third of the county is in the unglaciated part of the Appalachian Plateau province and has a more rugged topography, characterized by steeply sloping hills.

Columbiana County is drained by dendritic tributaries of the Ohio River; the northwestern portion is drained by the Mahoning River, the south by Yellow Creek, and the rest of the county by Little Beaver River and its tributaries.

The dip of the strata in Columbiana County is southerly, except where minor structures interrupt this trend. The rocks exposed above drainage include the uppermost members of the Pottsville formation, all of the Allegheny formation, and the lower half of the Conemaugh formation. Outcrops of the Pottsville members, from the Upper Mercer limestone to the Brookville (No. 4) coal bed, are confined to the Ohio River Valley. The Conemaugh formation is found near the hilltops in the northern tier of townships, but the base of the formation approaches stream level at the Ohio River, thus leaving little area for the Allegheny formation to be exposed in southern Columbiana County.

Coal Beds

The coal beds in the upper part of the Pottsville and lower part of the Allegheny formations are thin, discontinuous, and of no known economic value in the county. These include the Bedford, the Tionesta (No. 3b), the Brookville (No. 4), which is the basal member of the Allegheny, and the Clarion (No. 4a).

The Lower Kittanning (No. 5) coal bed occupies a position about midway in the Allegheny formation, and is approximately 40 feet below the Middle Kittanning (No. 6) coal bed, 100 feet below the Lower Freeport (No. 6a) coal bed, and 160 feet below the Upper Freeport (No. 7) coal bed, which is the top member of the Allegheny formation. The Lower Kittanning bed underlies a major portion of Columbiana County (fig. 11), but its area of outcrop is restricted to the valleys of the Ohio River, Little Beaver Creek, Yellow Creek, and the smaller streams in the northern tier of townships. The thickness of the coal bed varies, but nearly everywhere in the county it is at least 14 inches, and in large areas it exceeds 28 inches. In a few small areas, the thickness of the coal exceeds 42 inches, as

in the Leetonia area. The Lower Kittanning coal bed is overlain by a marine zone of either limestone or fossiliferous shale.

The Middle Kittanning (No. 6) coal bed is found throughout Columbiana County (fig. 12), but it is frequently thin and sometimes replaced by sandstone. Its two principal areas of development are in the Washingtonville-Leetonia area and in the Ohio River-Yellow Creek area. As a coal resource in Columbiana County, this coal bed ranks third, being exceeded by the Lower Kittanning and Upper Freeport coal beds. Like the Lower



Figure 13 - Area underlain by the Lower Freeport (No. 6a) coal bed of the Allegheny formation in Ohio. Diagonal pattern, area of estimated reserve; stippled pattern, area of other Lower Freeport coal.

Kittanning, the Middle Kittanning coal bed is overlain by a marine zone.

The Lower Freeport (No. 6a) coal is one of the least valuable of the minable seams that occur in Columbiana County. Although it is found throughout the county (fig. 13), it is usually thin. It is thickest in the vicinity of East Liverpool and along the southern boundary of Columbiana County, from whence it thickens to the south. Movable thicknesses of this coal bed have been observed in the Lisbon area and locally in the north-central part of the county.

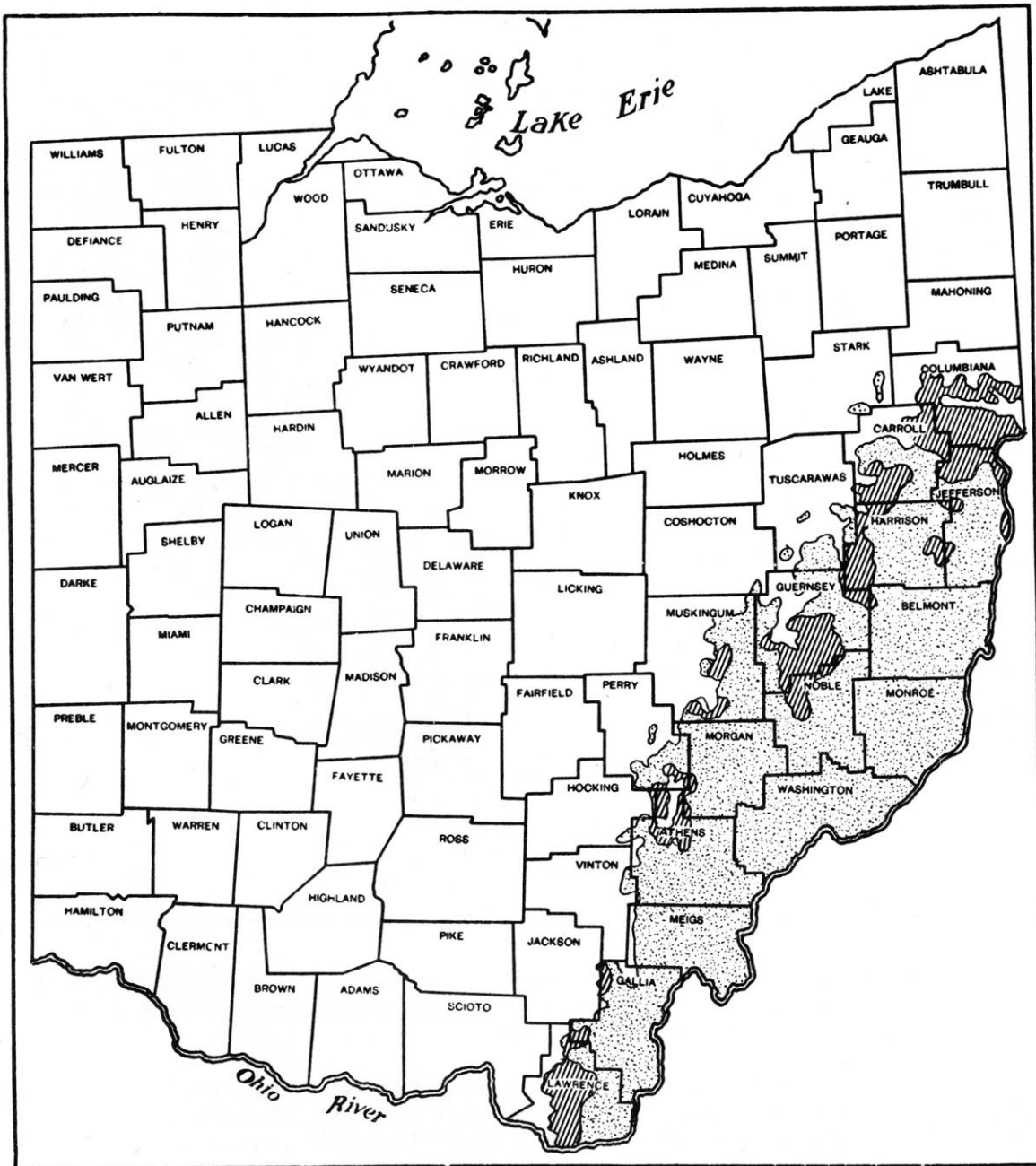


Figure 14 - Area underlain by the Upper Freeport (No. 7) coal bed of the Allegheny formation in Ohio. Diagonal pattern, area of estimated reserve; stippled pattern, area of other Upper Freeport coal.

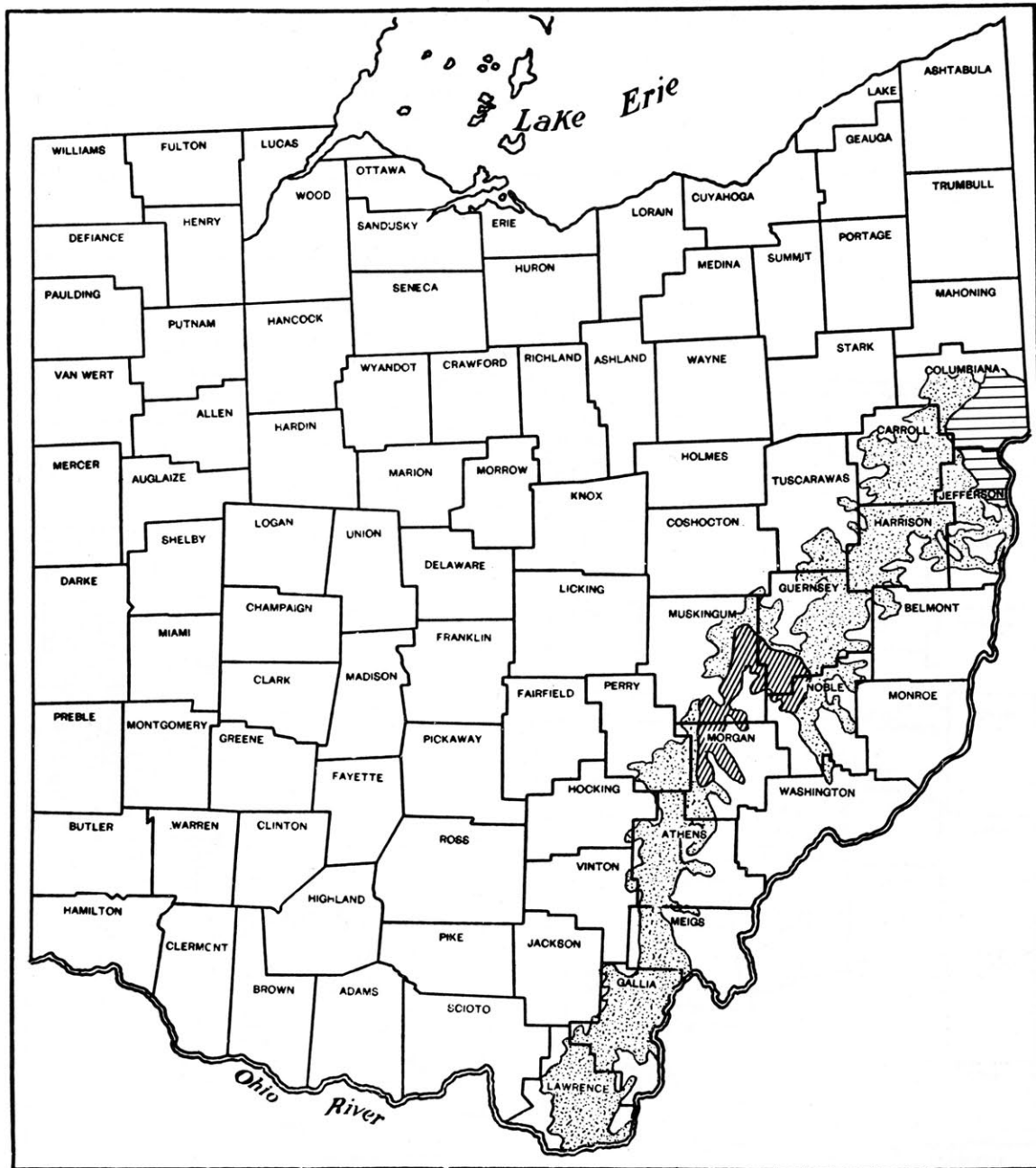


Figure 15 - Area underlain by the Conemaugh formation in Ohio. Stippled pattern, area of outcrop; horizontal pattern, area of minable Mahoning coal; diagonal pattern, area of minable Anderson coal.

The Upper Freeport (No. 7) coal bed constitutes the second most important source of solid fuel in Columbiana County. The distribution of the Upper Freeport coal in the county is extensive (fig. 14), and although the thickness is erratic, it locally is more than 28 inches in every township in which the coal is present, and in some places ranges up to 60 inches. The coal generally occurs in two benches separated by a shale parting a few inches thick.

In the Conemaugh formation, only one coal bed, the Mahoning, is of economic importance, although several other thin ones are present. The Mahoning coal bed is wide-

ly distributed (fig. 15), but highly variable in thickness in Columbiana County. The thickness of this bed is generally only a few inches, but, in local areas to the south and southeast, thicknesses of more than 3 feet have been observed. These deposits of thick coal have contributed considerably to the coal production of Columbiana County.

Reserve and Production

The total original coal reserve of Columbiana County is estimated at 2,803,343,000 tons. The greatest contribution to this reserve is the Lower Kittanning coal bed, which is estimated to contain 1,173,585,000 tons; next in order of importance are the Upper Freeport, Middle Kittanning, Lower Freeport, and Mahoning coal beds. These beds have been mined both by stripping and by underground methods. A total known production of 58,064,000 tons of coal is reported. During the past few years, production has exceeded 1 million tons per year (table 11), and 90 to 95 percent has been won by stripping. By comparing the total coal production with the estimated original reserve, it may be seen that a substantial reserve remains. Tables 37 and 38 show the distribution and classification of the reserve by thickness and reliability.

Selected References

- Brant, R. A., 1954, The Lower Kittanning (No. 5) coal bed in Ohio: Ohio Div. Geol. Survey Rept. Inv. 21, p. 23-25, fig. 6.
- 1956, Coal resources of the upper part of the Allegheny formation in Ohio: Ohio Div. Geol. Survey Rept. Inv. 29, p. 22-24, figs. 5, 6, 7.
- DeBrosse, T. A., 1957, Coal beds of the Conemaugh formation in Ohio: Ohio Div. Geol. Survey, Rept. Inv. 34, p. 26-28.
- Stout, W., and Lamborn, R. E., 1924, Geology of Columbiana County: Geol. Survey of Ohio. Bull. 28, 55-286, map 3.

TABLE 11. - COAL PRODUCTION, BY FORMATION OR BED, FOR COLUMBIANA COUNTY, 1946-57
(Short tons)

Formation or coal bed ¹	1946		1947		1948		1949	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	8,051	-	9,620	677	8,126	1,222	5,560	-
No. 5	11,904	-	20,787	7,522	26,076	-	20,294	-
No. 6	487,599	396,938	540,242	444,924	804,044	697,142	846,484	743,419
No. 6a	593	-	-	-	15,045	8,402	43,485	38,572
No. 7	109,692	81,577	249,919	216,060	308,701	290,911	292,766	280,863
Total	617,839	478,515	820,568	669,183	1,161,992	997,677	1,208,589	1,062,854

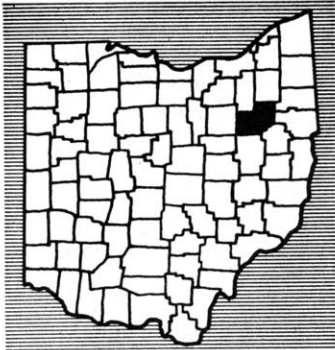
Formation or coal bed ¹	1950		1951		1952		1953	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	12,106	-	1,304	-	8,971	4,585	3,895	3,166
No. 5	17,365	-	27,682	5,126	12,093	2,968	16,717	1,738
No. 6	905,709	804,374	798,165	752,760	534,684	520,601	667,452	664,255
No. 6a	93,561	79,514	116,523	108,298	122,968	122,968	61,083	61,083
No. 7	413,738	395,355	457,683	438,189	506,201	466,310	513,510	470,620
Total	1,442,479	1,279,243	1,401,357	1,304,373	1,184,917	1,117,432	1,262,657	1,200,862

Formation or coal bed ¹	1954		1955		1956		1957	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	2,199	1,752	1,708	1,708	1,205	1,205	146	-
No. 5	23,646	13,555	34,803	25,541	57,950	54,769	48,401	48,401
No. 6	441,985	437,561	967,273	961,892	875,143	845,031	943,699	933,680
No. 6a	132,826	132,826	38,738	38,738	-	-	5,509	-
No. 7	629,765	597,799	300,456	269,578	483,399	483,399	511,533	489,701
Total	1,230,421	1,183,493	1,342,978	1,297,457	1,417,697	1,384,404	1,509,288	1,471,782

1 - Names of coal beds: No. 5, Lower Kittanning; No. 6, Middle Kittanning; No. 6a, Lower Freeport; No. 7, Upper Freeport.

STARK COUNTY

Geography and Geology



Stark County, which lies west of Columbiana County, is another of the highly industrialized counties of northeastern Ohio. The greatest concentration of this county's population of 283,194 is in the Canton-Massillon area, where urban districts are rapidly expanding. Industry is varied, but the manufacturing of steel and steel products is the most important. Three plants in Canton manufacturing primary steel have an annual capacity of 15,781,000 tons (Wright, 1957, p. 151).

The coal fields of Stark County are in an advantageous position to supply the large coal market in this area and to the north. Excellent rail and highway connections help facilitate movement of the coal to the various markets.

In northern Stark County the dip of the bedrock is gentle to the south, but gradually the dip changes to the southeast in the southern part of the county.

All of Stark County except the south-central and southeastern parts has been glaciated; thus, the county lies in both the glaciated and unglaciated parts of the Appalachian Plateau. The glaciated section has a gently rolling surface, whereas the unglaciated section is characterized by broad valleys with steep walls. The bedrock of the glaciated section is masked by glacial deposits, so that identification of coal beds in this section is uncertain.

The full thickness of the Pottsville and Allegheny formations and the basal part of the Conemaugh is present above drainage in Stark County. The Pottsville formation lies almost entirely in the glaciated section, and because it is hidden by glacial drift, it is not well known. The Allegheny formation, on the other hand, is well exposed in the unglaciated section, and its relationships and nature are rather well known. There are no Conemaugh coal beds of known value in Stark County.

Coal Beds

Eight coal beds have been mined in Stark County; others occur, but they are either of too limited extent or there is not enough data to make a resource appraisal. Four of the minable coal beds occur in the Pottsville formation and four are found in the Allegheny formation.

Lowest of the minable coal beds of Stark County is the Sharon (No. 1). At the turn of the century, this coal bed was mined intensively in the Massillon field, which lies in the western half of Stark County (fig. 9). In this field the coal was reached by both shaft and slope mines. Throughout the Massillon field, the Sharon coal was deposited in disconnected basins or channels on the eroded surface marked by the Mississippian-Pennsylvanian disconformity. The thickness of the seam in the basins is 3 to 4 feet, but the coal thins rapidly around the basin edges. The size of the basins varies, but the extent of many of the old workings did not exceed 40 to 60 acres.

The Lower Mercer (No. 3), Bedford, and Tionesta coal beds have supported small mining operations in the western and southwestern parts of Stark County, but none of these beds are strong contributors to the coal reserve of the county.

The best development of the Brookville (No. 4) coal bed in Ohio is in Stark County, where this coal is found in the southern, central and north-central parts of the county (fig. 10). Known thickness of the coal ranges from a few inches to 60 inches, but the average thickness is about 2 feet. In many places this coal bed occurs in two benches and is overlain by the Putnam Hill limestone, 1 to 4 feet thick.

The Lower Kittanning (No. 5) coal bed is of minable thickness throughout most of its outcrop area in eastern and southern Stark County (fig. 11). The thickness of the coal is moderately uniform. The coal is overlain by a carbonaceous marine shale that is locally very calcareous.

The Middle Kittanning (No. 6) coal bed occurs 30 to 60 feet above the Lower Kittanning and occupies an area similar to that of the Lower Kittanning (fig. 12). Except for the hilltops in the southern part of the county, where the coal is either thin or cut out, this bed is 28 inches or more in thickness.

The Upper Freeport (No. 7) coal bed is found in the hilltops of eastern and southeastern Stark County (fig. 14). The coal thickness is erratic and ranges from 0 to 54 inches.

Reserve and Production

The four Pottsville coal beds, together with the four Allegheny coal beds, provide a total estimated original reserve of 1,442,857,000 tons. Over 50 percent of this reserve is shared nearly equally by the Middle and Lower Kittanning coal beds. The original reserve (492 million tons, unclassified) of the Sharon coal bed is largely inferred and should be accepted only as a general indicator (table 37).

More than 54 million tons of coal is reported to have been mined in Stark County, through 1958. Strip-mine production first began in 1917 and has generally increased each year since. This type of mining accounts for about 8 percent of the alltime production; currently about 90 percent of the coal is produced by stripping (table 12).

Selected References

- Brant, R. A., 1954, The Lower Kittanning (No. 5) coal bed in Ohio: Ohio Div. Geol. Survey Rept. Inv. 21, p. 29-30, fig. 8.
- _____, 1956, Coal resources of the upper part of the Allegheny formation in Ohio: Ohio Div. Geol. Survey Rept. Inv. 29, p. 30, 32, figs. 8, 10.
- DeLong, R. M., 1957, Coal resources of the lower part of the Allegheny formation in Ohio: Ohio Div. Geol. Survey Rept. Inv. 31, p. 17, fig. 5.
- Granchi, J. A., 1958, Coal resources of the Pottsville formation: Ohio Div. Geol. Survey Rept. Inv. 36, p. 8-9, 19, 23, 28, 32, 36, 42, fig. 4.
- Newberry, J. S., 1878i, Report on the geology of Stark County, in Geol. Survey of Ohio Vol. 3 pt. 1, p. 151-176.

TABLE 12. - COAL PRODUCTION, BY FORMATION OR BED, FOR STARK COUNTY, 1946-57
(Short tons)

Formation or coal bed ¹	1946		1947		1948		1949	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	14,330	4,779	3,612	-	4,755	-	5,064	4,327
No. 4	-	-	-	-	2,779	2,779	35,416	35,416
No. 5	76,137	75,052	120,383	203,402	402,619	402,619	361,507	361,507
No. 6	159,129	152,899	217,050	173,856	256,429	251,688	394,300	351,521
No. 7	-	-	-	-	-	-	-	-
Total	249,596	232,730	341,045	377,258	666,582	657,086	796,287	752,771

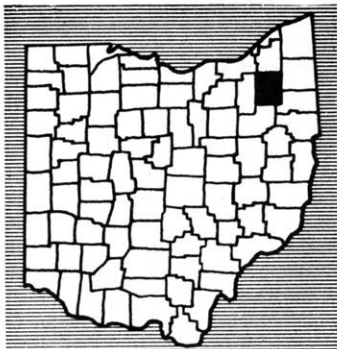
Formation or coal bed ¹	1950		1951		1952		1953	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	-	-	-	-	-	-	-	-
No. 4	103,920	103,920	115,855	115,855	194,758	194,758	118,203	118,203
No. 5	445,720	455,720	351,786	351,786	483,938	460,754	381,599	355,435
No. 6	460,739	405,333	477,532	423,713	355,373	321,384	474,334	446,168
No. 7	-	-	9,237	9,237	-	-	-	-
Total	1,020,379	964,973	954,410	900,591	1,034,069	976,896	974,136	919,806

Formation or coal bed ¹	1954		1955		1956		1957	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	-	-	-	-	-	-	35,205	3,124
No. 4	94,901	94,901	95,096	95,096	83,637	83,637	111,247	111,247
No. 5	453,924	382,703	520,497	430,045	348,101	256,262	410,171	327,411
No. 6	320,885	319,121	466,810	466,351	467,754	467,754	271,524	271,524
No. 7	-	-	-	-	-	-	-	-
Total	869,710	796,725	1,082,403	991,492	899,492	807,653	828,147	713,306

1 - Names of coal beds: No. 4, Brookville; No. 5, Lower Kittanning; No. 6, Middle Kittanning; No. 7, Upper Freeport.

PORTAGE COUNTY

Geography and Geology



Portage County, which lies north of Stark County, does not possess as much industry as do the surrounding counties. This county, however, has benefited from the neighboring industrial growth, and the 1950 population of 63,954 is twice that of 1910.

Glaciation of the entire county has resulted in low relief and a thick mantle of glacial drift. The drainage is divided between streams flowing into Lake Erie and tributaries of the Ohio River.

The bedrock units of Portage County are not definable in detail, because of the thick glacial cover and because adequate drill-hole information is not available. Data indicate that the Pottsville formation underlies most of the county and that small areas in the northeastern and northwestern corners are underlain by strata of Mississippian age. The Brookville (No. 4) coal bed, the basal member of the Allegheny formation, has not been identified in this county.

Coal Beds

The Sharon (No. 1) coal bed has been mined by shaft methods in the vicinity of Palmyra, but its minable extent from this area is not known. The coal lies nearly 100 feet below drainage at Palmyra and possibly as much as 200 feet below drainage over much of its area of occurrence in Portage County.

The Bedford coal bed, for which gross estimates are made without regard to classification (table 37), is exposed in strip-mine workings between Atwater and Deerfield (fig. 16). In the area of the mines the coal ranges from 3 to 5 feet in thickness. Because of the glacial cover, other Pottsville coal beds have been observed at only a few localities.

Reserve and Production

The total original coal reserve is estimated at 111,824,000 short tons. This estimated reserve occurs in three coal beds, of which the Sharon (No. 1) is the largest contributor, with 75 million tons. The other contributors are the Lower Mercer (No. 3) coal bed, with 23 million tons of estimated original reserve, and the Bedford coal bed with 13,824,000 tons.

Production of coal in Portage County from 1946 to 1957 is shown in table 13.

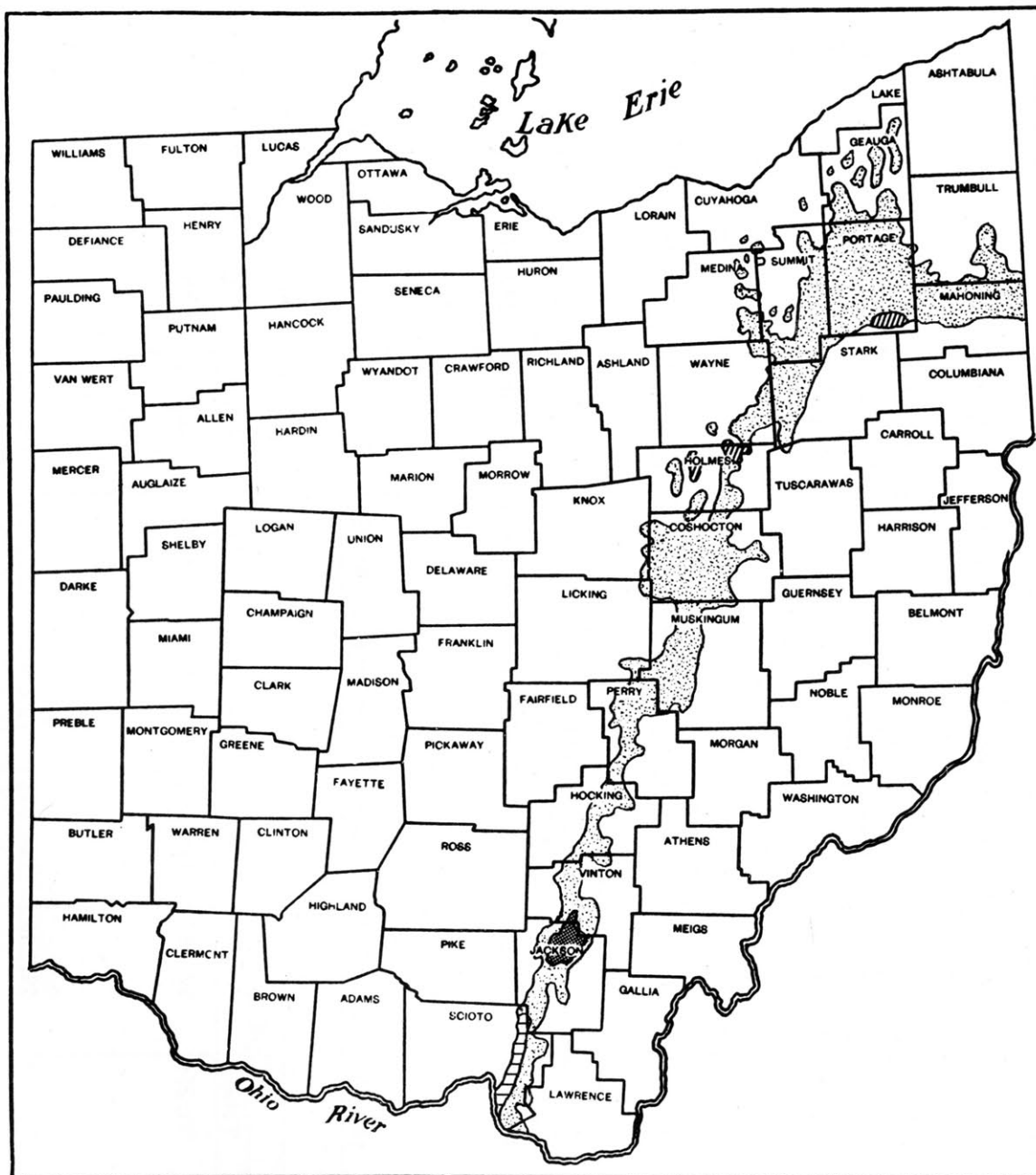


Figure 16 - Area of outcrop of the Pottsville formation in Ohio. Horizontal pattern, area of minable Upper Mercer (No. 3a) coal; diagonal pattern, area of minable Bedford coal; crosshatched pattern, area of minable Quakertown (No. 2) coal; stippled pattern, area of remainder of the outcrop of the Pottsville formation.

Selected References

Granchi, J. A., 1958, Coal resources of the Pottsville formation: Ohio Div. Geol. Survey Rept. Inv. 36, p. 10, 23, 32.

Newberry, J. S., 1878g, Geology of Portage County, in Geol. Survey of Ohio Vol. 3, pt. 1, p. 133-150.

TABLE 13. - COAL PRODUCTION, BY FORMATION, FOR PORTAGE COUNTY, 1946-57
(Short tons)

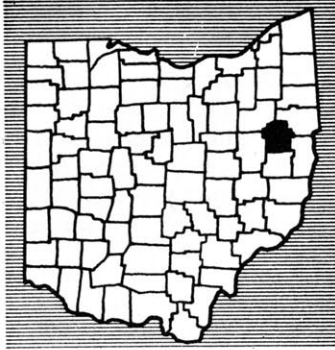
Formation	1946		1947		1948		1949	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	94,100	94,100	94,131	94,131	103,472	103,472	109,417	109,417
Total	94,100	94,100	94,131	94,131	103,472	103,472	109,417	109,417

Formation	1950		1951		1952		1953	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	153,272	153,272	182,911	182,911	191,991	191,991	142,858	142,858
Total	153,272	153,272	182,911	182,911	191,991	191,991	142,858	142,858

Formation	1954		1955		1956		1957	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	73,356	73,356	126,503	126,503	135,034	135,034	122,411	122,411
Total	73,356	73,356	126,503	126,503	135,034	135,034	122,411	122,411

CARROLL COUNTY

Geography and Geology



Carroll County adjoins the industrialized Stark and Columbiana Counties to the north, but has little industry itself. The population of Carroll County has increased steadily at a slow rate from the turn of the century; the 1950 census reported 19,000 people. Approximately 70 percent of the population is rural.

Carroll County lies entirely within the unglaciated part of the Appalachian Plateau province. The topography is that of a rugged upland with narrow V-shaped valleys, although in the western part of the county, a few broad valleys are present. The central and western parts of this county are drained westward by tributaries of the Tuscarawas River; the eastern part is drained southward to the Ohio River.

The rocks present in Carroll County are entirely of Pennsylvanian age. These rocks include the upper part of the Pottsville, the entire thickness of the Allegheny and the Conemaugh formations, and the lower part of the Monongahela formation. The Conemaugh formation is the most widely exposed unit in Carroll County. Because of the southeasterly dip in the county, the rock crops out in northeast-southwest bands, with the youngest units exposed to the southeast.

Coal Beds

Exposures of the Allegheny coal beds, the main contributors to the Carroll County coal reserve, are confined to the western and northern edges of this county. The Brookville (No. 4) coal bed, which is the basal unit of the Allegheny formation, is exposed near stream level along Sandy Creek in the northwestern part of the county (fig. 13). In this area the coal bed is from 14 to 28 inches thick. Eastward, however, it is under deep cover, and there are no available data; hence, the estimate of the original reserve is confined to the known area.

The Lower Kittanning (No. 5) coal bed lies about midway in the Allegheny formation. It is found above drainage only along the western and northwestern margins of the county (fig. 11), where it is between 28 and 42 inches thick. It is present at depth to the east, and although there is little drill-hole information available, indications are that the coal exceeds 14 inches in thickness throughout the county, with only rare exceptions.

The outcropping area of the Middle Kittanning (No. 6) coal bed also is confined to the western and northwestern parts of Carroll County, and the bed is under deep cover throughout the rest of the county (fig. 12). Coal of minable thickness extends over much of the western half of the county, but the eastern limit is not known.

The Lower Freeport (No. 6a) coal bed underlies virtually all of Carroll County (fig. 13). It is known to be of minable thickness in only two areas: in the Indian Fork Creek valley, west of Carrollton, and in the southeastern part of Carroll County, near the Carroll

and Jefferson County boundary, where the coal has been mined under deep cover. The area of estimated coal in southeastern Carroll County constitutes a part of a larger area that embraces southeastern Carroll, eastern Harrison, and most of Jefferson Counties.

The Upper Freeport (No. 7) coal bed, at the top of the Allegheny formation, crops out in the western and northern parts of Carroll County and is found in the deep valleys at the eastern edge of the county (fig. 14). The coal ranges in thickness from a few inches to almost 5 feet. Broad areas of coal exceeding 28 inches in thickness occur in the north-eastern and southwestern parts of the county, but the coal is either unknown or absent between these areas.

The Conemaugh formation, approximately 435 feet thick in Carroll County, has two coal beds that are of economic value, the Harlem and the Mahoning. Of the two the Harlem is the more important. In Lee Township, in the vicinity of Harlem Springs, and to a lesser extent in Perry and Union Townships, this coal has been mined for local use. In Lee Township, the thickness of the Harlem coal bed is nearly uniform and averages 25 inches. The Mahoning coal bed has been mined for local use in Center and Fox Townships, but it is irregular in thickness and does not exceed 2 feet.

The Pittsburgh (No. 8) coal bed occupies only a few acres of hilltop area in southeastern Carroll County (fig. 17). The reserve for this small acreage in the county is shown in table 37.

Reserve and Production

The estimated original coal reserve in Carroll County for the seven beds described above is 2,497,412,000 short tons. The greatest part of this estimated reserve is found in the Lower Kittanning coal bed, which is followed in order of reserve importance by the Middle Kittanning, Upper Freeport, Lower Freeport, Harlem, Brookville, and Pittsburgh coal beds.

Total production reported to January 1, 1959 is 27,134,000 tons. Most of this production is from underground mines, but in recent years strip-mine production has been predominant (table 14). Most of the principal coal beds are being worked, and recently augur methods have been introduced in mining some of the beds. Table 37 shows the estimated original reserve, by county and by coal bed.

Selected References

- Brant, R. A., 1954, The Lower Kittanning (No. 5) coal bed in Ohio: Ohio Div. Geol. Survey Rept. Inv. 21, p. 27, 29, fig. 6.
- _____, 1956, Coal resources of the upper part of the Allegheny formation in Ohio: Ohio Div. Geol. Survey Rept. Inv. 29, p. 24, 26, figs. 5, 6, 7.
- DeBrosse, T. A., 1957, Coal beds of the Conemaugh formation in Ohio: Ohio Div. Geol. Survey Rept. Inv. 34, p. 24-25, fig. 6.
- Lamborn, R. E., 1942, The coal beds of western Carroll County and southeastern Mahoning County: Geol. Survey of Ohio Bull. 43, 33 p.

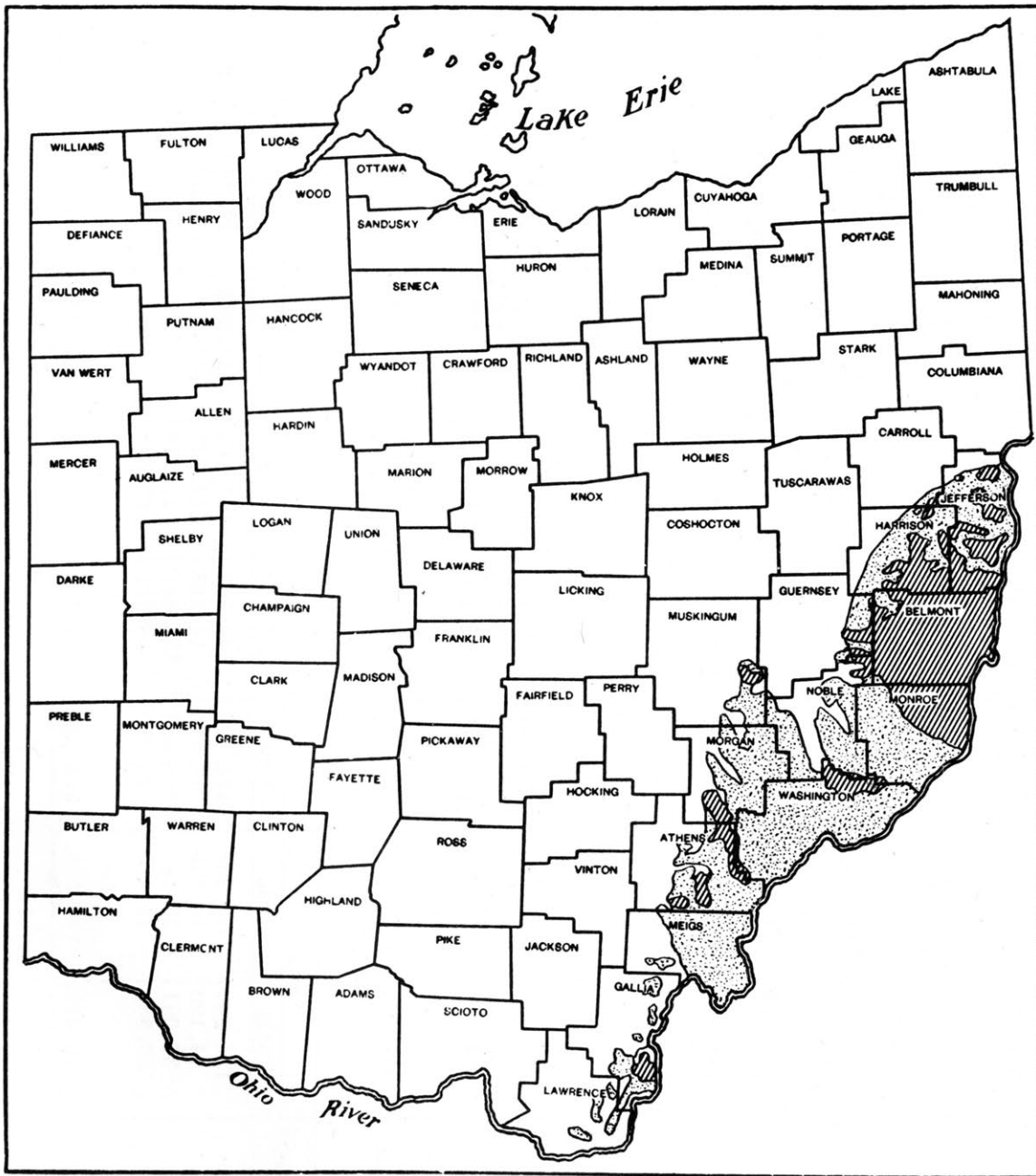


Figure 17 - Area underlain by the Pittsburgh (No. 8) coal bed in Ohio. Diagonal pattern, area of estimated reserve; stippled pattern, area of other Pittsburgh coal.

TABLE 14. - COAL PRODUCTION, BY BED, FOR CARROLL COUNTY, 1946-57
(Short tons)

Coal bed ¹	1946		1947		1948		1949	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 5	239,963	170,699	210,955	128,238	290,785	195,354	214,244	175,575
No. 6	21,343	-	5,503	1,603	223,665	1,348	121,048	64,223
No. 7	16,012	-	31,354	15,730	21,058	15,465	106,474	100,790
Other	270,774	127,867	188,484	49,416	136,062	-	128,921	-
Total	548,092	298,536	436,296	194,987	671,570	212,167	470,687	340,588

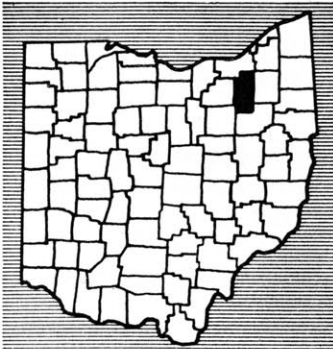
Coal bed ¹	1950		1951		1952		1953	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 5	185,227	133,887	200,774	170,334	177,174	156,924	190,067	178,895
No. 6	96,285	93,295	9,481	7,451	35,774	32,717	28,466	28,147
No. 7	138,479	125,470	12,556	7,865	3,138	3,138	55,563	55,533
Other	132,852	-	114,054	13,414	85,228	2,255	92,436	24,731
Total	552,843	352,652	336,865	199,064	301,314	195,034	366,532	287,306

Coal bed ¹	1954		1955		1956		1957	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 5	134,248	134,248	144,392	144,392	136,866	136,866	66,647	66,647
No. 6	14,190	14,190	14,165	14,165	143,297	143,297	160,209	160,209
No. 7	32,051	32,051	186,881	186,881	111,173	111,173	90,646	36,043
Other	69,330	16,167	68,891	6,111	67,631	-	6,314	-
Total	249,819	196,656	414,329	351,549	458,967	391,336	323,816	262,899

1 - Names of coal beds: No. 5, Lower Kittanning; No. 6, Middle Kittanning; No. 7, Upper Freeport.

SUMMIT COUNTY

Geography and Geology



Summit County, which has an immense rubber industry centered around Akron, is another of the highly industrialized counties in northeastern Ohio. The present population of 410,000, four times that of 1900, is predominantly an urban one that has now spread over much of the county. An excellent rail and highway net has been an important factor in the industrial growth.

Summit County lies entirely within the glaciated section of the Appalachian Plateau and has a topography of low relief. Glacial deposits which mask the bedrock geology are widespread.

A gentle dip of the strata to the south and east exposes rock of Mississippian age to the north and Pennsylvanian age to the south. Only the lower part of the Pottsville formation is present in Summit County and only one coal bed, the Sharon (No. 1), is of known economic importance

Coal Beds and Production

The Sharon (No. 1) coal bed has been mined in the southern part of the county (fig. 9). Production was reported first for the year 1810 and has totaled 10,346,000 tons, most of which has occurred since the Civil War.

The original coal reserve of Summit County is estimated at 228 million tons, all of which is contained in the Sharon coal bed. The reserve underlies about 60 square miles in the southern part of the county.

Selected References

Granchi, J. A., 1958, Coal resources of the Pottsville formation: Ohio Div. Geol. Survey Rept. Inv. 36, p. 9, 19, 23, fig. 4.

Newberry, J. S., 1873, Report on the geology of Summit County, in Geol. Survey of Ohio Vol. 1, p. 201-222.

MEDINA COUNTY

Geography and Geology



Medina County, which lies west of Summit County, has little industry, although it borders heavily industrialized counties of northeastern Ohio. Its population of 40,417 is largely rural.

A large part of this county lies in the glaciated section of the Appalachian Plateau; the northwestern corner lies in the Till Plains of the Central Lowland.

The Pottsville formation is restricted to the eastern and southeastern parts of this county.

Coal Beds and Production

The Sharon (No. 1) coal bed has given Medina County a small coal reserve. This coal bed was worked from 1870 to the early 1940's, during which time 4,755,000 tons was produced. Sharon and Wadsworth Townships were the principal areas of production.

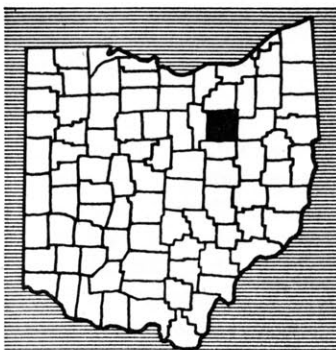
Approximately 20 square miles in this county is underlain by Sharon coal of 3-foot thickness (fig. 9) and contains an estimated original coal reserve of 73 million tons.

Selected References

- Granchi, J. A., 1958, Coal resources of the Pottsville formation: Ohio Div. Geol. Survey Rept. Inv. 36, p. 9, fig. 4.
- Wheat, A. W., 1878, Report on the geology of Medina County: in Geol. Survey of Ohio Vol. 3, p. 362-380.

WAYNE COUNTY

Geography and Geology



Wayne County lies south of Medina County in northeastern Ohio and is somewhat removed from the highly industrialized centers of Stark and Summit Counties, to the east. The population of 58,716 is well distributed; approximately half is in urban districts, the largest of which is Wooster, with 14,000 people. Highway facilities to major points in all directions are satisfactory.

Except for the northwestern part, which lies in the Till Plains of the Central Lowland, this county is in the glaciated part of the Appalachian Plateau. The plateau topography is one of rounded hills and moderate relief. Glacial deposits are widespread and cover most of the bedrock, but rock outcrops are found in road cuts and along valley walls.

The strata in Wayne County dip gently to the south and east. Rocks of Pennsylvanian age occur in the southeastern and eastern parts of this county; Mississippian strata underlie the surface of the rest of Wayne County.

The full thickness of the Pottsville formation and of Allegheny strata up through the Middle Kittanning (No. 6) coal bed is found in Wayne County. Because of the limited areal extent of these formations and the erratic thickness of the Pottsville coal beds, the coal reserve for this county is small.

Coal Beds

The Sharon (No. 1) coal bed underlies a large portion of the eastern tier of townships of Wayne County (fig. 9) and is exposed on the hill slopes in the southern tier of townships. The area of minable coal is restricted to the eastern tier of townships, which lies within the western limit of the Massillon coal field. The coal occurs as thick deposits in irregular basins, similar to its occurrence in the rest of the Massillon field. Farther west, the coal may be represented by a carbonaceous shale or may be absent, due to nondeposition.

Several other Pottsville coal beds are found in Wayne County, but all are highly variable in character and are found with minable thickness at only a few localities. The Anthony, Lower Mercer (No. 3), Upper Mercer (No. 3a), Bedford, and Tionesta coal beds have at various times yielded a limited amount of production.

The Brookville (No. 4) coal bed occurs near the hilltops in southeastern Wayne County and, therefore, is of very limited extent (fig. 10). The thickness, however, is generally about 14 to 28 inches and has been reported to be as much as 60 inches, locally. The coal is overlain by the Putnam Hill limestone, which varies from 1 to 5 feet in thickness.

The Lower Kittanning (No. 5) coal bed is found only on the hilltops in the southeastern corner of the county (fig. 11), where it occurs about 30 feet above the Brookville

coal bed. The coal ranges from 14 to 28 inches in thickness and is relatively uniform in thickness and minable extent.

Reserve and Production

In Wayne County, the Sharon (No. 1) coal bed contains an estimated 215 million tons of coal. Formerly this coal bed was of first importance in mining activity, but with the exhaustion of the accessible and better known deposits, mining activity in this unit ceased. Of the four eastern townships, the greatest activity was in Chippewa and Baughman Townships. Both drift and shaft methods were used to mine the coal.

Other coals in the Pottsville formation support only occasional mining operations. The Lower Mercer (No. 3) coal bed is thickest in Salt Creek Township, being more than 3 feet thick in places. The Lower Mercer coal bed contains an estimated 2,304,000 tons of original coal reserve. The Upper Mercer (No. 3a) and Bedford coal beds are rarely thick enough to make mining profitable and contain an estimated reserve of 3,456,000 tons and 6,912,000 tons of coal, respectively. The Tionesta coal bed has been worked in Paint and Salt Creek Townships and contains an estimated 6,912,000 tons of original coal reserve.

The Brookville coal bed has been an important source of fuel in the past, and in recent years it has been strip mined on a limited scale. The original reserve of the Brookville coal bed is estimated at 8,722,000 tons.

Although the Lower Kittanning coal bed is the most limited in extent of the Wayne County coals, it has ranked first in production in recent years (table 15). The original reserve for this coal bed is estimated at 12,574,000 tons.

Selected References

- Brant, R. A., 1954, The Lower Kittanning (No. 5) coal bed in Ohio: Ohio Div. Geol. Survey Rept. Inv. 21, p. 32, fig. 9.
- Conrey, G. W., 1921, Geology of Wayne County: Geol. Survey of Ohio Bull. 24.
- DeLong, R. M., 1957, Coal resources of the lower part of the Allegheny formation in Ohio: Ohio Div. Geol. Survey Rept. Inv. 31, p. 19, fig. 5.
- Granchi, J. A., 1958, Coal resources of the Pottsville formation: Ohio Div. Geol. Survey Rept. Inv. 36, p. 9, 19, 23, 28, fig. 4.

TABLE 15. - COAL PRODUCTION, BY FORMATION OR BED, FOR WAYNE COUNTY, 1946-57
(Short tons)

Formation or coal bed ¹	1946		1947		1948		1949	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	10,031	10,031	-	-	-	-	-	-
No. 4	-	-	-	-	-	-	-	-
No. 5	29,709	29,709	89,156	89,156	108,955	108,955	128,875	128,875
Total	39,740	39,740	89,156	89,156	108,955	108,955	128,875	128,875

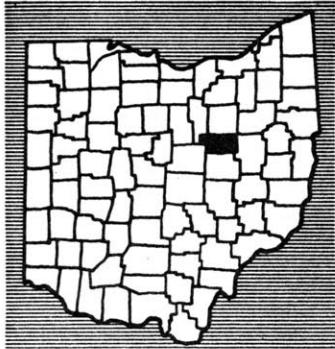
Formation or coal bed ¹	1950		1951		1952		1953	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	-	-	-	-	-	-	-	-
No. 4	-	-	-	-	-	-	-	-
No. 5	119,483	119,483	104,949	104,949	101,098	101,098	117,035	117,035
Total	119,483	119,483	104,949	104,949	101,098	101,098	117,035	117,035

Formation or coal bed ¹	1954		1955		1956		1957	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	-	-	-	-	-	-	-	-
No. 4	-	-	-	-	-	-	-	-
No. 5	113,164	113,164	108,741	108,741	121,919	121,919	109,259	109,259
Total	113,164	113,164	108,741	108,741	121,919	121,919	109,259	109,259

1 - Names of coal beds: No. 4, Brookville; No. 5, Lower Kittanning.

HOLMES COUNTY

Geography and Geology



Holmes County lies in northeastern Ohio, south of Wayne County, and far enough from the industrial centers that they do not alter its rural aspect. Its population of 18,760 is only slightly higher than that of the early 1900's, and the urban segment constitutes only about 20 percent of the population.

Rail facilities are limited, but highway connections are adequate in this county.

Holmes County is divided into two physiographic sections. The southern half of the county lies in the unglaciated part of the Appalachian Plateau, and the northern half lies in the glaciated part. The unglaciated section has moderate relief and steep-walled valleys, whereas the glaciated section has more gentle relief. Drainage of the entire county lies within the Muskingum River watershed and is dominated by the southward-flowing Killbuck Creek.

The dip of the strata to the south and east carries the Pottsville formation from the hilltops in western Holmes County to near stream level in the southeastern corner of the county. The Allegheny formation is found only on the highest hills west of Killbuck Creek, but is widespread in the southeastern part of the county.

Coal Beds

The Pottsville formation contains several coal beds that have been mined in the past, but none have supported mining operations in recent years. Coal beds with minable thicknesses are found only locally, and hence the beds are of little value as a coal reserve. These coal beds include the Quakertown (No. 2) coal bed, which at its maximum is $2\frac{1}{2}$ feet in thickness; the Lower Mercer (No. 3) coal bed, which has been worked in the northwestern and south-central parts of Holmes County; and the Tionesta (No. 3b) coal bed which is thickest in Prairie and Killbuck Townships. The most valuable of the Pottsville coal beds is the Bedford, which lies in most places about 55 feet below the Brookville (No. 4) coal bed. The Bedford is found in every township, and in most of them it has been mined for local use (fig. 16). The bed thickens and thins without respect to directional trends, and, thus, minable occurrences are patchy. The thickness usually does not exceed 2 feet, although in places it has been measured at greater than 3 feet. Although usually of bituminous nature, this bed in the southeastern part of the county contains, in part, cannel coal.

Minable Brookville (No. 4) coal of the Allegheny formation occurs east of Killbuck Creek (fig. 10). Some production has been reported in recent years from the northeastern part of the county, but generally the coal is thin in this area and not amenable to large-scale mining.

The Lower Kittanning (No. 5) coal bed is the most important and valuable coal bed in Holmes County. The bulk of the area underlain by this coal bed occurs east of Killbuck Creek, but some outliers occur in the western part of the county (fig. 11). A thickness of

more than 28 inches of coal underlies much of the northeastern part of the county. Here the coal crops out high on the hillsides and is readily available for strip mining.

The Middle Kittanning (No. 6) coal bed also lies high on the hills in the eastern part of Holmes County (fig. 12), where the thickness of the coal ranges from a few inches to 28 inches. There has been mining in this coal bed in recent years, despite its restricted extent and irregular thickness.

Reserve and Production

Seven beds contribute to the estimated original coal reserve of 352,083,000 tons in Holmes County. The Bedford coal bed contributes over 40 percent, or about 146 million tons, but most of the present production comes from the coal beds with smaller reserves: the Brookville, Lower Kittanning, and Middle Kittanning.

The total reported production since 1840 is more than 2 million tons. In 1957, about 16,000 tons of coal was produced, of which approximately 13,000 tons was by strip mining (table 16).

Selected References

- Brant, R. A., 1954, The Lower Kittanning (No. 5) coal bed in Ohio: Ohio Div. Geol. Survey Rept. Inv. 21, p. 32, 34, fig. 9.
- 1956, Coal resources of the upper part of the Allegheny formation in Ohio: Ohio Div. Geol. Survey Rept. Inv. 29, p. 32, 34, fig. 8.
- DeLong, R. M., 1957, Coal resources of the lower part of the Allegheny formation in Ohio: Ohio Div. Geol. Survey Rept. Inv. 31, p. 19-20, fig. 5.
- Granchi, J. A., 1958, Coal resources of the Pottsville formation: Ohio Div. Geol. Survey Rept. Inv. 36, p. 18, 23, 28, 36, fig. 8.
- White, G. W., 1949, Geology of Holmes County: Geol. Survey of Ohio Bull. 47.

TABLE 16. - COAL PRODUCTION, BY FORMATION OR BED, FOR HOLMES COUNTY, 1946-57
(Short tons)

Formation or coal bed ¹	1946		1947		1948		1949	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	-	-	-	-	9,019	9,019	824	824
No. 4	-	-	-	-	-	-	-	-
No. 5	111,001	105,957	48,325	43,568	-	-	-	-
No. 6	3,849	-	3,725	-	3,716	1,288	3,715	2,431
Total	114,850	105,957	52,050	43,568	12,735	10,307	4,539	3,255

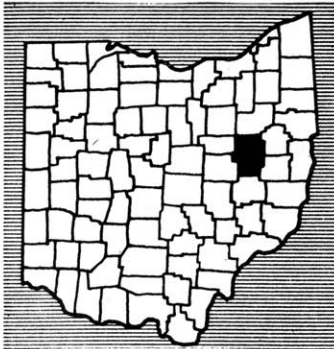
Formation or coal bed ¹	1950		1951		1952		1953	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	-	-	-	-	-	-	-	-
No. 4	-	-	-	-	-	-	-	-
No. 5	9,137	8,623	10,229	10,024	2,798	2,292	1,619	1,619
No. 6	3,341	975	1,547	-	4,260	3,131	893	-
Totals	12,478	9,598	11,776	10,024	7,058	5,423	2,512	1,619

Formation or coal bed ¹	1954		1955		1956		1957	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	-	-	-	-	-	-	-	-
No. 4	-	-	5,847	5,847	6,191	6,191	6,308	6,308
No. 5	7,090	7,090	15,963	15,963	22,153	22,153	6,308	6,308
No. 6	738	-	159	-	1,380	-	3,350	132
Total	7,828	7,090	21,969	21,810	29,724	28,344	15,966	12,748

1 - Names of coal beds: No. 4, Brookville; No. 5, Lower Kittanning; No. 6, Middle Kittanning.

TUSCARAWAS COUNTY

Geography and Geology



Tuscarawas County lies east of Holmes County, in eastern Ohio, and has a population of 70,320, of which approximately two-thirds live in the numerous cities or villages of the county. The increase in population has been slow and steady since the turn of the century.

Ceramic industries, which utilize local clay and fuel, are important in the economy of this county. The county is well serviced by railroads and highways, which, in the main, follow the river valleys.

The glacial boundary touches the northwest corner of Tuscarawas County and then follows near the Tuscarawas-Stark County boundary eastward a few miles before it turns to the north across Stark County. This places the greater portion of Tuscarawas County in the unglaciated part of the Appalachian Plateau province. However, some of the main outlets for the glacial melt water crossed the county, resulting in filling of the valleys with thick outwash deposits. The Tuscarawas River, the principal stream, and its tributaries, drain the entire county.

Because of the dip of the strata to the south and east in Tuscarawas County, the exposed rock ranges in age from upper Pottsville in the northwestern corner to lower Conemaugh in the southeastern part. The Allegheny formation is widely exposed throughout the county.

Coal Beds

Two Pottsville coal-bed members, the Upper Mercer (No. 3a) and the Tionesta (No. 3b), occur in the northern part of the county, where either bed may thicken locally to minable proportions. Both have been mined to a small extent in Sugar Creek Township, and the Tionesta coal has also been mined in Lawrence Township. Movable Tionesta coal is estimated to underlie a total area of 12 square miles in Tuscarawas County.

Although a number of coal beds in Tuscarawas County are known to be of minable thickness, the following four beds in the Allegheny formation constitute practically all of this county's coal reserve: the Brookville, Lower Kittanning, Middle Kittanning, and Upper Freeport.

The Brookville (No. 4) coal bed, the basal member of the Allegheny formation, is found high on the hillsides of northern Tuscarawas County where it occurs in minable thickness (fig. 10). This coal bed occurs as a north-south linear belt that is continuous with the field of Brookville coal in Stark County. The greater part of the field contains coal from 14 to 28 inches in thickness, but a small body of coal in the north-central area exceeds 28 inches.

The deep valleys and low dip of the strata make the Lower Kittanning (No. 5) coal bed available for strip mining over a wide area in Tuscarawas County (fig. 11). The coal

is somewhat irregular in thickness, ranging from a few inches to more than 42 inches.

The Strasburg (No. 5a) coal bed is found approximately 15 to 20 feet above the Lower Kittanning coal over a large area, but is of minable thickness in only a few places. In northern Tuscarawas County, particularly in the vicinity of the village of Strasburg, it is 15 inches thick, or slightly more, and is sometimes mined in conjunction with the Lower Kittanning coal.

The Middle Kittanning (No. 6) coal bed lies about 40 feet above the Lower Kittanning coal bed and the two have a similar areal distribution (figs. 11 and 12). The Middle Kittanning is less variable in thickness than the Lower Kittanning; only in the western and northern parts of Tuscarawas County is the Middle Kittanning coal known to measure less than 28 inches in thickness. This coal bed, together with the Lower Kittanning, contributes most of the present coal production of Tuscarawas County.

The Lower Freeport (No. 6a) coal bed occurs throughout eastern Tuscarawas County (fig. 13), but over much of the area it is too thin to be of economic value. Small areas in the northeastern and southeastern parts of the county contain Lower Freeport coal that exceeds 14 inches thickness, but nowhere does it measure as much as 28 inches.

The Upper Freeport (No. 7) coal bed is the top member of the Allegheny formation and is the highest stratigraphic coal of minable thickness in Tuscarawas County. The coal is found well above drainage in the eastern and southern parts of the county. Coal 42 inches thick is found only in the east-central part of the county (fig. 14), where it constitutes part of an important coal field that extends into Harrison and Guernsey Counties.

Reserve and Production

The estimated original coal reserve of Tuscarawas County totals 2,026,110,000 tons. Seven beds contribute to the estimate, of which the Middle Kittanning (No. 6), with an estimated original reserve of 1,000,390,000 short tons, is the principal coal resource. The Lower Kittanning (No. 5) is next in importance and is estimated to contain a reserve of nearly 750 million tons. The Brookville (No. 4), Upper Freeport (No. 7), Lower Freeport, Tionesta, and Upper Mercer coal beds contain an additional reserve, but are relatively unimportant when compared with the Middle and Lower Kittanning coal reserve.

In Tuscarawas County approximately 100 million tons of coal has been mined, most of which was produced by underground methods. Since 1917, strip-mine production has been reported, and, though in modest quantities in the earlier years, it now contributes nearly 60 percent of the total annual production (table 17.)

Comparison of the amount of coal mined, and the amount lost in mining (twice the total production, or 186 million tons) with the estimated original reserve of over 2 billion tons indicates that a substantial reserve of coal remains.

Selected References

Brant, R. A., 1954, The Lower Kittanning (No. 5) coal bed in Ohio: Ohio Div. Geol. Survey Rept. Inv. 21, p. 30, 32, fig. 8.

_____, 1956, Coal resources of the upper part of the Allegheny formation in Ohio: Ohio Div. Geol. Survey Rept. Inv. 29, p. 34, 36, figs. 8, 9, 10.

TABLE 17. - COAL PRODUCTION, BY FORMATION OR BED, FOR TUSCARAWAS COUNTY, 1946-57
(Short tons)

Formation or coal bed ¹	1946		1947		1948		1949	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	23,784	-	27,362	-	29,052	-	30,824	-
No. 4	-	-	-	-	-	-	-	-
No. 5	535,425	533,892	965,880	964,207	644,346	643,146	631,563	631,563
No. 6	1,043,556	321,321	992,421	41,516	984,744	82,117	926,967	210,686
No. 6a	8,153	-	1,078	-	6,038	-	393	-
No. 7	16,448	9,394	30,314	11,983	61,054	49,949	17,800	10,761
Total	1,627,366	864,607	2,017,055	1,017,706	1,725,234	775,212	1,607,547	853,010

Formation or coal bed ¹	1950		1951		1952		1953	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	31,853	-	24,517	-	16,186	-	28,810	-
No. 4	-	-	1,843	1,843	62,133	62,133	7,290	7,290
No. 5	783,362	783,309	767,490	767,490	704,085	704,085	717,696	716,768
No. 6	1,455,093	479,674	1,648,087	500,237	1,456,590	479,611	1,508,316	628,786
No. 6a	-	-	-	-	-	-	-	-
No. 7	4,220	2,815	14,813	8,885	25,081	19,307	5,072	-
Total	2,274,528	1,265,798	2,456,750	1,278,455	2,264,075	1,265,136	2,267,184	1,352,844

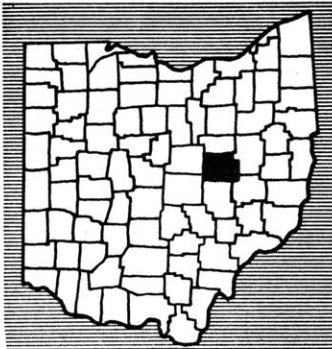
Formation or coal bed ¹	1954		1955		1956		1957	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	32,357	-	32,688	-	29,954	-	32,081	-
No. 4	69,794	69,794	5,389	5,389	15,389	15,389	38,604	38,604
No. 5	747,282	724,449	770,002	770,002	940,758	940,758	1,119,139	1,119,139
No. 6	1,417,596	561,917	1,317,499	482,069	1,188,819	423,797	1,306,468	541,869
No. 6a	-	-	-	-	-	-	-	-
No. 7	2,898	-	3,889	-	73,338	63,493	92,112	81,923
Total	2,269,927	1,356,160	2,129,467	1,257,460	2,248,258	1,443,437	2,588,404	1,781,535

¹ - Names of coal beds: No. 4, Brookville; No. 5, Lower Kittanning; No. 6, Middle Kittanning; No. 6a, Lower Freeport; No. 7, Upper Freeport.

DeLong, R. M., 1957, Coal resources of the lower part of the Allegheny formation in Ohio: Ohio Div. Geol. Survey Rept. Inv. 31, p. 19, fig. 5.
 Granchi, J. A., 1958, Coal resources of the Pottsville formation: Ohio Div. Geol. Survey Rept. Inv. 36, p. 28, 36.
 Lamborn, R. E., 1956, Geology of Tuscarawas County: Ohio Div. Geol. Survey Bull. 55.

COSHOCOTON COUNTY

Geography and Geology



Coshocoton County lies southwest of Tuscarawas County, on the western border of the Ohio coal field. The county is mostly in the Appalachian Plateau, although it borders the Central Lowland. Of the 31,141 population of this county, approximately half is urban. Past census figures show that the population has been stable and that the population at present is only slightly higher than in 1910. The railroads and highways follow the valleys that traverse Coshocoton and Tuscarawas Counties and provide adequate means of transport for coal and other material to the more industrialized areas to the north.

The glacial boundary follows the western edge of Coshocoton County northward into Holmes County, where a few miles north of the Coshocoton-Holmes County boundary it turns sharply eastward. The proximity of the glacier on the western and northern sides of Coshocoton County and the resulting great volume of melt water altered many of the stream courses and filled the wide, deep preglacial valleys with sand and gravel outwash. The Muskingum River, a former outlet for glacial melt water, and its tributaries, drain the entire county.

The dip of the strata in Coshocoton County is gentle, usually 20 to 60 feet per mile, to the south and east. Rocks exposed above drainage range in age from late Mississippian, in the northwestern part of the county, to early Conemaugh, in the southeast, and they include the full thickness of the Pottsville and Allegheny formations and the lower half of the Conemaugh formation.

Coal Beds

Of the many Pottsville coal beds in Coshocoton County, the Bedford is the most valuable. This coal has a wide distribution, but is highly variable in thickness, ranging from a few inches to 9 feet. It is thickest in Bedford and Jefferson Townships. Its shaly character and the interbedded cannel reduce the value of this coal, despite its unusual thickness. This bed was of great importance as a source of coal oil in the first half of the 19th century.

The Quakertown (No. 2) and the Upper Mercer (No. 3a) coal beds have been observed to be of greater than 14 inches thickness at only a few places.

The Brookville coal bed crops out in all but the northwestern townships of Coshocoton County (fig. 10), but is known to exceed 14 inches thickness only in small parts of Bedford and Adams Townships. The coal has been mined to a small extent in Bedford Township.

The Lower Kittanning (No. 5) coal bed (fig. 11) is variable in thickness throughout Coshocoton County. Areas in southern and northeastern Coshocoton County contain coal less than 14 inches thick, but elsewhere the thickness ranges up to 28 inches. Occurrence of

the coal in the hillsides makes it readily available to stripping operations, but because of the irregularity in thickness it has been mined only in a desultory way in recent years.

The Middle Kittanning (No. 6) coal bed is the largest contributor to the coal production of Coshocton County. The bed occurs well above drainage over much of eastern and southern part of the county. With minor exceptions in the eastern part of the county, the thickness of the coal exceeds 28 inches, and in wide areas in the southern part of the county it is more than 42 inches.

Reserve and Production

At present, the original reserve of coal in Coshocton County is estimated at 716,478,000 short tons. The principal deposits of minable coal are found in the Lower Kittanning (No. 5) and Middle Kittanning (No. 6) coal beds, which contain an estimated 209,085,000 tons and 334,969,000 tons, respectively. Five other coal beds constitute the remainder of the estimated reserve, of which the principal one is the Bedford coal bed. Others that show minable areas are the Brookville, Lower and Upper Mercer, and the Quakertown coal beds.

Reported production of coal in Coshocton County reveals that more than 29 million tons of coal have been removed since 1864. Production of coal was in progress prior to this date, but no records of quantity are available. Thus, it is probable that a total of about 60 million tons of coal either has been mined or lost in mining. This data would indicate that approximately 10 percent of the minable coal reserve has been depleted.

Most of the coal produced in the county has been removed by underground methods, but stripping methods prevail at present. In 1956, nearly 90 percent of the coal was produced by strip mining (table 18).

Selected References

- Brant, R. A., 1954, The Lower Kittanning (No. 5) coal bed in Ohio: Ohio Div. Geol. Survey Rept. Inv. 21, p. 34-35, fig. 9.
- _____, 1956, Coal resources of the upper part of the Allegheny formation in Ohio: Ohio Div. Geol. Survey Rept. Inv. 29, p. 31-37, figs. 13, 14.
- DeLong, R. M., 1957, Coal resources of the lower part of the Allegheny formation in Ohio: Ohio Div. Geol. Survey Rept. Inv. 31, p. 20, fig. 6.
- Granchi, J. A., 1958, Coal resources of the Pottsville formation: Ohio Div. Geol. Survey Rept. Inv. 36, p. 18, 22, 27, 31, 36, fig. 8.
- Lamborn, R. E., 1954, Geology of Coshocton County: Ohio Div. Geol. Survey Bull. 53.

TABLE 18. - COAL PRODUCTION, BY FORMATION OR BED, FOR COSHOCTON COUNTY, 1946-57
(Short tons)

Formation or coal bed ¹	1946		1947		1948		1949	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	-	-	-	-	-	-	-	-
No. 4	25,876	19,983	5,513	-	6,005	-	5,253	-
No. 5	-	-	6,930	6,930	9,202	9,202	692	692
No. 6	394,452	85,891	464,799	161,321	695,790	405,598	764,923	524,379
No. 7	26,340	26,340	52,913	52,913	69,878	69,878	71,572	71,572
Total	446,668	132,214	530,155	221,164	780,875	484,678	842,440	596,643

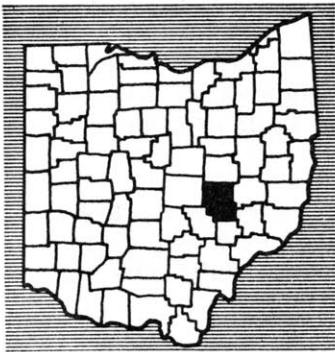
Formation or coal bed ¹	1950		1951		1952		1953	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	-	-	1,500	-	-	-	81	-
No. 4	3,497	-	5,509	-	553	-	-	-
No. 5	1,787	1,787	13,766	13,766	-	-	-	-
No. 6	872,408	661,910	800,793	583,721	885,852	719,453	877,879	693,003
No. 7	84,959	84,959	194,569	194,569	139,076	139,076	155,216	155,216
Total	962,651	748,656	1,016,137	792,056	1,025,481	858,529	1,033,176	848,219

Formation or coal bed ¹	1954		1955		1956		1957	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	-	-	-	-	-	-	-	-
No. 4	-	-	-	-	-	-	-	-
No. 5	-	-	-	-	-	-	48,282	48,282
No. 6	709,581	575,187	809,399	644,774	896,319	753,700	851,992	716,829
No. 7	131,166	131,166	148,427	148,427	148,641	148,641	173,204	173,204
Total	840,747	706,353	957,826	813,201	1,044,960	902,341	1,073,478	938,315

1 - Names of coal beds: No. 4, Brookville; No. 5, Lower Kittanning; No. 6, Middle Kittanning; No. 7, Upper Freeport.

MUSKINGUM COUNTY

Geography and Geology



Muskingum County lies south of Coshocton County and occupies an area that borders the western edge of the Ohio coal-field area. The population of the county has increased steadily since the early 1900's, to 74,535 in 1950. Of this population, nearly 55 percent live in Zanesville, the county seat. The manufacturing of clay products has long been the leading industry, but since World War II there has been considerable diversification of industry. Favorable rail and highway connections have facilitated recent industrial growth.

As the boundary marking the edge of glacial deposits to the west is a sinuous north-south line not far from the western Muskingum County line, most of this county is in the unglaciated section of the Appalachian Plateau province. The Muskingum River and its tributaries form the main drainage system of the county.

The axis of the northward trending Parkersburg-Lorain syncline passes through the eastern part of Muskingum County and imparts an unusually steep eastward dip to the strata. Because of the abnormal dip Muskingum County is the only county in Ohio in which the entire thickness of the Pennsylvanian system is found above drainage. Also, because of the steep dip the widths of the outcrop belts of the various Pennsylvanian formations are narrower than in other counties.

The Pottsville formation is about 250 feet thick and contains coal beds mined only for local use. Marine limestone is found above many of the Pottsville coal beds. The Allegheny formation, approximately 175 feet thick, is the thinnest of the Pennsylvanian formations in Muskingum County. However, some of the Allegheny coal beds are found at minable thickness over wide areas, and, consequently, this formation is the largest contributor to the original estimated coal reserve and to the present coal production in Muskingum County. Distinct marine zones are commonly found to overlies the lower and middle Allegheny coal beds, whereas fresh-water limestone is found to underlie the coal beds of the upper part of the Allegheny.

The Conemaugh formation is approximately 375 feet thick and contains several coal beds that are thin and generally of little value. In the lower half of this formation, marine and fresh-water limestone beds are associated with the coal, whereas in the upper half only fresh-water limestone is found. A considerable part of the formation is composed of soft shales that are subject to landsliding.

The Monongahela formation is approximately 200 feet thick and contains two coal beds of minable thickness, the Pittsburgh(No. 8) and Meigs Creek (No. 9). Because the Monongahela formation is restricted to only a small area in the southeastern part of Muskingum County, the associated coal beds are not as important economically in the county as are the Allegheny coal beds. Lithologically the Monongahela is more similar to the upper part of the Conemaugh formation than to the rest of the Pennsylvanian.

The basal members of the Washington formation of the Permian system are found in a very small area in the southeastern corner of Muskingum County and do not contain minable coal beds.

Coal Beds

The Bedford coal bed of the upper part of the Pottsville formation is the best known and thickest coal in the formation. It is most extensive west of the Muskingum River; it occurs only near stream level east of the river. This bed is persistent laterally, but is irregular in thickness, which reaches a maximum of $3\frac{1}{2}$ feet. It has been mined for local use at several places.

The Tionesta coal bed has a distribution similar to that of the Bedford coal bed, but it is even more irregular in thickness. This coal bed is thickest south of Zanesville, where it has been mined.

The Quakertown (No. 2) and Lower Mercer (No. 3) coal beds occur in the lower and middle parts of the Pottsville; outcrops of the beds are restricted to the western half of Muskingum County. Both beds are irregular in thickness and are generally thin, except locally, where they are more than 2 feet thick and have mined in a small way.

The Brookville (No. 4) coal bed underlies most of Muskingum County and is well exposed in the western half. Except for a small area in the west and one in the north-central part of the county, no known minable deposits occur.

The Lower Kittanning (No. 5) coal bed (fig. 11) occurs high on the hills to the west of the Muskingum River, but dips gradually to the east and south, until, east of the river, it is found only slightly above stream level. The Lower Kittanning coal is thickest in the eastern part of the county, where a small area exists in which this coal exceeds 28 inches, and locally 42 inches, in thickness. Under deep cover this coal is believed to be at least 14 inches thick. Elsewhere in Muskingum County the Lower Kittanning coal is generally thin.

The Middle Kittanning (No. 6) coal field in Muskingum County is a northern continuation of the vast coal field that extends northward from Hocking and Athens Counties through Perry County (fig. 12). This coal bed underlies most of Muskingum County, where it is between 28 and 42 inches thick. Only in the northern and southeastern parts of the county is it of less than minable (14 inches) thickness.

The Upper Freeport (No. 7) coal bed underlies the eastern half of Muskingum County (fig. 14). Three areas of minable Upper Freeport coal are known in the county: one, south of Zanesville, occupies an irregular 16 to 18 square-mile area; a second area, similar in size, is found just east of Zanesville; and a third and very small area is known in Monroe Township. This bed is erratic in thickness, which varies from a mere streak to more than 42 inches.

The Conemaugh formation is found above drainage throughout the eastern half of Muskingum County. Of the many coal beds that occur in the Conemaugh, only two, the Anderson and Harlem, attain known minable thickness in Muskingum County. The Anderson coal bed (fig. 15) is persistent throughout the county and is usually 16 to 30 inches thick; locally it may be thin or replaced with sandstone. The Harlem coal bed is fairly persistent, but irregular in thickness. A maximum thickness of 30 inches has been measured in Union Township, where this coal bed has been mined on a small scale. The characteristics of the bed in this county are poorly known.

The Monongahela formation, though of small areal extent in Muskingum County, contributes two coal beds, the Pittsburgh (No. 8) and the Meigs Creek (No. 9). The Pittsburgh (No. 8) coal is generally thin, and its area of occurrence is restricted to the southeastern part of the county (fig. 17), in Rich Hill and Union Townships, where it has been

mined locally.

Although the Meigs Creek or Sewickley (No. 9) coal bed is confined to a small area in southeastern Muskingum County (fig 18), it occurs at a minable thickness and is a valuable economic asset. This coal occurs in two benches, but, except in its extreme northern extent, only the lower bench is found to be more than 14 inches thick. As the thickness of the lower bench generally exceeds 42 inches, this coal is being mined at present, despite its low heating quality.



Figure 18 - Area underlain by the Meigs Creek (No. 9) (Sewickley) coal bed in Ohio. Diagonal pattern, area of estimated reserve; stippled pattern, area of other Meigs Creek coal.

Reserve and Production

The total estimated original coal reserve of Muskingum County is 2,029,340,000 tons, to which 12 coal beds are contributors. The Middle Kittanning (No. 6) coal bed is the most significant; over half (1,047,286,000 tons) of the estimated reserve is found in this member. The estimate for the Lower Kittanning (No. 5) coal reserve is 458,099,000 tons. Over 75 percent of the total reserve estimate, therefore, is contained in the Allegheny formation. All the other formations contribute to the reserve, but to only a modest extent.

Mining has a long history in Muskingum County; recorded production is first shown for the year 1810. Alltime production, through 1958, totals more than 50 million tons, about one fourth of which is from strip mining. Currently, over 80 percent of the production is by stripping (table 19). In 1956, of the total of 1,159,100 tons produced, 275,711 tons was produced by underground methods, 858,479 tons by strip mining, and 24,910 tons by auger methods (table 19).

Selected References

- Brant, R. A., 1954, The Lower Kittanning (No. 5) coal bed in Ohio: Ohio Div. Geol. Survey Rept. Inv. 21, p. 35-36, fig. 10.
- _____, 1956, Coal resources of the upper part of the Allegheny formation in Ohio: Ohio Div. Geol. Survey Rept. Inv. 29, p. 37-38, figs. 13, 14.
- DeBrosse, T. A., 1957, Coal beds of the Conemaugh formation in Ohio: Ohio Div. Geol. Survey Rept. Inv. 34, p. 13, 15-16; fig. 5.
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- _____, 1957, Coal resources of the lower part of the Allegheny formation in Ohio: Ohio Div. Geol. Survey Rept. Inv. 31, p. 20, 22, fig. 6.
- Smith, W. H., Brant, R. A., and Amos, F., 1952, The Meigs Creek (No. 9) coal bed in Ohio: Ohio Div. Geol. Survey Rept. Inv. 17, p. 21, maps I, II.
- Stout, W., 1918, Geology of Muskingum County: Geol. Survey of Ohio Bull. 21.

TABLE 19. - COAL PRODUCTION, BY BED, FOR MUSKINGUM COUNTY, 1946-57
(Short tons)

Coal bed ¹	1946		1947		1948		1949	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 4	426	-	447	-	-	-	-	-
No. 5	-	-	-	-	40	-	-	-
No. 6	1,103,329	783,387	1,534,225	1,135,315	2,141,104	1,649,758	1,524,074	1,205,042
No. 6a	528	-	-	-	-	-	-	-
No. 7	8,747	6,338	17,930	12,793	54,021	50,945	153,207	142,109
No. 8	-	-	40	-	-	-	-	-
No. 9	-	-	-	-	-	-	172	172
Total	1,113,030	789,725	1,552,642	1,148,108	2,195,165	1,700,703	1,677,453	1,347,323

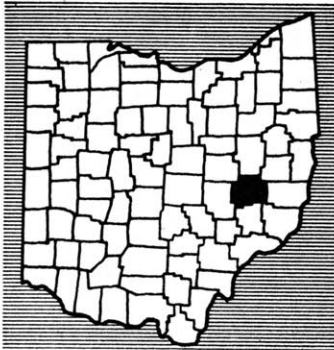
Coal bed ¹	1950		1951		1952		1953	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 4	-	-	-	-	149	149	-	-
No. 5	-	-	339	-	804	264	18,115	18,115
No. 6	1,405,068	986,045	1,120,220	684,652	931,910	874,191	1,033,525	757,788
No. 6a	-	-	-	-	-	-	-	-
No. 7	302,819	292,609	269,646	261,640	186,380	180,559	248,209	244,508
No. 8	542	-	-	-	-	-	-	-
No. 9	180,003	180,003	211,387	211,387	222,746	222,746	14,190	14,190
Total	1,888,432	1,458,657	1,601,592	1,157,679	1,341,989	1,277,909	1,314,039	1,034,601

Coal bed ¹	1954		1955		1956		1957	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 4	-	-	-	-	-	-	-	-
No. 5	16,567	16,377	21,955	21,865	18,488	18,488	21,133	21,133
No. 6	973,812	766,240	1,188,650	863,312	944,877	721,493	722,885	576,555
No. 6a	-	-	-	-	-	-	-	-
No. 7	52,894	49,160	117,006	112,800	138,261	135,934	168,809	167,788
No. 8	-	-	-	-	-	-	-	-
No. 9	13,780	13,780	25,518	25,518	7,474	7,474	2,531	2,531
Total	1,057,053	845,557	1,353,129	1,023,495	1,159,100	883,389	915,358	768,007

1 - Names of coal beds: No. 4, Brookville; No. 5, Lower Kittanning; No. 6, Middle Kittanning, No. 6a, Lower Freeport, No. 7, Upper Freeport; No. 8, Pittsburgh; No. 9, Meigs Creek.

GUERNSEY COUNTY

Geography and Geology



Guernsey County occupies a position in the central part of eastern Ohio, east of Muskingum County. The population of this county has declined steadily for the last 30 years, and according to the 1950 census it was only 38,452. Of this population, nearly 40 percent live in Cambridge, the county seat. Some light industries have moved to Cambridge since World War II, but the town is still predominantly a trading center.

Guernsey County is crossed by U. S. Route 40 and other major highways. Rail shipment in all directions is possible by two railroad lines that cross in Cambridge.

Guernsey County lies within the unglaciated part of the Appalachian Plateau province. Some changes in stream drainage have been effected by glaciation, but these are not as apparent as in those counties which immediately border the glacial area. Guernsey County is maturely dissected, and everywhere the surface is in slope.

Rock units ranging from the upper Pottsville formation to the upper Monongahela formation are found at the surface in Guernsey County. The Pottsville and Allegheny formations underlie nearly the entire county, but their area of outcrop is limited to small areas in the northwestern part. The Conemaugh formation is widely exposed throughout the county. The Monongahela formation occurs in two areas, one in the southeastern part of the county, the other in the southwestern part.

Coal Beds

The Allegheny formation contains the major part of the Guernsey County coal reserve. The Upper Freeport (No. 7) coal bed is historically the most important coal bed, although its total reserve is less than that of the Middle Kittanning (No. 6) and Lower Kittanning (No. 5).

The Lower Kittanning (No. 5) coal bed (fig. 11) is above drainage along Mill Creek in northwestern Guernsey County and goes under cover to the east. Along its area of outcrop, this coal bed varies in thickness from 4 feet to less than 14 inches. Under deep cover in the southwestern part of the county, another area of thick Lower Kittanning coal is known from drill-hole information. The extent of bodies of thick coal in Guernsey County is unknown, but the presence of minable coal in the Lower Kittanning coal zone is inferred for most of the county.

The Middle Kittanning (No. 6) coal bed (fig. 12) crops out along Mill Creek and its tributaries in the northwestern part of Guernsey County; to the east and south the coal dips beneath deep cover. In the northern part of the county the bed is thin and irregular, with a small area of coal less than 14 inches thick and a moderately large area with coal greater than 28 inches thick. Under cover in the northwestern and northeastern parts of the county, the coal is believed to range from 28 to more than 42 inches in thickness. In the southern

part of the county, an occurrence of this same coal at minable thickness is known from drill-hole data. The southern and northern areas of reserve are separated by a wide band of coal less than 14 inches thick.

The areas of thick Upper Freeport (No. 7) coal (fig. 14) are predominantly below drainage. Deep mining of this coal was extensive in the early part of the 20th century, south of Cambridge, in the Cambridge coal field. The northeastern corner of the county also contains an area of thick coal that extends into Harrison County.

Of the Conemaugh coal beds in Guernsey County (fig. 15) the Anderson is the thickest. In the southwestern part of the county, where the coal is of economic importance, thicknesses up to 32 inches have been observed. This coal bed underlies approximately 74 square miles and has an average thickness of 20 inches.

Coal of minable thickness in the Mahoning, Wilgus, Barton, and Harlem coal beds has been observed, but is irregular in occurrence.

The Pittsburgh (No. 8) coal bed is found in the southwestern townships and in the eastern tier of townships of Guernsey County, but it is of minable thickness only in the eastern part, where it represents the western margin of the Belmont coal field (fig. 17). The coal in this eastern area occurs high in the hills and is readily available to stripping operations. With few exceptions the thickness of the coal exceeds 28 inches and is usually more than 42 inches.

The Meigs Creek (No. 9) coal bed lies about 90 feet above the Pittsburgh and therefore is found only on the highest ridges in the southwestern parts of the county (fig. 18). The area underlain by this coal is small; however, the thickness generally exceeds $3\frac{1}{2}$ feet, so that where this coal bed is present, it has been mined by stripping methods.

Reserve and Production

The original coal reserve of Guernsey County totals an estimated 3,016,904,000 tons. This estimated reserve is contained in six coal beds. Leading in the estimated reserve is the Lower Kittanning (No. 5) coal bed, which is followed by the Middle Kittanning (No. 6), Upper Freeport (No. 7), Anderson, Pittsburgh (No. 8), and Meigs Creek (No. 9) coals.

The estimates for the Lower Kittanning (No. 5) and Middle Kittanning (No. 6) coal beds are the least documented and hence the assumption that they underlie a wide area of the county is mostly inferred. Estimates for the Upper Freeport, on the contrary, are well documented, particularly for the Cambridge coal field. The Anderson coal bed contains about 142 million tons of unclassified reserve and is not likely to support large-scale mining operations. The reserve of the Pittsburgh (No. 8) coal bed is estimated to be relatively small (64,786,000 tons), an estimate that is well documented. Although the reserve of Pittsburgh coal is next to the smallest of the coal beds estimated, more than 90 percent of the current coal production is from this source, as shown in table 20.

The Meigs Creek (No. 9) offers a modest reserve of 18,362,000 tons in some of the hilltop areas in the eastern part of the county. A listing of the estimated reserve for this coal is found in table 37.

Guernsey County coal production is reported for as far back as the year 1835, when an estimated 1,000 tons was mined. Since that time, a total of more than 123,563,000 tons of coal has been removed.

The growth of mining in the county was steady until the 1910-20 period, when a

peak annual production of 4,497,303 tons was reached in 1918. Small production marked the post World War I period, until the lowest ebb was reached in 1946, when only 311,539 tons was produced (table 20). Strip mining of coal, meanwhile, was first reported in 1915 and continued until 1927. No production of strip-mined coal is reported from 1927 until the year 1943, when more than 30,000 tons was mined by stripping. Since 1943, a relatively rapid increase in the quantity of strip-mined coal has taken place in the county, and in 1956, more than 517,000 tons was reported mined by strip methods (table 20).

Augering has accounted for a small, but increasing quantity of coal production during the last few years. In 1956, more than 65,000 tons was produced by this method.

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- _____, 1956, Coal resources of the upper part of the Allegheny formation in Ohio: Ohio Geol. Survey Rept. Inv. 29, p. 40, 42, figs, 11, 12.
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- Stevenson, J. J., 1878, Report on the geology of Guernsey County: in Geol. Survey of Ohio Vol. 3, p. 219-236.

TABLE 20. - COAL PRODUCTION, BY BED, FOR GUERNSEY COUNTY, 1946-57
(Short tons)

Coal bed ¹	1946		1947		1948		1949	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 6	3,915	-	10,944	-	6,645	-	3,817	-
No. 7	257,878	108,243	387,681	177,431	226,435	129,925	163,416	73,506
No. 8	18,354	-	63,343	38,698	147,677	113,836	125,142	112,618
No. 9	31,392	29,154	265,074	265,074	2,259	2,259	20,299	20,299
Total	311,539	137,397	727,042	481,203	383,016	246,020	312,674	206,423

Coal bed ¹	1950		1951		1952		1953	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 6	7,656	-	13,131	-	6,077	-	731	-
No. 7	136,811	66,952	156,598	79,294	118,648	61,008	72,712	24,670
No. 8	177,692	155,312	258,990	244,764	296,429	292,589	314,466	314,186
No. 9	200,956	200,956	160,167	160,167	49,847	49,847	-	-
Total	523,115	423,220	578,886	484,225	471,001	403,444	387,909	338,856

Coal bed ¹	1954		1955		1956		1957	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 6	1,033	-	7,010	-	7,674	-	3,314	-
No. 7	57,971	-	59,651	-	52,548	572	77,270	28,603
No. 8	346,181	329,826	654,065	651,782	572,937	570,612	656,232	654,025
No. 9	-	-	-	-	-	-	60,052	60,052
Total	405,185	329,826	720,726	651,782	633,159	571,184	796,868	742,680

1 - Names of coal beds: No. 6, Middle Kittanning; No. 7, Upper Freeport; No. 8, Pittsburgh; No. 9, Meigs Creek.

PERRY COUNTY

Geography and Geology



Perry County lies in southeastern Ohio, southwest of Muskingum County, and borders the central group of coal-bearing counties. This county has had a steady decline in population since 1920; in 1950 the census showed only 28,999 people. New Lexington, the county seat and largest village, has a population of 4,233. Perry County is serviced by the Chesapeake and Ohio, Baltimore and Ohio, and Pennsylvania Railroads, and several State highways.

Perry County lies within both the glaciated and the unglaciated portions of the Appalachian Plateau province. Glaciation has given the northwestern portion of the county a subdued topography, whereas the unglaciated southern and eastern sections of Perry County have a mature topography, with an average relief of approximately 200 feet.

The county is drained by the Hocking and Muskingum River systems and, to a very small extent, by the Scioto River in the northwestern corner of the county. Preglacial drainage to the west was reversed by the advance of the glacial ice, as is well illustrated by the barbed tributaries of Jonathan Creek and other streams.

The bedrock in Perry County dips to the east-southeast, and as a result, exposures of Mississippian rocks are restricted to the western part of the county. Pennsylvanian rocks occur elsewhere in the county.

The basal formation in the Pennsylvanian system is the Pottsville, in which the coal is generally less than 14 inches thick. However, minor amounts of coal occur in the Quakertown (No. 2), Lower Mercer (No. 3), Middle Mercer, and the Tionesta (No. 3b) coal beds.

The overlying Allegheny formation in Perry County, as in many other areas, is notable for its minable coal beds. The major coal beds in this formation are the Lower Kittanning (No. 5), Middle Kittanning (No. 6), and the Upper Freeport (No. 7). Other resources of economic importance found in the Allegheny formation include limestone, shale, and clay.

Only the lower half of the Conemaugh formation, which occurs in the southeastern part of the county, is present in Perry County. It has little to offer in the way of mineral resources; the thickest of the Conemaugh coal beds is the Mahoning, which locally may contain in insignificant reserve.

Coal Beds

The Pottsville coal beds vary in thickness from paper-thin streaks to beds thick enough to mine. Only at a few places does the coal occur with sufficient quality and thickness to make mining profitable. Although several Pottsville coal beds have been utilized locally to some extent, the reserve is assigned only to the Quakertown, Lower Mercer, and

Tionesta, as shown in table 37.

The most important of the Allegheny formation coal beds is the Middle Kittanning (No. 6). In Perry County, it occurs in the Hocking valley coal field, which also underlies parts of Hocking, Athens, and Morgan Counties. The bed underlies the eastern and southern parts of Perry County (fig. 12), and, except for the area of the Jumbo "fault", it is not known to be less than 42 inches in thickness. The Jumbo "fault", a miner's term, is a sandstone or shale facies that locally replaces a part of, or all, the coal bed. Although this coal bed has been mined intensively in Perry County for over half a century, it is still the leading producer and contains most of the coal reserve of the county.

The Upper Freeport (No. 7) coal bed underlies the eastern part of Perry County (fig. 14), but the thickness is irregular and only in widely separated areas is the coal found to be minable. The area in which this coal is thickest is in Salt Lick and Monroe Townships, where the bed exceeds 28 inches; elsewhere it is from 14 to 28 inches thick and in some places less than 14 inches. There has been only limited mining of this coal bed.

The lower half of the Conemaugh formation is found in the eastern part of Perry County. Three coal beds in this formation, the Mahoning, Mason, and Anderson, have been developed for local use. In places, these coal beds are as much as 3 feet thick, but in these areas the coal commonly is bony or shaly.

Reserve and Production

The estimated original coal reserve of Perry County is substantial and totals 1,148,247,000 tons. Of this reserve, only 13,824,000 tons is contributed by Pottsville coal beds. The major portion of the estimate is contained in the three principal Allegheny coal members: the Lower Kittanning, 295,884,000 tons; the Middle Kittanning, 772,617,000 tons; and the Upper Freeport, with an estimated 65,922,000 tons. Estimates of the reserve, by bed, are reported in table 37.

These estimates, although somewhat greater, are in general keeping with those of Flint (1951). The reserve is to a large extent well documented, with approximately 80 percent of the total estimated reserve in the proven or probable categories (see tables 37 and 37).

Total production of coal in Perry County amounted to more than 147 million tons through 1958. If this amount is doubled to allow for losses in mining, about 286 million tons, or nearly 25 percent, would be subtracted from the original reserve. Production of coal from 1946 to 1957 is shown in table 21.

Selected References

- Brant, R. A., 1954, The Lower Kittanning (No. 5) coal bed in Ohio: Ohio Div. Geol. Survey Rept. Inv. 21, p. 38-39, fig. 10.
- _____, 1956, Coal resources of the upper part of the Allegheny formation in Ohio: Ohio Div. Geol. Survey Rept. Inv. 29, p. 42, 44, figs. 13, 14.
- DeBrosse, T. A., 1957, Coal beds of the Conemaugh formation in Ohio: Ohio Div. Geol. Survey Rept. Inv. 34, p. 11-12.

Flint, N. K., 1951, Geology of Perry County: Ohio Div. Geol. Survey Bull. 48.

Granchi, J. A., 1958, Coal resources of the Pottsville formation: Ohio Div. Geol. Survey Rept. Inv. 36, p. 18, 22, 35.

TABLE 21. - COAL PRODUCTION, BY FORMATION OR BED, FOR PERRY COUNTY, 1946-57
(Short tons)

Formation or coal bed ¹	1946		1947		1948		1949	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	-	-	-	-	-	-	-	-
No. 5	183,200	175,880	643,110	629,683	752,579	748,396	484,447	476,794
No. 6	2,700,699	626,008	2,720,493	771,716	2,584,267	1,006,860	2,127,828	1,114,848
No. 7	76,821	71,040	46,480	43,458	61,102	59,820	45,085	45,085
Total	2,960,720	872,928	3,410,083	1,444,857	3,397,948	1,815,076	2,657,360	1,636,727

Formation or coal bed ¹	1950		1951		1952		1953	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	-	-	-	-	-	-	-	-
No. 5	419,264	406,446	452,972	443,139	493,493	486,961	314,917	307,703
No. 6	2,816,729	1,252,737	2,262,311	1,214,399	1,882,831	1,009,280	1,733,083	961,320
No. 7	26,098	25,964	35,142	35,142	-	-	-	-
Total	3,262,001	1,685,147	2,750,425	1,692,680	2,376,324	1,496,241	2,048,000	1,269,023

Formation or coal bed ¹	1954		1955		1956		1957	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	-	-	-	-	-	-	-	-
No. 5	290,207	282,802	350,962	344,399	357,090	346,907	337,275	330,275
No. 6	1,472,599	1,034,768	1,254,769	1,078,823	1,319,605	1,070,379	1,282,455	1,086,999
No. 7	25	-	-	-	-	-	136,022	136,022
Total	1,762,831	1,317,570	1,605,731	1,423,222	1,676,695	1,417,286	1,755,752	1,553,296

1 - Names of coal beds: No. 5, Lower Kittanning; No. 6, Middle Kittanning; No. 7, Upper Freeport

LICKING COUNTY

Geography and Geology



Licking County occupies an area in central Ohio, north of Perry County and west of Muskingum County, bordering the hills of eastern Ohio. The flat to subdued topography affords ready accessibility to the centers of population and permits total utilization of the land. As a result, there has been a steady increase in both the rural and urban population, which in 1950 reached 70,645.

The boundary between the Central Lowland and the Appalachian Plateau provinces passes through the eastern part of Licking County. Only a small area in the eastern edge of the county is unglaciated. This area, which is cut by streams with broad valleys, has ridge areas which form long narrow spurs that project westward between the valleys. These ridges contain the coal resources of Licking County.

Although the total area underlain by coal-bearing rocks is small, the entire thickness of the Pottsville formation is found in Licking County. Owing to the irregularity of the Pottsville coals and their limited areal extent, the reserve is small, and mining history in Licking County is scant.

Coal Beds and Reserve

The Sharon (No. 1) is the lowest and most extensive of the Pottsville coal beds. It is variable in thickness and has a known maximum thickness of 3 feet of hard bright coal. The coal averages 2 feet in thickness and underlies about 7 square miles of area, which gives an estimated 15 million tons of original Sharon coal reserve. It has been mined in a small way in Madison and Fallsbury Townships.

The Lower Mercer (No. 3) and Flint Ridge coal beds attain a thickness of as much as 3 feet on Flint Ridge, in Hopewell Township. Here, both of these coals are cannel and were once mined for the distillation of oil. The reserve of Lower Mercer coal is estimated at 13 million tons.

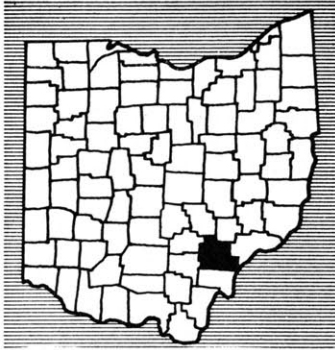
No data is available to indicate the extent of mining in the county.

Selected Reference

Granchi, J. A., 1958, Coal resources of the Pottsville formation: Ohio Div. Geol. Survey Rept. Inv. 36, p. 13, 22, 42.

ATHENS COUNTY

Geography and Geology



Athens County lies in southeastern Ohio, south of Perry County, and borders the Ohio River for a short distance along the eastern boundary of the county. The Ohio River does not, however, play an important role in the economy of Athens County, as the important centers of population lie well to the west of the river.

The population of Athens County has fluctuated during the first half of this century; by the 1950 census it was 45,839. The population is equally divided between rural and urban areas; Athens, the county seat and largest town, has a population of 11,660. The main arteries of communication follow the valleys of the principal streams in the county. Railroads servicing the county are the Chesapeake and Ohio, Baltimore and Ohio, and the New York Central lines.

Athens County lies entirely within the unglaciated section of the Appalachian Plateau. The topography is mature, with steep slopes that provide many exposures of the coal beds.

The stream pattern is dendritic, and the smaller streams have narrow, V-shaped valleys. As a result of earlier glaciation to the northwest, some reorganization of the drainage has taken place, and terraces of gravel have been found in the Hocking valley, and terraces of silt in the tributary valleys.

With only slight variations, the strata in Athens County dip gently to the east and south. Owing to this dip, progressively younger strata are found from west to east across the county. The exposed strata include the uppermost members of the Pottsville, the entire thickness of the Allegheny, Conemaugh, and Monongahela formations of the Pennsylvanian system, and the Washington and lower part of the Greene formations of the Permian.

Coal Beds

The Allegheny formation in the west and the Monongahela formation in the east form two separated areas of coal reserve and production in Athens County. The Middle Kittanning (No. 6) coal bed and the Upper Freeport (No. 7) are the basis for mining to the west and the Pittsburgh (No. 8) coal bed of the Monongahela formation has been the basis for the mining activity in the east-central part of Athens County. The Conemaugh formation, which separates the two areas, contains coal beds that are too thin and irregularly distributed to be of economic importance.

The Lower Kittanning (No. 5) coal bed of the Allegheny formation crops out in the northwestern part of the county, in York Township (fig. 11). Here and in adjacent areas, where the coal is not thick, it ranges in thickness from 14 inches to somewhat more than 28 inches, but it is sufficiently widespread to form a valuable future reserve.

The Middle Kittanning (No. 6) coal bed occurs at minable thickness in northwestern

Athens County (fig. 12). This area is a part of the fabulous Hocking valley coal field that extends into Hocking, Perry, and Morgan Counties (Orton, 1884b, p. 912, 991). In Athens County the coal occurs above drainage only in York Township, but because of its unusual thickness and quality it has been mined by shaft methods as far east as Canaanville, in Canaan Township. There is no information as to the eastern extent of this field, but the coal is known to decrease to 14 inches thickness in the southwestern part of the county. In northwestern Athens County, where the coal is greater than 5 feet in thickness, its continuity is broken by the Jumbo "fault", a miner's term for an area where sandstone and shale replace the coal.

Minable Lower Freeport (No. 6a) coal is found in some areas in the western part of the county. A small reserve is indicated, but because data is scant, no estimate has been made for this coal bed.

The Upper Freeport (No. 7) coal bed is second in importance to the Middle Kittanning coal bed of the Allegheny formation in Athens County. It crops out at or near stream level in York, Dover, and Trimble Townships in northwestern Athens County (fig. 14), where it forms a single bed of minable coal that ranges from 14 to more than 54 inches in thickness. This coal has been an important economic asset to Athens County for many years.

The Conemaugh formation is widespread in central and western Athens County, but does not contain any beds that have a coal reserve. The Mahoning, Mason, Wilgus, and Anderson coal beds locally thicken to more than 14 inches and have been mined for household use.

The Pittsburgh (No. 8) coal bed is the basal member of the Monongahela formation, a unit that underlies an extensive area of eastern and southern Athens County (fig. 17). This coal is found at minable thickness, however, only in two widely separated areas, the Federal Creek coal field in northeastern Athens County, and the Shade Creek coal field in the south-central part of the county. Of the two fields, the Federal Creek coal field contains the greater reserve. In both fields the coal is double benched and subject to rapid lateral variations, particularly at the margins of the fields. The maximum known thickness of the coal is 98 inches.

The Redstone (No. 8a) coal bed is of wide occurrence in Athens County, but it is of minable thickness only along the Athens-Meigs County boundary. In Lodi and Alexander Townships, the coal forms the thin northern edge of the Pomeroy coal field and does not exceed 28 inches in thickness.

The Meigs Creek coal field of southeastern Ohio extends into Bern and Rome Townships (fig. 18) from Morgan and Washington Counties, northeast of Athens County. The coal in these townships ranges from a few inches to 60 inches in thickness. Wherever it has been observed to be of a minable thickness, the Meigs Creek has two benches which are separated by a parting that averages 2 feet in thickness. There are 11 square miles of minable Meigs Creek coal in Athens County, but no production has been reported.

The Washington and Greene formations of the Permian system contain a number of coal beds in Athens County. These coal beds, however, are generally thin and, where they thicken, they are bony. Mining is reported from only Troy Township, where the Washington coal was mined for household use.

Reserve and Production

The estimated original coal reserve for Athens County totals 2, 225, 354, 000 tons. This reserve is contributed by six coal beds, of which the most important is the Middle Kittanning (No. 6) bed, with 1, 304, 501, 000 tons. The Middle Kittanning coal bed is followed

in estimated quantity by the Lower Kittanning (No. 5), with 322,552,000 tons, which is mostly thin coal (14 to 28 inches thick). Although the Upper Freeport (No. 7) coal bed is estimated at 321,743,000 tons, a somewhat smaller reserve than the Lower Kittanning, the bed is much thicker and, hence, is of more value than is the Lower Kittanning bed.

The coal reserve of the Pittsburgh coal bed occupies fourth place in quantity of estimated reserve, with 217,697,000 tons. However, the Pittsburgh coal fields accounted for approximately 20 percent of the 1956 production, because of the locally thick occurrence of the coal.

The Redstone and Meigs Creek coal beds contain an estimated 5,805,000 and 53,056,000 tons of original reserve, respectively. The Redstone has been stripped in conjunction with mining of the Pittsburgh coal along the Athens-Meigs County boundary. However, there has been no report of mining of either the Redstone or Meigs Creek coal beds in Athens County in recent years.

The total alltime reported coal production for Athens County is 197,280,000 tons. Production amounted to more than 1 million tons in 1887 and increased to an alltime annual high of 6,872,646 tons in 1920. Since 1920 a sustained decline in coal production has taken place. The largest amounts of coal have been taken from the Middle Kittanning coal bed, and lesser amounts have been removed from the Upper Freeport and Pittsburgh coal beds. Although the Middle Kittanning has been intensely mined, most of the production has been from shallow depths, and data indicate that a very favorable reserve still remains under deeper cover to the east of the old mining areas.

Tables 37 and 38 list the original reserve by coal bed and by township. Table 22 shows production, by bed, for the 12-year period, 1946-57.

Selected References

- Brant, R. A., 1954, The Lower Kittanning (No. 5) coal bed in Ohio: Ohio Div. Geol. Survey Rept. Inv. 21, p. 40, 42, fig. 11.
- _____, 1956, Coal resources of the upper part of the Allegheny formation in Ohio: Ohio Div. Geol. Survey Rept. Inv. 29, p. 46, 48, figs. 15, 16.
- DeBrosse, T. A., 1957, Coal beds of the Conemaugh formation in Ohio: Ohio Div. Geol. Survey Rept. Inv. 34, p. 10.
- DeLong, R. M., 1955, The Pittsburgh (No. 8) and Redstone (No. 8a) coal beds in Ohio: Ohio Div. Geol. Survey Rept. Inv. 26, p. 30, 42, figs. 8, 12.
- Denton, G. H., 1960, Coal resources of the upper part of the Monongahela formation and the Dunkard group in Ohio: Ohio Div. Geol. Survey Rept. Inv. 38.
- Orton, Edward, 1884, The Hocking valley coal field, in Geol. Survey of Ohio Vol. 5, p. 912-991.
- Smith, W. H., Brant, R. A., and Amos, F., 1952, The Meigs Creek (No. 9) coal bed in Ohio: Ohio Div. Geol. Survey Rept. Inv. 17, p. 19, maps I, II.
- Sturgeon, M. T., 1958, The geology and mineral resources of Athens County, Ohio: Ohio Div. Geol. Survey Bull. 57.

TABLE 22. - COAL PRODUCTION, BY BED, FOR ATHENS COUNTY, 1946-57
(Short tons)

Coal bed ¹	1946		1947		1948		1949	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 6	1,345,753	89,010	1,605,033	254,892	988,888	120,175	603,582	71,109
No. 7	293,006	241,832	315,774	217,444	282,573	211,475	150,783	128,270
No. 8	99,508	52,749	88,426	10,549	223,125	159,689	66,943	38,290
Total	1,738,267	383,591	2,009,233	482,885	1,494,586	491,339	821,308	237,669

Coal bed ¹	1950		1951		1952		1953	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 6	637,676	49,561	803,903	51,954	584,840	18,170	409,360	1,255
No. 7	165,099	137,147	124,924	86,588	191,433	129,101	108,557	59,927
No. 8	63,233	16,483	37,083	6,623	19,684	453	33,232	14,005
Total	866,008	203,191	965,910	145,165	795,957	147,724	551,149	75,187

Coal bed ¹	1954		1955		1956		1957	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 6	380,264	139	475,804	22,338	358,431	7,384	329,781	13,863
No. 7	101,315	37,780	121,933	29,398	89,510	7,000	83,533	-
No. 8	22,233	4,368	51,559	36,521	104,187	92,710	65,724	61,076
Total	503,812	42,287	649,296	88,257	552,128	107,094	479,038	74,939

1 - Names of coal beds: No. 6, Middle Kittanning; No. 7, Upper Freeport; No. 8, Pittsburgh.

MORGAN COUNTY

Geography and Geology



Morgan County lies in southeastern Ohio, north of Athens County, and is separated from the Ohio River by one tier of counties. As farming is the chief industry, less than 30 percent of the 12,836 inhabitants live in towns and villages. The main routes of communication follow the valley of the Muskingum River, which traverses the county from north to south. The Baltimore and Ohio is the only railroad that services McConnellsville, the county seat.

Morgan County lies entirely within the unglaciated part of the Appalachian Plateau. The topography is hilly and the streams generally have narrow steep-walled valleys. The drainage is dominated by the Muskingum River.

A dip in the strata that is steeper than normal for Ohio is found in the eastern part of Morgan County, as a result of the Parkersburg-Lorain syncline. The axis of this syncline passes north-northwestward through Center Township, where rocks of the Permian system are found fairly low on the hillsides. To the west, the full thickness of the Monongahela and Conemaugh formations is exposed, and the upper part of the Allegheny formation is found along the western margin of the county.

Coal Beds

The Lower Kittanning (No. 5) coal bed is below drainage. From data in its area of exposure to the west, this coal bed is inferred to be from 14 to 28 inches thick in western and southwestern Morgan County.

The Middle Kittanning (No. 6) coal bed of the Hocking valley coal field extends northward to embrace western Morgan County (fig. 12), but, except for a small area in the northwestern corner of the county, the coal lies below drainage. Most of the western tier of townships contain Middle Kittanning coal which is more than 28 inches thick, but the eastern extent of minable coal is not known. The coal has been mined by shaft methods in the northwestern part of the county.

The Upper Freeport (No. 7) coal bed (fig. 14) is found above drainage only in the northwestern corner of the county, where it has a thickness of approximately 14 inches. However, this coal is thickest in central-western Morgan County where it is below drainage. Here, drill records show this coal to be more than 5 feet thick.

Of the many coal beds in the Conemaugh formation, the Anderson (fig. 15) is the only one that attains a thickness of minable proportions. This coal bed has a uniform thickness over much of its area of exposure, but it is thickest in Bloom Township and south along the valley of the Muskingum River. The Anderson coal bed has been estimated to underlie approximately 202 square miles.

The Pittsburgh (No. 8) coal bed is of wide areal extent in Morgan County, but,

in much of its area of occurrence, it is thin and irregular in thickness. Most of Morgan County's Pittsburgh coal reserve is found in the southeastern part of the county (fig. 17), where the coal is locally more than 5 feet thick, and where it constitutes a part of the Federal Creek field. There are also small isolated areas of coal 14 to 28 inches thick in the northeastern and central-western parts of Morgan County.

With only minor exceptions, thick deposits of the Meigs Creek (No. 9) coal bed are restricted to the area east and north of the Muskingum River (fig. 18). In this area the coal is well distributed and occurs at a suitable elevation for strip mining. It is found in two benches; the lower bench, as much as 5 feet thick, is the thickest, and is separated from the upper bench by a persistent parting approximately 12 inches thick.

Only one coal bed of Permian age, the Waynesburg "A", has been recognized in Morgan County. This coal bed is found on some of the high hills and ridges in the eastern tier of townships. The coal is bony and commonly contains thin shale or bone partings. Because the thickness varies from a few inches to about 2 feet, the coal contributes only slightly to Morgan County's original coal reserve.

Reserve and Production

The estimated original reserve of coal in Morgan County is 419,433,000 tons and represents six contributing coal beds and three formations: the Lower Kittanning (100,413,000 tons), the Middle Kittanning (446,291,000 tons), and the Upper Freeport (41,202,000 tons), all of the Allegheny formation; the Anderson coal bed (407,232,000 tons) of the Conemaugh formation; and the Pittsburgh (82,463,000 tons), and the Meigs Creek (330,342,000 tons) coal beds of the Monongahela formation.

Present production is from three of the above named beds, the Middle Kittanning, the Pittsburgh, and the Meigs Creek. Before 1951, the Middle Kittanning and the Pittsburgh coal beds were the principal producing contributors, with an annual tonnage that varied from approximately 100,000 to 300,000 tons. In 1954, extensive stripping of the Meigs Creek coal to supply fuel for generation of electricity pushed the total annual tonnage to more than 1 million tons (table 23). There has been a moderate amount of production from the Pittsburgh and Middle Kittanning for the past several years. The Pittsburgh is both strip mined and deep mined; the Middle Kittanning is deep mined.

In Morgan County, the Lower Kittanning coal bed is below drainage and has not been opened. The area of thickest Upper Freeport coal is likewise below drainage and is still untouched.

Although the Anderson coal bed is widely distributed in Morgan County, it is too variable in thickness and too poor in quality to compete with the other coals. Its main use has been to supply local farms.

The Waynesburg "A" coal bed is of sufficient thickness in Manchester and Windsor Townships to warrant mining, but only for local use.

Tables 37 and 38 show the distribution of the estimated reserve by bed and by township. Table 23 shows the coal production of the county for the years 1946-57, inclusive.

Selected Reference

Brant, R. A., 1954, The Lower Kittanning (No. 5) coal bed in Ohio: Ohio Div. Geol. Survey Rept. Inv. 21, p. 36, 38, fig. 10.

TABLE 23. - COAL PRODUCTION, BY BED, FOR MORGAN COUNTY, 1946-57
(Short tons)

Coal bed ¹	1946		1947		1948		1949	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 6	264,092	9,464	289,670	6,799	266,422	-	138,032	12,143
No. 8	34,822	32,948	33,349	29,181	11,367	7,650	2,652	-
No. 9	1,148	-	832	-	594	175	19,182	18,461
Total	300,062	42,412	323,851	35,980	278,383	7,825	159,866	30,604

Coal bed ¹	1950		1951		1952		1953	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 6	113,970	82,246	25,106	-	16,865	-	32,966	-
No. 8	3,769	-	26,611	24,991	1,121	-	870	-
No. 9	62,475	61,522	34,328	33,241	15,335	15,253	16,583	16,583
Total	180,214	143,768	86,045	58,232	33,321	15,253	50,419	16,583

Coal bed ¹	1954		1955		1956		1957	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 6	10,489	-	361,222	-	302,846	-	177,738	-
No. 8	836	-	18,307	17,133	2,849	1,210	894	-
No. 9	1,010,981	1,010,863	1,271,343	1,271,343	1,472,001	1,472,001	1,740,729	1,740,729
Total	1,022,306	1,010,863	1,650,872	1,288,476	1,777,696	1,473,211	1,919,361	1,740,729

1 - Names of coal beds: No. 6, Middle Kittanning; No. 8, Pittsburgh; No. 9, Meigs Creek.

Brant, R. A., 1956, Coal resources of the upper part of the Allegheny formation in Ohio: Ohio Div. Geol. Survey Rept. Inv. 29, p. 48, 50, figs. 15, 16.

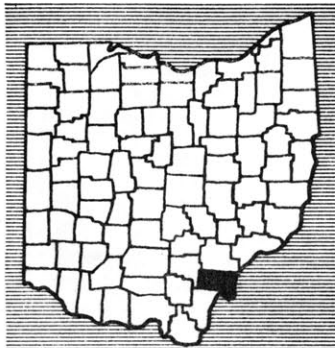
DeBrosse, T. A., 1957, Coal beds of the Conemaugh formation in Ohio: Ohio Div. Geol. Survey Rept. Inv. 34, p. 12, fig. 5.

DeLong, R. M., 1955, The Pittsburgh (No. 8) and Redstone (No. 8a) coal beds in Ohio: Ohio Div. Geol. Survey Rept. Inv. 26, p. 28, 30, fig. 8.

Denton, G. H., 1960, Coal resources of the upper part of the Monongahela formation and the Dunkard group in Ohio: Ohio Div. Geol. Survey Rept. Inv. 38.

MEIGS COUNTY

Geography and Geology



Meigs County is located in southeastern Ohio, south of Athens County, and is bounded on the east by the Ohio River. Despite the long river boundary created by the meandering of the Ohio, the river has had little influence on the economic growth of this county. The population of 23,227 (1950 census) is largely rural, and farming is the main industry in the county.

The topography in Meigs County is mature, with steep slopes and deep stream valleys, as is typical of the unglaciated part of the Appalachian Plateau province in southeastern Ohio. The county is drained by many small tributaries of the Ohio river.

Owing to the eastward dip of the rocks, the Conemaugh and the upper part of the Allegheny formations are exposed at the surface in the western third of the county, and the full thickness of the Monongahela formation is exposed in the central portion. The Dunkard series of Permian age, consisting of the Washington and the Greene formations, is restricted to the eastern third of the county and totals approximately 400 feet of strata.

Coal Beds

The Clarion (No. 4a) (fig. 19) and the Lower Kittanning (No. 5) (fig. 11) coal beds are both below drainage in the western part of Meigs County, and although there is no specific data on these beds within the county, it is believed that they contain a small amount of thin coal, 14 to 28 inches thick. Neither coal bed has been mined, and at present neither is of economic significance.

Exposures of the Middle Kittanning (No. 6) coal bed occur only in the stream valleys in the extreme northwestern corner of Meigs County (fig. 12), where the thickness exceeds 14 inches, but is less than 28 inches. The coal has been mined for local use in Vinton County just west of the Vinton-Meigs County boundary. The eastern extent of minable Middle Kittanning coal in Meigs County is unknown, but the area is believed to be small.

The Mahoning, Mason, and Brush Creek coal beds of the Conemaugh formation range in thickness from a smut streak to 2 feet and have been mined in the western tier of townships for local use. The Anderson coal bed has also been mined in the western part of the county near Dexter and Rutland, where it has a reported thickness of 3 feet, including a 1-foot parting of shale in the middle.

The Pittsburgh (No. 8) coal bed is present in the central portion of Meigs County (fig. 17). It is variable in thickness and only locally, in Scipio and Bedford Townships in northern central Meigs County, does it thicken to minable proportions. These areas of minable thicknesses are small; at best the coal is not more than 42 inches in thickness.

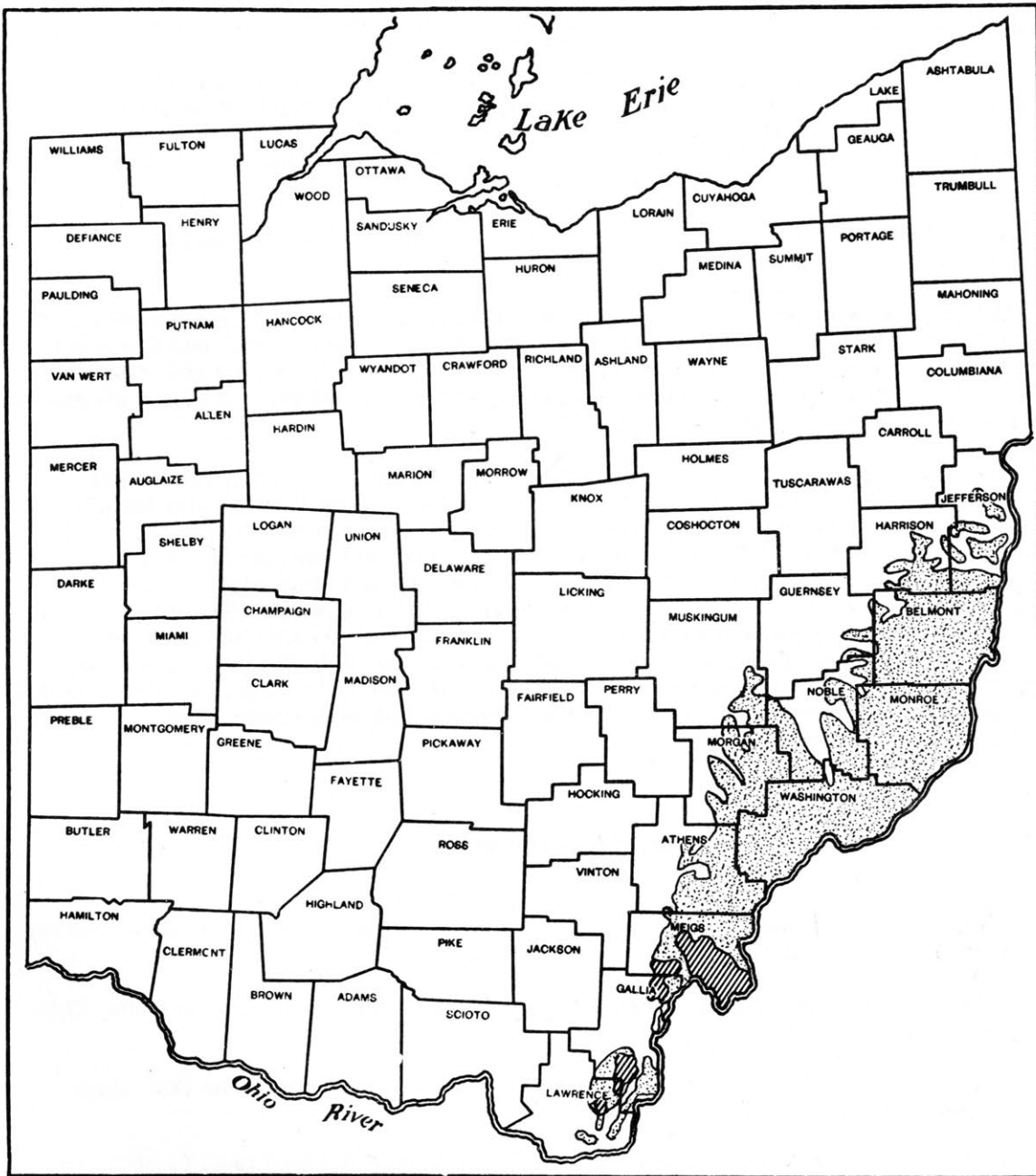


Figure 20 - Area underlain by the Redstone (No. 8a) (Pomeroy) coal bed in Ohio. Diagonal pattern, area of estimated reserve; stippled pattern, area of other Redstone coal.

by a smut streak or a few inches of coal or carbonaceous clay. One coal, the Washington, locally thickens to as much as 2 feet, but laterally within a few yards it thins to a few inches, and therefore is not considered a reserve.

Reserve and Production

The total estimated original coal reserve for Meigs County is 942,190,000 tons.

This reserve is estimated from the five coal beds for which data are available. Tables 37 and 38 list the estimated original reserve by coal bed and by township.

The best known and most extensive of the minable coal beds in Meigs County is the Redstone (No. 8a), or Pomeroy seam, as it is known locally, in the Monongahela formation. An estimated reserve of 617,246,000 tons, or about two-thirds of the total estimated reserve, lies in this bed. Most of the mining in the county has been in this coal bed.

A small area and consequent small tonnage estimate (45,144,000 tons) is offered for the Pittsburgh (No. 8) coal bed.

The next in importance is the Middle Kittanning (No. 6) coal, with an estimated reserve of 47,865,000 tons. Estimates of the Lower Kittanning (No. 5) coal bed are relatively large (226,413,000 tons), but these are all in the thin (14 to 28 inches) and inferred categories. The Clarion (No. 4a) coal bed also is present in the county and has an estimated original reserve of 5,522,000 tons.

Records of mining in the county extend back to the year 1806, when 100 tons of coal was reported mined. From that time to the end of 1958, production of more than 48 million tons of coal had been reported. The period of highest coal production in the county was in the years 1915-27; in 1927 more than 1 million tons of coal was mined. The year 1938 marked the low ebb, when only slightly more than 99,000 tons was produced. Since then, production has been on a general increase, until in 1956 it was 882,983 tons (table 24). In 1940, the first strip mining was reported, and although this production has fluctuated continuously, the trend is upward in mining by this method. In 1956, the amount of coal reported to be strip and auger mined was 795,570 tons (table 24), of which more than 270,000 tons was produced by the auger method. Table 24 includes with strip-mine production the coal produced by auger methods.

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- _____, 1956, Coal resources of the upper part of the Allegheny formation in Ohio: Ohio Div. Geol. Survey Rept. Inv. 29, p. 51, fig. 17.
- DeBrosse, T. A., 1957, Coal beds of the Conemaugh formation in Ohio: Ohio Div. Geol. Survey Rept. Inv. 34, p. 9.
- DeLong, R. M., 1955, The Pittsburgh (No. 8) and Redstone (No. 8a) coal beds in Ohio: Ohio Div. Geol. Survey Rept. Inv. 26, p. 31, 44, figs. 9, 12.
- Denton, G. H., 1960, Coal resources of the upper part of the Monongahela formation and the Dunkard group in Ohio: Ohio Div. Geol. Survey Rept. Inv. 38.
- Lovejoy, E. M., 1888, The Pomeroy and Federal Creek coal fields: Geol. Survey of Ohio Vol. 6, p. 627-652.

TABLE 24. - COAL PRODUCTION, BY BED, FOR MEIGS COUNTY, 1946-57
(Short tons)

Coal bed ¹	1946		1947		1948		1949	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 8	-	-	-	-	-	-	-	-
No. 8a	299,543	22,307	342,146	51,971	422,215	210,445	222,396	79,634
Total	299,543	22,307	342,146	51,971	422,215	210,445	222,396	79,634

Coal bed ¹	1950		1951		1952		1953	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 8	-	-	-	-	38,756	38,756	29,048	26,522
No. 8a	394,475	267,146	407,561	279,467	495,822	234,123	615,821	504,758
Total	394,475	267,146	407,561	279,467	534,578	272,879	644,869	531,280

Coal bed ¹	1954		1955		1956		1957	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 8	30,810	26,609	-	-	64,618	64,618	26,988	26,988
No. 8a	805,165	231,903	657,301	560,696	818,365	730,952	556,838	476,279
Total	835,975	258,512	657,301	560,696	882,983	795,570	583,826	503,267

1 - Names of coal beds: No. 8, Pittsburgh; No. 8a, Redstone.

HOCKING COUNTY

Geography and Geology



Hocking County is located northwest of Athens County, on the western side of the southeastern group of Ohio counties. Like many other hilly counties in southeastern Ohio, the population of Hocking County has, with slight exceptions, declined steadily since 1910. Of the 19,520 people counted in the 1950 census, the majority are rural, and farming is the main industry. Other industries, including coal mining and manufacturing of ceramic products, are for the most part dependent upon mineral resources.

The topography of Hocking County in general is rugged and of sharp relief, as all except the western margin of the county lies in the unglaciated part of the Appalachian Plateau. The proximity of the glacier altered the drainage pattern somewhat, so that today some of the small streams are in large valleys. Glacial outwash is present as terraces of various levels and, locally, as valley fills. The broad valley of the Hocking River bisects the county from northwest to southeast and provides an avenue for the main lines of communication.

The rock in Hocking County dips gently and uniformly to the south-southeast. Mississippian strata are present in the west, and strata of the Pottsville, Allegheny, and lower Conemaugh formations of the Pennsylvanian system occur eastward.

The Pottsville and Conemaugh formations contain only a small coal reserve; the main coal reserve in Hocking County is found in the Allegheny formation.

Coal Beds

The Pottsville coal beds are generally widespread, but thin and impure in character. Locally, small scattered areas of minable coal are found in Hocking County, but none are extensive or thick enough to be of great economic importance. These small areas have been mined only for local supply.

The Lower Mercer (No. 3) coal bed is apparently the most valuable of the Pottsville coals. The maximum observed thickness of this coal is $3\frac{1}{2}$ feet, but this is exceptional, as the coal is usually less than 18 inches thick.

Openings in the Sharon (No. 1) and Quakertown (No. 2) coal beds have also been made, but their number is small and data concerning them is scant.

A small amount of Brookville (No. 4) and Clarion (No. 4a) (fig. 19) coal lies in Hocking County. Brookville coal of minable thickness has been reported only in Washington Township, where it occurs in a small outlier. The Clarion coal field terminates in the southern tier of townships, where the bed measures as much as 28 inches in thickness.

Throughout most of its occurrence in eastern Hocking County, the Lower Kittanning (No. 5) coal bed (fig. 11) is 14 to 28 inches thick. Notable exceptions are in the southeastern

part of the county where the coal varies from a few inches to 5 feet in thickness.

The Middle Kittanning (No. 6) coal (fig. 12) is the most valuable in Hocking County, both historically and currently. Throughout its occurrence in eastern Hocking County it generally has a thickness of 42 to 54 inches, except in the Jumbo "fault" area. Unfortunately, this area of sandstone replacement of the coal is of rather wide extent in the county.

The Upper Freeport (No. 7) coal is found near the hilltops along the eastern boundary of Hocking County (fig. 14). The coal is of minable thickness only in Ward Township, where the thickness ranges from a few inches to more than 42 inches.

The basal 100 feet of the Conemaugh formations occurs in eastern Hocking County, but none of the coals in this formation exceed more than 3 or 4 inches thickness.

Reserve and Production

The Middle Kittanning reserve of 193,901,000 tons has been the most valuable coal resource in Hocking County. Intensive mining of this bed in the late 1800's and early 1900's greatly depleted the reserve, but the coal bed still plays a major role in Hocking County coal production.

The Lower Kittanning and Upper Freeport coal beds are mined to a lesser extent. The reserve of these beds is 48,271,000 tons and 25,218,000 tons, respectively. The Clarion coal bed supports very little mining, despite its 28,842,000 tons of reserve. The known original Brookville coal reserve of 203,000 tons occupies a few acres in Washington Township and has been strip mined.

The Pottsville coal beds, particularly the Lower Mercer, have been mined at several places, but they do not compare favorably with the other thicker and more regular seams. Table 37 lists the estimated coal reserve of Hocking County, by bed, thickness, and reliability category. Table 25 gives coal production in Hocking County from 1946 to 1957.

Selected References

- Brant, R. A., 1954, The Lower Kittanning (No. 5) coal bed in Ohio: Ohio Div. Geol. Survey Rept. Inv. 21, p. 39, fig. 11.
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- Granchi, J. A., 1958, Coal resources of the Pottsville formation: Ohio Div. Geol. Survey Rept. Inv. 36, p. 18, 22, 27, 31, 35, 40.
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TABLE 25. - COAL PRODUCTION, BY FORMATION OR BED, FOR HOCKING COUNTY, 1946-57
(Short tons)

Formation or coal bed ¹	1946		1947		1948		1949	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	-	-	273	-	-	-	-	-
Conemaugh	-	-	12,813	12,813	-	-	-	-
No. 5	-	-	19,044	19,044	-	-	-	-
No. 6	517,267	149,177	548,747	92,193	390,353	58,632	134,453	29,525
No. 6a	220,123	217,539	91,551	87,257	6,973	4,225	1,336	-
No. 7	188	-	1,461	-	1,380	-	233	-
Total	737,578	366,716	673,889	211,307	398,706	63,057	136,022	29,525

Formation or coal bed ¹	1950		1951		1952		1953	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	-	-	-	-	-	-	-	-
Conemaugh	-	-	-	-	-	-	-	-
No. 5	-	-	-	-	-	-	4,548	4,548
No. 6	113,519	44,092	137,676	77,660	86,063	21,287	60,930	12,324
No. 6a	-	-	-	-	-	-	-	-
No. 7	271	-	-	-	-	-	-	-
Total	113,790	44,092	137,676	77,660	86,063	21,287	65,478	16,872

Formation or coal bed ¹	1954		1955		1956		1957	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	-	-	-	-	-	-	-	-
Conemaugh	-	-	-	-	-	-	-	-
No. 5	-	-	-	-	-	-	2,008	2,008
No. 6	48,191	15,964	37,987	12,522	31,000	5,453	36,321	10,190
No. 6a	-	-	-	-	1,954	1,954	5,120	5,120
No. 7	-	-	46,702	46,702	29,382	29,382	45,022	45,022
Total	48,191	15,964	84,689	59,224	62,336	36,789	88,471	62,340

1 - Names of coal beds: No. 5, Lower Kittanning; No. 6, Middle Kittanning; No. 6a, Lower Freeport; No. 7, Upper Freeport.

VINTON COUNTY

Geography and Geology



Vinton County is located in the hills of southeastern Ohio, south of Hocking County. Its population has steadily declined during the 1900's, and by the 1950 census it was only 10,759. Approximately 25 percent of the people live in villages, the largest of which is McArthur, the county seat, with 1,466 people. Sixty eight percent of Vinton County's total area is in forest land, the largest percentage of forest land for any county in Ohio, which is an indication of the paucity of industry within the county.

Communication facilities are satisfactory for present and future developments in Vinton County. The Baltimore and Ohio and the Chesapeake and Ohio Railroads form a good rail net, and most of the highways are either adequate for the present needs or are being improved.

Vinton County is situated on the western edge of the unglaciated section of the Allegheny Plateau, in close proximity to the Central Lowland. Glaciation caused some drainage changes and stream reversals, but it left Vinton County's rough upland topography undisturbed.

Rock strata in Vinton County dip gently and uniformly toward the east-southeast. Rocks of the Mississippian system are restricted in occurrence to the western tier of townships, and, owing to the structure, Pennsylvanian rocks of Pottsville, Allegheny, and Conemaugh age are found progressively from west to east across the county.

Coal Beds

In its area of exposure in the west-central and central parts of the county, the Quakertown (No. 2) coal bed (fig. 16) is variable in thickness and only locally minable. The most valuable deposits of this coal are in the west-central part of the county, where the coal has been mined most extensively, but even here the thickness seldom exceeds $2\frac{1}{2}$ feet.

Of the other Pottsville coal beds present in Vinton County, only the Sharon (No. 1), Lower Mercer (No. 3), and Upper Mercer (No. 3a) attain minable proportions. Of these, the Lower Mercer, which has been mined in Swan and Richland Townships, is the most valuable. No measurements of the thickness of the Upper Mercer exceed $1\frac{1}{2}$ feet. The Sharon coal bed has been opened in Richland Township in the only known minable deposit of this coal (fig. 9).

Vinton County contains the most extensive area of minable Brookville coal in southeastern Ohio (fig. 10). This area includes a considerable portion of the east-central part of the county and, in the southern part of the county, a smaller body that continues into the northeastern corner of Jackson County. In a large part of these areas, the coal exceeds 28 inches in thickness and has supported mining activity for some time.

The Clarion (No. 4a) coal bed occurs in a northward-trending belt through the east-central part of Vinton County (fig. 19). An important portion of the Clarion coal reserve is found in this county, principally in the southern part, where the coal is 42 to 54 inches thick. In the northern part of the county, the coal thins to less than 28 inches. The character of the coal under deep cover to the east is not known.

The Lower Kittanning (No. 5) coal bed is restricted to the eastern part of Vinton County (fig. 11). To the northeast it occurs high on the hillsides, but it is near drainage level in the southeast. Over most of its area of occurrence the bed measures, with local exceptions, between 14 and 28 inches in thickness.

A part of the Hocking valley coal field extends southward into the northern part of Vinton County, where the Middle Kittanning (No. 6) coal bed thins to less than minable thickness. Although the Middle Kittanning coal occurs in the eastern part of the county (fig. 12), it is only in the northeastern area that the coal is of value. The thickest deposit in the extreme northern part is more than 42 inches thick, and bordering it is a considerable area underlain with coal 28 to 42 inches thick.

The Upper Freeport (No. 7) coal bed occurs near the summits of the ridges and in the high knobs in the eastern tier of townships. This bed is thin throughout Vinton County, except in a few small areas in the eastern and southern parts of the county, where coal as much as 28 inches thick has been observed.

A number of coal beds in the lower part of the Allegheny formation have been of local economic importance in the past in Vinton County. These coal beds are the Ogan, Winters and Scrubgrass, all of which occur mainly in the central part of the county. They thicken and thin erratically; the maximum thickness of 4 feet was observed in the Winters bed. The Ogan and Winters coal beds have been mined together in a single operation.

Reserve and Production

Despite an impressive total of 1, 172, 123, 000 tons of estimated original coal reserve in Vinton County, coal production is small. Production from the Middle Kittanning coal bed leads, in spite of the fact that its 173, 353, 000 tons ranks fourth in the county reserve. The Clarion coal bed with 346, 936, 000 tons is first in reserve standing, but it is currently being mined only on a small scale, as is the Lower Kittanning coal bed, which contains 203, 967, 000 tons of original reserve. The Brookville coal bed, with 102, 811, 000 tons, and the Upper Freeport, with 21, 336, 000 tons of original reserve, are both mined in a desultory way.

Mining of the Pottsville coal beds is sporadic and on a small scale. Most of the Pottsville production has been from the Quakertown (No. 2) coal bed, with subordinate amounts from other coal-bed members. The coal reserve is given in tables 37 and 38, and production of coal from 1946 to 1957 is given in table 26.

Selected References

Brant, R. A., 1954, The Lower Kittanning (No. 5) coal bed in Ohio: Ohio Div. Geol. Survey Rept. Inv. 21, p. 39-40, fig. 11.

1956, Coal resources of the upper part of the Allegheny formation in Ohio: Ohio Div. Geol. Survey Rept. Inv. 29, p. 51, 53, figs. 17, 18.

TABLE 26. - COAL PRODUCTION, BY FORMATION OR BED, FOR VINTON COUNTY, 1946-57
(Short tons)

Formation or coal bed ¹	1946		1947		1948		1949	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	9,199	8,410	1,998	-	4,383	3,827	650	-
No. 4	6,047	6,047	23,733	19,574	23,290	19,457	67,470	58,131
No. 4a	5,857	5,857	6,484	627	27,012	26,356	5,261	-
No. 5	19,834	19,772	-	-	1,805	1,805	361	-
No. 6	63,670	36,820	134,832	88,544	127,174	66,314	185,719	159,961
No. 7	76,091	61,337	263,553	242,892	167,747	146,176	183,413	182,229
Total	180,698	138,243	430,600	351,637	351,411	263,935	442,874	380,321

Formation or coal bed ¹	1950		1951		1952		1953	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	362	-	167	-	-	-	3,709	2,984
No. 4	44,998	21,557	28,310	24,315	20,856	20,776	24,445	24,445
No. 4a	15,774	-	8,740	-	6,320	-	1,978	-
No. 5	7,235	-	5,865	-	2,699	-	2,782	-
No. 6	177,562	142,723	196,331	168,572	190,829	151,559	162,768	135,990
No. 7	151,282	148,949	25,283	25,283	-	-	-	-
Total	397,213	313,229	264,696	218,170	220,704	172,335	195,682	163,419

Formation or coal bed ¹	1954		1955		1956		1957	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	6,488	5,917	169	-	203	-	230	-
No. 4	9,623	9,623	9,750	9,750	16,000	16,000	33,685	33,685
No. 4a	-	-	-	-	8,949	-	3,070	-
No. 5	-	-	-	-	-	-	12,738	9,668
No. 6	147,939	108,136	183,154	124,756	143,117	94,081	117,442	66,715
No. 7	7,505	7,505	1,950	1,950	-	-	-	-
Total	171,555	131,181	195,023	136,456	168,269	110,081	167,165	110,068

1 - Names of coal beds: No. 4, Brookville; No. 4a, Clarion; No. 5, Lower Kittanning; No. 6 Middle Kittanning; No. 7, Upper Freeport.

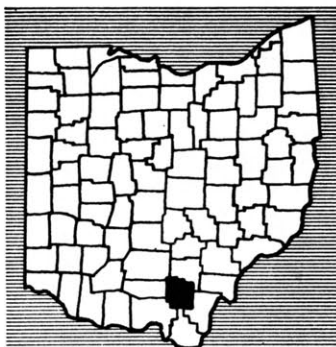
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JACKSON COUNTY

Geography and Geology



Jackson County is situated in southeastern Ohio, south of Vinton County, and midway between the Ohio River, to the east, and the Scioto River, to the west.

The population of this county has fluctuated since 1910; by 1950 it was 27,767, mostly rural. Formerly, mining and the manufacturing of steel were the leading industries, but, with the exhaustion of the Sharon coal in the Jackson field and the Quakertown coal in the Wellston field, and the passing of the charcoal furnaces, these industries have declined in importance, and for the most part have not been replaced. Some coal is produced currently and two steel mills located at Jackson are still in operation.

Jackson County is serviced by the Baltimore and Ohio, Chesapeake and Ohio, and the Detroit, Toledo and Ironton Railroads, in addition to a satisfactory network of State highways.

Jackson County lies in the unglaciated section of the Appalachian Plateau, and, except for a few abandoned preglacial valleys, the surface is deeply dissected. In western Jackson County and neighboring areas of Pike County, the resistant Sharon conglomerate, which is as much as 200 feet thick, occurs well above drainage and gives this area some of the roughest topography in southeastern Ohio.

As a result of the easterly dip, rocks of Mississippian age are found above drainage along the western edge of the county. Rocks of Pennsylvanian age, including the full thickness of the Pottsville and Allegheny formations and the lower part of the Conemaugh formation, are found in sequence to the east.

Coal Beds

Formerly the Sharon (No. 1) and Quakertown (No. 2) coal beds of the Pottsville formation were the principal coal beds, but, with their exhaustion through mining, the Clarion (No. 4a) bed presently leads the coal production for this county.

The Sharon (No. 1) coal bed (fig. 9) was for many years the basis for much of the economic wealth of Jackson County. The Jackson coal field, in which the Sharon was the main coal, was heavily mined in the latter part of the 19th century to supply fuel for the iron manufacturing industry in this and in neighboring areas. Because of its extremely low sulfur content, frequently less than 1 percent, this coal could be used raw in the furnaces, and it was, therefore, in great demand. The Jackson coal field lies in Lick and Liberty townships and in neighboring areas of surrounding townships. In the greater part of this field, the coal thickness ranges from 28 to 42 inches and is relatively uniform. This coal field is now nearly exhausted and little of the estimated original Sharon coal reserve of 119 million tons remains.

Jackson County contains the largest area of minable Quakertown (No. 2) coal in Ohio. This coal bed forms the Wellston field, which is centered around Wellston and Coalton in Coal and Milton Townships in northeastern Jackson County (fig. 16). The coal is 3 to 4 feet thick in the center of the field and thins gradually toward the margins of the field. The history of the Wellston coal field is parallel to that of the Jackson coal field. Because of its excellent burning qualities and low sulfur and ash content, the Quakertown coal is also a premium quality coal, a factor that caused mining of this coal to be expanded rapidly in the late 1800's. Although this field is somewhat larger than the Jackson coal field, the reserve of Quakertown coal was also largely depleted during this period of intense mining. In recent years, only one operator has reported mining this coal.

Other Pottsville coal beds are of little economic value and may be evaluated together. These beds include the Lower Mercer (No. 3), Upper Mercer (No. 3a), the Anthony, Bear Run, Vandusen, and Tionesta coal beds. For the relative position of these beds the reader is referred to figure 7. All are exposed along a northward-trending belt in the central and the eastern portions of the county. All these coals display much the same lithologic character, varying from a carbonaceous shale to cannel to bituminous coal in a single block or bench. The areas of thickening are indiscriminate and local, with thicknesses of more than 2 feet being uncommon. Except for one mine in the Tionesta coal in Milton Township, these coals have been mined only for local use.

The Brookville (No. 4) coal bed (fig. 10), the basal member of the Allegheny formation, has a broad areal extent in Jackson County, but is of little value. It is of minable thickness only in the northeastern corner of the county in Milton Township, where it exceeds 28 inches in thickness.

The Clarion (No. 4a) coal bed constitutes the Clarion coal field, which has an elongated northward-trending outline; the central and most valuable portion occurs in Jackson County (fig. 19). The Clarion coal is found well above drainage in the eastern part of the county, where it is 42 to 54 inches thick.

The Lower Kittanning (No. 5) coal bed is found only along the eastern margin of Jackson County (fig. 11), well above drainage level. In its area of occurrence, the coal is generally 28 inches thick, although small areas are more than 42 inches in thickness; in the southeastern corner of the county, it is too thin for mining.

The Middle Kittanning (No. 6) coal bed occurs high on the sides of the hills in the eastern tier of townships in Jackson County (fig. 12). Here the coal lacks the continuity and thickness found in the Hocking valley coal field to the north, and in most of this area the coal ranges from a few inches to 28 inches in thickness. The bulk of the reserve for this bed, as shown in table 37, is found in the southeastern part of the county where the coal commonly is found to be 14 to 28 inches thick, with local occurrences 28 to 42 inches thick.

The Upper Freeport (No. 7) coal bed marks the top of the Allegheny formation and is of limited areal extent in Jackson County, for it is found near the summits of the ridges and in the high knobs along the eastern boundary of the county (fig. 14). The area of thickest Upper Freeport coal is in the northeastern part of the county, where a small area of minable coal is shared with Vinton and Gallia Counties.

Reserve and Production

Jackson County contains some of the most important Pottsville coal reserve in Ohio, due to extensive areas of minable Sharon and Quakertown coal beds. Intensive mining of these two beds during the late 1800's largely depleted the areas of the best coal. As indicated in table 27, recent production is slight. The estimated original reserve for Potts-

ville coal beds in the county is 530,634,000 tons. The reserve of individual beds is given in table 37.

The reserve of the Allegheny formation is the principal coal source in Jackson County. The Clarion coal bed, with an estimated 234,621,000 tons, is the most important of the Allegheny coals, both in size of reserve and in present production. The Lower Kittanning, Middle Kittanning, and Upper Freeport coal beds contain 169,635,000 tons, 64,792,000 tons, and 5,157,000 tons of original reserve, respectively, and also contribute to the coal production for Jackson County. The Brookville coal bed contributes 5,167,000 tons to the Jackson County reserve, but little to the present production.

Selected References

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_____, 1956, Coal resources of the upper part of the Allegheny formation in Ohio: Ohio Div. Geol. Survey Rept. Inv. 29, p. 53, 55, figs. 17, 18.

DeLong, R. M. , 1957, Coal resources of the lower part of the Allegheny formation in Ohio: Ohio Div. Geol. Survey Rept. Inv. 31, p. 24, 32, 35, figs. 7, 9.

Granchi, J. A. , 1958, Coal resources of the Pottsville formation: Ohio Div. Geol. Survey Rept. Inv. 36, p. 6-7, 17, 21, 27, 35, 38, 40, figs. 3, 6.

Stout, W. , 1916, Geology of southern Ohio: Geol. Survey of Ohio Bull. 20, p. 15-273.

TABLE 27. - COAL PRODUCTION, BY FORMATION OR BED, FOR JACKSON COUNTY, 1946-57
(Short tons)

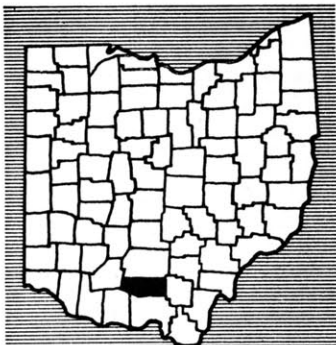
Formation or coal bed ¹	1946		1947		1948		1949	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	63,044	31,509	51,654	18,988	58,324	26,540	57,396	34,356
No. 4a	29,732	1,690	40,341	729	76,817	5,462	36,084	12,868
No. 5	49,520	19,022	91,075	66,807	117,915	100,297	60,362	58,364
No. 6	-	-	-	-	-	-	1,310	1,110
No. 7	18,494	18,494	17,304	17,304	20,866	20,866	106,085	106,085
Total	160,790	70,715	200,374	103,828	273,922	153,165	261,237	212,783

Formation or coal bed ¹	1950		1951		1952		1953	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	43,894	31,755	32,414	24,499	25,185	14,426	17,957	13,791
No. 4a	52,684	23,616	192,061	144,826	510,137	484,541	494,255	458,417
No. 5	46,343	41,504	70,032	63,302	37,253	37,253	18,291	18,291
No. 6	-	-	-	-	-	-	-	-
No. 7	16,148	16,148	10,806	10,806	6,406	6,406	-	-
Total	159,069	113,023	305,313	243,433	578,981	542,626	530,473	490,499

Formation or coal bed ¹	1954		1955		1956		1957	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	39,322	32,310	27,872	19,883	41,457	41,457	32,666	32,056
No. 4a	392,960	354,551	492,106	471,664	518,440	487,645	307,112	271,862
No. 5	48,913	48,913	32,528	32,528	56,622	56,622	91,278	90,697
No. 6	-	-	-	-	-	-	-	-
No. 7	2,699	2,699	5,361	5,361	11,904	11,904	7,111	7,111
Total	483,894	438,473	557,867	529,436	628,423	597,628	438,167	401,726

1 - Names of coal beds: No. 4a, Clarion; No. 5, Lower Kittanning; No. 6, Middle Kittanning; No. 7, Upper Freeport.

PIKE COUNTY



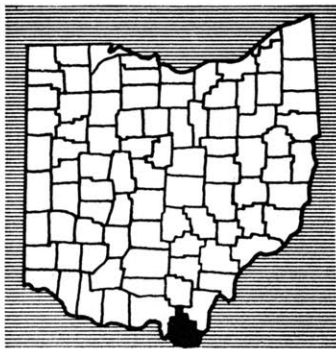
Pike County borders the Jackson coal field on the west, but it has little of the minable Sharon coal of that field. The coal in Pike County is found near the summits of the ridges along the eastern margin of the county. The thickness of the coal is from 14 to 28 inches, but, because of its limited extent, the reserve has not been estimated for Pike County.

Selected Reference

Granchi, J. A., 1958, Coal resources of the Pottsville formation: Ohio Div. Geol. Survey Rept. Inv. 36, p. 6, fig. 3.

LAWRENCE COUNTY

Geography and Geology



Lawrence County is the southernmost county in Ohio and is bounded on the south by the Ohio River. As a result of industrial growth, principally chemical industries, the population of this county increased steadily and by the 1950 census was 49,115.

The county is serviced by the Norfolk and Western and the Detroit, Toledo and Ironton Railroads.

Lawrence County has the typical rough topography that is common to areas lying in the unglaciated part of the Appalachian Plateau province. Drainage is by short streams that flow directly into the Ohio River, and except in flood-plain areas, slopes are generally steep.

The strata dip gently a few degrees south of east. The geologic units that occur above drainage are the upper part of the Pottsville formation, the Allegheny formation, the Conemaugh formation, and the lower part of the Monongahela formation. Along the Ohio River, sandstone beds make bold cliffs, and it is for these that the iron-making Hanging Rock district was named. The reason for the location of the iron furnaces here was not the occurrence of coal in the area, but rather, the availability of iron ore and of wood for making charcoal.

Coal Beds

The Pottsville coal beds of Lawrence County generally are thin and irregular throughout their area of occurrence and hence do not constitute an important coal reserve. The Lower Mercer (No. 3) coal bed attains a thickness of approximately 18 inches in Hamilton and Elizabeth townships, where it has been locally mined, and is believed to underlie approximately 2 square miles of area. The Upper Mercer (No. 3a) coal bed is persistent in its area of outcrop in southwestern Lawrence County, but it attains a thickness of 18 inches in only a few places. The Tionesta (No. 3b) coal bed has been mined for local use in western Lawrence County, but it is generally thin and is of little economic importance.

Minable Clarion (No. 4a) coal in Decatur and Washington Townships of northern Lawrence County (fig. 19) constitutes a part of the Clarion coal field that also extends into Jackson and Vinton Counties. The thickness of the coal in the Lawrence County portion of the Clarion field ranges from 28 to 42 inches, with a smaller border area of coal that is only 14 to 28 inches thick.

The Lower Kittanning (No. 5) coal bed is above drainage in the western portion of Lawrence County. In the greater part of its area of exposure the bed exceeds 28 inches in thickness, although in one area of north-central Lawrence County the bed thins to less than 14 inches thickness.

The "Lost Seam" described by Stout (1916, p. 387-388) is restricted in occurrence to Lawrence County. Here it is found from 1 to 6 feet above the Lower Kittanning coal bed and in some places is recovered with that bed in the same mining operation. Usually, however, it is of too poor a quality to be utilized. A reserve estimate for the "Lost Seam" has not been made.

The Middle Kittanning (No. 6) coal bed is generally minable in its area of exposure in western Lawrence County (fig. 12). There are, however, wide areas in which the coal is thin or absent. Three areas of minable coal are found: one in southern Lawrence County, one in central and northern Lawrence County, and one that continues northward into Jackson and Gallia Counties from the northern edge of Lawrence County. These areas are separated by areas of thin coal. Much of the area of the minable coal is 14 to 28 inches thick, but considerable amounts that are 28 to 42 inches thick also occur, as shown in table 37.

The Upper Freeport (No. 7) coal bed occurs in minable thicknesses in two separated areas, one that extends northward from the Ohio River to central Lawrence County, and a smaller area that extends into Gallia County from the northern portion of Lawrence County (fig. 14). Coal found in the central and northern areas exceeds 60 inches in thickness, whereas the coal in southern Lawrence County is from 14 to 28 inches in thickness.

Of the many coal beds in the Conemaugh formation, only the Wilgus is of known economic importance in Lawrence County. This coal occurs with a thickness of 2 to 3½ feet near Wilgus in Mason Township, near Arabia in Aid Township, and north of Sherritts in Symmes Township. Elsewhere in its outcrop area in central Lawrence County, the Wilgus coal bed is thin.

The Redstone (No. 8a)(Pomeroy) coal bed is restricted to the ridges of eastern and southeastern Lawrence County (fig. 20). This coal bed occurs at minable thickness in Mason and northern Windsor Townships. Here it forms a part of the Greasy Ridge coal field, which continues into Gallia County. The maximum thickness of this coal bed in Lawrence County is 66 inches.

Reserve and Production

The total estimated reserve for Lawrence County is 1,862,713,000 tons. The Allegheny formation, with 1,566,255,000 tons, contains the bulk of the reserve. The Lower Kittanning and Middle Kittanning coal beds lead in amount of reserve, with 812,702,000 tons and 431,500,000 tons, respectively.

There is active mining of all the Allegheny coal beds discussed above and also of the Redstone coal bed. The Wilgus coal bed and coal beds of the Pottsville formation are mined sporadically in small operations. Production of coal in Lawrence County from 1946 to 1957 is given in table 28.

Selected References

- Brant, R. A., 1954, The Lower Kittanning (No. 5) coal bed in Ohio: Ohio Div. Geol. Survey Rept. Inv. 21, p. 45, fig. 12.
- _____ 1956, Coal resources of the upper part of the Allegheny formation in Ohio: Ohio Geol. Survey Rept. Inv. 29, p. 56, figs. 17, 18.
- DeBrosse, T. A., 1957, Coal beds of the Conemaugh formation in Ohio: Ohio Div. Geol. Survey Rept. Inv. 34, p. 7, fig. 4.
- DeLong, R. M., 1955, The Pittsburgh (No. 8) and Redstone (No. 8a) coal beds in Ohio: Ohio Div. Geol. Survey Rept. Inv. 26, p. 32, fig. 9.
- _____ 1957, Coal resources of the lower part of the Allegheny formation in Ohio: Ohio Div. Geol. Survey Rept. Inv. 31, p. 45, fig. 12.
- Granchi, J. A., 1958, Coal resources of the Pottsville formation in Ohio: Ohio Div. Geol. Survey Rept. Inv. 36, p. 16, 21, 25, 34.
- Stout, W., 1916, Geology of southern Ohio: Geol. Survey of Ohio Bull. 20, p. 275-424.

TABLE 28. - COAL PRODUCTION, BY FORMATION OR BED, FOR LAWRENCE COUNTY, 1946-57
(Short tons)

Formation or coal bed ¹	1946		1947		1948		1949	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	-	-	-	-	165	-	-	-
No. 4a	25,869	974	15,548	-	52,013	-	15,092	-
No. 5	21,985	-	16,789	1,557	79,843	1,728	89,032	3,797
No. 6	1,240	-	2,280	-	2,695	-	4,526	-
No. 7	125	125	30	-	170	-	172	-
No. 8a	-	-	23,349	23,026	28,652	28,300	35,057	34,777
Total	49,219	1,099	57,996	24,583	163,538	30,028	143,879	38,574

Formation or coal bed ¹	1950		1951		1952		1953	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	-	-	-	-	4,521	4,521	-	-
No. 4a	6,940	736	634	-	220	-	260	-
No. 5	68,362	5,121	125,818	69,943	160,682	116,091	28,738	2,970
No. 6	8,963	-	2,844	-	8,490	-	5,722	-
No. 7	-	-	17,919	17,919	2,407	2,255	379	-
No. 8a	96,640	96,285	78,322	78,024	69,320	69,119	116,639	116,147
Total	180,905	102,142	225,537	165,886	245,640	191,986	151,738	119,117

Formation or coal bed ¹	1954		1955		1956		1957	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	-	-	-	-	-	-	-	-
No. 4a	353	-	217	-	2,509	-	138	-
No. 5	109,450	90,777	271,716	244,595	243,659	183,666	166,035	148,160
No. 6	1,259	-	5,879	834	178	178	820	347
No. 7	-	-	18	-	-	-	212	-
No. 8a	81,310	80,680	155,017	154,380	120,592	120,592	129,506	129,506
Total	192,372	171,457	431,847	399,809	366,938	304,436	297,711	278,013

1 - Names of coal beds: No. 4a, Clarion; No. 5, Lower Kittanning; No. 6, Middle Kittanning; No. 7, Upper Freeport; No. 8a, Redstone.

GALLIA COUNTY

Geography and Geology



Gallia County lies in southeastern Ohio and is bounded on the southwest by Lawrence County and on the east by the Ohio River. The economy of this county is based principally upon agriculture, and most of the 24,910 people of the county live in rural areas. An adequate network of State highways crosses the county, and the New York Central and Chesapeake and Ohio Railroads pass through Gallipolis, the county seat.

Gallia County occupies a part of the Appalachian Plateau province. As is characteristic of the topography of southeastern Ohio, the land here is in slope, with a relief of several hundred feet, except in local areas of flat land along present or past streams.

The steep slopes of this county afford exposures of rock that range in age from middle Allegheny to upper Monongahela. Because of the gentle dip to the east and south the Conemaugh formation is the most widespread geologic unit in the county.

Coal Beds

The Clarion (No. 4a) coal bed occurs above drainage in the northwestern corner of Greenfield Township (fig. 19), where it is known to range in thickness from a few inches to more than 28 inches.

The Lower Kittanning (No. 5) coal bed crops out in small areas of Greenfield and Huntington Townships, and it underlies, at depth, the rest of the county (fig. 11). Its thickness, where it is exposed, is about 28 inches.

The Middle Kittanning (No. 6) coal bed crops out in the western tier of townships in Gallia County (fig. 12). Movable coal occurs in two separated areas, one in the southwestern part, and the other in the northwestern part of the county. The southern area of movable coal is shared with Lawrence County, and the northern one with Jackson County. Locally the coal attains a thickness of 60 inches, but 14 to 28 inches is the most commonly found thickness. The nature of the coal to the east, where it extends below drainage, is not known.

The Upper Freeport (No. 7) coal bed is found at movable thicknesses in the western tier of townships in Gallia County (fig. 14), but in most of the area the bed is too thin for mining. Small areas of movable Upper Freeport coal occur in southwestern, west-central, and northwestern Gallia County. In each of these areas the coal attains a thickness of between 54 and 66 inches. Mining of this coal bed was reported last in 1954.

The Conemaugh formation is of wide areal extent in Gallia County, but it adds little to the economy of the county. The most commercially important of the Conemaugh

coals are the Mahoning, Mason, and Wilgus. Although not many of these beds are found to be more than 18 inches thick, some of them have been mined to supply local household needs.

The Pittsburgh (No. 8) coal bed is restricted to the Gallia field in the southeastern corner of the county (fig. 17). Here the coal exceeds 42 inches in thickness and crops out in the hilltops, where it has been strip mined.

In Gallia County, the Redstone (No. 8a) (Pomeroy) coal bed occurs at minable thickness in both the north and the south (fig. 20); the northern area constitutes a part of the Pomeroy coal field and the southern part is in the Greasy Ridge coal field, which extends southwestward into Lawrence County. Between these two areas, the coal is thin and of no economic value. Mining has been more intensive in the northern area than in the southern.

Reserve and Production

Gallia County contains an original reserve of coal which is estimated at 1,642,616,000 tons. The coal is contained in six beds, which are as follows:

- (1) Lower Kittanning (No. 5), with 948,029,000 tons;
- (2) Middle Kittanning (No. 6), with 270,187,000 tons;
- (3) Pittsburgh (No. 8), with 180,557,000 tons;
- (4) Redstone (No. 8a)(Pomeroy), with 150,548,000 tons;
- (5) Upper Freeport (No. 7), with 71,033,000 tons; and
- (6) the Clarion (No. 4a), with an estimated original reserve of 22,262,000 tons.

Although the Pittsburgh (No. 8) and Redstone (No. 8a) are subordinate to other coals in size of reserve, they are the main coals mined in the county at present (table 29).

Selected References

- Brant, R. A., 1954, The Lower Kittanning (No. 5) coal bed in Ohio: Ohio Div. Geol. Survey Rept. Inv. 21, p. 43, fig. 12.
- _____, 1956, Coal resources of the upper part of the Allegheny formation in Ohio: Ohio Div. Geol. Survey Rept. Inv. 29, p. 55, figs. 17, 18.
- DeBrosse, T. A., 1957, Coal beds of the Conemaugh formation in Ohio: Ohio Div. Geol. Survey Rept. Inv. 34, p. 9.
- DeLong, R. M., 1955, The Pittsburgh (No. 8) and Redstone (No. 8a) coal beds in Ohio: Ohio Div. Geol. Survey Rept. Inv. 26, p. 31, 44-45, figs. 9, 12.
- Stout, W., 1916, Geology of southern Ohio: Geol. Survey of Ohio Bull. 20, p. 599-635.

TABLE 29. - COAL PRODUCTION, BY BED, FOR GALLIA COUNTY, 1946-57
(Short tons)

Coal bed ¹	1946		1947		1948		1949	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 7	61,122	-	71,411	1,344	62,476	13,603	43,874	27,027
No. 8	1,187	-	7,448	-	45,384	-	38,480	9,669
No. 8a	13,977	-	133,301	-	285,597	5,614	383,632	137,181
Total	76,286	-	212,160	1,344	393,457	19,217	465,986	173,877

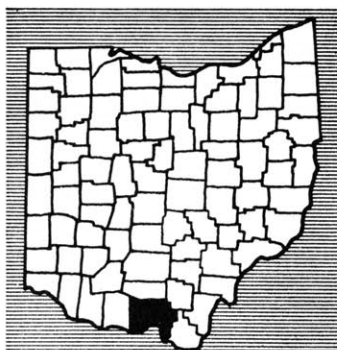
Coal bed ¹	1950		1951		1952		1953	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 7	49,731	49,731	38,863	38,863	36,951	36,951	32,903	32,903
No. 8	28,731	-	4,504	-	556	-	12,018	-
No. 8a	498,234	206,374	525,628	202,781	601,084	379,573	731,811	580,665
Total	576,696	256,105	568,995	241,644	638,591	416,524	776,732	613,568

Coal bed ¹	1954		1955		1956		1957	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 7	14,673	12,148	-	-	-	-	-	-
No. 8	87,788	86,233	108,136	107,696	153,996	153,922	216,131	216,131
No. 8a	765,657	569,047	720,470	612,959	603,375	529,444	560,355	488,457
Total	868,118	667,428	828,606	720,655	757,371	683,366	776,486	704,588

1 - Names of coal beds: No. 7, Upper Freeport; No. 8, Pittsburgh; No. 8a, Redstone.

SCIOTO COUNTY

Geography and Geology



Scioto County, which lies west of Jackson and Lawrence Counties, occupies a favorable position in southern Ohio for industry and for the movement of goods. Despite this advantage, the population of 82,910 in 1950 was less than the 1940 high of 86,565. World War II produced little change in industry, but, with the postwar years, there has been expansion in steelmaking and allied industries.

The rugged topography of Scioto County is typical of the unglaciated section of the Appalachian Plateau. Drainage is dominated by the Ohio and Scioto Rivers, which have cut deep wide valleys. These valleys and the abandoned preglacial valleys in the area provide excellent avenues for lines of communication.

Approximately 500 feet of coal-bearing strata occurs in Scioto County. This thickness includes the Pottsville formation and the lower half of the Allegheny formation, both of which are restricted to the eastern half of the county. The strata in Scioto County dip gently a few degrees south of east.

Coal Beds

The Pottsville coal beds are thin and discontinuous, and thicken to minable proportions only locally. Their contribution to the total coal reserve of the State is extremely small, but, because they are the only coals of appreciable extent, they are important in this county.

The five lowest coal beds of the Pottsville formation are, in ascending order, the Sharon (No. 1), the Anthony, the Quakertown (No. 2), the Bear Run, and the Vandusen. All of these are characteristically thin, and thicken to $1\frac{1}{2}$ to 2 feet only locally; thicknesses of 3 and 4 feet have rarely been observed. Mining of these coals has been on a small scale, and none has been reported to the Ohio Department of Industrial Relations within the last ten years.

The Lower Mercer (No. 3) coal lies well above drainage level in Green, Porter, Vernon, and Bloom Townships, where thicknesses of 2 feet have been measured locally. This is the only coal bed in Scioto County, of those reported to the Ohio Department of Industrial Relations, to be mined within the last ten years. This coal bed is estimated to underlie 6 square miles and to have an average thickness of $1\frac{1}{2}$ feet.

The Upper Mercer (No. 3a) coal bed varies in thickness from less than 1 foot to more than 3 feet in its area of exposure in Bloom, Vernon, and Green Townships (fig. 16). This coal bed is estimated to underlie 10 square miles and to have an average thickness of 2 feet.

The Tionesta (No. 3b) coal bed is variable in thickness and character; it ranges in thickness from a few inches to 3 feet and varies from a single seam of coal to a two- or

three-benched seam. The coal has been mined to supply local demand, predominantly in Vernon Township, and also in Bloom and Greene Townships. The total area of minable Tionesta coal is about 20 square miles.

The minable Clarion (No. 4a) coal bed in Scioto County occurs in the southern end of the Clarion coal field, which extends northward through Jackson and Vinton Counties into Hocking County. Only a small amount of Clarion coal is found in Scioto County, because its occurrence is limited to the hilltops in the eastern part of the county (fig. 19).

The Lower Kittanning (No. 5) coal bed is present in small outliers along the eastern edge of the county (fig. 11). This coal, which is 3 feet in thickness, has been mined, but because of its limited extent it is of little importance in Scioto County.

The Middle Kittanning (No. 6) coal bed underlies a few acres in the hilltops of the northeastern part of Scioto County.

Reserve and Production

The estimated 87,252,000 tons of original coal reserve for Scioto County is a comparatively small one. The Allegheny coal beds, which are important in neighboring counties, are thin and of extremely limited extent in Scioto County and contribute only 11,836,000 tons of the total reserve. The Pottsville coal beds have a much greater distribution, but because they are thin and irregular, mining has been desultory. This is illustrated by the amount of coal production in Scioto County from 1946 to 1957 (table 30).

Selected References

- Brant, R. A., 1954, The Lower Kittanning (No. 5) coal bed in Ohio: Ohio Div. Geol. Survey Rept. Inv. 21, p. 46, fig. 12.
- DeLong, R. M., 1957, Coal resources of the lower part of the Allegheny formation in Ohio: Ohio Div. Geol. Survey Rept. Inv. 31, p. 33, fig. 9.
- Granchi, J. A., 1958, Coal resources of the Pottsville formation: Ohio Div. Geol. Survey Rept. Inv. 36, p. 6, 16, 21, 26, 35, fig. 7.
- Stout, W., 1916, Geology of southern Ohio: Ohio Geol. Survey Bull. 20, p. 459-594.

TABLE 30. - COAL PRODUCTION, BY FORMATION, FOR SCIOTO COUNTY, 1946-57
(Short tons)

Formation	1946		1947		1948		1949	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	-	-	-	-	4,149	4,149	6,427	6,427
Total	-	-	-	-	4,149	4,149	6,427	6,427

Formation	1950		1951		1952		1953	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	7,380	7,380	1,619	1,619	-	-	-	-
Total	7,380	7,380	1,619	1,619	-	-	-	-

Formation	1954		1955		1956		1957	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
Pottsville	-	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-	-

BELMONT COUNTY

Geography and Geology



Belmont County is located in eastern Ohio and is bordered on the west by Guernsey County, and on the east by the Ohio River. This area has been an important east-west route along which industries were established at an early date, especially in the Ohio River valley. Of the 87,740 people counted in the 1950 census, approximately 40 percent live in the towns and villages located in the Ohio River valley. Coal mining is an important part of the Belmont County economy; approximately 3,500 are employed in this industry.

Belmont County has a good highway net and is serviced by the Pennsylvania, Baltimore and Ohio, and the Nickel Plate Railroads.

The county lies in the unglaciated part of the Appalachian Plateau and has a topography of steep slopes and abrupt relief along the Ohio River and its tributaries. Farther west, away from the river, the slopes are more gentle.

Owing to a dip of the strata to the southeast, the oldest rocks are found in the northern and western parts of the county, and the youngest rocks are found in the eastern and southern parts. The upper part of the Conemaugh formation is exposed in the northwest quadrant of the county, the Monongahela formation crops out in the western portion and in the deep valleys on the eastern side, and the Permian formations occur throughout most of the eastern half of the county. The Pottsville and Allegheny formations are present at depth, but very little is known about their character in this area.

Coal Beds

Although the Allegheny formation does not crop out in Belmont County, drill holes have penetrated coal beds of this formation in a number of places, and on the basis of this limited information, the coal reserve has been estimated for the Middle Kittanning and Upper Freeport coal beds.

Wherever observed at the surface, the coal beds of the Conemaugh formation are thin, and nowhere in Belmont County do they constitute a coal reserve.

The Pittsburgh (No. 8) coal bed of the Monongahela formation forms the Belmont coal field, which is centered in Belmont County and embraces parts of Jefferson, Harrison, Monroe, and Guernsey Counties (fig. 17). Because the coal throughout this field has a uniform average thickness of about 60 inches and because adequate transportation facilities are available in the area, this field has led all other areas of Ohio in coal production since the turn of the century. The Pittsburgh coal bed is best exposed in the northwestern and northern areas of Belmont County, where stripping is the principal mining method. In the central and southern parts of the county, the bed is near or below drainage and forms a continuous layer of coal containing a vast reserve. Production of this coal by deep mining has exceeded production by strip mining in Belmont County.

The Meigs Creek (No. 9) (Sewickley) coal bed crops out on the hillsides in western Belmont County and in the valley of the Ohio River and its tributaries (fig. 18). Like the Pittsburgh coal bed, it is accessible in much of its area of occurrence only by deep mining. Near the southern boundary of Belmont County the coal is 14 to 28 inches thick, but it thickens rapidly to the north, where its thickness, although erratic, averages about 60 inches. The lower bench is thicker than the upper bench and is separated from the upper one by a shale parting that is persistent throughout the field. With minor exceptions, this coal bed has been mined by strip methods during the last decade.



Figure 21 - Area underlain by the Uniontown (No. 10) coal bed in Ohio. Diagonal pattern, area of minable coal; stippled pattern, area of other Uniontown coal.



Figure 22 - Area underlain by the Waynesburg (No. 11) coal bed in Ohio. Diagonal pattern, area of estimated coal reserve; stippled pattern, area of other Waynesburg coal.

The Uniontown (No. 10) coal bed is present in every township of Belmont County (fig. 21). Throughout the county this coal bed is represented by smut streaks in clay, bone, carbonaceous shale, and alternating shale and bituminous coal, as well as by a single bench of coal. Lateral variations of thickness and quality are rapid, but the coal in only a few places exceeds $3\frac{1}{2}$ feet in thickness.

The Waynesburg (No. 11) coal bed is found throughout Belmont County (fig. 22) and ranges in thickness from a few inches to as much as 5 feet, but averages 3 to $3\frac{1}{2}$ feet.

The Waynesburg "A" coal bed of the Permian system is widespread in occurrence, except in the northwestern part of the county where it has been removed by erosion. The horizon of this coal bed may be represented by a smut, a zone of carbonaceous shale or bony coal interbedded with coal, and less frequently by a single layer of coal. This coal is thickest in Washington and Wayne Townships, where it varies in thickness, but does not exceed $3\frac{1}{2}$ feet.

The Washington (No. 12) coal bed has a wide occurrence in Belmont County, except where it has been removed by erosion from the northern and northwestern parts of the county. The bed is erratic in character and thickness and in many places is represented only by bony coal or carbonaceous shale. The best of this coal occurs in Washington Township.

Reserve and Production

Belmont County contains an estimated original reserve of 5,759,456,000 tons of coal. Of this amount, 2,752,476,000 tons, or nearly half of the total reserve, is contributed by the Pittsburgh coal bed. The remaining half is divided nearly equally between the Meigs Creek coal bed, with 1,639,697,000 tons, and the minor coal beds of the upper Monongahela and Permian, which together contribute a total of about 1,260,600,000 tons.

The Pittsburgh coal bed in Belmont County was mined early in the 19th century, and since the turn of the century it has been the most intensively mined coal in Ohio. Belmont County leads the State in coal production, and the Pittsburgh coal bed accounts for over 80 percent of the county total (table 31). At present, the field is approximately 30 percent depleted. Because of the deep occurrence of the field in this area, underground mining methods generally are used.

The Meigs Creek coal is of lower quality and cannot be mined profitably by deep mining. Because the coal crops out much higher in the hills than the Pittsburgh coal, strip mining accounts for practically all of its production in Belmont County (table 31).

Although the upper Monongahela and Permian coal beds are a source of a considerable coal reserve in Belmont County, their contribution toward production is almost nil. The lower quality and relative thinness make these beds economically unattractive and unable to compete with the thicker higher quality Pittsburgh and Meigs Creek coal beds. The thinner beds which have been mined for household use, are found at scattered localities, and the thicker Uniontown, Waynesburg "A", and Washington coal beds are found along Capitina Creek and its tributaries. In the past, there have been several small mining operations in the Waynesburg coal bed in Colerain and Richland Townships.

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TABLE 31. - COAL PRODUCTION, BY BED, FOR BELMONT COUNTY, 1946-57
(Short tons)

Coal bed ¹	1946		1947		1948		1949	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 8	7,094,963	363,220	8,063,119	546,908	7,730,930	603,613	5,772,990	370,188
No. 9	858,905	850,760	1,179,854	1,145,334	1,013,652	1,010,167	662,381	659,188
Total	7,953,868	1,213,980	9,242,973	1,692,242	8,744,582	1,613,780	6,435,371	1,029,376

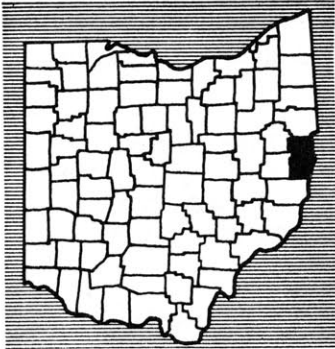
Coal bed ¹	1950		1951		1952		1953	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 8	6,645,408	312,025	7,994,362	496,914	7,192,521	794,165	6,668,263	613,542
No. 9	1,686,590	1,676,788	1,714,499	1,713,005	1,537,671	1,523,834	442,541	440,266
Total	8,331,998	1,988,813	9,708,861	2,209,919	8,730,192	2,317,999	7,110,804	1,053,808

Coal bed ¹	1954		1955		1956		1957	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 8	5,340,632	454,327	6,424,522	751,915	6,785,360	715,466	6,612,955	1,008,192
No. 9	719,878	718,292	507,579	506,657	637,277	636,716	960,906	960,906
Total	6,060,510	1,172,619	6,932,101	1,258,572	7,422,637	1,352,182	7,573,861	1,969,098

1 - Names of coal beds: No. 8, Pittsburgh; No. 9, Meigs Creek

JEFFERSON COUNTY

Geography and Geology



Jefferson County is situated on the Ohio River on the east border of the State, north of Belmont County. Industries were founded along the Ohio River in Jefferson County at an early date, and growth has continued to the present decade. Of the 96,495 people in the county, approximately 50 percent live in urban areas along the Ohio River. The main industries in this area are the manufacture of iron, steel, and clay products. To the west, away from the river, mining and agriculture are the dominant industries. Steubenville is the county seat and main city.

Jefferson County is crossed by U. S. Route 22 and several State routes, as well as by a network of county roads. Railroads servicing the county are the Pennsylvania and the Pittsburgh and West Virginia lines.

The county lies in the unglaciated section of the Appalachian Plateau. Its topography is characterized by steep slopes near the Ohio River and by maturely dissected areas of less relief farther west.

Geologic structure in Jefferson County is simple and is dominated by the gentle dip of the rocks a few degrees east of south. The Lower Kittanning coal bed, which crops out in the Ohio Valley in the northeastern part of the county, is the lowest minable coal seam exposed in Jefferson County. Strata belonging to the Allegheny formation above the Lower Kittanning coal are exposed in the valleys in the northern part of the county and along the Ohio River almost to Steubenville. The Conemaugh and Monongahela formations occur throughout the county, and the Washington formation of Permian age is found near the summits of the hills in the south.

Coal Beds

Most of Jefferson County is believed to be underlain by Lower Kittanning (No. 5) coal of minable thickness (fig. 11). The thickest known deposit of this coal is approximately 3 feet thick and crops out in the northeastern part of the county.

The Middle Kittanning (No. 6) coal bed occurs at minable thickness in three separated areas in Jefferson County (fig. 12). In the northeast area the bed is slightly above drainage and ranges from 0 to more than 28 inches in thickness. In the south-central area and in the southeastern area of the county, drill-hole information reveals the bed to be as much as 4 feet thick; however, owing to inadequate information, the exact extent of these deposits is not known.

The Lower Freeport (No. 6a) coal bed (fig. 13) is exposed along Yellow Creek and the Ohio River in northeastern Jefferson County, where it is generally 14 to 28 inches thick, although in places it is as much as 28 to 42 inches thick. As the bed dips south and goes below drainage, it attains thicknesses as great as 54 inches, which are maintained throughout most of central and southern Jefferson County. Shaft mining is the method currently used

for mining in Springfield Township, where the coal locally thickens to 60 inches.

The Upper Freeport (No. 7) coal bed is exposed only along the major streams in northern Jefferson County (fig. 14). The coal in this area is erratic in thickness, which varies from a few inches to as much as 84 inches. Small areas of minable coal are also found north of Steubenville and under deep cover west of the city.

The Conemaugh formation is found in every township of Jefferson County, but, of its many coal zones, only the Mahoning is of economic importance. This coal bed occurs near stream level in the northern part of the county (fig. 15) and varies from 0 to 60 inches in thickness, with an average of nearly 36 inches. The Harlem and Clarksburg coal beds have been observed at minable thickness, but their lack of continuity and their poor quality make them of little economic importance.

The Pittsburgh (No. 8) coal bed in Jefferson County is in a part of the Belmont coal field. This coal is found near stream level in the southern part of the county (fig. 17), but it gradually rises to the north, where it is readily available for strip mining. The uniform thickness of nearly 60 inches and the favorable elevation of the coal have made this county an important coal-producing region.

The Meigs Creek (No. 9)(Sewickley) coal bed is well distributed in the southern and central parts of Jefferson County (fig. 18), but the coal thins to less than 14 inches a few miles north of the Jefferson-Belmont County line.

The Fishpot coal bed is restricted to the southern part of Jefferson County and is of minor importance in Cross Creek and Mt. Pleasant Townships, where it occurs well up on the hillsides. The Waynesburg coal bed is even less extensive and has been identified only in Mt. Pleasant and Warren Townships. Both coal beds are generally thin and are known to be of minable dimensions only locally.

Reserve and Production

Nine coal beds of Jefferson County contain an estimated total of 3,433,759,000 tons of original reserve. Approximately two-thirds of this total reserve occurs for the most part under deep cover in four Allegheny coal beds. Of the Allegheny coal beds, the Lower Freeport contains the largest estimated reserve, with 1,480,555,000 tons, followed by the Lower Kittanning, with 563,114,000 tons; the Upper Freeport coal bed, with 265,749,000 tons; and the Middle Kittanning, with 106,086,000 tons. Of these four coal beds, the Lower Freeport, in which most of the production is by underground methods, is the most heavily mined. The Upper Freeport and Middle Kittanning coal beds each contribute modest amounts to the annual production of Jefferson County, and the Lower Kittanning, which ranks second in size of reserve, after the Lower Freeport, has the least production. All production from the Allegheny formation is from the northern part of the county.

Despite an estimated original reserve of 207,360,000 tons of coal in an area of approximately 60 square miles of the Mahoning coal bed, mining in this bed has not been reported in recent years. It is possible, however, that firms reporting to the Department of Industrial Relations have misidentified the seam, for the coal is of good quality and has been mined in several townships in the past.

The Pittsburgh coal bed lies at a favorable position on the hillsides for both drift and strip mining and, because of its high quality and uniform thickness, it has been mined intensively. The peak production for this coal bed in Jefferson County was in 1947 when 6,169,375 tons was reported to have been mined (table 32). Most of the production is in the southern part of the county, which contains most of the 718,581,000 tons of the original estimated reserve.

The Meigs Creek (No. 9) coal bed contributes 65,314,000 tons to the estimated original coal reserve of Jefferson County. Because this reserve is a lower quality coal, it has not been mined heavily in the past. At present (1958) there is no production listed in the Annual Coal and Non-Metallic Mineral Report of the Ohio Department of Industrial Relations; however, some of this coal may have been removed and reported as Pittsburgh (No. 8) coal.

Because of irregularity and low quality, the Fishpot and Waynesburg coal beds have never been mined extensively, despite their combined reserve of 66,315,000 tons.

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- Smith, W. H., Brant, R. A., and Amos, F., 1952, The Meigs Creek (No. 9) coal bed in Ohio: Ohio Div. Geol. Survey Rept. Inv. 17, p. 25-26, maps I, II.

TABLE 32. - COAL PRODUCTION, BY BED, FOR JEFFERSON COUNTY, 1946-57
(Short tons)

Coal bed ¹	1946		1947		1948		1949	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 5	12,136	-	24,257	-	32,345	-	17,952	-
No. 6	39,119	15,656	157,859	35,331	202,417	61,760	164,112	59,609
No. 6a	544,579	-	623,537	-	532,281	-	405,164	-
No. 7	66,197	27,734	106,122	62,629	216,159	190,227	46,233	18,999
No. 8	4,045,428	1,894,003	5,257,600	2,655,952	5,106,148	2,881,876	4,032,688	2,457,895
No. 9	-	-	-	-	-	-	-	-
Total	4,707,459	1,937,393	6,169,375	2,753,912	6,089,350	3,133,863	4,666,149	2,536,503

Coal bed ¹	1950		1951		1952		1953	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 5	8,839	-	7,099	-	62,429	24,236	5,635	-
No. 6	168,776	39,504	188,726	44,752	173,853	25,750	90,172	-
No. 6a	411,766	-	677,218	-	539,930	-	500,754	-
No. 7	91,391	51,850	98,450	44,752	77,600	24,236	17,572	570
No. 8	4,425,568	2,812,305	4,620,668	2,701,512	3,872,769	2,192,850	3,958,528	2,270,675
No. 9	1,484	1,484	-	-	-	-	-	-
Total	5,107,824	2,905,143	5,592,161	2,791,016	4,726,581	2,267,072	4,572,661	2,271,245

Coal bed ¹	1954		1955		1956		1957	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 5	19,883	14,108	-	-	-	-	-	-
No. 6	88,135	14,108	40,352	-	12,990	-	4,695	4,395
No. 6a	432,364	-	477,732	41,314	569,041	56,009	545,902	106,054
No. 7	46,997	1,981	192,596	89,501	203,382	95,722	176,082	60,812
No. 8	3,614,316	1,928,240	3,935,836	2,705,386	4,916,676	2,526,768	3,333,650	2,541,234
No. 9	-	-	-	-	-	-	-	-
Total	4,201,695	1,958,437	4,646,516	2,836,201	5,702,089	2,678,499	4,060,329	2,712,495

1 - Names of coal beds: No. 5, Lower Kittanning; No. 6, Middle Kittanning; No. 6a, Lower Freeport; No. 7, Upper Freeport; No. 8, Pittsburgh; No. 9, Meigs Creek.

HARRISON COUNTY

Geography and Geology



Harrison County lies in the hilly eastern section of Ohio, west of Jefferson County. It is separated from the areas of recent industrial growth, and in 1950 had a population of only 19,054. Agriculture and coal mining are the principal bases of the economy of this county.

The eastern and northern parts of Harrison County are crossed by the Pennsylvania, Nickel Plate, and the Wheeling and Lake Erie Railroads; the southwestern part of the county is crossed by the Baltimore and Ohio Railroad. U. S. Routes 22, 36, and 250 are part of the highway net in Harrison County.

The topography of Harrison County, which is typical of that of the unglaciated section of the Appalachian Plateau in eastern Ohio, is characterized by steep slopes. Because of the many streams that thoroughly dissect the region, the divides and spurs form long, sinuous ridges, some of which reach 1300 feet in elevation. Drainage is divided between the Ohio and Tuscarawas Rivers.

The strata in Harrison County dip gently to the south and east. The Conemaugh formation is the most widespread in the county and is found exposed in every township. The upper part of the Allegheny is found only in the valleys in the northwest, and the Monongahela formation is restricted to the southeastern part of the county.

Coal Beds

The Lower Kittanning (No. 5) coal bed (fig. 11) underlies Harrison County at depth and is known only by drill-hole information. It is inferred that most of the county is underlain by coal at least 14 inches thick and that the thickest deposit occurs in the eastern tier of townships, where coal 43 inches thick has been recovered.

The Middle Kittanning (No. 6) coal bed is below the drainage level of Harrison County. The coal is known to be of minable thickness in two distinct areas (fig. 12), one in the western third of the county, where a considerable region is underlain by coal more than 42 inches thick; the other in the east-central portion of the county, where the coal is generally 28 to 42 inches thick, and locally is more than 42 inches.

The Lower Freeport (No. 6a) coal bed is found low in the valleys in northwestern Harrison County, but is of value only in the eastern third of the county (fig. 13), where it has been shaft mined. Much of this deposit is more than 42 inches thick, and in an area east of Cadiz, it is found to be more than 60 inches thick.

The Upper Freeport (No. 7) coal bed crops out along Stillwater Creek in western Harrison County (fig. 14), where it varies from 28 to 42 inches in thickness and is locally more than 42 inches thick. Another deposit, with a thickness of approximately 42 to 54 inches, occurs in eastern Harrison County, where it has been shaft mined.

Approximately two-thirds of the surface of Harrison County is composed of the Conemaugh formation. However, the coal beds of the Conemaugh in this county are thin and of little economic value. The most important of these coal beds are the Harlem and Anderson, which in places thicken to minable dimensions and have been mined in a small way. The reserve has not been estimated for these coal beds in Harrison County.

The Pittsburgh (No. 8) coal bed is restricted to the southeastern part of Harrison County (fig. 17). The coal is usually 42 to 60 inches thick and has good continuity and a favorable elevation for strip mining.

The Meigs Creek (No. 9) (Sewickley) coal bed is of limited areal extent and is found high on the hillsides in southeastern Harrison County (fig. 18). In the southern part of its extent, the coal is more than 42 inches thick, but it thins northward to less than 14 inches. Most of this thickness is contributed by a lower bench of coal which is separated from the upper bench by a parting that varies in thickness from a few inches to 1 foot.

In the southeastern corner of Harrison County, the Uniontown (No. 10) coal bed (fig. 21) occurs in the hillsides and the Waynesburg (No. 11) coal bed (fig. 22) occurs near the summit of the high hills and ridges. Both coal beds are inferior in quality and somewhat variable in thickness. The Uniontown coal bed in Short Creek Township averages 30 inches in thickness and the Waynesburg coal bed averages 36 inches.

Reserve and Production

The estimated original reserve of 2,985,459,000 tons of coal for Harrison County is contained in two formations, the Allegheny and the Monongahela. Of this reserve, the Allegheny formation contributes about 80 percent, in the following four coal beds: the Middle Kittanning, with 723,795,000 tons; the Lower Kittanning, with 669,297,000 tons; the Lower Freeport, with 566,078,000 tons; and the Upper Freeport, with 386,049,000 tons. The Middle Kittanning coal bed currently supports a large underground mining operation in Green Township, but otherwise, production from these coal beds is slight.

In Harrison County, the Pittsburgh coal bed, with 490,728,000 tons, ranks between the Lower Freeport and Upper Freeport in size of reserve; however, within recent years the Pittsburgh has yielded from 50 to 75 percent of the annual production (table 33). Strip and underground methods are utilized in mining the Pittsburgh coal.

The Meigs Creek coal bed contains the least reserve, 133,034,000 tons, in Harrison County and is mined entirely by strip methods, at the rate of $\frac{1}{2}$ to $1\frac{1}{2}$ million tons annually (table 33).

Because of the small extent of the minor coal beds in the Monongahela formation, which include the Uniontown and Waynesburg, these beds account for only 19,778,000 tons of coal reserve in the county. Locally, each of these coal beds attains a thickness of 4 feet.

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TABLE 33. - COAL PRODUCTION, BY BED, FOR HARRISON COUNTY, 1946-57
(Short tons)

Coal bed ¹	1946		1947		1948		1949	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 5	-	-	-	-	-	-	-	-
No. 6a	796,947	-	895,017	-	718,759	-	587,464	-
No. 7	9,945	-	8,986	-	32,053	-	15,732	196
No. 8	4,341,003	3,539,937	4,793,054	3,964,664	3,972,039	3,264,053	3,878,884	3,671,120
No. 9	963,700	963,700	925,995	925,995	1,692,943	1,692,943	734,184	595,501
Total	6,111,595	4,503,637	6,623,052	4,890,659	6,415,794	4,956,996	5,216,264	4,266,817

Coal bed ¹	1950		1951		1952		1953	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 5	-	-	217	-	454	-	-	-
No. 6a	784,994	-	971,467	-	1,025,659	-	1,067,531	-
No. 7	24,584	-	47,330	27,474	53,075	44,737	9,764	7,046
No. 8	4,606,988	4,554,682	4,187,768	4,098,872	4,558,624	4,514,400	4,994,096	4,945,201
No. 9	242,530	242,530	506,732	506,732	194,612	194,612	1,004,984	1,004,984
Total	5,659,096	4,797,212	5,713,514	4,633,078	5,832,424	4,753,749	7,076,375	5,957,231

Coal bed ¹	1954		1955		1956		1957	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 5	-	-	-	-	-	-	-	-
No. 6a	964,891	-	1,275,167	-	1,413,916	-	1,372,857	-
No. 7	4,904	2,412	10,486	-	7,541	-	10,838	3,777
No. 8	4,475,207	4,440,910	5,803,796	5,066,581	5,818,338	5,778,659	6,716,258	5,206,080
No. 9	763,297	763,297	1,425,934	1,425,934	1,427,142	1,427,142	860,419	860,419
Total	6,208,299	5,206,619	8,515,383	6,492,515	8,666,937	7,205,801	8,960,372	6,070,276

1 - Names of coal beds: No. 5, Lower Kittanning; No. 6a, Lower Freeport; No. 7, Upper Freeport; No. 8, Pittsburgh; No. 9, Meigs Creek.

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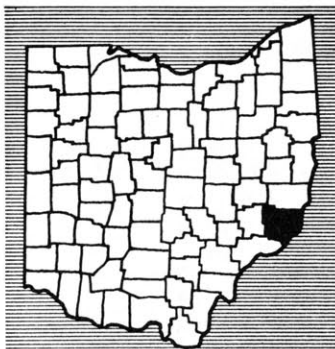
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MONROE COUNTY

Geography and Geology



Monroe County lies in southeastern Ohio along the Ohio River, south of Belmont County. In the past, the Ohio River had little influence on the economy, and because there were no rail connections to serve industry, farming was the principal occupation. Although agriculture is the principal industry, manufacturing is now taking place in the county. Because of assured cheap electrical power from a proven reserve of coal in the immediate area, an aluminum reduction plant and associated industries are currently being constructed in Ohio Township, along the Ohio River. To service this industry, the Pennsylvania Railroad built a spur line south from Powhattan Point.

Monroe County, which lies in the unglaciated part of the Appalachian Plateau, has a maturely dissected land surface; almost everywhere the surface is in slope. In regions near the Ohio River and also in the South Fork drainage in the northwest, the relief is more than 600 feet, and the slopes are very steep; in the central part of the county, the slopes become more moderate. The county is drained by small streams feeding directly into the Ohio River, and by South Fork, a part of the Muskingum River drainage, to the west.

The dip of the strata to the southeast restricts exposures of the Monongahela formation to the western edge of the county, except where the Ohio River has exposed the upper part of this formation in the eastern part of the county. Rocks of the Permian system occur generally throughout the rest of the county.

Coal Beds

Although the presence of deep coal beds in the older formations is known from wells drilled for oil and gas, and from one core record, little is known about their thickness and quality. The oldest or deepest coal bed for which there are sufficient data to form valid conclusions is the Pittsburgh (No. 8) coal bed.

The Pittsburgh (No. 8) coal bed (fig. 17), which occurs at the base of the Monongahela formation, is generally thin where it crops out. However, in the northeast quarter of Monroe County the thickness of the coal is as much as 60 inches. In this area the thick coal forms a part of the Belmont coal field.

Between the Pittsburgh (No. 8) and Meigs Creek (No. 9) coal beds in Monroe County are the Redstone (No. 8a), Fishpot, and a bed termed "the lower split" of the Meigs Creek coal. Of this group, only the Fishpot forms a reserve in Monroe County.

The Fishpot coal, which lies about 50 feet above the Pittsburgh coal, contains minable coal in moderately extensive areas in the northern part of the county. It is identified locally as the "Rich Fork" coal and has been mined locally, but never on large scale.

The Meigs Creek (No. 9) coal bed lies approximately 100 feet above the Pittsburgh

coal bed. Its outcrop is found along the western edge of the county as well as in the deeper valleys in the central and eastern parts of the county (fig. 18). Areas of minable coal in this bed, however, are found principally in the central and north-central parts of the county. The coal generally has a thickness of between 14 and 28 inches in its minable area. Coal in a few small areas is thicker than 42 inches.

The next higher coal bed of economic consideration in Monroe County is the Uniontown (No. 10) coal bed. This member lies approximately 140 feet above the Meigs Creek coal and is exposed over wide areas in Monroe County (fig. 21). In composition, it ranges from relatively clean coal to rather argillaceous bone, and in thickness it varies from a smut streak to as much as 10 feet of interbedded shale or bone and coal.

The Waynesburg (No. 11) coal bed occurs about 60 feet above the Uniontown coal. Its outcrop is found in every township of Monroe County, but it is of minable thickness only in Wayne and Switzerland Townships (fig. 22).

The Waynesburg "A" member is found in the eastern part of the county and generally occurs in two or three benches. Records indicate that the known thickness ranges from half a foot to 5 feet. It lies about 50 feet above the Waynesburg coal, but in places the massive Mannington sandstone replaces the coal and adjacent members. The Washington coal bed is the uppermost coal bed of economic importance in Ohio. It consists of interbedded shale, or bone, and clean coal in thicknesses as great as 11 feet. As a rule, this bed contains relatively less shale where the bed is thin.

Reserve and Production

The estimated original reserve of coal in Monroe County is 2,985,416,000 tons. Although a large untouched reserve remains, much of it is thin and impure coal, and thus constitutes a reserve of the distant future. The prime reserve is in the Pittsburgh (No. 8) coal bed, which has been mined to a small degree, and which has been estimated to contain an original reserve of 783,858,000 tons. Over half this estimate is in proved and probable classes. Tables 37 and 38 show the reserve by coal bed and by township.

Coal has been mined from each of the previously described coal beds. In its mining history, Monroe County has produced only 138,071 tons of coal, most of which was mined for the local market. Coal from the Pittsburgh bed has been mined underground in the county, but it was removed through portals in Belmont County. Table 34 indicates recent coal production in Monroe County.

Selected References

- DeLong, R. M., 1955, The Pittsburgh (No. 8) and Redstone (No. 8a) coal beds in Ohio: Ohio Div. Geol. Survey Rept. Inv. 26, p. 24, fig. 6.
- Denton, G. H., 1960, Coal resources of the upper part of the Monongahela formation and the Dunkard group in Ohio: Ohio Div. Geol. Survey Rept. Inv. 38.
- Smith, W. H., Brant, R. A., and Amos, F., 1952, The Meigs Creek (No. 9) coal bed in Ohio: Ohio Div. Geol. Survey Rept. Inv. 17, p. 26-27, maps I and II.

TABLE 34. - COAL PRODUCTION, BY BED, FOR MONROE COUNTY, 1946-57
(Short tons)

Coal bed ¹	1946		1947		1948		1949	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 8	-	-	4,183	4,183	-	-	-	-
Unident.	-	-	-	-	-	-	-	-
Total	-	-	4,183	4,183	-	-	-	-

Coal bed ¹	1950		1951		1952		1953	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 8	-	-	-	-	-	-	-	-
Unident.	-	-	-	-	10,000	10,000	-	-
Total	-	-	-	-	10,000	10,000	-	-

Coal bed ¹	1954		1955		1956		1957	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 8	-	-	-	-	-	-	-	-
Unident.	-	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-	-

¹ - Names of coal beds: No. 8, Pittsburgh; Unident., Unidentified.

WASHINGTON COUNTY

Geography and Geology



Washington County lies in southeastern Ohio, on the Ohio River, south of Monroe County. Farming and production of petroleum in the past have been the established industries of the county, and now, chemical and steel industries are being attracted to the area. The growth of industry is reflected by a continued growth in population, which totaled 44,407 in 1950.

The county is served by the Pennsylvania Railroad and the Baltimore and Ohio Railroad, which follow the valleys of the Ohio and Muskingum Rivers and Duck Creek. Both railroads pass through Marietta, the county seat, located at the junction of the Muskingum and Ohio Rivers.

Washington County, which is located in the unglaciated part of the Appalachian Plateau, displays a rough, deeply dissected topography developed by the erosion of the Ohio and Muskingum Rivers, Duck Creek, and tributary streams.

The county displays more features of geologic structure than any other county in southeastern Ohio. The more important geologic structures are the Parkersburg-Lorain syncline, the Cambridge anticline, and the northward-trending nose of the Burning Spring anticline of West Virginia. Because of structural control, the Monongahela formation is restricted to the valley bottoms from western to eastern Washington County. Rocks belonging to the Permian system have a wide areal distribution throughout the county and extend down to a level somewhat above drainage.

Coal Beds

The Pittsburgh (No. 8) coal bed is known to be of minable thickness in two widely separated areas, one in east-central Washington County, and the other along the western boundary (fig. 17). The area along the western boundary is the southeastern extension of the Federal Creek coal field from Athens County into Washington County. Here the coal lies below drainage and is known only from mine reports and drill records. Thicknesses of more than 60 inches have been reported for the coal, but its extent with this thickness is believed to be limited. The east-central area of minable Pittsburgh coal is along the Muskingum River and Duck Creek, where it is exposed slightly above stream level. Here the coal varies from a few inches to 30 inches in thickness. Most of the reserve of this field lies under deep cover and is classified as a low-reliability reserve.

The Meigs Creek (No. 9) (Sewickley) coal bed underlies nearly all of Washington County, but it crops out only along those streams which have cut deeply into the bedrock. Movable coal is largely restricted to the north-central part of the county (fig. 18), where the coal averages 42 to 54 inches in thickness. However, the bed thins rapidly to a thickness of less than 14 inches toward the south. As is characteristic of the Meigs Creek field, the coal in Washington County occurs as a double-benched seam with a clay-shale parting.

The Uniontown (No. 10) (fig. 21) and Waynesburg (No. 11) (fig. 22) coal beds both have a great extent of exposure and are found in nearly every township of Washington County. In petrographic character and in thickness the two beds are very similar. Both are thin persistent zones and are more of stratigraphic than economic interest. Usually, these zones are marked only by a thin smut of coal, but they grade laterally into a carbonaceous shale or bony coal and locally into a single layer of coal that is in a few places as much as 2 feet thick. Although the Uniontown coal bed shows some local thickening in every township and has the better quality of the two beds, there is no general area of concentrated reserve for this coal bed in Washington County. The Uniontown coal bed has been mined in several townships on a very small scale for household use, an indication of its rather marginal economic nature. The Waynesburg coal occurs with a thickness of 14 to 28 inches only in Ludlow, Marietta, and Waterford Townships.

The Waynesburg "A" (No. 11a) and the Washington (No. 12) coal beds of the Permian system are found throughout Washington County, except for the northwestern part, where they have been removed by erosion. These two coal beds are similar in petrographic character and thickness to each other and to the coal beds of the underlying upper Monongahela, for they occur as smut streaks and impure coal beds that range up to 3 feet in thickness. The Washington coal bed thickens locally to 2 feet of pure coal in Marietta, Newport, and Liberty Townships and provides a modest reserve. The Waynesburg "A" locally thickens to 2 feet in Aurelius, Adams, and Grandview Townships.

Reserve and Production

The estimated original coal reserve of Washington County totals an impressive 1,262,721,000 tons. However, much of this reserve occurs in the widespread thin coal beds of the upper Monongahela and Permian rocks. All coal mining reported in the county during the last decade has been done by stripping of the Meigs Creek coal bed (table 35), which contains by far the greatest amount of reserve, 512,353,000 tons.

Although the Pittsburgh and some minor coal beds, particularly the Uniontown, contain a considerable reserve, they have not been mined within recent years. In the past, these beds have supported small mining operations that supplied fuel for household use.

Selected References

- DeLong, R. M., 1955, The Pittsburgh (No. 8) and Redstone (No. 8a) coal beds in Ohio: Ohio Div. Geol. Survey Rept. Inv. 26, p. 28, fig. 8.
- Denton, G. H., 1960, Coal resources of the upper part of the Monongahela formation and the Dunkard group in Ohio: Ohio Div. Geol. Survey Rept. Inv. 38.
- Smith W. H., Brant, R. A., and Amos, F., 1952, The Meigs Creek (No. 9) coal bed in Ohio: Ohio Div. Geol. Survey Rept. Inv. 17, p. 17-19, maps I, II.

TABLE 35. - COAL PRODUCTION, BY BED, FOR WASHINGTON COUNTY, 1946-57
(Short tons)

Coal bed ¹	1946		1947		1948		1949	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 9	357	-	686	-	190,587	190,527	168,704	168,704
Total	357	-	686	-	190,587	190,527	168,704	168,704

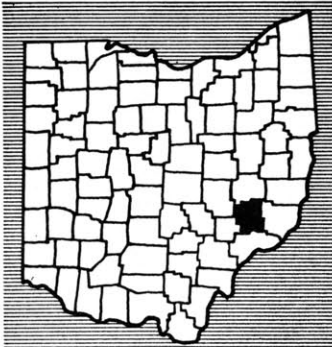
Coal bed ¹	1950		1951		1952		1953	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 9	136,533	135,801	106,896	106,563	167,797	167,797	138,492	138,492
Total	136,533	135,801	106,896	106,563	167,797	167,797	138,492	138,492

Coal bed ¹	1954		1955		1956		1957	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 9	67,217	67,217	151,053	151,009	243,746	243,746	250,055	250,055
Total	67,217	67,217	151,053	151,009	243,746	243,746	250,055	250,055

¹ - Name of coal bed: No. 9, Meigs Creek.

NOBLE COUNTY

Geography and Geology



Noble County, located north of Washington County, is like several other southeastern Ohio counties in that it is removed from industrial areas and has had a steady decline in population since the early 1900's. Agriculture is the basis for the economy of Noble County, and most of the 11,750 people live in the rural areas.

A good network of highways is found in Noble County, but rail connections are limited to a line of the Pennsylvania Railroad which passes through Caldwell, the county seat, on the way from Marietta to Cambridge.

Noble County lies well within the unglaciated part of the Appalachian Plateau and has a mature upland topography that has been deeply dissected by streams, so that the area is nearly everywhere in slope. Drainage of the county is controlled largely by Duck Creek in the south and Wills Creek in the north.

The northward-trending Parkersburg-Lorain syncline, which passes through the western part of the county, and the complementary Cambridge anticline, which passes through the central part, control the outcrop pattern in Noble County. Because of these structures, the Monongahela formation is present in the western, southern, and eastern parts of the county, and the older Conemaugh formation occurs in the central and northern portions. All but the basal members of the Conemaugh formation occur above drainage, and the underlying Allegheny formation lies entirely below drainage. In the northwestern corner of Noble County, the contact between the Allegheny and Conemaugh formations is 50 feet below stream level. The lower part of the Washington formation of Permian age is present in the hillsides from southwestern to southeastern Noble County.

Coal Beds

There are no known records of drill holes penetrating the Middle Kittanning (No. 6) coal bed (fig. 12) in Noble County, but in Guernsey County, just across the northern boundary of Noble County, a drill hole indicates that this coal is approximately 4 feet thick and lies at an elevation of about 620 feet, 110 feet below the Upper Freeport (No. 7) coal bed. The reserve given in table 37 is interpreted from this drill-hole datum.

The Upper Freeport (No. 7) coal bed, the uppermost member of the Allegheny formation, occurs in the Cambridge coal field (fig. 14). In the northwest corner of Noble County, this bed occurs at 770 feet elevation, or 50 feet below drainage. The elevation of the coal decreases to the east and south, owing to the dip of the strata. The extent of the field has been determined by drilling, and during World War I, the coal was produced by shaft mining. A second area of Upper Freeport coal reserve is in the northeastern part of the county, where the coal has been reported to attain a thickness of about 28 inches. However, the bulk of the reserve given in table 37 is in the Cambridge field.

Except for the Anderson coal bed, the coal beds of the Conemaugh formation are

thin and of no economic value in Noble County. Movable portions of the Anderson coal bed occur in parts of Muskingum, Morgan, and Guernsey Counties, and in the northwestern part of Noble County (fig. 15). In Noble County the coal is widespread, has a thickness of about 2 feet, and has been mined on many farms.

A small area of thick Pittsburgh (No. 8) coal that is continuous with the Belmont coal field is found in the northeastern corner of Noble County (fig. 17). Here, in north-east Beaver Township, the coal is from 42 to 54 inches thick. However, the coal thins rapidly to the southwest and nowhere else in Noble County does it reach minable dimensions.

The Meigs Creek (No. 9) (Sewickley) coal bed (fig. 18) is the most valuable coal deposit in Noble County. It underlies a large area, it is well situated on the hillsides for strip and drift mining, and it is continuous throughout its area of occurrence. Most of the Meigs Creek coal reserve occurs in beds that are between 28 and 42 inches thick; only a few measurements of less than 14 inches have been recorded. As is true elsewhere over much of its extent, the Meigs Creek bed in Noble County is double benched, the two benches being separated by a parting that varies in thickness from a few inches to 3 feet. The lower bench is more widespread and thicker; the upper bench thins to less than 14 inches in the western part of the county. The reserve given in table 37 includes both benches.

The Fishpot, Uniontown (No. 10) (fig. 21), and Waynesburg (No. 11) coal beds of the Monongahela formation and the Waynesburg "A" (No. 11a) coal bed of the Washington formation of Permian age are found in the hillsides of southwestern, southern, and eastern Noble County. The Fishpot underlies the greatest area and is thickest in Beaver Township, where the bed attains an average thickness of 28 inches. The Uniontown coal bed is thickest in Marion Township, where it averages 37 inches in thickness. The Waynesburg and Waynesburg "A" coal beds are generally thin and variable in thickness.

Reserve and Production

Nine coal beds, eight in the Pennsylvanian, and one, the Waynesburg "A", in the Permian, represent the estimated original coal reserve of Noble County, 1,415,084,000 tons. The Meigs Creek coal bed, with 854,039,000 tons, contributes approximately 60 percent of the total reserve and constitutes practically all the coal production in Noble County (table 36). A few large mining operations strip the Meigs Creek coal to supply fuel for electrical power plants. The remainder of the production in Noble County is from the Pittsburgh coal bed, which contains 27,277,000 tons of original reserve. The Upper Freeport coal bed, with 222,863,000 tons of estimated original reserve, is second to the Meigs Creek coal bed in quantity of reserve. The Upper Freeport was mined by shaft methods in the Cambridge field during the early 1900's, but it can no longer compete successfully with other coals.

The Middle Kittanning coal bed is the second Allegheny coal bed to contribute to the reserve of Noble County. The 7,856,000 tons of reserve of this bed lie under deep cover and are untouched; the extent of the bed is unknown.

The Anderson coal bed of the Conemaugh formation contains an estimated 133,632,000 tons of original reserve. This coal is thickest in Buffalo and parts of Noble and Seneca Townships, where it has been mined for local use.

The minor contributing coal beds of the Monongahela formation include the Fishpot, with 56,316,000 tons; the Uniontown, with 19,485,000 tons; and the Waynesburg, with 15,456,000 tons of estimated reserve. The Waynesburg "A" coal of the Permian system, with 7,686,000 tons of reserve, is comparable in character and quantity of reserve to the three above-mentioned Monongahela coal beds. These coal beds vary in thickness and in few places are more than 2 feet thick. They have been mined for local use in Beaver,

Marion, Stock, Seneca, and Sharon Townships.

Selected References

- Brant, R. A. , 1956, Coal resources of the upper part of the Allegheny formation in Ohio: Ohio Div. Geol. Survey Rept. Inv. 29, p. 38, 40, figs. 11, 12.
- DeBrosse, T. A. , 1957, Coal beds of the Conemaugh formation in Ohio: Ohio Div. Geol. Survey Rept. Inv. 34, p. 18, fig. 5.
- DeLong, R. M. , 1955, The Pittsburgh (No. 8) and Redstone (No. 8a) coal beds in Ohio: Ohio Div. Geol. Survey, Rept. Inv. 26, p. 27, fig. 7.
- Denton, G. H. , 1960, Coal resources of the upper part of the Monongahela formation and the Dunkard group in Ohio: Ohio Div. Geol. Survey Rept. Inv. 38.

TABLE 36. - COAL PRODUCTION, BY BED, FOR NOBLE COUNTY, 1946-57
(Short tons)

Coal bed ¹	1946		1947		1948		1949	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 8	40	-	1,750	-	5,803	-	1,250	-
No. 9	240,745	227,820	474,211	471,307	1,332,863	1,329,894	1,177,776	1,175,178
Total	240,785	227,820	475,961	471,307	1,338,666	1,329,894	1,179,026	1,175,178

Coal bed ¹	1950		1951		1952		1953	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 8	44,518	42,415	1,900	-	-	-	20,682	20,682
No. 9	1,983,332	1,982,309	1,580,340	1,580,340	1,866,203	1,866,203	1,711,193	1,699,969
Total	2,027,850	2,024,724	1,582,240	1,580,340	1,866,203	1,866,203	1,731,875	1,720,651

Coal bed ¹	1954		1955		1956		1957	
	Total	Strip	Total	Strip	Total	Strip	Total	Strip
No. 8	-	-	-	-	-	-	79	-
No. 9	1,265,081	1,235,742	1,181,207	1,169,391	1,149,672	1,145,952	1,187,014	1,186,217
Total	1,265,081	1,235,742	1,181,207	1,169,391	1,149,672	1,145,952	1,187,093	1,186,217

¹ - Names of coal beds: No. 8, Pittsburgh; No. 9, Meigs Creek.

GALLIA.....	1,642,616	1,130,515	340,311	171,790	-	195,003	27,682	112,184	55,137	518,196	184,354	217,189	116,653	929,417	918,479	10,938	-
Redstone	150,548	25,059	94,962	30,527	-	45,314	3,206	32,950	9,158	103,057	19,676	62,012	21,369	2,177	2,177	-	-
Pittsburgh	180,557	11,933	44,638	123,986	-	45,969	1,552	12,637	31,780	134,548	10,341	32,001	92,206	40	40	-	-
Upper Freeport	71,033	16,240	40,243	14,550	-	30,976	617	18,205	12,154	33,146	11,628	19,122	2,396	6,911	3,995	2,916	-
Middle Kittanning	270,187	175,164	92,296	2,727	-	55,296	13,259	39,992	2,045	123,367	70,944	682	51,741	91,524	90,961	563	-
Lower Kittanning	948,029	892,020	56,009	-	-	15,264	7,738	7,526	-	105,331	63,702	41,629	-	827,434	820,580	6,854	-
Clarion	22,262	10,099	12,163	-	-	2,184	1,310	874	-	18,747	8,063	10,684	-	1,331	726	605	-
GEAUGA.....	2,880	-	-	-	2,880	-	-	-	-	-	-	-	-	-	-	-	-
Sharon	2,880	-	-	-	2,880	-	-	-	-	-	-	-	-	-	-	-	-
GUERNSEY.....	3,016,904	1,049,489	1,471,658	353,677	142,080	328,187	24,613	221,847	81,727	1,091,868	150,494	675,761	265,613	1,454,769	874,382	574,050	6,337
Meigs Creek	18,352	2,746	15,616	-	-	7,609	-	314	-	7,295	-	10,655	2,334	8,321	-	98	-
Pittsburgh	64,786	1,936	62,850	-	-	20,028	544	22,484	-	40,638	1,170	39,468	-	1,120	222	898	-
Anderson	142,080	-	-	142,080	-	-	-	-	-	-	-	-	-	-	-	-	-
Upper Freeport	704,943	66,294	287,017	351,632	-	195,036	13,578	101,776	79,682	487,618	44,963	177,042	265,613	22,289	7,753	8,199	6,337
Middle Kittanning	1,042,214	258,232	781,937	2,045	-	91,071	8,766	80,260	2,045	438,746	75,256	363,490	-	512,397	174,210	338,187	-
Lower Kittanning	1,044,519	720,281	324,238	-	-	11,443	1,411	10,032	-	114,211	26,771	87,440	-	918,865	692,099	226,766	-
HARRISON.....	2,985,459	841,265	1,540,822	586,894	16,478	759,818	30,416	449,030	280,372	1,309,443	124,237	878,684	306,522	899,720	686,612	213,108	-
Waynesburg	7,128	-	-	-	7,128	-	-	-	-	-	-	-	-	-	-	-	-
Uniontown	9,350	-	-	-	9,350	-	-	-	-	-	-	-	-	-	-	-	-
Meigs Creek	133,034	9,516	96,784	26,734	-	82,796	5,905	63,776	13,115	50,238	3,611	33,008	13,619	-	-	-	-
Pittsburgh	490,728	363	178,404	311,961	-	177,186	-	65,270	111,916	309,559	343	109,171	200,045	3,983	20	3,963	-
Upper Freeport	386,049	63,352	320,766	1,931	-	139,925	15,982	123,375	568	201,160	34,310	165,487	1,363	44,964	13,060	31,904	-
Lower Freeport	566,078	44,446	303,420	218,212	-	178,081	954	45,071	132,056	280,491	10,912	183,423	86,156	107,506	32,580	74,926	-
Middle Kittanning	723,795	110,598	585,141	28,056	-	176,334	7,313	146,304	22,717	424,449	60,648	358,462	5,339	123,012	42,637	80,375	-
Lower Kittanning	669,297	612,990	56,307	-	-	5,496	262	5,234	-	43,546	14,413	29,133	-	620,255	598,315	21,940	-
HOCKING.....	347,699	74,048	58,968	163,419	51,264	133,753	12,412	23,996	97,345	157,622	56,576	34,972	66,074	5,060	5,060	-	-
Upper Freeport	25,218	3,657	21,561	-	-	9,870	1,610	8,260	-	2,047	-	13,301	-	17,229	66,074	-	-
Middle Kittanning	193,901	-	30,482	163,419	-	110,598	13,253	97,345	-	83,303	-	-	-	-	-	-	-
Lower Kittanning	48,271	42,490	5,781	-	-	7,323	5,984	1,339	-	36,191	31,749	4,442	-	4,757	4,757	-	-
Clarion	28,842	27,901	941	-	-	5,759	4,818	941	-	22,780	22,780	-	-	303	303	-	-
Brookville	203	-	203	-	-	203	-	203	-	-	-	-	-	-	-	-	-
Tionesta	3,456	-	-	-	3,456	-	-	-	-	-	-	-	-	-	-	-	-
Bedford	4,608	-	-	-	4,608	-	-	-	-	-	-	-	-	-	-	-	-
Upper Mercer	3,456	-	-	-	3,456	-	-	-	-	-	-	-	-	-	-	-	-
Lower Mercer	34,560	-	-	-	34,560	-	-	-	-	-	-	-	-	-	-	-	-
Quakertown	5,184	-	-	-	5,184	-	-	-	-	-	-	-	-	-	-	-	-
HOLMES.....	352,083	46,170	82,961	-	222,952	53,537	22,428	31,109	-	61,287	21,731	39,556	-	14,307	2,011	12,296	-
Middle Kittanning	22,201	13,101	9,100	-	-	13,870	8,945	4,925	-	8,192	4,017	4,175	-	139	139	-	-
Lower Kittanning	93,072	20,588	72,484	-	-	31,777	6,970	24,807	-	47,127	11,746	35,381	-	14,168	1,872	12,296	-
Brookville	13,858	12,481	1,377	-	-	7,890	6,513	1,377	-	5,968	5,968	-	-	-	-	-	-
Tionesta	11,520	-	-	-	11,520	-	-	-	-	-	-	-	-	-	-	-	-
Bedford	145,920	-	-	-	145,920	-	-	-	-	-	-	-	-	-	-	-	-
Lower Mercer	6,912	-	-	-	6,912	-	-	-	-	-	-	-	-	-	-	-	-
Quakertown	58,600	-	-	-	58,600	-	-	-	-	-	-	-	-	-	-	-	-
JACKSON.....	1,009,996	101,921	377,451	-	530,624	185,940	29,421	156,519	-	267,789	60,622	207,167	-	25,643	11,878	13,765	-
Upper Freeport	5,157	4,413	744	-	-	1,096	815	281	-	3,107	2,644	463	-	954	954	-	-
Middle Kittanning	64,792	43,990	20,802	-	-	28,588	16,996	11,592	-	36,204	26,994	9,210	-	-	-	-	-
Lower Kittanning	169,635	31,666	137,969	-	-	55,753	8,768	46,985	-	102,803	19,957	82,846	-	11,079	2,941	8,138	-
Clarion	234,621	18,869	215,752	-	-	97,587	1,673	95,914	-	123,424	9,213	114,211	-	13,610	7,983	5,627	-
Brookville	5,167	2,983	2,184	-	-	2,916	1,169	1,747	-	2,251	1,814	437	-	-	-	-	-
Tionesta	11,520	-	-	-	11,520	-	-	-	-	-	-	-	-	-	-	-	-
Upper Mercer	17,280	-	-	-	17,280	-	-	-	-	-	-	-	-	-	-	-	-
Lower Mercer	13,824	-	-	-	13,824	-	-	-	-	-	-	-	-	-	-	-	-
Quakertown	369,000	-	-	-	369,000	-	-	-	-	-	-	-	-	-	-	-	-
Sharon	119,000	-	-	-	119,000	-	-	-	-	-	-	-	-	-	-	-	-
JEFFERSON.....	3,433,759	556,719	2,066,256	576,424	234,360	626,244	33,625	329,022	263,597	1,341,426	142,928	885,671	312,827	1,231,729	380,166	851,563	-
Waynesburg	27,000	-	-	-	27,000	-	-	-	-	-	-	-	-	-	-	-	-
Meigs Creek	65,314	20,557	44,757	-	-	10,277	4,021	6,256	-	55,037	16,536	38,501	-	-	-	-	-
Pittsburgh	718,581	-	235,776	482,805	-	263,851	-	80,072	183,779	449,017	-	149,991	299,026	5,713	-	5,713	-
Mahoning	207,360	-	-	207,360	-	-	-	-	-	-	-	-	-	-	-	-	-
Upper Freeport	265,749	60,390	191,649	13,710	-	71,581	9,978	48,745	12,858	161,285	38,764	121,669	852	32,883	11,648	21,235	-
Lower Freeport	1,480,555	93,723	1,306,923	79,909	-	250,227	13,060	170,207	66,960	541,017	40,311	487,757	12,949	689,311	40,352	648,959	-
Middle Kittanning	106,086	70,625	35,461	-	-	9,626	6,063	13,563	-	65,709	43,811	21,898	-	20,751	20,751	-	-
Lower Kittanning	563,114	311,424	251,690	-	-	10,682	503	10,179	-	69,361	3,506	65,855	-	483,071	307,415	175,656	-
LAWRENCE.....	1,862,713	953,205	610,827	24,881	273,800	263,928	49,477	193,148	21,303	643,596	258,991	381,027	3,578	681,389	644,737	36,652	-
Redstone	22,658	3,527	17,288	1,843	-	7,106	181	5,082	1,843	14,289	2,217	12,072	-	1,263	1,129	134	-
Wilgus	173,000	-	-	173,000	-	-	-	-	-	-	-	-	-	-	-	-	-
Upper Freeport	249,777	129,583	97,271	22,923	-	77,527	17,413	40,769	19,345	118,706	58,957	56,171	3,578	53,544	53,213	331	-
Middle Kittanning	431,500	222,611	208,889	-	-	72,511	14,651	57,860	-	257,730	118,431	139,299	-	101,389	89,529	11,730	-
Lower Kittanning	812,702	590,348	222,454	-	-	78,663	16,285	62,378	-	208,716	73,097	135,619	-	525,323	500,866	24,457	-
Clarion	72,276	7,236	64,925	115	-	28,121	947	27,059	115	44,155	6,289	37,866	-	-	-	-	-
Tionesta	51,840	-	-	-	51,840	-	-	-	-	-	-	-	-	-	-	-	-
Upper Mercer	43,200	-	-	-	43,200	-	-	-	-	-	-	-	-	-	-	-	-
Lower Mercer	3,456	-	-	-	3,456	-	-	-	-	-	-	-	-	-	-	-	-
Quakertown	2,304	-	-	-	2,304	-	-	-	-	-	-	-	-	-	-	-	-

ESTIMATED ORIGINAL RESERVE

TABLE 37. - ESTIMATED ORIGINAL COAL RESERVE OF OHIO, BY COUNTY AND COAL BED (CON.)
(In short tons)

County and bed	Total					Proven				Probable				Inferred			
	Total	Thickness category			Unclassified	Total	Thickness category			Total	Thickness category			Total	Thickness category		
		14"-28"	28"-54"	54"+			14"-28"	28"-54"	54"+		14"-28"	28"-54"	54"+		14"-28"	28"-54"	54"+
LICKING.....	28,000	-	-	-	28,000	-	-	-	-	-	-	-	-	-	-	-	-
Lower Mercer	13,000	-	-	-	13,000	-	-	-	-	-	-	-	-	-	-	-	-
Sharon	15,000	-	-	-	15,000	-	-	-	-	-	-	-	-	-	-	-	-
MAHONING.....	1,049,678	144,534	427,640	-	477,504	86,854	18,605	68,249	-	365,852	89,231	276,621	-	119,468	36,698	82,770	-
Lower Freeport	437	437	-	-	437	-	-	-	-	-	-	-	-	-	-	-	-
Middle Kittanning	113,389	77,842	35,547	-	22,408	10,813	11,595	-	64,232	49,258	14,974	-	26,749	17,771	8,978	-	
Lower Kittanning	458,348	66,255	392,093	-	64,009	7,355	56,654	-	301,620	39,973	261,647	-	92,719	18,927	73,792	-	
Bedford	5,184	-	-	-	5,184	-	-	-	-	-	-	-	-	-	-	-	-
Upper Mercer	184,320	-	-	-	184,320	-	-	-	-	-	-	-	-	-	-	-	-
Lower Mercer	149,000	-	-	-	149,000	-	-	-	-	-	-	-	-	-	-	-	-
Sharon	139,000	-	-	-	139,000	-	-	-	-	-	-	-	-	-	-	-	-
MEDINA.....	73,000	-	-	-	73,000	-	-	-	-	-	-	-	-	-	-	-	-
Sharon	73,000	-	-	-	73,000	-	-	-	-	-	-	-	-	-	-	-	-
MEIGS.....	942,190	416,141	389,359	136,690	-	280,702	41,480	166,675	72,547	331,954	82,613	185,198	64,143	329,534	292,048	37,486	-
Redstone	617,246	121,180	360,816	135,250	-	254,400	35,865	147,313	71,222	289,879	49,834	176,017	64,028	72,967	35,481	37,486	-
Pittsburgh	45,144	15,362	28,342	1,440	-	25,317	4,697	19,295	1,325	19,827	10,665	9,047	115	115	-	-	-
Middle Kittanning	47,865	47,865	-	-	-	616	616	-	-	17,135	17,135	-	-	30,114	30,114	-	-
Lower Kittanning	226,413	226,413	-	-	-	-	-	-	-	5,113	4,979	134	-	226,413	226,413	-	-
Clarion	5,522	5,321	201	-	-	369	302	67	-	6,113	4,979	134	-	40	40	-	-
MONROE.....	2,985,416	275,333	441,612	345,310	1,923,161	126,549	32,053	36,897	57,599	549,697	167,220	147,181	235,296	386,009	76,060	257,534	52,415
Washington	468,178	-	-	-	468,178	-	-	-	-	-	-	-	-	-	-	-	-
Waynesburg A	377,970	-	-	-	377,970	-	-	-	-	-	-	-	-	-	-	-	-
Waynesburg	59,970	-	-	-	59,970	-	-	-	-	-	-	-	-	-	-	-	-
Uniontown	632,613	-	-	-	632,613	-	-	-	-	-	-	-	-	-	-	-	-
Meigs Creek	276,297	222,077	54,220	-	56,820	32,053	24,767	-	182,187	152,734	29,453	-	37,290	37,290	-	-	
Fishpot	384,430	-	-	-	384,430	-	-	-	-	-	-	-	-	-	-	-	-
Pittsburgh	783,858	52,680	385,868	345,310	69,729	-	12,130	-	57,599	365,410	13,910	116,204	235,296	348,719	38,770	257,534	52,415
Upper Freeport	2,100	576	1,524	-	2,100	-	-	-	2,100	576	1,524	-	-	576	1,524	-	-
MORGAN.....	1,419,433	291,882	583,896	124,933	418,722	218,911	32,265	132,256	54,390	449,387	93,241	285,603	70,543	332,413	166,376	166,037	-
Waynesburg A	11,490	-	-	-	11,490	-	-	-	-	-	-	-	-	-	-	-	-
Meigs Creek	330,342	69,089	244,719	16,534	104,779	14,556	80,639	9,584	224,190	53,160	164,080	6,950	1,373	1,373	-	-	
Pittsburgh	82,463	40,383	21,483	20,597	35,392	13,971	8,328	13,093	46,567	25,908	13,155	7,504	504	504	-	-	
Anderson	407,232	-	-	-	407,232	-	-	-	-	-	-	-	-	-	-	-	-
Upper Freeport	41,202	11,332	17,012	12,858	25,564	2,903	10,598	12,063	13,610	6,401	6,414	795	795	2,028	2,028	-	
Middle Kittanning	446,291	70,665	300,682	74,944	53,176	-	835	32,691	165,020	7,772	101,954	55,294	228,095	62,058	166,037	-	
Lower Kittanning	100,413	100,413	-	-	-	-	-	-	-	-	-	-	100,413	100,413	-	-	
MPSKINGUM.....	2,029,340	523,257	1,281,476	15,103	209,504	310,082	20,321	283,975	5,786	746,940	90,679	646,944	9,317	762,814	412,257	350,557	-
Meigs Creek	138,268	5,258	119,951	13,059	-	34,668	1,314	28,590	4,764	96,646	3,885	84,466	8,295	6,954	59	6,895	
Pittsburgh	12,675	11,532	1,143	-	2,245	2,245	1,472	773	-	10,309	9,939	370	-	121	121	-	
Anderson	154,560	-	-	-	154,560	-	-	-	-	-	-	-	-	-	-	-	
Upper Freeport	156,274	32,263	124,011	-	63,153	7,394	55,759	-	91,941	24,153	67,788	-	1,180	716	464	-	
Middle Kittanning	1,047,286	99,747	945,495	2,044	186,981	2,584	183,375	1,022	460,552	20,852	438,678	1,022	399,753	76,311	323,442	-	
Lower Kittanning	458,099	367,382	90,717	-	20,155	4,836	15,319	-	83,138	27,496	55,642	-	354,806	335,050	19,756	-	
Brookville	7,234	7,075	159	-	2,880	2,721	159	-	4,354	4,354	-	-	-	-	-	-	
Tionesta	11,520	-	-	-	11,520	-	-	-	-	-	-	-	-	-	-	-	
Bedford	13,824	-	-	-	13,824	-	-	-	-	-	-	-	-	-	-	-	
Lower Mercer	4,600	-	-	-	4,600	-	-	-	-	-	-	-	-	-	-	-	
Quakertown	12,000	-	-	-	12,000	-	-	-	-	-	-	-	-	-	-	-	
Sharon	13,000	-	-	-	13,000	-	-	-	-	-	-	-	-	-	-	-	
NOBLE.....	1,415,084	233,984	719,450	229,075	232,575	480,082	62,732	314,857	102,493	611,929	106,997	394,423	110,509	90,498	64,255	10,170	16,073
Waynesburg A	7,686	-	-	-	7,686	-	-	-	-	-	-	-	-	-	-	-	
Waynesburg	15,456	-	-	-	15,456	-	-	-	-	-	-	-	-	-	-	-	
Uniontown	19,485	-	-	-	19,485	-	-	-	-	-	-	-	-	-	-	-	
Meigs Creek	854,039	141,514	583,089	129,436	438,852	61,851	293,534	83,467	415,187	79,663	289,555	45,969	-	-	-	-	
Fishpot	56,316	-	-	-	56,316	-	-	-	-	-	-	-	-	-	-	-	
Pittsburgh	27,277	7,417	19,860	-	9,649	483	9,166	-	14,544	3,850	10,694	-	3,084	3,084	-		
Anderson	133,632	-	-	-	133,632	-	-	-	-	-	-	-	-	-	-	-	
Upper Freeport	222,863	24,251	98,973	99,639	29,343	398	9,919	19,026	166,528	20,215	81,773	64,540	26,992	3,638	7,281	16,073	
Middle Kittanning	7,856	2,584	5,272	-	1,363	-	1,363	-	6,493	2,584	3,909	-	-	-	-		
Lower Kittanning	70,474	58,218	12,256	-	875	-	875	-	9,177	685	8,492	-	60,422	57,533	2,889	-	
PERRY.....	1,148,247	191,131	448,789	494,503	13,824	856,915	18,737	343,675	494,503	173,109	75,956	97,153	-	104,399	96,438	7,961	-
Upper Freeport	65,922	26,715	28,802	10,405	-	35,647	11,132	17,110	10,405	27,275	15,583	11,692	-	-	-	-	
Middle Kittanning	772,617	-	288,519	484,098	-	772,617	-	288,519	484,098	-	-	-	-	-	-	-	
Lower Kittanning	295,884	164,416	131,468	-	45,651	7,605	38,046	-	145,834	60,373	85,461	-	104,399	96,438	7,961	-	
Tionesta	8,640	-	-	-	8,640	-	-	-	-	-	-	-	-	-	-	-	
Lower Mercer	2,304	-	-	-	2,304	-	-	-	-	-	-	-	-	-	-	-	
Quakertown	2,880	-	-	-	2,880	-	-	-	-	-	-	-	-	-	-	-	
PORTAGE.....	111,824	-	-	-	111,824	-	-	-	-	-	-	-	-	-	-	-	
Bedford	13,824	-	-	-	13,824	-	-	-	-	-	-	-	-	-	-	-	
Lower Mercer	23,000	-	-	-	23,000	-	-	-	-	-	-	-	-	-	-	-	
Sharon	75,000	-	-	-	75,000	-	-	-	-	-	-	-	-	-	-	-	

SCIOTO.....	87,252	5,721	6,115	-	75,416	2,307	120	2,187	-	8,171	4,243	3,928	-	1,358	1,358	-	-
Middle Kittanning	1,750	1,551	199	-	-	-	-	-	-	855	556	199	-	898	895	-	-
Lower Kittanning	4,908	2,759	2,149	-	-	1,094	-	974	-	3,452	2,277	1,175	-	362	362	-	-
Clarion	5,178	1,411	3,767	-	-	1,213	120	1,213	-	3,864	1,310	2,554	-	101	101	-	-
Tionesta	40,320	-	-	-	40,320	-	-	-	-	-	-	-	-	-	-	-	-
Upper Mercer	23,000	-	-	-	23,000	-	-	-	-	-	-	-	-	-	-	-	-
Lower Mercer	10,368	-	-	-	10,368	-	-	-	-	-	-	-	-	-	-	-	-
Quaker town	1,728	-	-	-	1,728	-	-	-	-	-	-	-	-	-	-	-	-
STARK.....	1,442,857	212,568	707,541	15,196	507,552	118,021	19,662	92,398	5,961	522,512	86,492	426,785	9,235	294,772	106,414	188,358	-
Upper Freeport	25,671	4,791	7,067	13,813	-	6,221	974	669	4,578	19,186	3,677	6,274	9,235	264	140	124	-
Middle Kittanning	348,654	16,857	331,797	-	-	46,574	4,175	42,399	-	211,557	11,112	200,445	-	90,523	1,570	88,953	-
Lower Kittanning	362,216	152,294	209,922	-	-	28,366	7,255	21,111	-	144,927	46,161	98,766	-	188,923	98,878	90,045	-
Brookville	198,764	38,626	158,755	1,383	-	36,860	7,258	28,219	1,383	146,842	25,542	121,300	-	15,062	5,826	9,236	-
Tionesta	6,912	-	-	-	6,912	-	-	-	-	-	-	-	-	-	-	-	-
Bedford	3,456	-	-	-	3,456	-	-	-	-	-	-	-	-	-	-	-	-
Lower Mercer	5,184	-	-	-	5,184	-	-	-	-	-	-	-	-	-	-	-	-
Sharon	492,000	-	-	-	492,000	-	-	-	-	-	-	-	-	-	-	-	-
SUMMIT.....	228,000	-	-	-	228,000	-	-	-	-	-	-	-	-	-	-	-	-
Sharon	228,000	-	-	-	228,000	-	-	-	-	-	-	-	-	-	-	-	-
TRUMBULL.....	149,760	-	-	-	149,760	-	-	-	-	-	-	-	-	-	-	-	-
Sharon	149,760	-	-	-	149,760	-	-	-	-	-	-	-	-	-	-	-	-
TUSCARAWAS.....	2,026,110	535,940	1,409,712	35,810	44,648	500,331	51,740	428,398	20,193	1,009,923	301,894	692,412	15,617	471,208	182,306	288,902	-
Upper Freeport	121,604	8,866	90,374	22,364	-	29,785	656	17,555	11,574	86,704	5,944	69,970	10,790	5,115	2,266	2,849	-
Lower Freeport	18,281	9,084	9,197	-	-	9,544	3,101	6,443	-	8,737	5,983	2,754	-	-	-	-	-
Middle Kittanning	1,000,390	84,698	902,822	12,870	-	354,997	16,200	330,754	8,043	495,180	67,087	423,266	4,827	150,213	1,411	148,802	-
Lower Kittanning	749,643	371,542	378,101	-	-	91,876	25,473	66,403	-	353,169	178,487	174,682	-	304,598	167,582	137,016	-
Brookville	91,544	61,750	29,218	576	-	14,129	6,310	7,243	576	66,133	44,393	21,740	-	11,282	11,047	235	-
Tionesta	27,648	-	-	-	27,648	-	-	-	-	-	-	-	-	-	-	-	-
Upper Mercer	17,000	-	-	-	17,000	-	-	-	-	-	-	-	-	-	-	-	-
VINTON.....	1,172,123	333,319	505,784	9,300	323,720	276,875	61,971	208,732	6,172	534,385	234,205	297,052	3,128	37,143	37,143	-	-
Upper Freeport	21,336	10,039	9,309	1,988	-	14,610	4,572	8,050	1,988	6,726	5,467	1,259	-	-	-	-	-
Middle Kittanning	173,353	59,216	109,820	4,317	-	71,177	19,321	50,379	1,477	100,089	37,808	59,441	2,840	2,087	2,087	-	-
Lower Kittanning	203,967	140,606	63,361	-	-	43,669	17,838	25,831	-	137,278	99,748	37,530	-	23,020	23,020	-	-
Clarion	346,936	79,890	264,051	2,995	-	120,594	11,128	106,759	2,707	216,928	59,348	57,292	288	9,414	9,414	-	-
Brookville	102,811	43,568	59,243	-	-	26,825	9,112	17,713	-	73,364	31,834	41,530	-	2,622	2,622	-	-
Upper Mercer	25,920	-	-	-	25,920	-	-	-	-	-	-	-	-	-	-	-	-
Lower Mercer	28,800	-	-	-	28,800	-	-	-	-	-	-	-	-	-	-	-	-
Quaker town	269,000	-	-	-	269,000	-	-	-	-	-	-	-	-	-	-	-	-
WASHINGTON.....	1,262,721	441,809	237,919	16,269	566,724	169,922	78,000	89,792	2,130	371,017	231,085	134,721	5,211	155,058	132,724	13,406	8,928
Washington	28,464	-	-	-	28,464	-	-	-	-	-	-	-	-	-	-	-	-
Waynesburg A	35,640	-	-	-	35,640	-	-	-	-	-	-	-	-	-	-	-	-
Uniontown	502,620	-	-	-	502,620	-	-	-	-	-	-	-	-	-	-	-	-
Meigs Creek	512,353	287,908	219,961	4,484	-	139,426	57,416	79,880	2,130	284,678	150,789	131,535	2,354	88,249	79,703	8,546	-
Pittsburgh	183,644	153,901	17,958	11,785	-	30,496	20,584	9,912	-	86,339	80,296	3,186	2,857	66,809	53,021	4,860	8,928
WAYNE.....	261,064	10,925	10,371	-	239,768	8,735	5,443	3,292	-	7,328	4,616	2,712	-	5,233	866	4,367	-
Lower Kittanning	12,574	3,143	9,431	-	-	4,085	1,733	2,352	-	3,256	544	2,712	-	5,233	866	4,367	-
Brookville	8,722	7,782	940	-	-	4,650	3,710	940	-	4,072	4,072	-	-	-	-	-	-
Tionesta	6,912	-	-	-	6,912	-	-	-	-	-	-	-	-	-	-	-	-
Bedford	6,912	-	-	-	6,912	-	-	-	-	-	-	-	-	-	-	-	-
Upper Mercer	3,456	-	-	-	3,456	-	-	-	-	-	-	-	-	-	-	-	-
Lower Mercer	2,304	-	-	-	2,304	-	-	-	-	-	-	-	-	-	-	-	-
Quaker town	5,184	-	-	-	5,184	-	-	-	-	-	-	-	-	-	-	-	-
Sharon	215,000	-	-	-	215,000	-	-	-	-	-	-	-	-	-	-	-	-

Wayne	150,556	74,778	63,113	12,665	-	21,682	7,215	14,467	-	76,571	15,823	48,083	12,665	52,303	51,740	563	-
West	229,563	131,154	59,961	38,448	-	16,178	-	5,047	11,131	60,242	815	32,280	27,147	153,143	130,339	22,634	170
Yellow Creek	128,476	59,033	62,230	7,213	-	58,802	22,617	30,335	5,850	65,455	34,280	29,812	1,363	4,219	2,136	2,083	-
Undistributed	76,944	-	-	-	76,944	-	-	-	-	-	-	-	-	-	-	-	-
COSHOCTON	716,478	133,035	426,421	454	156,568	153,580	15,783	137,343	454	323,427	66,288	257,139	-	82,903	50,964	31,939	-
Adams	47,151	19,045	22,106	-	-	6,792	4,025	2,767	-	28,110	11,795	16,315	-	6,249	3,225	3,024	-
Bedford	47,009	7,194	39,815	-	-	8,782	2,339	6,443	-	28,514	4,594	23,920	-	9,713	30,261	9,452	-
Bethlehem	13,125	2,479	10,646	-	-	2,683	-	2,683	-	3,595	-	3,595	-	6,847	2,479	4,368	-
Clark	16,980	2,672	14,308	-	-	4,353	139	4,214	-	8,691	579	8,112	-	3,936	1,954	1,982	-
Crawford	15,382	4,630	10,752	-	-	5,065	884	4,181	-	9,442	2,871	6,571	-	875	875	-	-
Franklin	54,575	523	54,052	-	-	15,105	-	15,105	-	39,249	302	38,947	-	221	221	-	-
Jackson	81,605	17,377	64,228	-	-	26,168	1,169	24,999	-	48,241	12,640	35,601	-	7,196	3,568	3,628	-
Jefferson	2,152	1,552	600	-	-	889	323	566	-	215	181	34	-	1,048	1,048	-	-
Keene	21,904	2,680	19,224	-	-	4,382	-	4,382	-	13,225	1,975	11,250	-	4,297	705	3,592	-
Lafayette	23,655	4,048	19,607	-	-	6,147	239	5,908	-	13,867	5,044	13,363	-	3,641	3,305	336	-
Linton	84,532	18,989	65,543	-	-	26,554	-	26,554	-	39,049	60	38,989	-	18,929	18,929	-	-
Mill Creek	13,499	4,277	9,222	-	-	3,594	60	3,534	-	8,100	2,748	5,352	-	1,805	1,469	336	-
Monroe	1,702	1,299	403	-	-	880	477	403	-	199	199	-	-	623	623	-	-
Oxford	24,373	24,373	-	-	-	4,705	4,705	-	-	15,939	15,939	-	-	3,729	3,729	-	-
Perry	181	181	-	-	-	-	-	-	-	-	-	-	-	181	181	-	-
Pike	360	360	-	-	-	-	-	-	-	-	-	-	-	360	360	-	-
Tuscarawas	28,798	8,284	20,514	-	-	9,204	665	8,539	-	17,619	5,644	11,975	-	1,975	1,975	-	-
Virginia	57,471	6,793	50,678	-	-	19,208	-	12,208	-	32,828	2,399	30,429	-	5,435	4,394	1,041	-
Washington	12,175	1,521	10,654	-	-	1,228	-	1,228	-	6,703	281	6,422	-	4,244	1,240	3,004	-
White Eyes	19,281	4,758	14,609	-	454	7,841	758	6,629	454	9,841	3,577	6,264	-	1,599	423	1,176	-
Undistributed	156,568	-	-	-	156,568	-	-	-	-	-	-	-	-	-	-	-	-
GALLIA	1,642,616	1,130,515	340,311	171,790	-	195,003	27,682	112,184	55,137	518,196	184,354	217,189	116,653	929,417	918,479	10,938	-
Addison	66,527	61,621	4,906	-	-	7,836	6,122	1,714	-	28,835	25,643	3,192	-	29,856	29,856	-	-
Cheshire	115,739	63,402	29,931	22,406	-	19,487	-	12,978	6,509	32,850	-	16,953	15,897	63,402	63,402	-	-
Clay	119,944	52,396	6,160	61,388	-	17,727	1,875	2,007	13,845	56,595	4,899	4,153	47,543	45,622	45,622	-	-
Gallipolis	23,581	21,328	2,253	-	-	3,563	1,310	2,253	-	10,684	10,684	-	-	9,334	9,334	-	-
Green	79,853	79,147	706	-	-	1,352	646	706	-	463	463	-	-	78,038	78,038	-	-
Greenfield	93,388	47,018	46,370	-	-	27,144	9,178	17,966	-	53,957	26,158	27,799	-	12,287	11,682	605	-
Guyan	149,017	74,813	50,993	23,211	-	26,552	121	13,381	13,050	56,220	8,447	37,612	10,161	66,245	66,245	-	-
Harrison	96,420	72,999	6,911	9,809	-	6,535	625	6,535	2,649	21,676	7,439	9,975	4,262	64,935	64,935	-	-
Huntington	185,350	98,357	80,802	6,191	-	35,854	1,879	28,704	5,271	94,106	41,424	51,762	920	55,390	55,054	336	-
Morgan	64,187	64,187	-	-	-	-	-	-	-	-	-	-	-	64,187	64,187	-	-
Ohio	126,711	55,720	30,394	40,597	-	13,352	201	8,266	4,885	65,238	7,398	22,128	35,712	48,121	48,121	-	-
Perry	128,351	109,863	18,488	-	-	7,793	159	7,634	-	25,955	16,526	9,429	-	94,603	93,178	1,425	-
Raccoon	148,274	120,556	27,718	-	-	8,352	5,347	3,005	-	43,719	26,087	17,632	-	96,203	89,122	7,081	-
Springfield	75,841	75,841	-	-	-	-	-	-	-	-	-	-	-	75,841	75,841	-	-
Walnut	169,433	133,267	25,080	11,086	-	16,182	219	7,035	8,928	27,898	9,186	16,554	2,158	125,353	123,862	1,491	-
GEAUGA	2,880	-	-	-	-	2,880	-	-	-	-	-	-	-	-	-	-	-
Undistributed	2,880	-	-	-	-	2,880	-	-	-	-	-	-	-	-	-	-	-
QUEBENSEY	3,016,904	1,049,489	1,471,658	353,677	142,080	328,187	24,613	221,847	81,727	1,091,868	150,494	675,761	265,613	1,454,769	874,382	574,050	6,337
Adams	158,139	41,112	117,027	-	-	4,472	-	4,472	-	19,546	2,385	17,161	-	134,121	38,727	95,394	-
Cambridge	252,417	69,171	162,584	20,662	-	20,149	1,014	4,823	14,312	63,638	8,527	48,761	6,350	168,630	59,630	109,000	-
Center	193,520	82,123	71,891	39,506	-	16,433	-	3,313	13,120	62,112	7,852	29,214	25,046	114,975	74,271	39,364	1,340
Jackson	182,812	57,586	23,282	101,944	-	27,772	-	3,862	23,910	97,222	-	19,188	78,034	57,818	57,586	232	-
Jefferson	144,758	48,341	96,417	-	-	629	-	629	-	30,366	3,598	26,768	-	113,763	44,743	69,020	-
Knox	138,994	15,267	123,727	-	-	12,689	795	11,894	-	57,959	199	57,760	-	68,346	14,273	54,073	-
Liberty	141,028	4,441	136,587	-	-	24,187	1,750	22,437	-	93,246	2,510	90,736	-	23,595	181	23,414	-
Londonderry	275,632	72,646	202,077	909	-	89,490	5,112	83,469	909	134,634	16,026	118,608	-	51,508	51,508	-	-
Madison	129,493	65,885	63,608	-	-	11,085	2,604	8,481	-	62,727	12,205	50,522	-	55,681	51,076	4,605	-
Millwood	53,435	8,348	45,087	-	-	15,879	321	15,558	-	32,952	3,884	29,068	-	4,604	4,143	461	-
Monroe	126,171	65,090	61,081	-	-	-	-	-	-	2,352	1,391	961	-	123,819	63,699	60,120	-
Oxford	31,399	49,245	1,136	-	-	19,196	219	17,841	1,136	45,575	14,171	31,404	-	17,009	17,009	-	-
Richland	169,505	72,035	31,135	66,335	-	22,097	5,268	3,653	13,176	79,441	5,804	22,977	50,660	67,967	60,963	4,505	2,499
Spencer	97,224	64,069	26,283	6,872	-	5,809	255	5,440	114	24,234	1,844	16,881	5,509	67,181	61,970	3,962	1,249
Valley	200,728	36,666	47,749	116,313	-	22,237	-	7,187	15,050	147,705	10,258	37,433	100,014	30,786	26,408	3,129	1,249
Washington	133,995	50,495	83,500	-	-	8,255	40	8,215	-	33,435	1,749	31,686	-	92,305	48,706	43,599	-
Westland	119,014	76,465	42,549	-	-	3,213	438	2,775	-	11,621	4,910	6,711	-	104,180	71,117	33,063	-
Wheeling	82,320	63,171	19,149	-	-	6,811	2,007	4,804	-	45,798	33,065	12,733	-	29,711	28,099	1,612	-
Wills	193,859	125,179	68,680	-	-	17,784	4,790	12,994	-	47,305	20,116	27,189	-	128,770	100,273	28,497	-
Undistributed	142,080	-	-	-	142,080	-	-	-	-	-	-	-	-	-	-	-	-
HARRISON	2,985,459	841,265	1,540,822	586,894	16,478	759,818	30,416	449,030	280,372	1,309,443	124,237	878,684	306,522	899,720	686,612	213,108	-
Archer	191,856	76,515	79,583	35,758	-	39,049	2,499	20,474	16,076	81,442	15,783	45,977	19,682	71,365	58,233	13,132	-
Athens	170,275	5,296	86,380	77,069	1,530	57,279	3,551	39,501	14,227	111,466	1,745	46,879	62,842	-	-	-	-
Cadiz	222,716	77,680	102,439	42,597	-	61,411	1,284	33,387	26,740	93,384	10,065	67,462	15,857	67,921	66,331	1,590	-
Franklin	155,660	57,381	98,279	-	-	34,213	-	34,213	-	47,077	2,028	45,049	-	74,370	55,353	19,017	-
Freeport	218,425	50,249	145,459	22,717	-	121,784	99	98,968	22,717	47,048	557	46,491	-	49,593	49,593	-	-

LAWRENCE.....	1,862,713	953,205	610,827	24,881	273,800	263,928	49,477	193,148	21,303	643,596	258,991	381,027	3,578	681,389	644,737	36,652	-
Aid	236,958	136,990	85,712	14,256	-	46,994	5,718	30,598	10,678	108,943	51,477	53,888	3,578	81,021	79,795	1,226	-
Decatur	117,502	42,335	75,052	115	-	38,600	7,337	31,148	115	75,920	32,016	43,904	-	2,982	2,982	-	-
Elizabeth	80,257	37,399	42,858	-	-	21,558	3,707	17,851	-	45,789	21,050	24,739	-	12,910	12,642	268	-
Fayette	155,887	178,627	17,260	-	-	3,074	1,451	1,623	-	35,403	23,476	11,927	-	117,410	113,700	3,710	-
Hamilton	7,541	259	7,282	-	-	799	60	739	-	3,022	-	3,022	-	3,720	199	3,521	-
Lawrence	141,103	120,761	20,342	-	-	17,855	10,991	6,864	-	57,280	43,802	13,478	-	65,968	65,968	-	-
Mason	126,040	100,910	23,287	1,843	-	7,726	775	5,108	1,843	21,924	4,076	17,848	-	96,390	96,059	331	-
Perry	155,658	28,839	126,819	-	-	27,930	4,294	23,636	-	95,022	16,849	78,173	-	32,706	7,696	25,010	-
Rome	71,084	71,084	-	-	-	-	-	-	-	-	-	-	-	71,084	71,084	-	-
Symes	184,632	90,168	86,081	8,383	-	47,338	7,684	31,271	8,383	96,219	43,861	52,358	-	41,075	38,623	2,452	-
Union	73,354	73,354	-	-	-	-	-	-	-	-	-	-	-	73,354	73,354	-	-
Upper	54,345	10,569	43,492	284	-	15,019	1,802	12,933	284	39,004	8,445	30,559	-	322	322	-	-
Washington	97,804	18,992	78,812	-	-	36,350	5,477	30,873	-	61,213	13,274	47,939	-	241	241	-	-
Windsor	86,748	82,918	3,830	-	-	685	181	504	-	3,857	665	3,192	-	82,206	82,072	134	-
Undistributed	273,800	-	-	-	273,800	-	-	-	-	-	-	-	-	-	-	-	-
LICKING.....	28,000	-	-	-	28,000	-	-	-	-	-	-	-	-	-	-	-	-
Undistributed	28,000	-	-	-	28,000	-	-	-	-	-	-	-	-	-	-	-	-
MAHONING.....	1,049,678	144,534	427,640	-	477,504	86,854	18,605	68,249	-	365,852	89,231	276,621	-	119,468	36,698	82,770	-
Beaver	97,786	22,163	75,623	-	-	16,266	4,633	11,633	-	73,664	14,747	58,917	-	7,856	2,783	5,073	-
Berlin	11,019	-	11,019	-	-	-	-	-	-	-	-	-	-	11,019	-	11,019	-
Boardman	9,841	7,457	2,384	-	-	523	322	201	-	6,456	4,273	2,183	-	2,862	2,862	-	-
Canfield	34,413	7,800	26,613	-	-	3,796	1,491	2,305	-	20,216	4,475	15,741	-	10,401	1,834	8,567	-
Ellsworth	7,289	-	7,289	-	-	-	-	-	-	-	-	-	-	7,289	-	7,289	-
Goshen	123,484	44,969	78,515	-	-	5,007	2,420	2,587	-	75,113	28,933	46,180	-	43,364	13,616	29,748	-
Green	123,081	23,953	99,128	-	-	40,033	6,440	33,593	-	80,904	16,141	64,763	-	2,144	1,372	772	-
Poland	15,290	8,605	6,685	-	-	403	-	403	-	6,388	442	5,946	-	8,499	8,163	336	-
Smith	53,927	338	53,589	-	-	5,969	-	5,969	-	28,428	338	28,090	-	19,530	12,530	19,530	-
Springfield	96,044	29,249	66,795	-	-	14,857	3,299	11,558	-	74,683	19,882	54,801	-	6,504	6,068	436	-
Undistributed	477,504	-	-	-	477,504	-	-	-	-	-	-	-	-	-	-	-	-
MEDINA.....	73,000	-	-	-	73,000	-	-	-	-	-	-	-	-	-	-	-	-
Undistributed	73,000	-	-	-	73,000	-	-	-	-	-	-	-	-	-	-	-	-
MEIGS.....	942,190	416,141	389,359	136,690	-	280,702	41,480	166,675	72,547	331,954	82,613	185,198	64,143	329,534	292,048	37,486	-
Bedford	61,679	39,030	21,209	1,440	-	34,916	18,527	15,064	1,325	26,642	20,382	6,148	115	-	121	-	-
Chester	85,910	29,836	51,581	4,493	-	5,246	-	5,188	88	46,601	7,499	34,667	4,435	34,063	22,337	11,726	-
Columbia	55,366	-	55,165	201	-	985	918	67	-	22,248	22,114	134	-	32,133	32,133	-	-
Lebanon	117,933	18,970	88,318	10,645	-	18,446	40	15,526	2,880	71,208	7,439	56,004	7,765	28,279	11,491	16,788	-
Letart	72,566	-	46,543	26,023	-	27,030	-	16,519	3,766	30,766	-	27,262	9,504	8,770	-	8,770	-
Orange	302	302	-	-	-	-	-	-	-	302	302	-	-	-	-	-	-
Rutland	143,962	92,513	25,922	25,527	-	21,223	1,653	8,719	10,851	33,451	1,572	17,203	14,676	89,288	89,288	-	-
Salem	88,541	88,541	-	-	-	20	20	-	-	1,270	1,270	-	-	87,251	87,251	-	-
Salisbury	141,833	56,246	38,867	46,720	-	67,710	9,516	26,105	32,089	31,909	4,516	12,762	14,631	42,214	42,214	-	-
Scipio	45,535	32,454	13,081	-	-	18,646	10,685	7,961	-	19,514	14,596	4,918	-	7,375	7,173	202	-
Sutton	128,563	3,084	103,637	21,842	-	86,480	121	77,534	8,825	42,043	2,923	26,103	13,017	40	40	-	-
MONROE.....	2,985,416	275,333	441,612	345,310	1,923,161	126,549	32,053	36,897	57,599	549,697	167,220	147,181	235,296	386,009	76,060	257,534	52,415
Adams	223,237	5,982	96,319	-	120,936	5,484	-	5,484	-	55,106	4,217	50,889	-	41,711	1,765	39,946	-
Benton	27,953	1,841	-	-	26,112	-	-	-	-	1,760	1,760	-	-	81	81	-	-
Bethel	110,537	46,047	22,298	-	42,192	22,187	10,515	11,672	-	42,166	31,540	10,626	-	3,992	3,992	-	-
Center	271,795	47,106	44,176	-	180,513	1,059	1,059	-	-	8,847	8,847	-	-	81,376	37,200	44,176	-
Franklin	84,761	18,655	19,324	-	46,782	9,612	4,767	4,845	-	28,367	13,888	14,479	-	-	-	-	-
Green	37,298	14,012	23,286	-	-	-	-	-	-	4,402	-	4,402	-	32,896	14,012	18,884	-
Jackson	53,376	-	53,376	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lec	60,786	-	60,786	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Malaga	306,659	27,293	47,898	28,512	202,956	3,871	3,119	752	-	17,714	17,714	-	-	82,118	6,460	47,146	28,512
Ohio	147,428	8,165	44,517	-	94,746	-	-	-	-	8,158	4,697	3,461	-	44,524	3,468	41,056	-
Perry	85,584	23,342	4,642	-	57,600	4,805	980	3,825	-	21,414	20,597	817	-	1,765	1,765	-	-
Salem	347,089	9,710	78,261	59,558	199,560	14,341	3,743	10,598	-	87,530	9,710	33,122	44,698	45,658	-	41,396	4,262
Seneca	32,787	5,853	2,766	-	24,168	2,223	1,569	654	-	6,396	4,284	2,112	-	-	-	-	-
Summit	83,690	7,553	2,877	-	73,260	3,917	3,296	621	-	6,513	4,257	2,256	-	-	-	-	-
Sunsbury	481,014	18,675	47,555	105,004	309,780	20,920	-	2,258	18,662	102,303	13,104	20,367	68,832	48,011	5,571	24,930	17,510
Switzerland	530,932	33,073	7,693	152,236	337,930	37,188	5,806	3,043	28,339	153,389	26,973	4,650	121,766	2,425	294	-	2,131
Washington	45,914	6,554	-	-	39,360	667	-	-	-	4,435	-	-	-	1,452	-	-	-
Wayne	54,576	1,472	-	-	53,104	275	275	-	-	1,197	-	-	-	-	-	-	-
MOBGAN.....	1,419,433	291,882	583,896	124,933	418,722	218,911	32,265	132,256	54,390	449,387	93,241	285,603	70,543	332,413	166,376	166,037	-
Bloom	10,529	6,359	4,170	-	1,827	-	137	1,690	-	4,204	4,724	2,480	-	1,498	-	-	-
Bristol	68,678	9,236	57,872	1,570	-	22,852	2,342	19,669	841	45,826	6,894	38,203	729	-	-	-	-
Center	112,697	5,964	106,285	448	-	28,368	2,383	25,985	-	84,329	3,581	80,300	448	-	-	-	-
Deerfield	109,157	20,589	88,568	-	-	-	-	-	-	2,637	-	2,637	-	106,520	20,589	85,931	-
Homer	234,177	96,151	61,982	76,044	-	38,685	2,633	16,671	19,381	109,960	10,471	42,826	56,663	85,532	83,047	2,485	-

TABLE 38. - ESTIMATED ORIGINAL COAL RESERVE OF OHIO, BY COUNTY AND TOWNSHIP (CON.)
(In short tons)

County and Township	Total					Proven				Probable				Inferred				
	Total	Thickness category			Unclassified	Total	Thickness category			Total	Thickness category			Total	Thickness category			
		14"-28"	28"-54"	54"+			14"-28"	28"-54"	54"+		14"-28"	28"-54"	54"+		14"-28"	28"-54"	54"+	
MORGAN (CON.)																		
Malta	10,690	10,690	-	-	-	-	-	-	-	314	314	-	-	10,376	10,376	-	-	-
Manchester	66,223	2,217	46,080	14,236	3,690	28,347	1,099	18,785	8,463	34,186	1,118	27,295	5,773	-	-	-	-	-
Marion	19,532	8,835	3,728	6,969	-	9,728	1,986	3,330	4,412	5,793	2,838	398	2,557	4,011	4,011	-	-	-
Meigsville	70,669	50,846	19,543	280	-	24,009	14,364	9,365	280	46,660	36,482	10,178	-	-	-	-	-	-
Morgan	12,453	3,135	9,318	-	-	4,865	1,138	3,727	-	7,588	1,997	5,591	-	-	-	-	-	-
Penn	1,202	1,202	-	-	-	-	-	-	-	745	745	-	-	457	457	-	-	-
Union	174,751	37,247	114,844	22,660	-	32,672	1,319	12,782	18,571	45,528	6,562	34,877	4,089	96,551	29,366	67,185	-	-
Windsor	28,077	19,558	719	-	7,800	4,211	3,492	719	-	14,693	14,693	-	-	1,373	1,373	-	-	-
York	93,366	19,853	70,787	2,726	-	23,347	1,372	19,533	2,442	43,924	2,822	40,818	284	26,095	15,659	10,136	-	-
Undistributed	407,232	-	-	-	407,232	-	-	-	-	-	-	-	-	-	-	-	-	-
MUSKINGUM	2,029,340	523,257	1,281,476	15,103	209,504	310,082	20,321	283,975	5,786	746,940	90,679	646,944	9,317	762,814	412,257	350,557	-	-
Adams	88,168	-	88,168	-	-	6,367	-	6,367	-	57,038	-	57,038	-	24,763	24,763	-	-	-
Blue Rock	31,868	21,594	10,274	-	-	3,304	724	2,580	-	13,998	6,598	7,400	-	14,566	14,272	294	-	-
Brush Creek	141,101	13,980	127,121	-	-	40,339	2,719	37,620	-	85,110	9,756	75,354	-	15,652	1,505	14,147	-	-
Cass	1,921	99	1,822	-	-	994	-	927	-	99	99	828	-	-	-	-	-	-
Clay	32,022	636	31,386	-	-	16,637	417	16,220	-	15,385	219	15,166	-	-	-	-	-	-
Falls	4,584	443	4,141	-	-	364	-	364	-	2,617	-	2,617	-	1,603	443	1,160	-	-
Harrison	67,060	25,283	41,777	-	-	18,044	3,200	14,844	-	32,269	16,203	16,066	-	16,747	5,880	10,867	-	-
Highland	132,517	49,392	83,155	-	-	24,447	-	24,447	-	1,922	-	1,922	-	130,625	49,392	81,233	-	-
Hopewell	4,467	100	4,367	-	-	3,267	60	3,207	-	1,200	40	1,160	-	-	60	-	-	-
Jackson	60	60	-	-	-	-	-	-	-	-	-	-	-	60	60	-	-	-
Madison	53,976	6,975	47,001	-	-	27,442	2,661	24,781	-	26,534	4,314	22,220	-	-	-	-	-	-
Meigs	96,693	8,790	74,844	13,059	-	14,892	-	10,128	4,764	1,472	58,115	8,295	-	13,919	7,318	6,601	-	-
Monroe	117,696	23,881	93,815	-	-	24,447	457	23,990	-	65,476	1,531	63,945	-	27,773	21,893	5,880	-	-
Muskingum	6,362	-	6,362	-	-	3,711	-	3,711	-	2,651	-	2,651	-	-	-	-	-	-
Newton	68,896	4,147	62,705	2,044	-	41,725	259	40,444	1,022	24,490	1,207	22,261	1,022	2,681	2,681	-	-	-
Perry	164,376	54,229	110,147	-	-	8,579	159	8,420	-	47,339	2,087	45,292	-	108,418	51,983	56,435	-	-
Rich Hill	130,749	93,343	37,406	-	-	18,370	1,516	16,854	-	27,330	6,778	20,552	-	85,049	85,049	-	-	-
Salem	99,066	14,355	84,711	-	-	1,358	199	1,159	-	23,919	795	23,124	-	73,789	13,361	60,428	-	-
Salt Creek	131,949	97,594	34,355	-	-	1,789	1,391	398	-	40,081	18,249	21,832	-	90,079	77,954	-	-	-
Springfield	16,063	161	15,902	-	-	6,361	-	6,361	-	7,761	161	7,541	-	-	-	-	-	-
Union	133,214	74,613	58,601	-	-	645	645	-	-	5,489	4,831	658	-	127,080	69,137	57,913	-	-
Washington	140,689	10,680	130,009	-	-	40,843	2,302	38,541	-	91,891	3,984	87,907	-	7,955	4,394	3,561	-	-
Wayne	156,309	22,902	133,407	-	-	30,604	3,612	26,992	-	103,650	12,355	91,295	-	22,055	6,935	15,120	-	-
Undistributed	209,504	-	-	-	209,504	-	-	-	-	-	-	-	-	-	-	-	-	-
NOBLE	1,415,084	233,984	719,450	229,075	232,575	480,082	62,732	314,857	102,493	611,929	106,997	394,423	110,509	90,498	64,255	10,170	16,073	-
Beaver	93,626	8,387	51,832	3,923	29,484	21,845	962	18,081	2,802	42,297	7,425	33,751	1,121	-	-	-	-	-
Brookfield	113,254	14,935	83,971	14,348	-	69,683	-	57,521	12,162	30,087	1,451	26,450	2,186	13,484	13,484	-	-	-
Buffalo	143,331	40,597	31,855	70,879	-	5,362	-	2,238	3,124	76,386	5,257	19,447	51,682	61,583	35,340	10,170	16,073	-
Center	24,561	8,279	15,162	1,120	-	13,801	4,473	8,768	560	10,760	3,806	6,394	-	-	-	-	-	-
Elk	125,269	50,615	71,459	3,195	-	70,677	27,353	40,129	3,195	51,508	20,178	31,330	-	3,084	3,084	-	-	-
Enoch	95,280	10,671	45,107	39,502	-	56,303	6,552	27,343	22,408	38,977	4,119	17,764	17,094	-	-	-	-	-
Jackson	111,594	9,416	79,277	22,901	-	39,903	3,570	21,177	15,156	71,691	5,846	58,100	7,745	-	-	-	-	-
Jefferson	90,902	10,051	69,866	10,985	-	53,209	4,770	37,678	10,761	37,693	5,281	32,188	2,224	-	-	-	-	-
Marion	96,741	15,252	43,799	6,838	30,852	4,394	13,983	3,251	44,261	10,858	29,816	3,587	-	-	-	-	-	-
Noble	98,638	15,670	56,650	26,318	-	26,418	-	11,822	14,596	63,010	6,460	44,828	11,722	9,210	9,210	-	-	-
Olive	31,982	5,538	21,175	5,269	-	10,482	1,668	7,861	953	21,500	3,870	13,314	4,316	-	-	-	-	-
Seneca	39,371	7,971	25,346	6,054	-	15,259	2,884	11,758	617	23,814	4,789	13,588	5,437	298	298	-	-	-
Sharon	101,510	5,983	76,303	2,298	16,926	34,208	628	32,851	729	50,376	5,355	43,452	1,569	-	-	-	-	-
Stock	93,791	21,519	37,588	13,003	21,681	38,064	5,041	22,150	10,873	34,046	16,478	15,438	-	-	-	-	-	-
Wayne	21,602	9,100	10,060	2,442	-	21,602	437	1,497	10,306	15,523	5,824	8,563	1,136	2,839	2,839	-	-	-
Undistributed	133,632	-	-	-	133,632	-	-	-	-	-	-	-	-	-	-	-	-	-
PERRY	1,148,247	191,131	448,789	494,503	13,824	856,915	18,737	343,675	494,503	173,109	75,956	97,153	-	104,399	96,438	7,961	-	-
Bearfield	187,085	51,412	122,213	13,460	-	125,000	1,590	109,950	13,460	11,955	4,362	7,593	-	50,130	45,760	4,670	-	-
Clayton	120,863	7,169	67,407	46,287	-	88,810	1,446	41,077	46,287	30,723	4,796	25,927	-	1,330	927	403	-	-
Coal	56,926	2,946	1,888	52,092	-	53,954	1,034	828	52,092	2,972	1,912	1,060	-	-	-	-	-	-
Harrison	106,315	10,681	21,746	73,888	-	81,972	914	7,170	73,888	23,456	8,880	14,576	-	887	887	-	-	-
Hopewell	643	342	301	-	-	-	-	-	-	268	-	268	-	375	342	33	-	-
Jackson	25,019	6,914	16,004	2,101	-	17,907	40	15,766	2,101	5,056	4,818	238	-	2,056	2,056	-	-	-
Madison	17,666	3,615	8,599	5,452	-	11,378	451	5,475	5,452	4,373	1,249	3,124	-	1,915	1,915	-	-	-
Monday Creek	26,665	8,526	45	18,094	-	20,800	2,661	45	18,094	5,785	5,785	-	-	80	80	-	-	-
Monroe	210,528	16,247	37,121	157,160	-	188,638	4,194	27,284	157,160	15,661	5,824	9,837	-	6,229	6,229	-	-	-
Pike	156,595	32,761	119,347	4,487	-	105,419	3,761	97,171	4,487	43,354	21,178	22,176	-	7,822	7,822	-	-	-

Pleasant	69,174	29,856	18,349	20,969	-	36,146	517	14,660	20,969	5,599	1,943	3,656	-	27,429	27,396	33	-
Reading	28,497	3,143	25,354	-	-	14,101	-	14,101	-	8,854	423	8,431	-	5,542	2,720	2,822	-
Salt Lick	128,447	17,519	10,415	100,513	-	112,790	2,129	10,148	100,513	15,053	14,786	267	-	604	604	-	-
Undistributed	13,824	-	-	-	-	13,824	-	-	-	-	-	-	-	-	-	-	-
PORTAGE.....	111,824	-	-	-	-	111,824	-	-	-	-	-	-	-	-	-	-	-
Undistributed	111,824	-	-	-	-	111,824	-	-	-	-	-	-	-	-	-	-	-
SCIOTO.....	87,252	5,721	6,115	-	75,416	2,307	120	2,187	-	8,171	4,243	3,928	-	1,358	1,358	-	-
Bloom	3,316	1,403	1,913	-	-	1,061	120	941	-	1,996	1,024	972	-	259	259	-	-
Green	1,954	342	1,612	-	-	974	-	974	-	980	342	638	-	-	-	-	-
Vernon	6,566	3,976	2,590	-	-	272	-	272	-	5,195	2,877	2,318	-	1,099	1,099	-	-
Undistributed	75,416	-	-	-	75,416	-	-	-	-	-	-	-	-	-	-	-	-
STARK.....	1,442,857	212,568	707,541	15,196	507,552	118,021	19,662	92,398	5,961	522,512	86,492	426,785	9,235	294,772	106,414	188,358	-
Bethlehem	35,234	6,019	29,215	-	-	4,227	1,250	2,977	-	29,709	3,706	26,003	-	1,298	1,063	235	-
Canton	80,940	8,100	72,840	-	-	11,250	1,429	9,821	-	69,204	6,369	62,835	-	486	302	184	-
Jackson	605	-	605	-	-	-	-	-	-	605	-	605	-	-	-	-	-
Lake	4,487	1,290	2,563	634	-	3,503	746	2,123	634	984	544	440	-	-	-	-	-
Lexington	48,278	3,725	44,553	-	-	23,594	1,447	22,147	-	20,115	2,278	17,837	-	4,569	-	4,569	-
Marlboro	4,775	261	4,514	-	-	-	-	-	-	-	-	-	-	4,775	261	4,514	-
Nimishillen	94,389	26,973	67,416	-	-	3,704	-	3,704	-	37,969	5,443	32,526	-	52,716	21,530	31,186	-
Osnaburg	103,782	35,379	68,403	-	-	12,166	3,124	9,042	-	69,022	19,877	49,145	-	22,594	12,378	10,216	-
Paris	179,413	51,019	119,875	8,519	-	15,181	636	11,240	3,305	89,472	5,428	78,830	5,214	74,760	44,955	29,805	-
Perry	30,991	6,027	24,964	-	-	415	-	415	-	15,799	100	15,699	-	14,777	5,922	8,850	-
Pike	92,733	29,391	62,593	749	-	24,582	5,832	18,001	749	65,793	21,731	44,062	-	2,358	1,828	530	-
Sandy	41,783	17,717	24,066	-	-	10,170	2,046	8,124	-	29,013	14,131	14,882	-	2,600	1,540	1,060	-
Sugar Creek	5,905	5,905	-	-	-	826	826	-	-	4,616	4,616	-	-	463	463	-	-
Tuscarawas	383	-	-	-	-	-	-	-	-	-	-	-	-	-	383	383	-
Washington	211,607	20,379	185,934	5,294	-	8,403	2,326	4,804	1,273	90,211	2,269	83,921	4,021	112,993	15,784	97,209	-
Undistributed	507,552	-	-	-	507,552	-	-	-	-	-	-	-	-	-	-	-	-
SUMMIT.....	228,000	-	-	-	228,000	-	-	-	-	-	-	-	-	-	-	-	-
Undistributed	228,000	-	-	-	228,000	-	-	-	-	-	-	-	-	-	-	-	-
TRUMBULL.....	149,760	-	-	-	149,760	-	-	-	-	-	-	-	-	-	-	-	-
Undistributed	149,760	-	-	-	149,760	-	-	-	-	-	-	-	-	-	-	-	-
TUSCARAWAS.....	2,026,110	535,940	1,409,712	35,810	44,648	500,331	51,740	428,398	20,193	1,009,923	301,894	692,412	15,617	471,208	182,306	288,902	-
Auburn	53,560	30,203	23,357	-	-	14,213	4,055	10,158	-	28,434	21,350	7,084	-	10,913	4,798	6,115	-
Bucks	33,216	17,126	9,700	5,576	-	17,126	5,576	4,124	-	40,622	27,620	13,002	-	20	20	-	-
Clay	101,658	5,418	96,240	-	-	16,951	159	16,792	-	51,019	2,820	48,199	-	33,688	2,439	31,249	-
Dover	106,821	33,112	73,709	-	-	31,592	8,930	22,662	-	69,423	18,376	51,047	-	5,806	5,806	-	-
Fairfield	93,613	27,404	66,209	-	-	22,305	2,921	19,384	-	58,769	11,944	46,825	-	12,539	12,539	-	-
Franklin	17,591	5,593	11,998	-	-	8,160	1,885	6,275	-	9,170	3,447	5,723	-	261	261	-	-
Goshen	74,344	5,531	59,896	8,917	-	25,636	1,108	20,268	4,260	45,277	1,853	38,767	4,657	3,431	2,570	861	-
Jefferson	85,149	45,515	39,634	-	-	21,140	4,223	16,917	-	59,836	37,119	22,717	-	4,173	4,173	-	-
Lawrence	49,042	26,491	22,551	-	-	9,292	2,553	6,739	-	33,911	18,334	15,577	-	5,839	5,604	235	-
Mill	154,777	37,264	99,238	18,275	-	67,903	4,193	54,692	9,018	77,258	23,455	44,546	9,257	9,616	9,616	-	-
Oxford	77,560	23,523	54,037	-	-	6,559	1,093	5,466	-	41,996	15,318	26,678	-	29,005	7,112	21,893	-
Perry	142,588	52,428	90,160	-	-	2,982	-	2,982	-	16,426	557	15,869	-	123,180	51,871	71,309	-
Rush	197,502	65,006	126,135	6,361	-	30,429	696	24,905	4,828	96,360	15,619	79,208	1,533	70,713	48,691	22,022	-
Salem	101,438	39,325	62,113	-	-	20,240	5,622	14,618	-	80,560	33,703	46,857	-	638	638	-	-
Sandy	73,357	20,058	52,723	576	-	28,900	2,679	25,645	576	43,596	17,379	26,217	-	861	861	-	-
Sugarcreek	20,059	2,180	17,879	-	-	5,290	40	5,250	-	11,487	201	11,286	-	3,282	1,939	1,343	-
Union	168,735	18,414	150,321	-	-	85,892	342	85,550	-	75,385	12,436	62,949	-	7,458	5,636	1,822	-
Warren	108,004	23,314	84,690	-	-	27,100	1,114	25,986	-	66,767	10,851	55,916	-	14,137	11,349	2,788	-
Warwick	71,662	23,102	48,560	-	-	33,553	2,479	31,074	-	36,718	19,232	17,486	-	1,391	1,391	-	-
Washington	156,015	6,048	149,967	-	-	3,909	-	3,909	-	21,349	-	21,349	-	130,757	6,048	124,709	-
Wayne	12,401	3,464	8,937	-	-	6,428	1,086	5,342	-	5,933	2,338	3,595	-	40	40	-	-
York	65,244	9,331	54,232	1,681	-	22,157	986	19,660	1,511	39,627	7,942	31,515	170	3,460	3,460	3,057	-
Undistributed	44,648	-	-	-	44,648	-	-	-	-	-	-	-	-	-	-	-	-
VINTON.....	1,172,123	333,319	505,784	9,300	323,720	276,875	61,971	208,732	6,172	534,385	234,205	297,052	3,128	37,143	37,143	-	-
Brown	148,522	43,301	100,904	4,317	-	55,866	9,777	44,612	1,477	92,314	33,182	56,292	-	2,840	342	342	-
Clinton	72,125	24,310	47,815	-	-	25,945	6,913	19,032	-	45,837	17,054	28,783	-	343	343	-	-
Elk	76,455	16,902	59,553	-	-	32,248	4,708	27,540	-	43,723	11,710	32,013	-	484	484	-	-
Knox	61,870	40,469	21,401	-	-	26,199	13,544	12,655	-	35,671	26,925	8,746	-	-	-	-	-
Madison	126,870	64,480	59,395	2,995	-	37,546	11,698	23,141	2,707	85,353	48,811	36,254	288	3,971	3,971	-	-
Richland	645	645	-	-	-	484	-	484	-	161	161	-	-	-	-	-	-
Swan	33,931	10,400	23,531	-	-	13,870	1,551	12,319	-	17,965	6,753	11,212	-	2,096	2,096	-	-
Vinton	166,045	60,802	105,243	-	-	39,887	7,647	32,240	-	119,001	45,998	73,003	-	7,157	7,157	-	-
Wilkesville	161,940	72,010	87,942	1,988	-	44,830	5,649	37,193	1,988	94,360	43,611	50,749	-	22,750	22,750	-	-
Undistributed	323,720	-	-	-	323,720	-	-	-	-	-	-	-	-	-	-	-	-

ESTIMATED ORIGINAL RESERVE

TABLE 38. - ESTIMATED ORIGINAL COAL RESERVE OF OHIO, BY COUNTY AND TOWNSHIP (CON.)
(In short tons)

County and Township	Total					Proven				Probable				Inferred			
	Total	Thickness category			Unclassified	Total	Thickness category			Total	Thickness category			Total	Thickness category		
		14"-28"	28"-54"	54"+			14"-28"	28"-54"	54"+		14"-28"	28"-54"	54"+		14"-28"	28"-54"	54"+
WASHINGTON.....	1,262,721	441,809	237,919	16,269	566,724	169,922	78,000	89,792	2,130	371,017	231,085	134,721	5,211	155,058	132,724	13,406	8,928
Adams	84,242	43,253	40,989	-	-	26,055	6,826	19,229	-	45,927	24,167	21,760	-	12,260	12,260	-	-
Aurélius	46,274	8,442	36,711	1,121	-	24,036	2,991	20,204	841	22,238	5,451	16,507	280	-	-	-	-
Barlow	67,980	-	-	-	67,980	-	-	-	-	-	-	-	-	-	-	-	-
Belpre	30,072	-	-	-	30,072	-	-	-	-	-	-	-	-	-	-	-	-
Decatur	49,265	19,929	6,301	11,785	-	2,353	1,981	372	-	13,509	9,583	1,069	2,857	22,153	8,365	4,860	8,928
Dunham	40,176	-	-	-	40,176	-	-	-	-	-	-	-	-	-	-	-	-
Fairfield	27,425	785	-	-	26,640	-	-	-	-	-	-	-	-	785	785	-	-
Fearing	48,288	24,909	2,547	-	20,832	2,742	1,230	1,512	-	16,161	15,126	1,035	-	8,553	8,553	-	-
Grandview	95,289	11,289	-	-	84,000	1,653	1,653	-	-	4,697	4,697	-	-	4,939	4,939	-	-
Independence	7,986	552	-	-	7,434	373	373	-	-	179	179	-	-	-	-	-	-
Lawrence	107,586	51,312	31,758	-	24,516	19,097	10,136	8,961	-	53,420	30,623	22,797	-	10,553	10,553	-	-
Liberty	156,639	118,179	19,584	-	18,876	25,803	20,441	5,362	-	81,619	67,397	14,222	-	30,341	30,341	-	-
Ludlow	71,958	37,249	2,453	-	32,256	13,959	12,044	1,915	-	22,840	22,302	538	-	2,903	2,903	-	-
Marietta	13,224	-	-	-	13,224	-	-	-	-	-	-	-	-	-	-	-	-
Muskingum	10,895	863	-	-	10,032	-	-	-	-	745	745	-	-	118	118	-	-
Newport	45,964	6,688	-	-	39,276	2,844	2,844	-	-	1,765	1,765	-	-	2,079	2,079	-	-
Salem	96,707	41,775	44,712	392	9,828	43,830	15,343	28,095	392	43,049	26,432	16,617	-	-	-	-	-
Warren	62,748	-	-	-	62,748	-	-	-	-	-	-	-	-	-	-	-	-
Waterford	63,927	26,521	37,406	-	-	4,163	490	3,673	-	41,854	8,121	33,733	-	17,910	17,910	-	-
Watertown	87,633	20,049	-	-	67,584	-	-	-	-	-	-	-	-	20,049	20,049	-	-
Wesley	48,443	30,014	15,458	2,971	-	3,014	1,648	469	897	23,014	14,497	6,443	2,074	22,415	13,869	8,546	-
WAYNE.....	261,064	10,925	10,371	-	239,768	8,735	5,443	3,292	-	7,328	4,616	2,712	-	5,233	866	4,367	-
Franklin	5,307	3,266	2,041	-	-	3,690	1,976	1,714	-	1,617	1,290	327	-	-	-	-	-
Paint	11,609	6,470	5,139	-	-	4,722	3,144	1,578	-	5,711	3,326	2,385	-	1,176	-	1,176	-
Salt Creek	3,735	544	3,191	-	-	-	-	-	-	-	-	-	-	3,735	544	3,191	-
Sugar Creek	645	-	-	-	-	-	-	-	-	-	-	-	-	322	322	-	-
Undistributed	239,768	-	-	-	239,768	-	-	-	-	-	-	-	-	-	-	-	-

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APPENDIX A

ANALYSES OF OHIO COAL, BY BED

County	Township	File number	Kind	Source	Condition	Proximate analysis					Ultimate analysis				Heat value		Year
						Moisture	Volatiles	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories	B. t. u.	
WASHINGTON																	
BELMONT	WASHINGTON	152	1	1	1	408	3369	4123	2100	286	476	5993	109	1036	6012	10822	14
					2	3512	4298	2190	298	449	6248	114	701	6268	11282		
					3	4497	5503		382	575	8000	146	897	8026	14446		
					4	4307	5693							8279	14902		
					5	539	4075	5386						7833	14098		
WAYNESBURG A																	
MORGAN	WINDSOR	499	1	2	1	408	3854	5026	712	445	630	5840	108	2265	6197	11154	29
					2	4018	5240	742	464	610	6088	113	1983	6460	11628		
					3	4340	5660		501	659	6576	122	2142	6978	12560		
					4	4219	5781							7079	12742		
					5	4027	519							6758	12165		
WAYNESBURG																	
BELMONT	COLERAIN	214	1	2	1	527	3742	4261	1470	219	497	6445	144	1225	6434	11581	27
					2	3950	4498	1552	231	462	6804	152	799	6793	12225		
					3	4676	5324		273	547	8054	180	946	8040	14471		
					4	4555	5445							8207	14773		
					5	636	4265	5099						7686	13835		
"	GOSHEN	213	1	1	1	431	3532	4415	1622	353	498	6410	120	997	6447	11605	14
					2	3691	4614	1695	369	470	6698	125	643	6737	12127		
					3	4444	5555		444	566	8065	151	774	8112	14602		
					4	4278	5722							8328	14991		
					5	555	4049	5416						7883	14190		
"	MEAD	212	1	2	1	351	3758	4194	1687	359	470	6318	125	1041	6320	11377	27
					2	3905	4347	1748	372	447	6548	129	756	6550	11791		
					3	4732	5268		451	542	7935	156	916	7937	14289		
					4	4573	5427							8153	14676		
					5	440	4372	5188						7795	14031		
"	RICHLAND	211	1	2	1	358	3736	4589	1307	175					6678	12020	27
					2	3878	4765	1357	182					6933	12479		
					3	4487	5513		211					8022	14438		
					4	4383	5617							8160	14688		
					5	4194	5373							7806	14051		
"	SMITH	209	1	2	1	178	3916	4355	1541	268	487	6515	118	1071	6505	11709	26
					2	3987	4444	1569	273	475	6633	120	930	6623	11921		
					3	4729	5271		324	563	7868	142	1103	7856	14139		
					4	4601	5399							8028	14450		
					5	217	4501	5282						7853	14136		
"	"	210	1	2	1	372	3586	4431	1411	250					6439	11590	27
					2	3083	4701	1496	265					6830	12232		
					3	4472	5528		312					8032	14456		
					4	4342	5658							8200	14760		
					5	686	4045	5269						7638	13749		
"	SOMERSET	153	1	1	1	446	3660	4419	1475	302	510	6532	116	1065	6553	11795	14
					2	3831	4625	1544	316	481	6837	121	701	6859	12346		
					3	4531	5469		374	569	8085	143	829	8111	14600		
					4	4389	5611							8299	14939		
					5	541	4152	5307						7850	14130		
"	UNION	619	3	3	1	42	349	447	162	30					6430	11574	57
					2	364	467	169	31					6712	12081		
					3	438	562		37					8077	14538		
					4	422	578							8277	14899		
					5	52	401	547						7849	14129		
"	WASHINGTON	164	1	1	1	457	3681	4417	1445	259					6574	11833	14
					2	3857	4629	1514	271					6889	12400		
					3	4545	5455		319					8118	14612		
					4	4415	5585							8293	14928		
					5	551	4172	5277						7837	14106		
"	WAYNE	154	1	1	1	440	3710	4306	1544	290					6476	11657	14
					2	3881	4504	1615	303					6774	12193		
					3	4629	5371		361					8079	14541		
					4	4483	5512							8270	14886		
					5	538	4247	5215						7825	14085		
"	"	208	2	2	1	559	3838	3970	1633	320					6110	10999	26
					2	4066	4205	1729	339					6472	11650		
					3	4916	5084		410					7825	14085		
					4	4772	5228							8027	14448		
					5	694	4440	4866						7471	13447		

COAL RESOURCES OF OHIO

County	Township	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis				Heat value		Year		
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories		B. t. u.	
BELMONT (Cont'd)	YORK	207	1	2	1	28.4	40.07	43.75	13.34	4.91					6526	11746	26	
					2		41.24	45.03	13.73	5.06						6716		12089
					3		47.80	52.20		5.87						7785		14013
					4		46.27	53.73								7981		14366
					5	34.3	44.68	51.89								7708		13874
WAYNESBURG (CON.)																		
BELMONT	GOSHEN	155	1	1	1	47.0	34.21	45.75	15.34	2.85	4.95	63.71	1.33	11.82	6479	11662	14	
					2		35.90	48.00	16.10	2.99	4.65	66.85	1.40	8.01	6799	12238		
					3		42.79	57.21		3.56	5.54	79.68	1.67	9.55	8104	14586		
					4		41.27	58.73							8294	14930		
					5	57.4	38.90	55.36							7817	14071		
UNIONTOWN																		
"	"	216	1	2	1	8.3	41.21	44.29	13.67	2.59					6747	12145	26	
					2		41.56	44.66	13.78	2.81					6803	12246		
					3		48.20	51.80		3.03					7890	14203		
					4		47.10	52.90							8043	14478		
					5	9.9	46.63	52.38							7964	14336		
MONROE	ADAMS	156	1	1	1	48.5	35.93	43.90	15.32	3.96	4.87	63.59	1.19	11.07	6412	11542	14	
					2		37.76	46.14	16.10	4.16	4.55	66.83	1.25	7.11	6739	12130		
					3		45.01	54.99		4.96	5.42	79.66	1.49	8.47	8032	14458		
					4		43.33	56.67							8246	14842		
					5	5.97	40.75	53.28							7754	13957		
"	"	215	1	2	1	25.7	40.87	42.82	13.74	3.06	4.83	65.96	1.37	11.04	6573	11831	26	
					2		41.95	43.94	14.11	3.15	4.73	67.68	1.40	8.93	6746	12143		
					3		48.84	51.16		3.67	5.51	78.79	1.63	10.40	7854	14138		
					4		47.65	52.35							8019	14435		
					5	3.08	46.17	50.75							7772	13989		
MEIGS CREEK																		
BELMONT	FLUSHING	149	1	1	1	46.3	33.84	52.50	9.03	2.18						6		
					2		35.48	50.05	9.47	2.29								
					3		39.19	60.81		2.53								
					4		38.19	61.81		2.53								
					5	5.20	36.21	58.59										
"	"	177	1	1	1	55.1	35.95	49.89	8.65	2.31						6		
					2		38.05	52.80	9.15	2.44								
					3		41.88	58.12		2.69								
					4		40.94	59.06										
					5	6.16	38.41	55.43										
"	"	423	1	2	1	49.8	33.30	48.90	12.82	2.41	4.95	66.31	1.19	12.32	6652	11974	7	
					2		35.05	51.46	13.49	2.53	4.63	69.79	1.25	8.31	7001	12602		
					3		40.52	59.48		2.92	5.35	80.68	1.44	9.61	8093	14567		
					4		39.22	60.78							8247	14845		
					5	5.87	36.91	57.22							7713	13973		
"	GOSHEN	148	1	1	1	42.3	36.41	47.91	11.45	3.16						6		
					2		38.02	50.02	11.96	3.30								
					3		43.18	56.82		3.75								
					4		41.92	58.08										
					5	4.92	39.86	55.22										
"	"	422	1	2	1	34.0	35.72	45.94	14.94	4.39	4.86	64.77	1.08	9.96	6578	11840	7	
					2		36.98	47.56	15.46	4.54	4.64	67.05	1.12	7.19	6809	12256		
					3		43.74	56.26		5.37	5.49	79.32	1.32	8.50	8054	14497		
					4		41.99	58.01							8270	14886		
					5	4.17	40.24	55.59							7926	14267		
"	PEASE	421	1	2	1	45.5	36.19	42.97	16.19	3.13	4.72	62.63	1.26	12.07	6265	11278	27	
					2		37.95	45.07	16.98	3.28	4.41	65.68	1.32	8.33	6571	11828		
					3		45.71	54.29		3.95	5.31	79.12	1.59	10.03	7915	14247		
					4		44.18	55.82							8114	14606		
					5	5.76	41.64	52.60							7647	13765		
"	PULTNEY	419	1	2	1	38.8	38.84	43.96	13.32	2.71						27		
					2		40.41	45.73	13.86	2.82								
					3		46.91	53.09		3.27								
					4		45.73	54.27										
					5	4.61	43.62	51.77										
"	"	420	1	2	1	41.3	39.58	42.47	13.82	3.38	5.03	65.61	1.21	10.95	6584	11852	27	
					2		41.29	44.30	14.41	3.52	4.77	68.44	1.26	7.60	6868	12363		
					3		48.24	51.76		4.11	5.57	79.97	1.47	8.88	8024	14444		
					4		46.94	53.06							8207	14772		
					5	4.96	44.61	50.43							7799	14039		
"	RICHLAND	417	1	2	1	55.1	38.18	44.01	12.30	2.60						27		
					2		40.11	46.57	13.02	2.75								
					3		46.46	53.54		3.16								
					4		45.33	54.67										
					5	6.46	42.39	51.15										

County	Township	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis					Heat value		Year			
						Mois- ture	Vola- tile	Fixed carbon	Ash	Sulphur	Hydro- gen	Carbon	Nitro- gen	Oxygen	Calo- ries	B. t. u.				
BELMONT	RICHLAND	418	1	2		MEIGS CREEK (CON.)													27	
						467	3986	4326	1221	335								6672		12010
						4181	4538	1281	352									6999		12598
						4795	5205		404									8027		14449
						4675	5325											8193		14748
		550	4418	5032										7743	13937					
		"	600	1	3		314	3589	4411	1676	321	480	6417	101	1005	6415	11547			
							4493	5507	1730	332	460	6625	104	749	6623	11921				
							4333	5667		401	556	8011	126	906	8008	14415				
							392	4164	5444									8216	14788	
																		7894	14209	
		SMITH	416	1	2		352	3474	4990	1184	367	502	6736	105	1106	6884	12391			
							3601	5172	1227	380	480	6982	109	822	7135	12843				
							4105	5895		433	547	7959	124	937	8133	14639				
							413	3794	5793									8303	14946	
																		7961	14329	
		UNION	414	1	2		417	3509	5114	960	311	497	6990	109	1133	7001	12602			
							3662	5336	1002	324	470	7294	114	796	7306	13150				
							4070	5930		360	522	8106	127	885	8120	14614				
							3950	6050										8256	14861	
							474	3763	5763									7864	14156	
		"	415	1	2		431	3247	5154	1168	194	509	6832	111	1186	6837	12307			
							3393	5386	1221	203	482	7140	115	839	7145	12861				
							3865	6135		231	549	8133	131	956	8139	14650				
							3751	6249										8272	14889	
							499	3564	5937									7858	14145	
		WARREN	157	1	1		434	3895	4550	1121	365	531	6817	120	1046	6890	12402			
	4072						4756	1172	382	505	7126	125	690	7203	12965					
	4613						5397		433	572	8071	142	782	8159	14686					
	4488						5512										8326	14986		
	505						4261	5234									7904	14228		
	"	413	1	2		447	3531	4715	1307	327	499	6583	113	1171	6668	12002				
						3696	4956	1368	342	471	6891	118	810	6980	12564					
						4282	5718		396	546	7984	136	938	8086	14555					
						4139	5861										8261	14870		
						532	3919	5549									7822	14079		
	WASHINGTON	165	1	1		351	3715	4153	1781	405					6396	11513				
						3850	4304	1846	420								6629	11932		
						4722	5278		515								8130	14633		
						4546	5454										8376	15076		
						447	4342	5211									8001	14401		
	WAYNE	412	1	2		421	3951	4386	1242	281					6786	12214				
						4125	4578	1297	294								7084	12751		
						4740	5260		338								8140	14651		
						4627	5373										8299	14938		
						495	4397	5108									7887	14197		
	WHEELING	411 ⁵	1	2		752	3175	4949	1124	211	514	6641	111	1399	6589	11860				
						3433	5352	1215	228	465	7181	121	790	7125	12824					
						3908	6092		260	529	8174	138	899	8110	14598					
						3789	6211										8246	14843		
						867	3451	5672									7532	13558		
	"	585	1	3		235	3143	4181	2441	234					5757	10363				
						3219	4281	2500	240								5897	10615		
						4292	5785		320								7863	14153		
						4078	5922										8134	14641		
						325	3945	5730									7868	14162		
	"	585	2	1	3	245	3457	5273	1025	261					6937	12488				
						3544	5405	1051	268								7111	12801		
						3960	6040		299								7946	14304		
						3846	6154										8073	14531		
						280	3738	5932									7847	14124		
	"	585	3	1	3	242	3453	5233	1072	193					6962	12533				
						3538	5363	1099	198								7135	12844		
						3975	6025		222								8016	14430		
						3873	6127										8134	14642		
						277	3766	5957									7909	14236		
	"	585	4	1	3	219	3945	4959	877	335					7149	12869				
						4033	5070	897	343								7309	13157		
						4430	5570		377								8029	14453		
						4325	5675										8158	14685		
						247	4218	5535									7957	14322		
	"	585	9	1	3	237	3476	4941	1346	245					6710	12078				
						3550	5061	1379	251								6872	12371		
						4129	5871		291								7971	14350		
						4000	6000										8126	14626		
						282	3888	5830									7896	14213		
	YORK	410	1	2		326	4094	4482	1098	386	506	6907	119	984	6946	12502				
						4232	4634	1134	400	486	7139	123	718	7180	12923					
						4773	5227		451	548	8052	139	810	8098	14576					
						4654	5346										8262	14872		
						379	4478	5143									7950	14310		

COAL RESOURCES OF OHIO

County	Township	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis					Heat value		Year	
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories	B. t. u.		
																		1
HARRISON	ATHENS	409	1	2	1	535	3309	MEIGS	CREEK (CON.)	1029	220	521	6867	125	1238	6885	12393	7
						2	3496	5417	1087	232	488	7255	132	806	7274	13093		
						3	3922	6078		232	548	8140	148	904	8191	14690		
						4	3813	6187		260					8288	14919		
						5	610	3580	5810						7783	14009		
	"	"	521	17	1	3	193	3913	4989	905	419					7074	12733	49
							2	3990	5087	923	427					7213	12983	
							3	4396	5604		470					7946	14303	
							4	4271	5729							8091	14563	
							5	220	4177	5603						7913	14244	
	"	"	521	27	1	3	173	3698	4753	1376	310					6810	12259	49
							2	3753	4836	1401	315					6930	12475	
							3	4376	5624		366					8059	14508	
							4	4240	5750							8231	14816	
							5	207	4152	5641						8059	14507	
	"	"	521	37	1	3	193	3470	4921	1416	405					6737	12126	49
							2	3538	5018	1444	413					6869	12365	
							3	4135	5865		483					8028	14452	
							4	3966	6034							8224	14803	
							5	234	3873	5893						8031	14456	
"	"	521	47	1	3	186	3734	5214	866	242					7203	12966	49	
						2	3805	5313	882	247					7340	13212		
						3	4173	5827		271					8050	14480		
						4	4080	5920							8159	14687		
						5	208	3995	5797						7989	14381		
"	"	521	57	1	3	172	3938	5087	803	242					7306	13151	49	
						2	4007	5176	817	246					7434	13381		
						3	4353	5637		268					8095	14571		
						4	4279	5721							8200	14760		
						5	191	4197	5612						8043	14478		
"	"	521	97	1	3	187	3718	5000	1095	341					6993	12588	49	
						2	3789	5095	1116	347					7126	12828		
						3	4265	5735		391					8021	14439		
						4	4139	5861							8171	14708		
						5	217	4048	5735						7994	14389		
"	"	523	17	1	3	190	3813	4986	1011	367					7031	12656	49	
						2	3887	5083	1030	374					7167	12901		
						3	4333	5667		417					7990	14382		
						4	4210	5790							8136	14644		
						5	218	4118	5664						7959	14326		
"	"	523	27	1	3	202	3358	5014	1426	179					6674	12014	49	
						2	3427	5118	1455	183					6812	12261		
						3	4011	5989		214					7972	14349		
						4	3887	6113							8118	14613		
						5	242	3794	5964						7923	14261		
"	"	523	37	1	3	216	3476	5478	830	145					7163	12894	49	
						2	3553	5599	848	148					7321	13178		
						3	3882	6118		162					7999	14399		
						4	3805	6195							8087	14556		
						5	239	3715	6046						7893	14208		
"	"	523	47	1	3	190	3171	4752	1887	111					6294	11329	49	
						2	3232	4845	1923	113					6416	11548		
						3	4001	5999		140					7944	14297		
						4	3858	6142							8121	14618		
						5	240	3767	5993						7927	14268		
"	"	523	57	1	3	206	3582	5517	695	135					7277	13099	49	
						2	3657	5633	710	138					7430	13374		
						3	3936	6064		149					7998	14396		
						4	3871	6129							8072	14529		
						5	225	3784	5991						7891	14203		
"	"	523	67	1	3	220	3488	5131	1161	256					6803	12246	49	
						2	3566	5247	1187	262					6957	12522		
						3	4046	5954		297					7894	14209		
						4	3926	6074							8029	14452		
						5	256	3826	5918						7823	14082		
"	"	523	97	1	3	203	3528	5143	1126	221					6910	12438	49	
						2	3601	5250	1149	226					7053	12696		
						3	4068	5932		255					7969	14344		
						4	3959	6041							8098	14572		
						5	234	3867	5899						7906	14231		
MONROE	PERRY	408	1	2	1	252	3930	4384	1454	359	493	6678	95	921	6759	12167	27	
					2	4023	4489	1488	368	478	6837	97	732	6920	12456			
					3	4726	5274		432	562	8032	114	860	8130	14633			
					4	4587	5413							8324	14983			
					5	282	4458	5260						8090	14562			
MORGAN	BRISTOL	407	1	2	1	505	3783	4675	1037	430	514	6704	89	1226	6730	12114	7	
					2	3984	4924	1092	453	482	7061	94	818	7088	12758			
					3	4472	5528		509	541	7926	106	918	7957	14322			
					4	4335	5665							8122	14620			
					5	584	4082	5334						7648	13766			

County	Township	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis					Heat value		Year
						Mois-ture	Vol-a-tile	Fixed carbon	Ash	Sulphur	Hydro-gen	Carbon	Nitro-gen	Oxygen	Calo-ries	B. t. u.	
MORGAN	BRISTOL	542	7	3	1	359	3976	4154	1501	621					6497	11694	50
							4128	4313	1559	645					6746	12142	
							4890	5110		764					7992	14385	
							4704	5296							8248	14846	
						459	4489	5052							7868	14163	
		597 A1	3	3	1	220	3742	4347	1691	740					6386	11496	53
							3826	4445	1729	757					6530	11755	
							4626	5374		915					7895	14212	
							4387	5613							8190	14743	
						283	4263	5454							7958	14325	
		597 A2	3	3	1	212	3911	4467	1410	698					6640	11953	53
							3996	4564	1440	713					6784	12212	
							4668	5332		833					7926	14267	
							4468	5535							8180	14724	
						262	4348	5390							7965	14337	
		597 A3	3	3	1	216	4074	4599	1111	482					6929	12472	53
							4164	4700	1136	493					7081	12747	
							4698	5302		556					7988	14380	
							4559	5441							8168	14703	
						253	4443	5304							7961	14330	
		597 A4	3	3	1	194	3440	3970	2396	385					5819	10474	53
							3508	4049	2443	393					5934	10681	
							4642	5358		520					7852	14133	
							4416	5584							8151	14673	
						269	4298	5433							7932	14278	
		597 A5	3	3	1	218	4399	4757	626	481					7312	13162	53
							4497	4863	640	492					7475	13455	
							4804	5196		525					7986	14375	
							4701	5299							8119	14615	
						241	4588	5171							7924	14263	
		597 A6	3	3	1	192	4091	4660	1057	378					7004	12608	53
							4171	4751	1078	385					7141	12855	
							4675	5325		432					8004	14408	
							4575	5442							8157	14683	
						221	4458	5321							7976	14356	
		597 A7	3	3	1	203	3918	4527	1352	405					6660	11988	53
							3999	4621	1380	413					6797	12236	
							4639	5361		479					7886	14195	
							4496	5504							8068	14524	
						241	4386	5370							7872	14170	
		597 A8	3	3	1	185	3957	4310	1548	339					6516	11729	53
							4032	4391	1577	345					6639	11950	
							4787	5213		410					7882	14188	
							4648	5352							8070	14527	
						227	4542	5231							7887	14197	
		597 A9	3	3	1	214	3959	4478	1349	493	497	6613	103	945	6704	12067	53
							4046	4576	1378	504	484	6758	105	771	6851	12331	
							4693	5307		585	561	7838	122	894	7946	14302	
							4535	5465							8149	14669	
						269	4417	5324							7939	14290	
		597 B1	3	3	1	192	3825	4243	1740	491	474	6209	96	990	6318	11373	53
							3900	4326	1774	501	462	6330	98	835	6442	11596	
							4741	5259		609	562	7695	119	1015	7851	14097	
							4556	5444							8072	14530	
						245	4444	5311							7874	14174	
		597 B2	3	3	1	178	3128	3086	3608	328					4720	8497	53
							3185	3142	3673	334					4806	8651	
							5034	4966		528					7596	13673	
							4714	5286							8058	14504	
						301	4572	5127							7816	14069	
		597 B3	3	3	1	196	3646	3883	2275	531					5777	10399	53
							3719	3961	2320	542					5892	10607	
							4842	5158		706					7672	13811	
							4609	5391							7979	14363	
						270	4485	5245							7764	13975	
		597 C1	3	3	1	235	3859	4580	1326	556					6641	11954	53
							3952	4690	1358	569					6801	12242	
							4573	5427		658					7870	14166	
							4399	5601							8081	14546	
						284	4274	5442							7851	14132	
		597 C2	3	3	1	211	3379	3706	2704	316					5494	9889	53
							3452	3786	2752	323					5612	10102	
							4769	5231		446					7754	13957	
							4555	5465							8074	14534	
						306	4396	5298							7828	14091	
		597 C3	3	3	1	232	3971	4409	1388	507					6560	11809	53
							4065	4514	1421	519					6716	12089	
							4738	5262		605					7828	14091	
							4577	5423							8034	14462	
						282	4448	5270							7808	14054	

COAL RESOURCES OF OHIO

County	Township	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis					Heat value		Year			
						Moisture	Volatiles	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories	B. t. u.				
																		1	2	3
MORGAN	BRISTOL	597 C4	3	3	1	1	180	2908	MEIGS CREEK (CON.)	3023	3889	250						4458	8024	53
						2	2961	3079	3960	255							4540	8171		
						3	4902	5098			422						7517	13528		
						4	4554	5446									8004	14407		
						5	4409	5273									7750	13950		
	"	"	597 C9	3	3	1	2	236	3832	4356	1566	520	476	6315	97	1026	6430	11575	53	
	3						3925	4471	1604	533	461	6467	99	836	6585	11855				
	4						4675	5325		635	549	7702	118	996	7843	14120				
	5						4494	5506							8073	14532				
	5						4351	5345							7836	14104				
	"	CENTER	495	1	2	1	2	253	4122	4240	1385	566						6680	12024	29
	2						4229	4350	1421	581							6853	12336		
	3						4929	5071		677							7988	14379		
	4						4757	5233									8215	14787		
	5						309	4619	5072								7962	14331		
"	MANCHESTER	406	1	2	1	2	407	3751	4766	1066	507	510	6619	87	1211	6779	12202	7		
2						3921	4968	1111	529	484	6900	91	885	7067	12720					
3						4411	5589		595	544	7763	102	996	7950	14310					
4						4255	5745							8132	14638					
5						475	4052	5473						7746	13942					
"	MEIGSVILLE	405	1	2	1	2	513	3607	4706	1174	489	506	6477	87	1267	6625	11925	7		
2						3802	4960	1238	515	473	6827	92	855	6983	12569					
3						4339	5661		588	540	7791	105	976	7970	14345					
4						4173	5827							8162	14692					
5						606	3920	5474						7668	13802					
MUSKINGUM	BLUE ROCK	404	1	2	1	2	516	4012	4158	1314	507	522	6325	86	1246	6429	11572	17		
						2	4250	4384	1386	534	490	6669	90	831	6779	12202				
						3	4911	5089		620	569	7742	104	965	7870	14165				
						4	4757	5243							8077	14388				
						5	622	4461	4917						7574	13633				
NOBLE	BEAVER	172	1	1	1	1	414	3842	4482	1262	361	522	6687	120	1048	6739	12130	14		
						2	4008	4675	1317	377	497	6976	125	708	7030	12654				
						3	4616	5384		434	572	8035	144	815	8096	14573				
						4	4482	5518							8274	14893				
						5	4262	5247							7867	14161				
	"	"	587	1	3	1	2	449	2897	3727	2927	1401					5118	9214	52	
	2						3033	3902	3065	1467					5359	9647				
	3						4373	5627		2115					7727	13911				
	4						3741	6259							8417	15151				
	5						740	3465	5795						7794	14029				
	"	"	587	2	1	3	2	466	3992	4444	1098	421					6869	12364	52	
	2						4187	4661	1152	442					7205	12968				
	3						4752	5268		500					8143	14656				
	4						4603	5397							8319	14974				
	5						543	4353	5104						7867	14161				
	"	"	587	3	1	3	1	396	3835	4416	1353	418					6700	12060	52	
	2						3993	4598	1409	435					6976	12557				
	3						4648	5352		506					8121	14688				
	4						4488	5502							8321	14977				
	5						477	4284	5239						7924	14263				
	"	"	587	4	1	3	1	355	3850	4351	1434	500					6631	11936	52	
	2						3996	4516	1488	519					6882	12388				
	3						4695	5305		610					8085	14553				
	4						4526	5474							8311	14960				
	5						446	4324	5230						7941	14293				
"	"	587	9	1	3	1	397	3858	4406	1329	449	498	6430	102	1192	6686	12036	52		
2						4028	4588	1384	468	472	6696	106	874	6962	12334					
3						4675	5325		543	548	7772	123	1014	8080	14547					
4						4522	5478							8285	14913					
5						477	4307	5216						7889	14200					
"	BROOKFIELD	402	1	2	1	2	485	3728	4805	982	559	526	6601	97	1235	6834	12301	7		
2						3918	5050	1032	587	496	6937	101	847	7182	12928					
3						4369	5631		655	553	7735	113	944	8008	14416					
4						4205	5795							8197	14755					
5						3969	5469							7737	13927					
"	"	403	1	2	1	2	354	3741	4582	1323	621	512	6444	88	1012	6642	11856	7		
2						3898	4750	1372	644	490	6680	91	723	6886	12395					
3						4495	5505		746	568	7743	105	838	7981	14366					
4						4300	5700							8216	14788					
5						430	4115	5455						7862	14151					
"	"	543	1	7	1	3	235	3768	4208	1789	750					6065	10918	49		
3						3859	4309	1832	768					6211	11181					
4						4725	5275		940					7604	13689					
5						4481	5519							7893	14208					
5						307	4343	5350						7651	13772					
"	"	543	2	1	3	1	275	3747	4646	1332	621					6334	11401	49		
2						3853	4777	1370	639					6512	11723					
3						4465	5535		740					7546	13684					
4						4270	5730							7756	13960					
5						335	4126	5589						7496	13492					

County	Township	File number	Kind	Source	Condition	Proximate analysis			Ultimate analysis				Heat value		Year					
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen		Calories	B. t. u.			
NOBLE	BROOKFIELD	543	37	1	3	MEIGS CREEK CON.)														
						1	326	3816	5056	822	404					6920	12457	49		
						2		3944	5206	850	418					7153	12877			
						3		4310	5690		457					7817	14073			
						4		4190	5810							7951	14311			
		5	357	4036	5597							7658	13785							
		"	"	543	47	1	3	1	323	3375	4433	1869	269					6079	10943	49
								2		3488	4581	1931	278					6282	11308	
								3		4323	5677		345					7785	14014	
								4		4152	5848							7994	14390	
								5	412	3981	5607							7666	13798	
		"	"	543	97	1	3	1	284	3721	4596	1399	550					6375	11476	49
								2		3850	4750	1440	566					6561	11811	
								3		4474	5526		661					7665	13798	
								4		4289	5711							7874	14173	
								5	347	4140	5513							7601	13682	
		"	"	598	A1	3	3	1	247	4116	4570	1067	358					6874	12373	53
								2		4220	4686	1094	367					7048	12686	
								3		4738	5282		412					7914	14244	
								4		4626	5374							8061	14510	
5	286							4493	5221							7831	14096			
"	"	598	A2	3	3	1	228	3843	4252	1677	528					6329	11392	53		
						2		3933	4351	1716	540					6477	11658			
						3		4748	5252		652					7819	14073			
						4		4560	5440							8060	14508			
						5	289	4428	5283							7827	14089			
"	"	598	A3	3	3	1	222	4165	4759	854	336					7151	12873	53		
						2		4260	4867	873	344					7313	13165			
						3		4667	5333		377					8012	14424			
						4		4570	5430							8140	14652			
						5	250	4455	5295							7937	14287			
"	"	598	A4	3	3	1	228	4124	4771	877	429					7052	12695	53		
						2		4220	4882	898	439					7217	12991			
						3		4636	5364		482					7929	14273			
						4		4520	5480							8073	14532			
						5	259	4403	5338							7864	14155			
"	"	598	A5	3	3	1	212	3443	3995	2350	588					5736	10326	53		
						2		3518	4082	2400	601					5860	10550			
						3		4629	5371		791					7711	13842			
						4		4350	5640							8046	14482			
						5	297	4230	5473							7807	14053			
"	"	598	A9	3	3	1	241	3779	4325	1655	488	476	6288	101	992	6361	11450	53		
						2		3872	4432	1696	500	460	6443	104	797	6518	11733			
						3		4663	5337		602	554	7759	125	960	7849	14129			
						4		4480	5520							8082	14548			
						5	303	4345	5352							7837	14106			
"	"	598	B1	3	3	1	217	2438	3016	4329	1350					3846	6923	53		
						2		2492	3083	4425	1380					3931	7077			
						3		4470	5530		2475					7051	12694			
						4		3555	6445							7952	14314			
						5	474	3386	6140							7575	13635			
"	"	598	B2	3	3	1	255	3770	4120	1855	862					6120	11016	53		
						2		3859	4228	1903	885					6280	11304			
						3		4778	5222		1093					7756	13961			
						4		4509	5491							8091	14564			
						5	339	4356	5305							7817	14071			
"	"	598	B3	3	3	1	262	3948	4455	1335	435					6607	11894	53		
						2		4054	4575	1371	447					6785	12214			
						3		4698	5302		518					7863	14155			
						4		4551	5449							8052	14493			
						5	315	4408	5277							7798	14036			
"	"	598	B4	3	3	1	246	3947	4489	1318	364					6700	12060	53		
						2		4047	4602	1351	373					6869	12364			
						3		4679	5321		431					7942	14295			
						4		4546	5454							8116	14609			
						5	294	4412	5294							7878	14180			
"	"	598	B5	3	3	1	221	3507	4025	2247	523					5805	10449	53		
						2		3586	4116	2298	535					5936	10685			
						3		4656	5344		695					7707	13873			
						4		4413	5587							8012	14421			
						5	303	4280	5417							7768	13983			
"	"	598	B9	3	3	1	254	3762	4250	1724	498	469	6255	93	961	6277	11299	53		
						2		3854	4365	1771	512	451	6425	93	746	6447	11605			
						3		4696	5304		622	548	7808	115	907	7834	14103			
						4		4506	5494							8077	14539			
						5	336	4355	5309							7806	14051			
"	"	598	C1	3	3	1	333	3713	4416	1538	594					6311	11361	53		
						2		3841	4568	1591	614					6528	11752			
						3		4368	5452		730					7763	13976			
						4		4356	5554							8004	14407			
						5	416	4184	5400							7672	13809			

COAL RESOURCES OF OHIO

County	Township	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis					Heat value		Year		
						Mois-ture	Vola-tile	Fixed carbon	Ash	Sulphur	Hydro-gen	Carbon	Nitro-gen	Oxygen	Calo-ries	B. t. u.			
																		1	2
NOBLE (Cont'd.)	BROOKFIELD	598 C 2	3	3	3	1	319	3667	4242	1772	556					6136	11045	53	
						2		3788	4382	1830	574					6338	11409		
						3		4636	5364		703					7758	13965		
						4		4427	5573							8016	14429		
						5	410	4245	5345							7688	13839		
	"	"	598 C 3	3	3	3	1	353	3988	4576	1083	422					6777	12199	53
							2		4134	4743	1123	437					7025	12645	
							3		4657	5343		492					7914	14245	
							4		4527	5473							8077	14539	
							5	411	4341	5248							7746	13942	
	"	"	598 C 4	3	3	3	1	289	3261	3501	2949	733					5115	9208	53
							2		3358	3605	3037	755					5267	9482	
							3		4823	5377		1084					7564	13618	
							4		4462	5338							8023	14441	
							5	451	4260	5289							7661	13789	
"	"	598 C 9	3	3	3	1	314	3676	4184	1826	556					6124	11023	53	
						2		3795	4320	1885	574					6323	11380		
						3		4677	5323		707					7792	14023		
						4		4464	5536							8057	14503		
						5	407	4283	5310							7731	13915		
"	CENTER	401	1	2	3	1	452	4113	4401	1024	417					6791	12224	27	
						2		4312	4614	1074	437					7120	12816		
						3		4831	5169		490					7977	14358		
						4		4711	5289							8138	14649		
						5	533	4460	5007							7704	13867		
"	ELK	400	1	2	3	1	306	3843	4618	1233	600	511	6618	86	952	6865	12357	7	
						2		3964	4764	1272	619	492	6827	89	701	7082	12747		
						3		4542	5458		709	564	7822	102	803	8114	14605		
						4		4362	5638							8339	15011		
						5	357	4203	5430							8033	14460		
"	"	497	1	2	3	1	151	4509	4205	1135	545	412	6866	112	930	7063	12713	29	
						2		4578	4268	1154	553	401	6970	114	808	7171	12007		
						3		5175	4825		625	453	7880	129	913	8106	14591		
						4		5047	4953							8304	14948		
						5	178	4956	4866							8156	14680		
"	"	572	1	1	3	1	279	3633	4056	2032	593					6200	11160	51	
						2		3737	4172	2091	610					6378	11480		
						3		4725	5275		771					8064	14515		
						4		4490	5510							8383	15089		
						5	373	4323	5304							8069	14525		
"	"	572	2	1	3	1	224	4036	4374	1366	627					6736	12125	51	
						2		4128	4474	1398	641					6890	12703		
						3		4799	5201		745					8010	14419		
						4		4620	5380							8249	14848		
						5	274	4494	5232							8022	14440		
"	ENOCH	398	1	2	3	1	290	3724	4970	1016	427	522	6853	104	1078	7051	12690	7	
						2		3835	5119	1046	440	505	7058	107	844	7261	13069		
						3		4283	5717		491	564	7883	119	943	8119	14596		
						4		4144	5856							8273	14892		
						5	335	4005	5660							7997	14394		
"	"	399	1	2	3	1	386	4491	3962	1161	535					6836	12304	27	
						2		4671	4121	1208	556					7110	12799		
						3		5313	4687		632					8087	14558		
						4		5187	4813							8292	14925		
						5	457	4950	4593							7912	14241		
"	"	596 A 1	1	3	3	1	466	3853	4355	1326	581					6550	11790	53	
						2		4041	4568	1391	609					6870	12366		
						3		4694	5306		707					7980	14364		
						4		4516	5484							8209	14776		
						5	555	4261	5174							7746	13942		
"	"	596 A 2	1	3	3	1	407	3787	4307	1499	535					6461	11631	53	
						2		3948	4490	1562	558					6735	12124		
						3		4679	5321		661					7982	14368		
						4		4496	5504							8219	14795		
						5	503	4270	5227							7807	14052		
"	"	596 A 3	1	3	3	1	406	3661	4304	1629	639					6344	11419	53	
						2		3816	4486	1698	666					6612	11902		
						3		4596	5404		802					7964	14336		
						4		4377	5623							8240	14832		
						5	515	4151	5334							7816	14069		
"	"	596 A 4 ¹⁰	1	3	3	1	357	1624	1342	6667	359					1756	3161	53	
						2		1686	1393	6921	373					1823	3281		
						3		5476	4524		1211					5921	10656		
						4		4237	5763							7409	13337		
						5	1410	3640	4950							6366	11458		
"	"	596 A 9	1	3	3	1	428	3782	4323	1467	574					6466	11640	53	
						2		3951	4516	1533	600					6755	12160		
						3		4666	5334		709					7978	14362		
						4		4477	5523							8221	14798		
						5	528	4241	5231							7787	14016		

County	Township	File number	Kind	Source	Condition	Proximate analysis			Ultimate analysis					Heat value		Year			
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories		B. t. u.		
																		1	2
NOBLE	ENOCH	596 81	1	3	1	570	3267	3906	2257	462						5644	10160	53	
					2		3465	4142	2393	490					5985	10774			
					3		4555	5445		644					7868	14163			
					4		4307	5693							8186	14734			
					5	780	3970	5250							7548	13586			
		596 82	1	3	1	911	1204	794	7091	205							1084	1951	53
					2		1325	873	7802	226					1193	2147			
					3		6028	3972		1028					5428	9768			
					4		4211	5789							7796	14032			
					5	4087	2489	3424							4607	8293			
		596 83	1	3	1	513	3533	3799	2155	340							5778	10401	53
					2		3724	4004	2272	358					6090	10963			
					3		4819	5181		463					7880	14186			
					4		4625	5375							8152	14673			
					5	685	4308	5007							7593	13668			
		596 89	1	3	1	604	3042	3440	2914	396							5034	9062	53
					2		3238	3661	3101	421					5358	9645			
					3		4693	5307		610					7766	13980			
4					4395	5605							8165	14697					
5	910				3995	5095							7422	13359					
603 A1	1	3	1	293	3851	4299	1557	611	490	6319	99	924	6494	11689	54				
			2		3957	4429	1604	629	471	6510	102	684	6690	12042					
			3		4725	5275		749	561	7754	121	815	7968	14343					
			4		4528	5472							8224	14804					
			5	367	4362	5271							7923	14261					
603 A2	1	3	1	330	3736	4052	1882	390	488	6144	108	988	6248	11247	54				
			2		3864	4190	1946	403	467	6354	112	718	6461	11631					
			3		4798	5202		500	580	7889	139	892	8022	14441					
			4		4621	5379							8272	14889					
			5	426	4423	5151							7919	14255					
603 81	1	4	1	276	3663	4167	1894	630	465	6014	93	904	6197	11155	54				
			2		3757	4285	1948	648	447	6184	96	677	6373	11472					
			3		4678	5322		805	555	7680	119	841	7915	14247					
			4		4446	5554							8214	14786					
			5	363	4284	5353							7916	14248					
603 82	1	4	1	285	3486	3798	2431	381	457	5700	100	931	5821	10478	54				
			2		3588	3910	2502	392	438	5867	103	698	5992	10785					
			3		4785	5215		523	584	7825	137	931	7991	14384					
			4		4562	5438							8306	14951					
			5	398	4381	5221							7977	14358					
JACKSON	JACKSON	397	1	2	1	452	4216	4126	1206	454	512	6608	88	1132	6722	12099	27		
					2		4416	4321	1263	475	484	6921	92	765	7040	12672			
					3		5054	4946		544	554	7921	105	876	8058	14504			
					4		4925	5075							8249	14848			
					5	535	4662	4803							7807	14053			
		601 81	3	3	1	196	4160	4453	1191	532						6916	12449	53	
					2		4243	4542	1215	543					7054	12698			
					3		4830	5170		618					8030	14454			
					4		4683	5317							8229	14813			
					5	253	4574	5193							8037	14467			
		601 82	3	3	1	192	4247	4498	1063	579						7037	12668	53	
					2		4330	4586	1084	590					7175	12916			
					3		4856	5144		662					8047	14486			
					4		4712	5288							8244	14840			
					5	225	4606	5169							8059	14506			
		601 83	3	3	1	216	3625	3958	2191	383						6051	10892	53	
					2		3705	4056	2239	391					6185	11132			
					3		4774	5226		504					7969	14343			
4					4574	5426							8248	14846					
5	291				4441	5268							8008	14415					
601 84	3	3	1	235	4090	5006	669	252						7382	13288	53			
			2		4188	5127	685	258					7560	13608					
			3		4496	5504		277					8116	14609					
			4		4420	5580							8212	14782					
			5	257	4307	5436							8001	14402					
601 89	3	3	1	224	4044	4532	1200	439	513	6776	105	967	6890	12402	53				
			2		4137	4636	1227	449	499	6931	108	786	7048	12686					
			3		4716	5284		512	569	7900	123	896	8034	14460					
			4		4579	5421							8214	14786					
			5	265	4457	5278							7998	14396					
601 C1	3	3	1	218	4195	4257	1330	563						6782	12209	53			
			2		4288	4352	1360	576					6933	12481					
			3		4963	5037		667					8024	14446					
			4		4807	5193							8246	14843					
			5	264	4681	5055							8028	14451					
601 C2	3	3	1	231	3652	4179	1928	462						6243	11238	53			
			2		3749	4278	1973	473					6391	11504					
			3		4670	5330		589					7962	14332					
			4		4471	5529							8227	14808					
			5	301	4336	5363							7979	14363					

County	Township	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis				Heat value		Year		
						Mois- ture	Vola- tile	Fixed carbon	Ash	Sulphur	Hydro- gen	Carbon	Nitro- gen	Oxygen	Calo- ries		B. t. u.	
NOBLE	STOCK	288	1	2	1	MEIGS CREEK (CON.)											7	
						255	3840	4754	1141	579	511	6750	92	927	6952	12514		
							3940	4889	1171	594	496	6926	94	719	7134	12841		
							4463	5537		673	562	7845	106	814	8080	14544		
							4292	5708							8288	14918		
	302	4162	5536						8038	14468								
"	"	394	1	2	1	408	4349	4156	1087	539	519	6670	102	1083	6831	12296	27	
							4534	4353	1153	562	495	6954	106	750	7122	12820		
							5113	4387		634	558	7842	120	846	8032	14458		
							4982	5018							8227	14809		
							478	4744	4778						7833	14100		
WASHINGTON	ADAMS	287	1	2	1	295	3747	4669	1289	555	505	6588	92	971	6803	12245	4	
							3851	4811	1328	572	486	6788	95	731	7010	12617		
							4452	5548		660	560	7827	110	843	8083	14549		
							4273	5727							8303	14945		
							355	4122	5523						8008	14414		
"	"	496	1	2	1	272	4116	4457	1155	448	683	6707	104	903	6850	12330	29	
							4231	4582	1187	461	671	6895	107	679	7042	12675		
							4801	5199		523	761	7825	121	770	7990	14382		
							4668	5332							8168	14702		
							320	4519	5161						7907	14232		
"	AURELIUS	286	1	2	1	340	3795	4907	958	503	531	6833	90	1085	7083	12749	7	
							3928	5080	992	521	510	7073	93	811	7332	13198		
							4361	5639		578	566	7853	103	900	8139	14651		
							4212	5788							8317	14970		
							391	4048	5561						7991	14384		
BELMONT	MEAD	351	2	2	1	FISHPOT											26	
						254	4081	4092	1573	500						6522		11739
							4187	4199	1614	513						6692		12045
							4993	5007		612						7980		14363
							4831	5169								8212		14782
	316	4679	5005							7952	14314							
MON ROE	MALAGA	350	1	2	1	516	3773	3749	1962	519	502	5961	95	961	6068	10922	27	
							3978	3953	2059	548	470	6285	100	528	6398	11516		
							5016	4984		691	593	7924	126	666	8067	14520		
							4814	5186							8367	15061		
							679	4488	4853						7799	14038		
GALLIA	CHESHIRE	237	1	2	1	REDSTONE											7	
						821	3423	4610	1146	218	548	6295	102	1691	6387	11497		
							3729	5022	1249	237	498	6858	111	1047	6958	12524		
							4251	5739		271	569	7837	127	1196	7951	14328		
							4148	5852							8088	14559		
	950	3754	5296						7321	13177								
MEIGS	BEDFORD	236	1	2	1	702	3970	4287	1041	616					6463	11634	28	
							4270	4611	1119	663					6951	12512		
							4808	5192		747					7827	14089		
							4646	5354							8030	14454		
							822	4265	4913						7371	13267		
"	RUTLAND	234	1	2	1	763	3333	4811	1093	183	520	6529	103	1572	6512	11722	7	
							3608	5209	1183	198	471	7068	112	968	7050	12690		
							4092	5908		225	534	8016	127	1098	7996	14393		
							3987	6013							8121	14618		
							875	3639	5486						7411	13339		
"	SALISBURY	197	1	2	1	551	3819	4572	1058	417	540	6555	95	1335	6661	11990	7	
							4042	4838	1120	441	507	6937	101	894	7049	12688		
							4552	5448		497	571	7811	114	1007	7938	14288		
							4417	5583							8103	14586		
							639	4134	5227						7586	13655		
"	"	230	1	2	1	722	3282	5067	929	132	539	6647	110	1643	6668	12002	7	
							3538	5461	1001	142	495	7164	119	1079	7187	12936		
							3912	6068		158	550	7961	132	1199	7986	14375		
							3847	6153							8084	14552		
							809	3535	5656						7431	13375		
"	"	231	1	2	1	733	3459	4939	869	205	553	6671	106	1596	6725	12105	7	
							3732	5330	938	221	509	7199	114	1019	7257	13062		
							4118	5882		244	562	7944	126	1124	8008	14414		
							4025	5975							8116	14609		
							819	3696	5485						7452	13413		
"	"	232	1	2	1	605	4196	4376	823	261					6857	12342	28	
							4466	4658	876	278					7298	13136		
							4895	5105		305					7999	14397		
							4814	5186							8112	14602		
							675	4489	4836						7565	13617		

COAL RESOURCES OF OHIO

County	Township	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis				Heat value		Year	
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories		B. t. u.
MEIGS	SUTTON	235	1	2	1	REDSTONE (CON.)											7
						485	3628	4655	1252	294	532	6529	117	1276	6624	11923	
						3813	4871	1316	309	502	6862	123	888	6962	12531		
						4391	5609		356	578	7901	142	1023	8017	14430		
						4262	5738							8177	14719		
	572	4018	5410						7709	13877							
ATHENS	ALEXANDER	188	1	2	1	PITTSBURGH											28
						713	4151	4209	927	452	540	6440	96	1545	6559	11807	
						4470	4522	998	487	497	6934	103	981	7062	12713		
						4966	5054		541	552	7703	114	1090	7846	14122		
						4848	5152							8004	14408		
	815	4452	4753						7353	13235							
"	BERN	277	1	1	2	PITTSBURGH											7
						650	3505	4815	1020	341	513	6661	93	1372	6607	11893	
						3753	5155	1092	365	471	7132	100	840	7074	12733		
						4213	5787		410	529	8006	112	943	7941	14293		
						4083	5917							8088	14559		
	758	3773	5469						7476	13457							
"	"	277	2	1	2	PITTSBURGH											7
						451	3824	4576	1149	488	510	6592	99	1162	6636	11945	
						4005	4792	1203	541	482	6903	104	797	6949	12508		
						4553	5447		581	548	7847	118	906	7899	14218		
						4400	5600							8084	14552		
	531	4166	5303						7656	13780							
"	"	278	1	1	2	PITTSBURGH											28
						594	4015	4526	855	335	532	6782	128	1358	6774	12194	
						4268	4812	920	356	496	7210	136	882	7202	12964		
						4700	5300		392	546	7941	150	971	7932	14277		
						4599	5401							8062	14512		
	669	4292	5039						7522	13540							
"	"	278	2	1	2	PITTSBURGH											28
						566	4396	4352	686	410	546	6825	108	1425	6939	12491	
						4660	4613	727	435	512	7234	114	978	7355	13240		
						5025	4975		469	552	7801	123	1055	7932	14278		
						4933	5067							8060	14508		
	627	4624	4749						7556	13600							
"	"	279	A	1	2	PITTSBURGH											7
						578	3743	4879	800	419	514	6755	95	1417	6833	12299	
						3973	5178	849	445	478	7169	101	58	7252	13053		
						4342	5658		486	522	7835	110	1047	7925	14264		
						4217	5783							8064	14516		
	649	3943	5408						7542	13575							
"	"	279	B	1	2	PITTSBURGH											29
						362	4484	4469	685	374					6980	12564	
						4652	4637	711	388	418				7242	13036		
						5008	4992							7796	14033		
						4923	5077							7911	14239		
	400	4726	4874						7594	13669							
"	"	279	C	1	2	PITTSBURGH											29
						370	4385	4461	784	424					6949	12508	
						4553	4633	814	440	479				7216	12989		
						4956	5044							7855	14139		
						4856	5144							7989	14381		
	415	4655	4930						7658	13784							
"	"	281	1	1	2	PITTSBURGH											28
						587	4193	4339	881	401	535	6706	105	1372	6806	12251	
						4454	4610	936	426	500	7124	112	902	7230	13015		
						4914	5086		470	552	7859	124	995	7977	14359		
						4807	5193							8123	14622		
	665	4488	4847						7583	13650							
"	"	281	2	1	2	PITTSBURGH											28
						631	4316	4295	758	375	549	6728	152	1438	6879	12383	
						4607	4584	809	400	511	7181	162	937	7342	13217		
						5013	4987		435	556	7814	176	1019	7988	14380		
						4920	5080							8119	14615		
	703	4574	4723						7549	13588							
"	"	583	1	2	3	PITTSBURGH											52
						72	4748	401	4779	649					1783	3209	
						4782	404	4814	654					1796	3232		
						9221	779	1261						3463	6232		
						9311	689							3634	6541		
	161	9161	678						3576	6436							
"	"	583	2	1	3	PITTSBURGH											52
						153	2821	2554	4472	248					4068	7322	
						2865	2594	4541	252					4131	7436		
						5248	4752		462					7567	13622		
						4843	5157							8192	14746		
	304	4696	5000						7944	14299							
"	"	583	3	1	3	PITTSBURGH											52
						177	4319	4434	1070	631					6934	12482	
						4397	4514	1089	642					7059	12707		
						4934	5066		720					7922	14260		
						4785	5212							8123	14622		
	208	4685	5107						7954	14318							
"	"	605	1	1	3	PITTSBURGH											54
						580	3804	4383	1233	654					6344	11419	
						4038	4633	1309	694					6735	12122		
						4646	5364		799					7749	13948		
						4456	5544							7973	14352		
	698	4145	5157						7417	13350							

County	Township	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis					Heat value		Year			
						Mois- ture	Vola- tile	Fixed carbon	Ash	Sulphur	Hydro- gen	Carbon	Nitro- gen	Oxygen	Calo- ries	B. t. u.				
ATHENS	BERN	605	2	1	3	PITTSBURGH (CON.)													54	
						1	651	3783	4399	1167	632							6307		11354
						2		4047	4705	1248	676							6746		12145
						3		4624	5376		772							7708		13877
						4		4440	5560									7922		14259
	5	776	4095	5129									7307	13153						
	" CANAAN	275	1	2	1	2	1	737	3902	4253	1108	420						6407	11533	
							2		4212	4592	1196	454						6917	12451	
							3		4784	5216		516						7857	14142	
							4		4652	5348								8028	14451	
							5	860	4252	4888								7338	13208	
	" LODI	274	1	1	2	1	1	852	3915	4244	989	306	541	6419	160	1585	6442	11595		
2								4279	4640	1081	334	487	7017	175	906	7042	12675			
3								4798	5202		374	546	7868	196	1016	7896	14211			
4								4693	5307							8034	14462			
5							972	4238	4790							7253	13056			
" "	274	2	1	2	1	1	673	4120	4099	1108	278	534	6457	113	1510	6500	11700			
						2		4417	4395	1188	298	492	6923	121	978	6969	12544			
						3		5012	4988		338	558	7857	137	1110	7909	14235			
						4		4914	5086							8051	14492			
						5	778	4532	4690							7425	13365			
BELMONT	COLERAIN	273	1	2	1	1	379	3637	5084	900	416	514	7041	109	1020	7145	12861			
						2		3780	5284	936	432	491	7318	113	710	7426	13367			
						3		4170	5830		477	542	8073	125	783	8193	14747			
						4		4036	5964							8348	15027			
						5	431	3862	5707							7989	14380			
	" FLUSHING	272	1	2	1	2	1	423	3634	5022	921	417	514	6875	109	1164	7003	12605		
							2		3794	5244	952	435	488	7178	114	823	7312	13162		
							3		4198	5802		481	540	7942	126	911	8090	14563		
							4		4062	5938							8246	14842		
							5	482	3867	5651							7848	14126		
	" "	574	1	1	1	2	1	19	392	495	94	47					7194	12950		
							2		399	505	96	48					7328	13190		
3								441	559		53					8106	14591			
4								428	572							8270	14886			
5							22	419	559							8095	14571			
" KIRKWOOD	271	1	2	1	2	1	375	3799	4742	1084	476	509	6741	111	1079	6865	12357			
						2		3947	4927	1126	495	485	7004	115	775	7132	12838			
						3		4448	5352		558	547	7892	130	873	8037	14467			
						4		4299	5701							8218	14792			
						5	438	4110	5452							7858	14145			
" MEAD	270 A	1	2	1	2	1	291	3794	5115	800	431	511	7295	104	859	7340	13212			
						2		3908	5268	824	444	493	7513	107	619	7560	13608			
						3		4269	5741		484	537	8187	117	675	8239	14830			
						4		4133	5867							8388	15098			
						5	327	3998	5675							8114	14605			
" "	270 B	1	2	1	2	1	184	3898	4664	1254	482					7005	12609			
						2		3971	4751	1278	491					7136	12845			
						3		4553	5447		563					8182	14727			
						4		4398	5602							8383	15090			
						5	220	4301	5479							8199	14758			
" PEASE	158 A	1	1	1	2	1	40	396	483	81	34					7222	13000			
						2		413	503	84	35					7523	13541			
						3		451	549		38					8213	14783			
						4		441	559							8343	15017			
						5	45	420	535							7974	14354			
" "	158 B	1	1	1	2	1	39	389	480	92	36					7144	12860			
						2		405	499	96	37					7434	13381			
						3		448	532		41					8223	14802			
						4		437	563							8369	15064			
						5	44	417	539							7997	14395			
" "	158 C	1	1	1	2	1	39	387	493	81	33					7244	13040			
						2		403	513	84	34					7538	13569			
						3		440	560		37					8229	14813			
						4		430	570							8358	15045			
						5	44	410	546							7998	14396			
" "	158 K	1	1	1	2	1	39	396	480	85	34	53	712	13	103	7200	12960			
						2		411	499	89	36	50	741	14	70	7494	13490			
						3		452	548		39	55	813	15	78	8222	14800			
						4		442	558							8362	15051			
						5	44	422	534							7988	14379			
" "	269	1	2	1	2	1	339	3684	5191	786	297	521	7145	124	1127	7217	12991			
						2		3813	5373	814	307	501	7395	128	855	7470	13446			
						3		4151	5849		334	545	8051	139	931	8132	14637			
						4		4049	5951							8249	14849			
						5	377	3897	5786							7938	14289			
" FULTNEY	160 A	1	1	1	2	1	399	3877	4917	807	349					7279	13102			
						2		4038	5122	840	364					7582	13648			
						3		4408	5592		397					8277	14900			
						4		4302	5698							8413	15143			
						5	446	4110	5444							8037	14466			

COAL RESOURCES OF OHIO

County	Township	File number	Kind	Source	Condition	Proximate analysis			Ultimate analysis					Heat value		Year		
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories		B. t. u.	
BELMONT	PULTNEY	160 B	1	1	1	PITTSBURGH (CON.)											5	
						406	3945	5005	644	355								
							4112	5217	671	349								
							4408	5592		374								
							4314	5686										
			445	4122	5433													
			268	1	2	1	380	3718	5007	395	427	523	7057	120	978	7103	12785	
							3865	5205	930	444	500	7336	125	665	7383	13289		
							4261	5739		490	551	8088	138	733	8140	14658		
							432	3950	5618						8295	14931		
															7938	14288		
			575 A	1	1	1	332	4080	4911	677	355							
		4220					5080	700	367									
		4538					5462		395									
		4443					5557											
		4280					5354											
		575 B	1	1	1	310	4076	5011	603	342								
						4206	5172	622	353					7553	13595			
						4485	5515		376					7795	14031			
						4396	5604							8312	14962			
						338	4248	5414						8427	15168			
		575 C	1	2	1	351	3865	5098	686	376	545	7206	117	1070	7325	13185		
						4006	5283	711	390	524	7468	121	786	7591	13664			
						4313	5687		420	564	8040	130	846	8172	14709			
	4206					5794							8298	14936				
	388					4043	5569						7977	14358				
	RICHLAND	500 A	1	1	1	33	385	496	86	33								
							398	513	89	34								
							437	563		37								
							426	574										
							37	411	552									
	500 B	1	1	2	1	32	387	479	102	36								
							400	495	105	37								
							447	553		41								
							434	566										
							37	419	544									
	500 C	1	1	1	2	35	375	483	106	33								
							389	501	110	34								
							437	563		38								
							425	575										
							407	551										
	SMITH	265	1	2	1	600	4119	4399	882	432	576	6902	116	1092	6990	12583		
							4382	4680	938	460	542	7342	123	595	7436	13386		
							4836	5164		508	598	8101	136	657	8206	14772		
							4721	5279							8368	15063		
							681	4399	4920						7799	14038		
	266	1	2	1	2	321	3682	5271	726	428	514	7149	106	1077	7297	13135		
							3804	5446	750	442	495	7386	109	818	7539	13570		
							4112	5688		478	535	7985	118	884	8150	14670		
							3987	6013							8289	14920		
							357	3845	5798						7993	14388		
	SOMERSET	264 A	1	2	1	408	3708	4823	1061	495	489	6877	110	968	6931	12476		
							3866	5088	1106	516	463	7169	115	631	7226	13006		
							4347	5653		580	521	8061	129	709	8125	14623		
							4191	5809							8311	14959		
							475	3992	5533						7916	14249		
	264 B	1	1	1	2	372	4101	4578	949	457								
							4259	4755	986	475								
							4725	5275		527								
							4600	5400										
							426	4405	5169									
	UNION	262	1	2	1	446	3600	4878	1076	445	485	6824	110	1060	6903	12425		
							3758	5106	1126	466	456	7142	115	695	7225	13005		
							4246	5754		525	514	8048	130	783	8142	14655		
							4094	5906							8321	14977		
							519	3882	5599						7889	14200		
	263	1	2	1	2	422	4186	4400	992	456								
							4370	4594	1036	476								
							4875	5185		531								
							4753	5247										
							486	4522	4992									
	WARREN	151 A	1	1	1	413	4271	4383	933	446								
							4455	4572	973	465								
							4935	5065		515								
							4821	5179										
							472	4594	4934									
	151 B	1	1	1	2	372	4325	4440	853	445								
							4492	4612	896	462								
							4934	5066		507								
							4825	5175										
							422	4621	4957									

APPENDIX "A"

County	Township	File number	Kind	Source	Condition	Proximate analysis			Ultimate analysis					Heat value		Year			
						Mois- ture	Vola- tile	Fixed carbon	Ash	Sulphur	Hydro- gen	Carbon	Nitro- gen	Oxygen	Calo- ries		B. t. u.		
																		1	2
BELMONT	WARREN	151 K	1	1	1	PITTSBURGH (CON.)													14
						388	4309	4396	907	436	546	6997	127	987	7132	12838			
						4483	4573	944	454	523	7280	132	667	7420	13356				
						4950	5050		501	578	8038	146	737	8193	14748				
						4840	5160							8354	15038				
	442	4626	4932						7985	14373									
	"	"	261	1	2	1	447	3753	4699	1101	467	517	6764	108	1043	6875	12375		
							3929	4919	1152	489	490	7080	113	676	7196	12953			
							4441	5559		553	554	8001	128	764	8133	14639			
							4290	5710							8319	14974			
							523	4056	5411						7886	14194			
	"	WASHINGTON	260	1	2	1	279	3788	4991	942	509	525	6976	109	939	7215	12987		
							3897	5154	959	524	508	7176	112	711	7422	13360			
							4315	5685		580	563	7946	124	787	8218	14793			
							4156	5834							8397	15115			
321							4032	5647						8128	14631				
"	WHEELING	150 A	1	1	1	396	3809	4891	904	425						6			
						3965	5094	941	443	489									
						4377	5623												
						4248	5752												
						451	4057	5492											
"	"	150 B	1	1	1	413	3922	4869	796	415				7271	13088				
						4091	5079	830	430	469				7584	13651				
						4461	5539							8270	14887				
						4345	5655							8418	15153				
						463	4143	5394						8029	14453				
"	"	259 ¹³	1	2	1	425	3353	5187	1035	395	519	6817	109	1125	6903	12425			
						3502	5417	1081	413	493	7119	114	780	7209	12976				
						3926	6074		463	553	7981	128	875	8083	14349				
						3777	6223							8244	14839				
						490	3592	5918						7839	14111				
"	YORK	257	1	2	1	311	4181	4774	734	345				7306	13152				
						4315	4988	757	356	385				7540	13574				
						4668	5332							8158	14686				
						4576	5424							8282	14907				
						345	4418	5237						7997	14394				
"	"	258	1	2	1	226	4263	4843	668	318	520	7424	140	930	7456	13421			
						4362	4955	683	326	506	7595	143	747	7628	13731				
						4682	5318		350	543	8152	153	802	8187	14738				
						4599	5401							8299	14938				
						248	4485	5267						8093	14568				
GALLIA	GREEN	256	1	2	1	673	3434	4590	1303	437	511	6230	114	1405	6356	11441			
						3682	4921	1397	468	468	6680	122	865	6814	12266				
						4280	5720		544	544	7765	142	1005	7920	14258				
						4109	5891							8118	14613				
						806	3777	5417						7464	13436				
"	HARRISON	254	1	2	1	783	3415	4826	976	389	518	6459	109	1549	6544	11779			
						3705	5236	1059	422	468	7007	118	926	7099	12778				
						4144	5856		472	523	7837	132	1036	7940	14291				
						4002	5998							8096	14572				
						897	3643	5450						7371	13267				
"	"	255	1	2	1	698	3614	4785	903	521	524	6491	101	1460	6583	11849			
						3885	5144	971	560	481	6977	108	903	7076	12737				
						4303	5697		620	533	7727	120	1000	7837	14107				
						4146	5854							8007	14412				
						799	3814	5387						7368	13262				
"	OHIO	253	1	2	1	580	3676	4758	1006	434	516	6494	110	1440	6551	11792			
						3902	5050	1068	460	480	6894	117	981	6954	12517				
						4369	5631		515	537	7719	131	1098	7785	14014				
						4227	5773							7943	14298				
						659	3944	5387						7413	13343				
GUERNSEY	MILLWOOD	173 A	1	1	1	45	406	466	83	46	54	703	11	103	7111	12800			
						425	489	87	49	52	736	12	64	7444	13400				
						465	535		53	57	807	13	70	8156	14680				
						454	546							8311	14960				
						51	430	519						7889	14200				
	"	"	173 B	1	1	1	47	404	463	86	42				7072	12730			
							424	485	91	44	49				7422	13360			
							466	534							8167	14700			
							454	546							8311	14960			
							53	430	517						7867	14160			
	"	"	173 C	1	1	1	39	398	468	95	49	52	699	12	93	7028	12650		
							415	486	99	51	50	727	12	61	7311	13160			
							460	540		56	55	807	14	68	8117	14610			
							446	554							8289	14920			
							45	426	529						7917	14250			
"	"	173 K	1	1	1	43	403	465	89	46	55	729	12	69	7072	12730			
						421	486	93	48	52	761	13	33	7389	13300				
						464	536		53	58	840	14	35	8150	14670				
						452	548							8311	14960				
						490	430	521						7906	14230				

COAL RESOURCES OF OHIO

County	Township	File number	Kind	Source	Condition	Proximate analysis			Ultimate analysis					Heat value		Year	
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories		B. t. u.
PITTSBURGH (CON.)																	
GUERNSEY	MILLWOOD	174	1	1	1	436	4114	4576	874	485	537	6930	126	1048	7061	12710	14
					2	4302	4784	914	507	511	7246	132	690	7383	13289		
					3	4735	5265		558	562	7976	145	759	8126	14626		
					4	4610	5390							8292	14925		
					5	496	4380	5124						7881	14185		
HARRISON	ATHENS	252	1	2	1	598	3435	5370	597	135	544	7222	131	1371	7202	12964	7
					2		3653	5712	635	144	508	7681	139	893	7660	13788	
					3		3901	6099		154	542	8202	148	954	8179	14723	
					4		3838	6162						8251	14852		
					5	644	3592	5764						7720	13896		
"	CADIZ	251	1	2	1	383	3670	4869	1088	438	509	6770	127	1068	6864	12355	7
					2		3816	5053	1131	455	485	7040	132	757	7137	12847	
					3		4303	5697		513	547	7937	149	854	8047	14485	
					4		4155	5845						8221	14797		
					5	446	3970	5584						7854	14138		
"	GERMAN	118	1	1	1	36	395	492	77	38	54	717	14	100	7206	12970	38
					2		409	511	80	39	52	744	14	71	7472	13470	
					3		445	555		42	57	809	16	76	8117	14610	
					4		435	565						8256	14860		
					5	40	417	543						7922	14260		
"	SHORT CREEK	249 ⁸	1	2	1	654	3548	5124	674	219	570	7049	122	1366	7061	12710	7
					2		3796	5483	721	234	532	7542	131	840	7555	13599	
					3		4091	5909		252	573	8129	141	905	8142	14656	
					4		4008	5992						8237	14827		
					5	715	3722	5563						7649	13769		
"	"	250	1	2	1	418	3695	5065	822	283	536	7120	126	1113	7160	12888	7
					2		3856	5286	858	295	511	7431	131	774	7472	13450	
					3		4218	5782		323	559	8128	143	847	8173	14712	
					4		4118	5882						8293	14928		
					5	467	3925	5608						7906	14231		
JEFFERSON	CROSS CREEK	190	1	1	1	519	3469	5067	945	238						4	
					2		3659	5344	997	251							
					3		4064	5936		279							
					4		3960	6040									
					5	587	3727	5686									
"	KNOX	121	1	1	1	337	3786	4878	999	394						16	
					2		3917	5049	1034	408							
					3		4369	5631		455							
					4		4240	5760									
					5	387	4077	5536									
"	"	186	1	1	1	318	3811	4935	936	402						16	
					2		3936	5097	967	415							
					3		4367	5643		459							
					4		4231	5769									
					5	363	4077	5560									
"	MT. PLEASANT	248	1	2	1	310	3792	4946	952	383	522	6956	110	1077	7153	12875	7
					2		3913	5104	983	395	504	7178	113	827	7382	13287	
					3		4340	5660		438	559	7961	125	917	8187	14735	
					4		4215	5785						8338	15009		
					5	354	4066	5580						8043	14477		
"	"	604 A ¹⁴	1	3	1	188	3722	4685	1405	317						54	
					2		3793	4775	1432	323							
					3		4427	5573		377							
					4		4289	5711									
					5	226	4192	5582									
"	"	604 B ¹⁵	1	3	1	456	3667	4781	1096	283						54	
					2		3842	5010	1148	297							
					3		4340	5660		336							
					4		4224	5776									
					5	527	4002	5471									
"	SMITHFIELD	162	1	1	1	545	3573	5422	460	84						13	
					2		3779	5735	486	89							
					3		3972	6028		94							
					4		3930	6070									
					5	576	3704	5720									
"	"	163	1	2	1	496	3451	5408	645	175	537	7243	133	1267	7277	13099	7
					2		3631	5690	679	184	507	7621	140	869	7656	13781	
					3		3896	6104		197	544	8177	150	932	8214	14785	
					4		3822	6178						8297	14935		
					5	539	3616	5845						7851	14132		
"	"	192	1	1	1	487	3663	5125	725	260	536	7191	138	1150	7218	12992	13
					2		3851	5387	762	273	507	7559	145	754	7583	13658	
					3		4169	5831		296	549	8182	157	816	8214	14785	
					4		4078	5922						8322	14979		
					5	537	3858	5605						7875	14175		
"	"	193	1	1	1	547	3577	5328	548	77						13	
					2		3784	5636	580	81							
					3		4017	5983		86							
					4		3972	6028									
					5	584	3740	5676									

APPENDIX "A"

County	Township	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis					Heat value		Year	
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories	B. I. u.		
PITTSBURGH (CON.)																		
JEFFERSON	SMITHFIELD	246	1	2	1	430	3528	5254	788	301	518	7134	120	1139	7144	12859	7	
					2	3687	5490	823	315	491	7455	125	791	7465	13437			
					3	4018	5982		343	535	8124	136	862	8154	14642			
					4	3910	6090							8254	14858			
					5	479	3723	5798						7859	14147			
	"	"	573 A	1	1	1	406	3849	4970	775	367					7304	13147	5
						2	4012	5180	808	382					7613	13703		
						3	4365	5635		416					8282	14908		
						4	4255	5745							8418	15153		
						5	453	4052	5485						8037	14466		
	"	"	573 B	1	1	1	420	3716	5113	751	322						5	
						2	3879	5337	784	336								
3						4209	5791		365									
4						4105	5895											
5						466	3914	5620										
"	STEUBENVILLE	179	1	1	1	655	3448	5036	861	252						4		
					2	3690	5389	921	270									
					3	4064	5936		297									
					4	3951	6039											
					5	733	3671	5596										
"	WARREN	159 A	1	1	1	469	3557	5373	601	154					7403	13325	5	
					2	3732	5637	631	162					7767	13981			
					3	3983	6017		173					8290	14923			
					4	3983	6081							8367	15061			
					5	506	3720	5774						7943	14297			
"	"	159 B	1	1	1	499	3533	5398	570	95						5		
					2	3718	5682	600	100									
					3	3955	6045		106									
					4	3904	6096											
					5	535	3696	5769										
"	"	244	1	2	1	313	3788	5077	822	402	538	7103	126	1009	7233	13019	7	
					2	3910	5241	849	415	519	7332	130	755	7466	13439			
					3	4273	5727		454	567	8012	142	825	8159	14686			
					4	4151	5849							8302	14943			
					5	352	4006	5642						8009	14417			
"	"	245	1	2	1	457	3240	5403	900	155	506	7118	132	1189	7105	12789	7	
					2	3395	5662	943	162	477	7459	138	821	7445	13401			
					3	3748	6252		179	527	8236	152	906	8220	14796			
					4	3650	6340							8322	14979			
					5	511	3473	6016						7897	14214			
"	WAYNE	191 A	1	1	1	501	3615	5283	601	174					7327	13189	12	
					2	3806	5551	633	183					7713	13883			
					3	4063	5937		195					8234	14821			
					4	3926	6004							8314	14965			
					5	541	3779	5690						7864	14156			
"	"	191 B	1	1	1	432	3709	4914	945	382					7072	12730	12	
					2	3876	5136	988	399					7391	13304			
					3	4301	5699		443					8201	14763			
					4	4174	5826							8355	15039			
					5	493	3969	5538						7944	14299			
"	"	191 K	1	1	1	470	3650	5081	789	280	528	7172	135	1096	7195	12950	12	
					2	3800	5332	828	294	599	7523	142	714	7545	13589			
					3	4188	5812		320	544	8204	154	778	8228	14809			
					4	4088	5912							8344	15019			
					5	523	3874	5603						7913	14243			
"	"	243	1	2	1	505	3588	5112	795	261	532	7068	125	1219	7147	12865	7	
					2	3779	5384	837	275	501	7444	132	811	7527	13549			
					3	4124	5876		300	547	8124	144	885	8215	14787			
					4	4027	5973							8330	14994			
					5	561	3801	5638						7863	14153			
"	WELLS	180 A	1	1	1	379	3878	5003	740	384					7267	13081	13	
					2	4031	5200	769	399					7553	13595			
					3	4367	5633		432					8182	14728			
					4	4257	5743							8315	14967			
					5	422	4077	5501						7966	14338			
"	"	180 B	1	1	1	428	3741	5029	802	372					7201	12962	13	
					2	3908	5254	838	389					7523	13541			
					3	4265	5735		425					8211	14780			
					4	4150	5850							8349	15028			
					5	479	3951	5570						7949	14308			
"	"	180 K	1	1	1	411	3796	5023	770	384	523	7169	139	1015	7230	13014	13	
					2	3959	5238	803	400	497	7477	145	678	7540	13572			
					3	4305	5695		435	540	8130	158	737	8198	14757			
					4	4190	5810							8335	15003			
					5	469	3998	5543						7953	14315			
"	"	181	1	2	1	489	3310	5155	1046	409	503	6801	112	1129	6953	12515	7	
					2	3480	5420	1100	430	472	7151	117	730	7310	13158			
					3	3910	6090		483	530	8036	131	820	8213	14784			
					4	3755	6245							8365	15093			
					5	566	3542	5892						7911	14239			

COAL RESOURCES OF OHIO

County	Township	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis					Heat value		Year	
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories	B. t. u.		
																		1
PITTSBURGH (CON.)																		
JEFFERSON	WELLS	182	1	1	1	527	3487	4915	1070	307							4	
						3	3681	5190	1129	324								
						4	4149	5851		365								
						5	4023	5977										
						607	3780	5613										
"	"	183	1	1	2	478	3593	5398	531	98	535	7413	146	1277	7417	13351	13	
						3	3773	5669	558	103	506	7785	153	895	7789	14020		
						4	3996	6004		109	536	8245	162	948	8249	14849		
						5	3947	6053							8308	14954		
						510	3746	5744							7884	14192		
"	"	184	1	1	2	452	3640	5110	798	333				7157	12883	13		
						3	3812	5352	836	349				7496	13493			
						4	4160	5840		381				8180	14724			
						5	4049	5951						8309	14956			
						505	3844	5651						7889	14200			
"	"	185	1	1	2	426	3661	5218	695	257				7307	13153	13		
						3	3824	5450	726	268				7632	13738			
						4	4123	5877		289				8229	14813			
						5	4035	5965						8334	15001			
						468	3845	5687						7944	14300			
MEIGS	BEDFORD	202	1	2	1	543	4240	4119	1098	680				6517	11731	28		
						2	4483	4356	1161	719				6891	12404			
						3	5072	4928		813				7796	14033			
						4	4913	5087						8013	14423			
						5	643	4598	4759					7498	13496			
"	"	241	1	2	1	2145	3249	3680	926	154	532	4891	105	3382	4541	8173	28	
						2	4136	4685	1179	209	375	6226	134	1877	5781	10407		
						3	4689	5404		237	425	7058	152	2128	6544	11798		
						4	4599	5404							6646	11963		
						5	2407	3490	4103						5045	9081		
MORGAN	HOMER	239	1	2	1	480	4222	4303	995	519				6600	11880	29		
						2	4435	4520	1045	545				6933	12479			
						3	4953	5047		609				7742	13935			
						4	4822	5178						7912	14241			
						5	4554	4890						7472	13450			
"	"	240	1	2	1	687	4055	4439	819	422	532	6739	90	1398	6722	12100	7	
						2	4354	4767	879	453	490	7236	96	846	7218	12992		
						3	4774	5226		497	537	7933	105	928	7914	14244		
						4	4661	5339							8058	14504		
						5	773	4301	4926						7435	13383		
MUSKINGUM	UNION	238	1	2	1	671	4017	4198	1114	520				6496	11693	27		
						2	4306	4500	1194	558				6963	12534			
						3	4890	5110		634				7907	14233			
						4	4745	5255						8102	14583			
						5	788	4371	4841						7463	13433		
WASHINGTON	LUDLOW	502	2	1	2	22	381	459	138	57	49	662	10	84	6744	12140	48	
						3	389	470	141	58	47	677	10	67	6894	12410		
						4	453	547		68	55	788	12	77	8028	14450		
						5	435	565							8253	14856		
						27	423	550							8036	14464		
"	"	503	2	1	1	100	315	445	140	19	49	577	10	205	5472	9850	48	
						2	350	494	156	21	42	641	11	129	6078	10940		
						3	415	585		25	50	759	13	153	7201	12950		
						4	401	599							7341	13214		
						5	119	353	528						6464	11636		
"	SALEM	494	1	2	1	219	4106	4600	1075	519	491	6837	70	1008	6972	12550	29	
						2	4198	4703	1099	530	477	6991	71	832	7128	12831		
						3	4716	5284		595	536	7854	80	935	8008	14415		
						4	4574	5426							8192	14746		
						5	4457	5287							7983	14369		
HARLEM																		
CARROLL	LEE	316	1	2	1	707	3655	5034	604	57	549	7104	122	1564	7025	12645	26	
						2	3933	5417	650	61	508	7644	131	1006	7559	13606		
						3	4205	5764		65	543	8176	140	1076	8084	14552		
						4	4163	5837							8141	14653		
						5	759	3847	5394						7523	13542		

County	Township	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis					Heat value		Year
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories	B. t. u.	
ANDERSON																	
GUERNSEY	VALLEY	169	1	1	1	433	4021	4507	1039	375	537	6830	150	1069	6940	12492	14
					2	4203	4711	1086	392	511	7139	157	715	7254	13057		
					3	4715	5285		440	573	8009	176	802	8138	14648		
					4	4598	5402							8297	14935		
					5	499	4358	5133						7883	14189		
MUSKINGUM	HARRISON	385	1	2	1	556	4272	3992	1170	488	530	6361	103	1348	6579	11842	17
					2	4528	4232	1240	517	495	6743	109	896	6974	12552		
					3	5169	4831		590	565	7698	124	1023	7961	14329		
					4	5040	4960							8153	14676		
					5	658	4704	4628						7609	13696		
NOBLE	SALT CREEK	384	1	2	1	651	3984	4496	859	208	561	6890	132	1350	6854	12337	17
					2	4256	4814	920	222	523	7377	141	817	7339	13210		
					3	4698	5302		244	576	8125	155	900	8083	14548		
					4	4619	5381							8191	14744		
					5	738	4278	4984						7587	13656		
NOBLE	NOBLE	493	1	2	1	329	4084	4657	920	257	384	6990	92	1347	7060	12708	29
					2	4223	4813	951	276	359	7393	95	1090	7301	13142		
					3	4667	5333		305	397	7988	105	1205	8068	14523		
					4	4576	5424							8190	14742		
					5	371	4406	5223						7885	14193		
WILGUS																	
LAWRENCE	MASON	204	1	2	1	695	3908	4642	755	360	543	6683	133	1526	6649	11968	28
					2	4200	4989	811	387	501	7182	143	976	7145	12862		
					3	4571	5489		421	545	7816	156	1062	7776	13997		
					4	4457	5533							7898	14216		
					5	773	4122	5105						7287	13117		
"	SYMMES	206	1	2	1	815	3848	4590	747	283	540	6618	128	1684	6575	11835	28
					2	4189	4998	813	308	489	7205	139	1046	7158	12885		
					3	4560	5440		335	532	7843	151	1139	7791	14025		
					4	4459	5531							7901	14221		
					5	902	4066	5032						7188	12939		
MAHONING																	
COLUMBIANA	MADISON	425	1	2	1	318	3647	5221	814	153	531	7292	134	1076	7347	13224	21
					2	3767	5392	841	158	513	7531	139	818	7587	13657		
					3	4113	5887		173	560	8222	152	893	8284	14911		
					4	4038	5922							8377	15079		
					5	352	3896	5752						8083	14549		
"	MIDDLETON	424	1	2	1	322	3676	5238	764	198	526	7310	142	1060	7368	13263	21
					2	3798	5413	789	205	507	7554	147	798	7514	13705		
					3	4123	5877		223	550	8201	160	866	8266	14879		
					4	4043	5957							8364	15055		
					5	355	3900	5745						8067	14520		
"	"	547	1	4	1	415	3620	4715	1250	206						99	
					2	3777	4919	1304	215								
					3	4343	5657		247								
					4	4233	5767										
					5	486	4027	5487									
"	YELLOW CREEK	120	1	1	1	315	3932	5115	638	355	556	7535	135	781	7548	13586	16
					2	4050	5281	659	367	538	7780	139	517	7793	14027		
					3	4346	5654		393	576	8329	149	553	8343	15017		
					4	4249	5751							8464	15235		
					5	346	4101	5553						8172	14769		
JEFFERSON	ISLAND CREEK	189	1	1	1	389	3646	5225	740	363						4	
					2	3794	5436	770	378								
					3	4111	5889		410								
					4	3997	6003										
					5	432	3824	5744									
UPPER FREEPORT																	
ATHENS	DOVER	488	1	2	1	811	3744	5011	434	121	562	6232	123	2528	6885	12393	29
					2	4074	5453	473	132	514	6782	134	1965	7493	13487		
					3	4276	5784		139	540	7118	141	2062	7865	14156		
					4	4230	5770							7918	14252		
					5	857	3868	5275						7238	13030		

County	Township	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis					Heat value		Year		
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories	B. t. u.			
COLUMBIANA	WEST	341	1	2	1	718	3496	4891	895	252	515	6672	125	1541	6705	12069	21		
						2	3766	5269	965	272	469	7188	134	972	7224	13003			
						3	4168	5832			301	519	7956	148	1076	7996		14392	
						4	4064	5936								8116		14608	
						5	807	3737	5456							7459		13427	
	" YELLOW CREEK	135	1	1	1	513	3801	4858	828	378					7200	12960	16		
						2	4007	5120	873	398						7590		13662	
						3	4390	5610			436					8316		14969	
						4	4275	5725								8463		15233	
						5	577	4027	5396							7974		14353	
	" "	137	1	1	1	346	3674	4887	1093	428	524	6989	138	828	7073	12731	16		
						2	3806	5062	1132	443	503	7239	143	540	7326	13187			
						3	5336	4664			500	567	8163	161	609	8261		14870	
						4	4146	5854								8441		15193	
						5	403	3979	5618							8101		14582	
" "	141	1	1	1	343	3781	5128	748	286	553	7431	148	834	7425	13365	16			
					2	3915	5310	775	296	533	7695	153	548	7689	13840				
					3	4244	5756			321	578	8341	166	594	8335		15003		
					4	4149	5851								8452		15213		
					5	380	3992	5628							8130		14634		
GALLIA	WALNUT	339	1	2	1	752	3285	4714	1239	181	519	6348	128	1585	6371	11468	2		
						2	3556	5103	1341	196	470	6871	139	983	6896	12413			
						3	4137	5893			226	543	7935	161	1135	7964		14335	
						4	3991	6009								8102		14584	
						5	890	3636	5474							7382		13288	
GUERNSEY	CENTER	147 A	1	1	1	580	3689	5073	658	262						5			
						2	3916	5385	699	278									
						3	4210	5790			299								
						4	4123	5877											
						5	634	3862	5504										
	" "	147 B	1	1	1	628	3581	5061	730	355					7056	12701	5		
						2	3821	5400	779	379						7529		13552	
						3	4144	5856			411					8165		14697	
						4	4050	5970								8294		14930	
						5	697	3749	5554							7717		13890	
	" "	337	1	2	1	647	3590	5185	578	113	541	7259	141	1368	7076	12736	25		
						2	3858	5544	618	121	501	7761	151	848	7565	13617			
						3	4091	5999			129	534	8272	161	904	8063		14514	
						4	4056	5964								8128		14630	
						5	695	3756	5549							7563		13614	
	" RICHLAND	167 A	1	1	1	609	3522	5176	693	162					7077	12739	14		
						2	3750	5512	738	172						7536		13565	
						3	4049	5951			186					8136		14646	
						4	3977	6023								8221		14798	
						5	655	3712	5623							7675		13815	
		" "	167 B	1	1	1	595	3573	5057	795	215					7034	12661	14	
							2	3799	5356	845	228						7479		13462
							3	4150	5860			249					8169		14705
							4	4062	5938								8274		14894
							5	659	3794	5547							7729		13913
" "		167 K	1	1	1	607	3504	5166	733	195	537	7124	139	1272	7062	12712	14		
						2	3790	5400	780	208	500	7564	148	780	7518	13532			
						3	4046	5954			226	542	8225	161	846	8154		14677	
						4	3964	6036								8249		14849	
						5	657	3700	5633							7700		13860	
" "	175 A	1	1	1	537	3580	5078	805	164					7102	12784	14			
					2	3783	5366	851	173						7505		13509		
					3	4135	5855			169					8203		14766		
					4	4057	5943								8299		14938		
					5	594	3816	5590							7806		14050		
" "	175 B C	1	1	1	638	3357	5214	781	216					7015	12627	14			
					2	3596	5570	834	231						7493		13487		
					3	3923	6077			252					8175		14714		
					4	3831	6169								8279		14903		
					5	706	3561	5733							7696		13852		
" "	175 K	1	1	1	600	3422	5195	783	198	538	7138	132	1211	7067	12721	14			
					2	3640	5527	833	211	501	7593	140	722	7519	13532				
					3	3971	6089			230	547	8282	153	788	8201		14762		
					4	3883	6117								8302		14944		
					5	663	3627	5710							7752		13954		
" "	338	1	2	1	498	3642	5136	724	138	527	7199	143	1269	7094	12769	25			
					2	3833	5405	762	145	497	7576	150	870	7466	13438				
					3	4149	5851			157	538	8201	162	942	8082		14546		
					4	4093	5917								8162		14692		
					5	545	3860	5595							7718		13892		
" "	591	3	4	1	257	3944	4576	1213	319					6816	12268	52			
					2	4052	4702	1246	328						7003		12605		
					3	4629	5371			375					7999		14399		
					4	4509	5491								8157		14682		
					5	314	4368	5318							7901		14221		

County	Township	File number	Kind	Source	Condition	Proximate analysis			Ultimate analysis					Heat value		Year	
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories		B. t. u.
UPPER FREEPORT (CON.)																	
HARRISON	FREEPORT	534	3	4	1	249	3825	5183	743	362					7325	13185	23
					2		3923	5315	762	371				7512	13522		
					3		4247	5753		402				8132	14637		
					4		4139	5861						8257	14863		
					5	277	4023	5700						8028	14451		
"	"	535	3	4	1	216	3926	5120	738	283				7706	13871	14	
					2		4013	5233	754	289				7876	14177		
					3		4340	5660		313				8518	15333		
					4		4251	5749						8636	15545		
					5	239	4149	5612						8431	15175		
"	MONROE	332	1	2	1	684	3601	4688	1027	263	516	6722	142	1330	6650	11970	25
					2		3855	5032	1103	282	472	7216	152	775	7138	12848	
					3		4344	5656		317	531	8110	171	871	8023	14441	
					4		4234	5756						8158	14684		
					5	782	3903	5315						7520	13536		
JEFFERSON	SALINE	138 A	1	1	1	475	3828	5191	506	176				7480	13464	16	
					2		4019	5470	531	185				7853	14135		
					3		4244	5756		195				8293	14135		
					4		4185	5815						8366	15059		
					5	508	3972	5520						7942	14296		
"	"	138 B	1	1	1	343	3626	4957	1074	505	515	6966	137	803	7068	12722	16
					2		3755	5133	1112	523	494	7213	142	516	7319	13174	
					3		4225	5775		588	556	8115	160	581	8235	14822	
					4		4061	5939						8428	15171		
					5	401	3898	5701						8091	14563		
"	"	139	1	1	1	373	3654	5124	849	287				7290	13122	16	
					2		3795	5323	882	298				7572	13630		
					3		4162	5838		327				8304	14948		
					4		4058	5942						8431	15175		
					5	418	3889	5693						8078	14541		
LAWRENCE	AID	329	1	2	1	845	3125	4902	1128	93	510	6520	128	1621	6405	11529	1
					2		3413	5355	1232	102	454	7122	140	950	6996	12593	
					3		3893	6107		116	518	8123	160	1083	7979	14362	
					4		3801	6199						8089	14561		
					5	958	3433	5599						7307	13152		
"	"	330	1	2	1	837	3180	5160	823	129	521	6694	131	1702	6596	11873	1
					2		3470	5632	898	141	467	7305	143	1046	7198	12956	
					3		3812	6188		155	513	8026	157	1149	7908	14234	
					4		3733	6267						7996	14393		
					5	986	3388	5686						7257	13062		
"	"	331	1	2	1	785	3290	4707	1218	266	509	6303	125	1579	6305	11349	1
					2		3570	5188	1322	289	458	6840	135	956	6842	12316	
					3		4114	5886		333	528	7881	156	1102	7884	14192	
					4		3980	6020						8037	14467		
					5	919	3615	5456						7298	13136		
"	LAWRENCE	328	1	2	1	720	3225	4988	1057	233	503	6503	125	1569	6556	11801	1
					2		3475	5375	1150	251	456	7007	135	1001	7065	12717	
					3		3927	6073		284	515	7917	153	1131	7983	14369	
					4		3808	6192						8115	14607		
					5	826	3494	5680						7444	13400		
"	SYMMES	325	1	2	1	838	3145	5008	1009	184	518	6490	127	1672	6497	11695	1
					2		3433	5456	1101	201	464	7083	139	1012	7091	12764	
					3		3858	6142		226	521	7960	156	1137	7968	14343	
					4		3752	6248						8086	14555		
					5	951	3395	5654						7318	13172		
"	"	326	1	2	1	713	3365	5031	891	131	533	6709	128	1608	6716	12089	1
					2		3623	5417	960	141	489	7224	137	1049	7231	13016	
					3		4008	5992		156	541	7991	152	1160	7999	14398	
					4		3927	6073						8094	14569		
					5	795	3616	5589						7451	13411		
"	"	327	1	2	1	877	3170	5082	871	76	532	6688	125	1708	6586	11855	1
					2		3475	5370	955	83	477	7330	137	1018	7219	12994	
					3		3842	6158		92	527	8104	151	1126	7981	14366	
					4		3772	6228						8064	14516		
					5	973	3404	5623						7280	13104		
MUSKINGUM	BRUSH CREEK	324	1	2	1	472	4347	4425	756	500	555	6827	132	1230	7046	12683	2
					2		4562	4645	793	525	528	7165	138	851	7395	13311	
					3		4955	5045		570	573	7783	150	924	8032	14457	
					4		4843	5157						8187	14736		
					5	530	4587	4883						7753	13956		
"	HARRISON	322	1	2	1	489	4235	4498	778	436	553	6774	117	1342	6944	12499	2
					2		4453	4729	818	458	525	7122	123	954	7301	13142	
					3		4850	5150		499	572	7756	134	1039	7951	14313	
					4		4743	5257						8093	14567		
					5	548	4483	4969						7649	13768		
"	"	323	1	2	1	427	4553	4107	903	523	536	6798	112	1128	6967	12541	17
					2		4767	4290	943	546	511	7101	117	782	7278	13100	
					3		5263	4737		603	564	7841	129	863	8036	14464	
					4		5153	4847						8209	14776		
					5	489	4900	4611						7808	14054		

COAL RESOURCES OF OHIO

County	Township	File number	Kind	Source	Condition	Proximate analysis			Ultimate analysis					Heat value		Year	
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories		B. t. u.
UPPER FREEPORT (CON.)																	
MUSKINGUM	PERRY	321	1	2	1	928	3890	4363	819	362	560	6571	97	1591	6584	11851	17
					2		4288	4809	903	399	504	7243	107	844	7257	13063	
					3		4714	5286		439	554	7961	118	928	7977	14360	
					4		4606	5394							8116	14609	
					5	1041	4127	4832							7271	13088	
"	WAYNE	320	1	2	1	511	3550	4679	1260	384	511	6481	125	1239	6558	11804	2
					2		3741	4931	1328	405	478	6830	132	827	6911	12440	
					3		4314	5686		467	551	7876	152	954	7969	14345	
					4		4162	5838							8149	14668	
					5	606	3911	5483							7654	13778	
NOBLE	NOBLE	166 A	1	1	1	488	3776	4893	843	295					7073	12731	13
					2		3970	5144	886	310					7436	13385	
					3		4356	5644		340					8159	14686	
					4		4255	5745							8284	14911	
					5	547	4022	5431							7831	14096	
"	"	166 B	1	1	1	513	3717	4959	811	299					7053	12695	13
					2		3918	5287	855	315					7435	13383	
					3		4284	5716		344					8130	14634	
					4		4182	5818							8253	14855	
					5	573	3942	5485							7779	14002	
"	"	166 K	1	1	1	515	3734	4900	851	294	542	7051	150	1112	7074	12733	13
					2		3937	5166	897	310	512	7434	158	689	7459	13426	
					3		4325	5675		341	562	8166	174	757	8194	14749	
					4		4222	5778							8321	14977	
					5	577	3979	5444							7839	14111	
"	"	319	1	2	1	477	3706	5033	784	243	526	7157	141	1149	7028	12651	25
					2		3892	5285	823	255	497	7515	148	762	7380	13285	
					3		4241	5759		278	542	8189	161	830	8042	14476	
					4		4151	5849							8148	14667	
					5	529	3931	5540							7717	13891	
PERRY	MONROE	490	1	2	1	542	4174	4679	605	270					6971	12547	29
					2		4413	4948	639	285					7368	13263	
					3		4714	5286		304					7871	14168	
					4		4641	5359							7963	14334	
					5	589	4368	5043							7497	13494	
TUSCARAWAS	MILL	318	1	2	1	632	3766	4948	654	291	526	7078	143	1308	6985	12573	25
					2		4020	5282	698	311	487	7556	153	795	7456	13421	
					3		4322	5678		334	524	8123	164	855	8015	14428	
					4		4231	5769							8121	14617	
					5	692	3938	5370							7559	13606	
"	RUSH	317	1	2	1	638	3969	4702	691	313	535	6942	139	1380	7005	12609	25
					2		4239	5022	739	334	496	7415	148	868	7482	13468	
					3		4577	5423		361	536	8006	160	937	8079	14543	
					4		4487	5513							8194	14749	
					5	703	4171	5126							7618	13712	
LOWER FREEPORT																	
ATHENS	YORK	524	1	1	1	54	406	456	84	29	55	679	13	140	6822	12280	48
					2		429	482	89	30	52	718	14	97	7211	12980	
					3		471	529		33	57	788	15	107	7915	14240	
					4		462	538							8032	14458	
					5	60	434	506							7547	13584	
"	"	524	2	1	1	53	413	467	67	29	55	695	12	142	7000	12600	48
					2		436	493	71	31	52	735	13	98	7394	13310	
					3		470	530		33	56	791	14	106	7959	14330	
					4		461	539							8064	14516	
					5	58	434	508							7589	13661	
COLUMBIANA	ST. CLAIR	129	1	1	1	358	3847	4748	1047	449	539	7004	156	805	7138	12848	16
					2		3990	4924	1086	466	518	7264	162	504	7403	13325	
					3		4476	5524		523	581	8149	182	565	8305	14948	
					4		4336	5664							8486	15275	
					5	415	4156	5429							8134	14641	
"	YELLOW CREEK	130	1	1	1	594	3273	4981	1152	149	528	6830	135	1206	6726	12107	17
					2		3480	5295	1225	158	491	7262	144	720	7151	12872	
					3		3966	6034		180	560	8275	164	821	8149	14669	
					4		3894	6136							8274	14493	
					5	685	3598	5717							7707	13872	
JEFFERSON	ISLAND CREEK	349	1	2	1	310	3806	4891	993	360	514	7053	110	970	7222	12999	26
					2		3928	5047	1025	371	496	7279	114	715	7453	13415	
					3		4377	5623		413	553	8110	127	797	8304	14947	
					4		4256	5744							8459	15226	
					5	355	4104	5541							8158	14685	
"	SALINE	131	1	1	1	426	3555	4810	1209	236					6941	12494	16
					2		3713	5024	1253	246					7250	13050	
					3		4250	5750		282					8298	14936	
					4		4133	5867							8448	15207	
					5	497	3928	5575							8028	14450	

County	Township	File number	Kind	Source	Condition	Proximate analysis			Ultimate analysis				Heat value		Year			
						Mois-ture	Vola-tile	Fixed carbon	Ash	Sulphur	Hydro-gen	Carbon	Nitro-gen	Oxygen		Calo-ries	B. t. u.	
LOWER FREEPORT (CON.)																		
JEFFERSON	SPRINGFIELD	195 A	1	1	1	340	3801	5237	622	220					7518	13532	12	
					2	3935	5421	644	228					7783	14009			
					3	4206	5794		244					8319	14973			
					4	4131	5869								8410	15138		
					5	369	3979	5652							8099	14578		
	"	"	195 B	1	1	1	350	3793	5063	794	314					7364	13255	12
						2	3931	5246	823	325					7631	13736		
						3	4284	5716		354					8315	14968		
					4	4182	5818								8442	15196		
					5	390	4018	5592							8112	14602		
	"	"	195 C	1	1	1	359	3703	5064	874	370	519	7130	139	968	7224	13003	12
						2	3841	5252	907	384	497	7395	144	673	7493	13487		
3						4224	5776		422	547	8133	158	740	8240	14832			
				4	4103	5897								8384	15092			
				5	406	3936	5658							8044	14479			
"	"	196 A	1	1	1	347	3851	4956	826	240					7346	13223	12	
					2	4000	5144	856	249					7610	13698			
					3	4374	5626		272					8322	14980			
				4	4287	5713								8436	15185			
				5	387	4121	5492							8110	14598			
"	"	196 B	1	1	1	358	3758	4917	957	308					7156	12881	12	
					2	3897	5100	1003	319					7421	13358			
					3	4331	5659		355					8248	14847			
				4	4220	5780								8388	15099			
				5	407	4049	5544							8047	14485			
"	"	196 C	1	1	1	404	3851	4893	842	295					7234	13021	12	
					2	4024	5099	877	307					7539	13570			
					3	4411	5589		337					8264	14874			
				4	4312	5688								8390	15102			
				5	452	4117	5431							8011	14419			
"	"	347	1	2	1	383	4100	4768	749	286	550	7176	117	1122	7269	13084	26	
					2	4254	4957	779	298	528	7462	122	811	7558	13604			
					3	4624	5376		323	573	8092	132	880	8197	14753			
				4	4539	5451								8311	14959			
				5	424	4346	5230							7958	14325			
"	"	571 A	1	1	1	366	3743	5123	758	307					7342	13216	12	
					2	3885	5318	797	319					7621	13718			
					3	4221	5779		347					8281	14906			
				4	4121	5879								8403	15126			
				5	3953	5640								8062	14511			
"	"	571 B	1	1	1	352	3831	5078	739	299					7363	13253	12	
					2	3971	5253	756	310					7632	13738			
					3	4300	5700		336					8265	14878			
				4	4205	5795								8383	15089			
				5	389	4042	5569							8055	14499			
"	"	571 C	1	1	1	327	3887	5037	749	323					7359	13246	12	
					2	4018	5208	774	334					7608	13694			
					3	4355	5645		362					8246	14843			
				4	4256	5744								8368	15063			
				5	353	4102	5535							8065	14517			
"	"	571 D	1	1	1	336	3756	5206	702	240							10	
					2	3887	5387	726	248									
					3	4191	5809		267									
				4	4108	5892												
				5	359	3956	5675											
"	STEBENVILLE	187 A	1	1	1	380	3539	5339	742	191					7344	13219	13	
					2	3679	5550	771	199					7634	13741			
					3	3986	6014		216					8272	14889			
				4	3906	6094								8367	15060			
				5	418	3742	5840							8018	14432			
"	"	187 B	1	1	1	382	3590	5343	685	190	524	7420	145	1036	7418	13352	13	
					2	3733	5555	712	198	501	7715	151	723	7712	13882			
					3	4019	5981		213	539	8307	163	778	8303	14946			
				4	3943	6057								8394	15109			
				5	417	3778	5805							8044	14480			
MUSKINGUM	MADISON	345	1	2	1	535	4446	4333	686	209	585	7003	140	1377	7099	12778	17	
					2	4697	4578	725	220	556	7399	147	953	7500	13500			
					3	5064	4936		237	599	7977	159	1028	8086	14555			
				4	5003	4997								8178	14721			
				5	585	4711	4704							7700	13860			
MIDDLE KITTANNING																		
ATHENS	ATHENS	298	1	2	1	617	3640	4961	782	90	543	6922	130	1533	6868	12362	2	
					2	3880	5287	833	96	505	7377	139	1050	7319	13174			
					3	4233	5767		105	551	8047	152	1145	7984	14371			
				4	4172	5888								8060	14508			
				5	678	3889	5433							7514	13526			

COAL RESOURCES OF OHIO

County	Township	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis					Heat value		Year
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories	B. t. u.	
MIDDLE KITTANNING (CON.)																	
ATHENS	CANAAN	297	1	2	1	636	3419	5096	849	51	540	6925	143	1492	6919	12454	7
					2	3651	5442	907	54	501	7395	153	990	7389	13300		
					3	4015	5985		59	551	8133	168	1089	8126	14626		
					4	3956	6044							8201	14762		
					5	702	3679	5619						7625	13725		
	" DOVER	299	1	2	1	714	3422	5192	672	165	556	6932	130	1545	6863	12353	2
					2	3685	5591	724	178	514	7465	139	980	7390	13302		
					3	3973	6027		192	554	8048	150	1056	7967	14340		
					4	3899	6101							8049	14488		
					5	777	3596	5627						7423	13361		
	" "	486 A	1	1	1	93	354	500	53	9					6850	12330	30
					2	390	551	59	10					7552	13594		
					3	414	586		11					8026	14446		
					4	409	591							8078	14540		
					5	99	369	532						7278	13100		
" "	486 B	1	1	1	880	355	503	54	6					6900	12420	30	
				2	389	552	59	7					7566	13618			
				3	413	587							8040	14472			
				4	410	590							8094	14570			
				5	94	371	535						7333	13200			
" "	486 C	1	1	1	98	354	487	61	8					6717	12090	30	
				2	392	540	68	9					7447	13404			
				3	421	579		10					7990	14382			
				4	416	584							8050	14490			
				5	105	372	523						7200	12960			
" "	486 D ¹⁸	1	2	1	602	3928	4974	496	81	441	7132	98	1752	7067	12720	30	
				2	4180	5293	527	86	398	7568	104	1297	7518	13532			
				3	4413	5587		91	420	8010	110	1369	7936	14285			
				4	4373	5627							7986	14375			
				5	639	4094	5267						7478	13460			
" "	486 K	1	1	1	86	353	500	61	8	56	694	14	167	6817	12270	30	
				2	386	548	66	9	51	759	15	100	7456	13420			
				3	413	587		10	54	813	17	106	7989	14380			
				4	409	591							8056	14500			
				5	93	370	537						7306	13150			
" "	606	1	3	1	411	3687	5194	708	68					6962	12532	54	
				2	3845	5417	738	71					7260	13069			
				3	4151	5849		77					7838	14110			
				4	4100	5900							7902	14223			
				5	447	3917	5636						7549	13588			
" "	606	2	3	1	333	3465	4518	1694	211					6197	11156	54	
				2	3574	4674	1752	218					6410	11540			
				3	4333	5667		264					7772	13991			
				4	4190	5810							7950	14310			
				5	413	4017	5570						7622	13720			
" "	606	3	3	1	277	3908	4086	1729	348					6267	11281	54	
				2	4019	4203	1778	358					6446	11602			
				3	4888	5112		435					7840	14111			
				4	4736	5264							8051	14491			
				5	349	4571	5080						7770	13986			
" "	606	9	3	1	343	3673	4602	1382	196					6455	11620	54	
				2	3803	4756	1431	203					6684	12033			
				3	4438	5562		237					7800	14042			
				4	4324	5676							7945	14301			
				5	408	4148	5444						7621	13717			
" TRIMBLE	295	1	2	1	728	3238	5361	673	86	545	6946	134	1616	6894	12409	2	
				2	3492	5782	726	93	500	7491	145	1045	7435	13383			
				3	3755	6235		100	539	8078	156	1127	8017	14431			
				4	3706	6294							8084	14552			
				5	789	3414	5797						7447	13404			
" WATERLOO	293	1	2	1	670	3536	5119	675	228	549	6921	118	1509	6921	12458	2	
				2	3790	5487	723	244	509	7418	126	980	7418	13352			
				3	4085	5915		263	549	7996	136	1056	7996	14393			
				4	4001	5999							8091	14563			
				5	733	3707	5560						7498	13497			
" "	294	1	2	1	680	3690	4825	805	214	549	6740	137	1555	6794	12229	2	
				2	3959	5177	864	230	507	7232	147	1020	7290	13122			
				3	4333	5667		252	555	7916	161	1116	7979	14363			
				4	4248	5752							8083	14549			
				5	754	3928	5318						7472	13450			
" YORK	485	1	2	1	740	3928	4792	540	97	447	6985	98	1833	7029	12652	30	
				2	4242	5175	583	104	395	7544	105	1269	7591	13663			
				3	4505	5493		110	419	8011	112	1348	8061	14509			
				4	4460	5540							8119	14613			
				5	790	4108	5102						7478	13460			
CARROLL ORANGE	296	1	2	1	376	3911	5034	679	306	536	7199	140	1140	7238	13028	2	
				2	4064	5231	705	318	513	7480	146	838	7521	13537			
				3	4372	5628		342	552	8047	157	902	8091	14564			
				4	4281	5719							8200	14760			
				5	413	4105	5482						7862	14151			

County	Township	File number	Kind	Source	Condition	Proximate analysis			Ultimate analysis					Heat value		Year		
						Mois-ture	Vola-tile	Fixed carbon	Ash	Sulphur	Hydro-gen	Carbon	Nitro-gen	Oxygen	Calo-ries		B. t. u.	
MIDDLE KITTANNING (CON.)																		
COLUMBIANA	LIVERPOOL	125	1	1	1	479	3483	5295	743	179	539	7399	138	1002	7329	13192	16	
					2	3658	5552	780	188	510	7771	145	606	7698	13856			
					3	3967	6053		204	553	8429	157	657	8349	15028			
	"	"	126	1	1	1	433	3675	5431	461	146					7589	13660	16
						2	3841	5677	482	153					7933	14279		
						3	4036	5954		161					8335	15002		
	"	"	127	1	1	1	508	3578	5315	599	207					7412	13342	16
						2	3759	5600	631	218					7809	14056		
						3	4023	5977		233					8335	15003		
	"	"	292	1	2	1	360	3616	5554	460	176	546	7706	138	974	7789	14020	7
						2	3751	5772	477	183	525	7994	143	678	8080	14544		
						3	3939	6061		192	551	8395	150	712	8485	15272		
"	"	292	1	2	4	383	3730	5887							8556	15401	7	
					5									8012	14421			
														8228	14811			
"	YELLOW CREEK	128	1	1	1	341	3466	5118	1075	70	522	7162	145	1026	7128	12830	16	
					2	3588	5299	1113	72	501	7415	150	749	7380	13284			
					3	4037	5963		81	564	8343	169	843	8304	14948			
					4	3962	6058							8403	15126			
					5	389	3807	5804						8077	14539			
COSHOCTON	ADAMS	291	1	2	1	458	3918	4749	875	536	540	6751	124	1174	6878	12380	2	
					2	4156	4977	917	562	512	7075	130	804	7208	12974			
					3	4521	5479		619	564	7789	143	885	7936	14284			
	"	CLARK	290	1	2	1	530	3908	4947	615	372	550	6959	112	1392	7084	12751	2
						2	4127	5224	649	393	518	7348	118	974	7480	13464		
						3	4413	5587		420	554	7858	126	1042	7999	14398		
	"	"	340	1	2	4	580	4313	5687							8115	14607	2
						5	4063	5357							7645	13761		
	"	"	340	1	2	1	640	3792	5249	319	201	567	7272	125	1516	7325	13185	2
						2	4051	5608	341	215	530	7769	133	1012	7826	14086		
						3	4194	5806		223	549	8042	138	1048	8102	14583		
"	"	340	1	2	4	671	4139	5861							8163	14693	2	
					5	3861	5468							7616	13708			
"	CRAWFORD	289	1	2	1	470	3920	4481	1129	560	523	6478	112	1198	6594	11869	2	
					2	4113	4722	1185	588	494	6797	118	818	6919	12454			
					3	4666	5334		667	560	7711	134	928	7849	14128			
					4	4505	5495							8046	14482			
					5	555	4255	5190						7599	13678			
"	FRANKLIN	393	1	2	1	433	4111	4897	559	400	541	7142	122	1236	7269	13084	2	
					2	4297	5119	584	418	515	7465	128	890	7598	13676			
					3	4554	5436		444	547	7928	136	945	8069	14524			
					4	4468	5552							8186	14735			
					5	472	4257	5271						7801	14041			
"	JACKSON	392	1	2	1	532	4093	4745	630	422	550	6929	124	1345	7086	12755	2	
					2	4253	5022	655	446	519	7318	141	925	7484	13471			
					3	4651	5369		478	556	7839	140	987	8017	14431			
					4	4528	5472							8145	14661			
					5	585	4263	5152						7669	13804			
"	KEENE	391	1	2	1	540	3992	4960	508	318	558	7090	124	1402	7194	12949	2	
					2	4220	5243	537	336	526	7495	131	975	7605	13689			
					3	4459	5541		355	556	7921	138	1030	8037	14466			
					4	4377	5623							8134	14641			
					5	582	4123	5295						7660	13788			
"	LINTON	388	1	2	1	437	4097	4930	536	361	556	7134	128	1285	7247	13045	2	
					2	4284	5155	561	377	530	7460	134	938	7578	13640			
					3	4539	5461		399	562	7903	142	994	8028	14451			
					4	4450	5550							8134	14642			
					5	474	4239	5287						7749	13949			
"	"	389	1	2	1	1093	3400	4843	654	203	537	6308	115	2173	6133	11039	2	
					2	3817	5437	746	228	467	7081	129	1349	6885	12393			
					3	4125	5875		246	505	7652	139	1458	7440	13392			
					4	4043	5957							7522	13540			
					5	1192	3561	5247						6626	11926			
"	OXFORD	387	1	2	1	444	4071	5040	445	354	553	7265	135	1248	7351	13231	2	
					2	4260	5274	466	370	527	7603	141	893	7693	13847			
					3	4468	5552		388	553	7974	148	937	8063	14524			
					4	4385	5615							8167	14701			
					5	476	4176	5348						7777	13999			
"	VIRGINIA	386	1	2	1	512	3899	4887	702	387	545	6949	120	1297	7066	12719	2	
					2	4109	5151	740	408	514	7324	127	887	7447	13405			
					3	4437	5563		441	555	7909	137	958	8042	14476			
					4	4330	5670							8170	14706			
					5	567	4065	5348						7707	13873			

COAL RESOURCES OF OHIO

County	Township	File number	Kind	Source	Condition	Proximate analysis			Ultimate analysis					Heat value		Year	
						Mois-ture	Vola-tile	Fixed carbon	Ash	Sulphur	Hydro-gen	Carbon	Nitro-gen	Oxygen	Calo-ries		B. t. u.
MIDDLE KITTANNING (CON.)																	
COSHOCTON	WHITE EYES	472	1	2	1	532	3789	4869	860	436	532	6741	118	1313	6828	12290	2
						2	3949	5143	908	460	500	7120	125	887	7212	12982	
						3	4343	5657		506	550	7831	137	976	7932	14278	
						4	4212	5788							8082	14547	
						5	602	3959	5439						7594	13669	
"	"	484	1	2	1	460	3873	5080	597	363	553	7094	130	1263	7173	12911	2
						2	4055	5320	625	380	527	7428	136	904	7511	13519	
						3	4325	5675		405	562	7924	145	964	8012	14420	
						4	4227	5773							8123	14622	
						5	4019	5489							7724	13904	
GALLIA	GREENFIELD	483	1	2	1	808	3753	4587	852	364	548	6571	118	1547	6717	12091	6
						2	4083	4990	927	396	498	7149	128	1002	7307	13153	
						3	4500	5500		436	549	7880	141	994	8054	14497	
						4	4385	5615							8196	14753	
						5	910	3986	5104						7451	13412	
HOCKING	GREEN	482	1	2	1	655	3730	4918	697	257	545	6840	118	1543	6901	12422	2
						2	3991	5263	746	275	505	7319	126	1029	7385	13293	
						3	4313	5687		297	546	7909	136	1112	7980	14365	
						4	4226	5774							8082	14548	
						5	719	3922	5359						7501	13501	
"	STARR	481	1	2	1	652	3830	4715	803	352	549	6733	120	1443	6850	12330	2
						2	4097	5044	859	377	510	7203	128	923	7328	13190	
						3	4482	5518		412	558	7880	140	1010	8017	14429	
						4	4374	5626							8148	14666	
						5	729	4056	5215						7553	13596	
"	WARD	478	1	2	1	740	3417	5343	500	106	555	7058	132	1649	7027	12649	2
						2	3490	5700	540	114	511	7622	143	1070	7589	13660	
						3	3901	6099		121	540	8057	151	1131	8022	14440	
						4	3850	6150							8079	14542	
						5	787	3547	5666						7443	13598	
"	"	479	1	2	1	745	3501	5273	481	66	553	7104	143	1653	7057	12703	2
						2	3783	5697	520	71	508	7676	154	1071	7625	13725	
						3	3991	6009		75	536	8097	162	1130	8043	14478	
						4	3950	6050							8091	14564	
						5	789	3638	5573						7453	13416	
"	"	480	1	2	1	755	3403	5257	585	77	552	7005	142	1639	6950	12510	2
						2	3681	5686	633	83	506	7577	154	1047	7518	13532	
						3	3930	6070		89	540	8089	164	1118	8026	14446	
						4	3880	6120							8084	14552	
						5	810	3565	5625						7429	13373	
"	"	527	1	1	1	102	354	491	53	6	57	686	14	184	6717	12090	48
						2	394	547	59	7	51	763	16	105	7478	13460	
						3	419	581		7	54	812	17	110	7947	14310	
						4	415	585							7997	14395	
						5	109	369	522						7132	12837	
"	"	527	2	1	1	92	333	469	106	5	55	652	13	169	6367	11460	48
						2	366	517	117	5	49	718	14	97	7011	12620	
						3	415	585		6	55	813	16	110	7940	14290	
						4	407	593							8034	14462	
						5	104	366	530						7197	12954	
"	"	527	3	1	1	104	355	465	76	14	55	645	14	196	6283	11310	48
						2	395	519	85	15	49	719	16	116	7011	12620	
						3	433	567		17	53	786	17	127	7662	13790	
						4	426	574							7744	13940	
						5	114	377	509						6861	12349	
"	"	568	1	1	1	972	3244	5341	443	54	570	6950	125	1858	6804	12247	7
						2	3583	5916	491	60	512	7699	138	1100	7537	13567	
						3	3779	6221		63	538	8097	145	1157	7926	14268	
						4	3740	6260							7970	14345	
						5	1024	3358	5618						7152	12874	
HOLMES	CLARK	477	1	2	1	584	4029	4860	527	265					7093	12767	28
						2	4279	5161	560	262					7533	13559	
						3	4533	5467		299					7980	14363	
						4	4460	5540							8067	14521	
						5	629	4180	5191						7559	13607	
"	WALNUT CREEK	476	1	2	1	731	3492	5356	421	100	542	7062	144	1731	6952	12514	2
						2	3768	5778	454	108	497	7619	156	1166	7500	13500	
						3	3947	6053		113	521	7982	163	1221	7857	14142	
						4	3903	6097							7904	14228	
						5	770	3602	5628						7296	13133	
JEFFERSON	SALINE	122	1	1	1	264	3675	4946	1115	207	526	7104	149	899	7158	12884	16
						2	3775	5080	1145	213	510	7297	153	682	7352	13234	
						3	4263	5737		241	576	8240	173	770	8303	14945	
						4	4162	5858							8435	15183	
						5	304	4035	5661						8178	14721	
"	SPRINGFIELD	117 A	1	1	1	35	377	508	80	30					7367	13260	30
						2	391	520	83	31					7634	13741	
						3	426	574		34					8325	14985	
						4	417	583							8450	15210	
						5	39	400	561						8117	14610	

County	Township	File number	Kind	Source	Condition	Proximate analysis			Ultimate analysis					Heat value		Year		
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories		B. t. u.	
MIDDLE KITTANNING (CON.)																		
JEFFERSON	SPRINGFIELD	117 B	1	1	1	32	382	502	84	36					7300	13140	30	
							395	518	87	37					7541	13574		
							433	557		41					8259	14867		
							420	580							8394	15110		
							405	558							8094	14570		
	"	"	117 C	1	1	1	34	375	509	82	35				7367	13260	30	
								388	527	85	36					7626		13727
								424	575		39					8334		15002
								413	587							8472		15250
								397	565							8150		14670
	"	"	117 D	1	1	1	39	375	504	82	21				7333	13200	30	
								390	525	85	22					7631		13736
								426	574		24					8340		15012
								418	582							8450		15210
								400	557							8083		14550
	"	"	117 E	1	1	1	36	381	500	83	25				7350	13230	30	
								395	519	86	26					7624		13724
								432	568		28					8342		15015
								424	575							8461		15220
								407	553							8122		14620
"	"	117 F	1	1	1	37	376	518	69	33				7428	13370	30		
							390	538	72	34					7713		13883	
							420	580		37					8311		14960	
							411	589							8428		15170	
							394	565							8083		14550	
"	"	117 K	1	1	1	35	377	507	80	29	56	717	14	7350	13230	30		
							391	526	83	30	54	743	15	7624	13724			
							426	574		33	59	810	16	8314	14966			
							416	584						8439	15190			
							400	560						8100	14580			
LAWRENCE	PERRY	475	1	2	1	664	3428	4816	1092	332	516	6495	123	1442	6626	11927	7	
							3672	5158	1170	355	473	6957	132	913	7097	12775		
							4159	5841		402	536	7879	149	1034	8037	14468		
							4023	5977							8194	14749		
							3713	5518							7564	13615		
MAHONING	GREEN	471	1	2	1	504	4014	5131	351	106	542	7414	141	1446	7426	13366	21	
							4227	5403	370	112	513	7807	149	1049	7819	14675		
							4389	5647		116	533	8107	155	1089	8119	14616		
							4353	5647							8165	14697		
							527	4124	5349						7734	13922		
"	"	473	1	2	1	523	3686	5319	472	217	550	7384	141	1236	7502	13504	7	
							3889	5613	498	229	519	7791	149	814	7916	14249		
							4093	5907		241	546	8199	157	857	8331	14996		
							4025	5975							8411	15139		
							558	3801	5641						7942	14295		
MONROE	JACKSON	581	1	3	3	122	2213	2200	5465	212					3439	6190	51	
							2240	2228	5532	215					3482	6267		
							5013	4987		481					7793	14026		
							4380	5620							8758	15765		
							4248	5446							8490	15282		
"	"	581	2	3	3	127	2958	3770	3145	396					5508	9914	51	
							2996	3719	3185	401					5578	10042		
							4396	5604		588					8185	14735		
							4071	5929							8624	15524		
							3990	5811							8453	15215		
"	"	581	3	3	3	135	3656	5022	1177	339					7336	13204	51	
							3716	5091	1193	344					7436	13384		
							4219	5781		391					8443	15197		
							4087	5913							8613	15503		
							4023	5819							8477	15259		
MUSKINGUM	ADAMS	474	1	2	1	553	4470	4484	483	332	569	7141	125	1350	7206	12971	17	
							4737	4751	512	351	537	7567	133	900	7635	13743		
							4993	5007		370	566	7975	140	949	8047	14485		
							4923	5077							8145	14661		
							606	4624	4770						7653	13775		
"	BRUSH CREEK	468	1	2	1	555	4436	4285	714	443	564	6835	102	1342	6960	12528	17	
							4701	4542	757	470	531	7244	108	890	7377	13278		
							5086	4914		508	574	7838	117	963	7981	14365		
							4989	5011							8120	14616		
							629	4676	4695						7609	13696		
"	"	470	1	2	1	508	3975	4540	977	554	532	6574	114	1249	6802	12244	2	
							4188	4783	1029	584	501	6925	120	841	7166	12899		
							4668	5332		651	558	7720	134	937	7988	13799		
							4520	5480							8175	14715		
							588	4254	5158						7694	13850		
"	"	558	1	1	1	410	3836	3817	1937	604	487	5831	105	1036	5962	10731	50	
							4000	3930	2020	630	460	6080	110	700	6217	11190		
							5013	2937		789	576	7620	138	877	7791	14023		
							4800	5200							8086	14555		
							541	4540	4919						7648	13766		

COAL RESOURCES OF OHIO

County	Township	File number	Kind	Source	Condition	Proximate analysis			Ultimate analysis					Heat value		Year	
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories		B. t. u.
MUSKINGUM	CLAY	559	1	1	1	400	4070	4253	1277	518	505	6422	106	1172	6480	11664	50
						4240	4430	4370	540	480	6690	110	850	6750	12150		
						4890	5110	5251	623	554	7716	127	980	7785	14014		
						4739	5251	5009						7984	14371		
						480	4511	5009						7601	13682		
	HARRISON	469	1	2	1	467	4032	4518	983	410	538	6771	116	1182	6873	12371	2
						4230	4739	4739	1031	430	510	7103	121	805	7210	12978	
						4716	5284	5284		479	569	7919	135	898	8039	14470	
						4596	5404	5404						8197	14755		
						4349	5115	5115						7757	13963		
	MADISON	465	1	2	1	613	4425	4442	520	364	576	7002	122	1416	7108	12794	17
						4714	4732	554	388	541	7459	130	928	7572	13629		
						4990	5010		411	573	7896	138	982	8016	14428		
						4913	5087							8123	14622		
						4587	4749							7584	13652		
	"	466	1	2	1	462	4095	4785	658	449	547	6958	130	1258	7126	12827	2
						4293	5017	690	471	520	7295	136	888	7471	13448		
						4611	5389		506	559	7835	146	954	8025	14445		
						4501	5499							8159	14687		
						511	4272	5217						7743	13937		
	"	467	1	2	1	475	3988	4609	928	535	535	6669	128	1205	6854	12337	2
						4187	4839	974	562	506	7002	134	822	7471	13448		
						4639	5361		623	561	7757	148	911	7973	14350		
						4496	5504							8148	14667		
546						4251	5203						7704	13867			
MONROE	462	1	2	1	588	4381	4651	380	298	574	7218	127	1403	7308	13154	17	
					4655	4941	404	317	541	7668	135	935	7764	13975			
					4851	5149		330	564	7991	141	974	8091	14563			
					4788	5212							8175	14715			
					4489	4887							7665	13797			
"	463	1	2	1	552	4473	4512	463	350	566	7090	111	1420	7241	13034	17	
					4734	4776	490	370	535	7504	118	983	7664	13795			
					4978	5022		389	563	7890	124	1034	8059	14506			
					4906	5094							8159	14686			
					593	4616	4791						7676	13816			
MUSKINGUM	464	1	2	1	555	4027	4895	523	363	557	7054	126	1377	7191	12944	2	
					4263	5183	554	384	524	7469	133	936	7614	13705			
					4513	5487		407	555	7906	141	991	8061	14509			
					4423	5577							8168	14703			
					4158	5241							7677	13819			
NEWTON	461	1	2	1	502	3816	4726	956	597	529	6588	112	1218	6758	12164	2	
					4018	4976	1006	629	498	6936	118	813	7115	12807			
					4467	5533		699	554	7712	131	904	7911	14239			
					4302	5698							8101	14581			
					581	4052	5367						7631	13735			
WASHINGTON	460	1	2	1	544	3915	4613	928	377	534	6716	118	1327	6822	12280	2	
					4140	4879	981	399	501	7102	125	892	7214	12985			
					4590	5410		442	555	7875	139	989	7999	14397			
					4474	5526							8144	14660			
					619	4198	5183						7642	13755			
WAYNE	459	1	2	1	593	4569	4254	584	371	567	6721	124	1633	7067	12721	17	
					4856	4523	621	394	532	7145	132	1176	7312	13522			
					5178	4822		420	567	7618	141	1254	8009	14417			
					5101	4899							8124	14623			
					647	4772	4581						7598	13677			
PERRY	BEARFIELD	458	1	2	1	590	3658	4742	1010	496	526	6543	122	1303	6686	12035	2
						3887	5040	1073	527	490	6953	129	828	7105	12789		
						4354	5646		590	549	7788	145	928	7959	14326		
						4199	5801							8137	14647		
						683	3912	5405						7582	13648		
	CLAYTON	457	1	2	1	672	3830	4834	664	243	561	6845	129	1558	6903	12425	2
						4107	5182	711	260	522	7338	139	1030	7400	13320		
						4421	5579		280	562	7899	150	1109	7966	14340		
						4342	5658							8062	14512		
						734	4022	5244						7471	13448		
"	553 A	1	3	1	529	3993	3883	1595	172					6327	11389	51	
					4216	4100	1684	182					6680	12025			
					5070	4930		219					8033	14460			
					4960	5040							8204	14768			
					4640	4714							7674	13813			
"	553 B	1	3	1	512	3466	3913	2109	124					5821	10478	51	
					3653	4124	2223	131					6135	11043			
					4697	5303		168					7889	14200			
					4547	5453							8102	14584			
					4243	5088							7560	13608			
"	553 C	1	3	1	575	3354	3611	2460	317					5464	9834	51	
					3559	3831	2610	336					5797	10434			
					4816	5184		455					7844	14119			
					4596	5404							8152	14673			
					802	4227	4971						7498	13497			

County	Township	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis					Heat value		Year	
						Mois-ture	Vola-tile	Fixed carbon	Ash	Sulphur	Hydro-gen	Carbon	Nitro-gen	Oxygen	Calo-ries	B. t. u.		
MIDDLE KIT TANNING (CON.)																		
PERRY	CLAYTON	553 D	1	3	1	543	3452	3826	2209	179						5811	10461	51
					2	3650	4120	2230	189					6145	11061			
					3	4698	5302		243					7909	14236			
					4	4535	5465							8137	14646			
					5	4213	5075							7558	13604			
"	"	553 K	1	3	1	540	3566	3826	2068	198					5856	10541	51	
					2	3770	4044	2186	209					6190	11142			
					3	4625	5175		267					7922	14259			
					4	4625	5333							8149	14669			
					5	705	4337	4958						7576	13636			
"	"	602 A1	1	3	1	320	4385	4574	721	465					7067	12722	53	
					2	4550	4725	745	480					7301	13143			
					3	4895	5105		519					7889	14201			
					4	4790	5210							8026	14447			
					5	357	4619	5024						7739	13931			
"	"	602 A2	1	3	1	270	4119	5104	507	180					7280	13105	53	
					2	4233	5246	521	185					7482	13469			
					3	4466	5534		195					7893	14209			
					4	4410	5590							7961	14329			
					5	289	4283	5428						7731	13915			
"	"	602 A3	1	3	1	280	3717	4047	1956	155					6072	10931	53	
					2	3824	4164	2012	159					6247	11246			
					3	4787	5213		199					7820	14079			
					4	4651	5349							8016	14428			
					5	359	4484	5157						7728	13911			
"	"	602 A9	1	3	1	320	4018	4577	1085	268					6761	12170	53	
					2	4251	4728	1121	277					6985	12572			
					3	4675	5328		312					7867	14159			
					4	4574	5422							7998	14396			
					5	359	4405	5226						7703	13865			
"	"	602 B1	1	3	1	372	4056	3661	1911	1182					5909	10636	53	
					2	4213	3802	1985	1228					6137	11047			
					3	5256	4744		1532					7657	13783			
					4	4962	5038							8072	14529			
					5	511	4708	4731						7659	13787			
"	"	602 B2	1	3	1	464	4004	4136	1396	379					6355	11439	53	
					2	4199	4337	1464	397					6664	11996			
					3	4919	5081		465					7807	14053			
					4	4784	5216							7992	14386			
					5	560	4516	4924						7544	13580			
"	"	602 B3	1	3	1	304	3091	3093	3512	185					4721	8499	53	
					2	3188	3190	3622	191					4869	8765			
					3	4998	5002							7634	13743			
					4	4716	5284							8050	14490			
					5	498	4481	5021						7649	13769			
"	"	602 B9	1	3	1	395	3871	3744	1990	707					5874	10575	53	
					2	4050	3898	2072	737					6116	11010			
					3	5083	4917		928					7714	13887			
					4	4852	5148							8037	14467			
					5	529	4596	4875						7610	13698			
"	HARRISON	454	1	2	1	640	3800	4802	758	272	549	6806	126	1489	6867	12361	2	
					2	4050	5130	810	290	511	7271	135	983	7337	13206			
					3	4488	5582		316	556	7911	147	1070	7984	14370			
					4	4327	5673							8093	14568			
					5	709	4019	5272						7520	13536			
"	"	455	1	2	1	570	3883	4702	845	338	537	6777	118	1385	6851	12332	2	
					2	4118	4986	896	358	503	7187	125	931	7265	13077			
					3	4523	5477		393	553	7894	137	1023	7980	14364			
					4	4418	5582							8110	14598			
					5	640	4135	5225						7591	13664			
"	"	456	1	2	1	721	3760	4993	526	234	560	6977	126	1577	7008	12614	2	
					2	4052	5381	567	252	517	7519	136	1009	7553	13595			
					3	4296	5704		267	548	7971	144	1070	8007	14412			
					4	4223	5777							8091	14563			
					5	775	3896	5329						7463	13433			
"	MONROE	450	1	2	1	679	3545	5185	591	100	549	7030	130	1600	6983	12569	2	
					2	3804	5582	634	107	508	7542	139	1070	7492	13485			
					3	4061	5959		114	542	8054	148	1142	7999	14398			
					4	4009	5991							8061	14510			
					5	730	3715	5555						7473	13452			
"	"	487	1	2	1	660	4062	4520	758	260					6871	12367	30	
					2	4349	4839	812	278					7356	13241			
					3	4733	5267		303					8006	14411			
					4	4652	5348							8114	14606			
					5	730	4312	4958						7522	13539			
"	PIKE	123 A	1	1	1	887	3932	4781	400	174						5		
					2	4315	5246	439	192									
					3	4513	5487		201									
					4	4462	5538											
					5	936	4044	5020										

COAL RESOURCES OF OHIO

County	Township	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis					Heat value		Year	
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calo-ries	B. t. u.		
																		1
MIDDLE KITTANNING (CON.)																		
PERRY	PIKE	123 B	1	1	1	89.2	38.68	46.65	58.5	30.0						68.49	123.28	5
					2	42.36	51.22	64.2	32.9							75.20	135.36	
					3	45.27	54.73		35.2							80.36	144.65	
					4	44.41	55.59									81.41	146.33	
					5	9.59	40.11	50.20								73.51	132.32	
	"	"	452	1	2	1	52.5	38.85	46.04	98.6	34.3	5.38	6.605	1.18	14.10	67.73	121.91	2
						2	41.00	48.59	104.1	36.2	5.07	6.971	1.24	9.95	71.48	128.66		
						3	45.76	54.24		40.4	5.66	7.781	1.38	11.11	79.79	143.61		
						4	44.62	55.38							81.22	146.20		
						5	6.00	41.95	52.05						76.34	137.42		
	"	"	453 A	1	2	1	70.0	37.12	48.93	69.5	23.3	5.58	6.829	1.26	15.59	68.80	123.84	2
						2	39.91	52.62	74.7	25.1	5.16	7.343	1.35	10.08	73.98	133.16		
						3	43.13	56.87		27.1	5.58	7.936	1.46	10.89	79.95	143.91		
						4	42.31	57.59							80.93	145.67		
						5	7.57	39.07	53.26						74.72	134.49		
"	"	453 B	1	1	1	4.8	4.37	4.67	4.8	2.5	5.7	7.16	1.4	14.0	72.39	130.30	28	
					2	4.59	4.91	5.0	2.6	5.5	7.52	1.4	10.3	76.00	136.80			
					3	4.83	5.17		2.8	5.8	7.92	1.5	10.7	80.06	144.10			
					4	4.78	5.22							80.89	145.60			
					5	5.1	4.53	4.95						76.72	138.10			
"	SALT LICK	124 A	1	1	1	107.8	34.86	48.23	61.3	11.1					66.63	119.93	5	
					2	39.07	54.06	68.7	12.4					74.68	134.42			
					3	41.95	58.05		13.3					80.19	144.34			
					4	41.38	58.62							80.89	145.60			
					5	11.52	36.57	51.81						71.49	128.68			
"	"	124 B	1	1	1	97.9	35.74	48.46	60.1	14.3						5		
					2	39.62	53.72	65.6	15.9									
					3	42.45	57.55		17.0									
					4	41.83	58.17											
					5	10.56	37.41	52.03										
"	"	451	1	2	1	77.6	33.50	51.27	74.7	14.5	5.46	6.830	1.18	16.14	67.72	121.90	2	
					2	36.32	55.58	81.0	15.7	4.99	7.404	1.28	10.02	73.42	132.16			
					3	39.52	60.48		17.1	5.43	8.057	1.39	10.90	79.89	143.81			
					4	38.77	61.23							80.74	145.34			
					5	8.51	35.47	56.02						73.87	132.96			
STARK	LEXINGTON	449	1	2	1	59.9	39.05	50.14	48.2	3.61	5.56	7.182	1.33	12.86	73.14	131.65	7	
					2	41.54	53.33	51.3	3.84	5.21	7.639	1.41	8.02	77.80	140.44			
					3	43.39	56.21		4.05	5.49	8.052	1.49	8.45	82.01	147.61			
					4	42.87	57.13							83.09	149.57			
					5	64.5	40.11	53.44						77.73	139.91			
"	NIMISHILLEN	448	1	2	1	5.55	38.51	45.76	100.8	41.3	5.29	6.692	1.19	12.39	68.68	123.62	7	
					2	40.82	48.50	106.8	43.8	4.94	7.093	1.26	7.81	72.79	131.02			
					3	45.70	54.30		4.90	5.53	7.942	1.41	8.74	81.49	146.69			
					4	44.41	55.59							83.17	149.70			
					5	6.51	41.51	51.98						77.76	139.97			
"	SANDY	301 B ²⁰	1	2	1	64.9	40.26	46.64	6.51	1.93					69.42	124.95	26	
					2	43.05	49.88	7.07	2.07					74.23	133.62			
					3	43.39	53.57		2.23					79.43	143.39			
					4	45.56	54.34							80.74	145.34			
					5	7.07	42.44	50.49						75.03	135.06			
"	"	446	1	2	1	6.66	36.24	48.88	8.22	2.66	5.37	6.894	1.20	13.61	69.77	125.59	7	
					2	38.82	52.37	88.1	2.85	4.96	7.386	1.28	8.24	74.75	134.55			
					3	42.57	57.43		3.13	5.44	8.099	1.40	9.04	81.97	147.55			
					4	41.58	58.42							83.18	149.72			
					5	74.3	38.00	54.07						76.99	138.59			
TUSCARAWAS	AUBURN	444	1	2	1	4.30	40.07	48.00	7.63	3.97	5.41	6.939	1.28	12.32	70.01	126.02	2	
					2	41.87	50.16	79.7	4.15	5.15	7.251	1.34	8.88	73.16	131.69			
					3	45.50	54.50		4.51	5.60	7.878	1.46	9.65	79.50	143.09			
					4	44.41	55.59							80.81	145.46			
					5	4.80	42.28	52.92						76.93	138.47			
"	BUCKS	443	1	2	1	5.19	40.79	48.15	5.87	3.55	5.59	7.012	1.36	13.51	71.22	128.20	2	
					2	43.02	50.79	61.9	3.74	5.29	7.395	1.43	9.40	75.12	135.22			
					3	45.86	54.14		3.99	5.64	7.883	1.52	10.02	80.08	144.14			
					4	44.96	55.04							81.18	146.12			
					5	5.66	42.42	51.92						76.59	137.86			
"	CLAY	442	1	2	1	34.1	39.73	47.48	9.38	4.88	5.23	6.877	1.30	10.44	69.71	125.48	2	
					2	41.14	49.15	97.1	5.05	5.02	7.120	1.35	7.67	73.77	129.91			
					3	45.56	54.44		5.59	5.56	7.886	1.50	8.49	79.93	143.88			
					4	44.21	55.79							81.59	146.87			
					5	39.1	42.47	53.62						78.40	141.12			
"	DOVER	440	1	2	1	49.4	36.20	49.36	9.50	4.19	5.14	6.754	1.30	12.33	68.56	123.41	2	
					2	38.08	51.93	9.99	4.41	4.83	7.107	1.37	8.33	72.14	129.85			
					3	42.31	57.69		4.90	5.37	7.896	1.52	9.25	80.15	144.26			
					4	40.92	59.08							81.71	147.08			
					5	5.65	38.62	55.73						77.08	138.75			
"	"	441	1	2	1	35.2	40.25	50.22	6.01	3.17	5.41	7.213	1.28	12.00	72.97	131.35	2	
					2	41.72	52.05	62.3	3.29	5.20	7.476	1.33	9.19	75.63	136.13			
					3	44.49	55.51		3.51	5.55	7.972	1.42	9.80	80.65	145.17			
					4	43.63	56.37							81.69	147.04			
					5	3.84	41.95	54.21						78.56	141.41			

County	Township	File number	Kind	Source	Condition	Proximate analysis			Ultimate analysis					Heat value		Year		
						Mois-ture	Volat-ile	Fixed carbon	Ash	Sulphur	Hydro-gen	Carbon	Nitro-gen	Oxygen	Calo-ries		B. t. u.	
MIDDLE KITTANNING (CON.)																		
TUSCARAWAS	FAIRFIELD	438	1	2	1	715	3834	4995	466	262	564	7129	123	1466	7194	12949	7	
					2	4129	5380	491	282	522	7678	132	895	7748	13946			
					3	4342	5658		297	549	8074	139	941	8148	14666			
					4	4270	5750							8234	14821			
					5	764	3943	5293						7605	13689			
	"	"	439	1	2	1	466	3925	4987	622	328	548	7080	128	1294	7097	12775	2
						2	4117	5231	652	344	521	7426	134	923	7444	13399		
						3	4404	5596		368	557	7945	143	987	7963	14334		
						4	4313	5687							8069	14525		
						5	509	4093	5398						7659	13786		
	"	GOSHEN	437	1	2	1	351	4160	4720	769	456	545	7026	122	1082	7153	12875	2
						2	4311	4892	797	473	524	7282	126	798	7413	13343		
						3	4684	5316		514	569	7913	137	867	8055	14499		
						4	4570	5430							8201	14761		
						5	394	4390	5216						7878	14180		
"	JEFFERSON	436	1	2	1	472	4030	4951	547	405	553	7108	132	1255	7199	12958	2	
					2	4230	5196	574	425	526	7460	138	877	7555	13599			
					3	4488	5512		451	558	7915	146	930	8015	14427			
					4	4389	5611							8131	14636			
					5	514	4163	5323						7714	13885			
"	LAWRENCE	445	1	2	1	469	3957	4668	906	470	530	6759	124	1211	6881	12386	2	
					2	4153	4897	950	494	501	7092	130	833	7220	12996			
					3	4589	5411		546	554	7836	144	920	7978	14360			
					4	4458	5242							8139	14650			
					5	535	4219	5246						7703	13866			
"	MILL	435	1	2	1	378	3827	4953	842	383	526	7031	122	1096	7101	12782	2	
					2	3977	5148	875	398	503	7307	127	790	7380	13284			
					3	4358	5642		436	551	8008	139	866	8088	14558			
					4	4241	5759							8227	14809			
					5	426	4061	5513						7877	14179			
"	SALEM	434	1	2	1	345	4002	4886	767	522	530	7002	126	1053	7135	12843	2	
					2	4145	5061	794	541	509	7252	130	774	7390	13302			
					3	4502	5498		588	553	7877	141	841	8027	14449			
					4	4370	5630							8185	14733			
					5	388	4201	5411						7868	14162			
"	SANDY	433	1	2	1	492	3813	4991	704	291	540	7045	128	1292	7082	12748	2	
					2	4010	5250	740	306	511	7410	134	899	7448	13406			
					3	4330	5670		330	552	8002	145	971	8043	14477			
					4	4238	5762							8152	14673			
					5	542	4009	5449						7711	13880			
"	UNION	114 A	1	1	1	54	402	478	66	25					7150	12870	31	
					2	425	505	70	26					7558	13605			
					3	457	543		28					8127	14629			
					4	449	551							8222	14800			
					5	59	423	513						7739	13930			
"	"	114 B	1	1	1	47	411	474	68	29					7194	12950	31	
					2	431	498	71	30					7549	13589			
					3	464	534		32					8127	14628			
					4	456	544							8239	14830			
					5	52	432	515						7811	14060			
"	"	114 K	1	1	1	51	405	475	67	27	56	718	13	119	7189	12940	31	
					2	428	502	70	28	52	756	14	80	7572	13630			
					3	460	540		31	56	814	15	84	8150	14670			
					4	452	548							8256	14860			
					5	56	427	517						7794	14030			
"	"	432	1	2	1	381	3871	5147	601	324	541	7230	136	1168	7306	13151	2	
					2	4024	5351	625	336	519	7516	141	863	7595	13671			
					3	4292	5708		358	554	8017	150	921	8101	14582			
					4	4201	5799							8207	14773			
					5	415	4027	5558						7867	14160			
"	WARWICK	431	1	2	1	410	4164	4905	521	325	557	7245	142	1210	7331	13196	2	
					2	4342	5115	543	338	534	7555	148	882	7644	13759			
					3	4591	5409		357	565	7989	156	933	8083	14549			
					4	4512	5488							8182	14727			
					5	443	4312	5245						7821	14077			
"	YORK	430	1	2	1	318	4356	4633	693	412	550	7113	128	1104	7305	13149	2	
					2	4499	4785	716	425	532	7346	132	849	7545	13581			
					3	4846	5154		458	573	7913	142	914	8127	14628			
					4	4750	5250							8259	14866			
					5	352	4583	5065						7967	14341			
VINTON	BROWN	426	1	2	1	858	4053	4036	1063	407	555	6297	133	1555	6322	11379	25	
					2	4433	4415	1152	445	503	6888	145	867	6915	12447			
					3	5010	4990		503	568	7785	164	980	7815	14068			
					4	4891	5109							7979	14363			
					5	993	4406	4601						7187	12936			
"	"	427	1	2	1	783	4171	4473	573	266	574	6868	153	1566	6779	12202	25	
					2	4525	4853	622	289	528	7451	166	944	7355	13239			
					3	4825	5175		308	563	7945	177	1007	7843	14117			
					4	4755	5245							7934	14281			
					5	848	4352	4800						7261	13069			

COAL RESOURCES OF OHIO

County	Township	File number	Kind	Source	Condition	Proximate analysis			Ultimate analysis					Heat value		Year	
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories		B. t. u.
MIDDLE KITTANNING (CON.)																	
VINTON	BROWN	428	1	2	1	989	3814	4358	839	325	559	6456	147	1674	6387	11496	25
					2	4232	4856	932	361	498	7165	163	881	7088	12758		
					3	4657	5353		398	549	7901	180	972	7816	14069		
					4	4553	5437							7945	14301		
					5	1109	4057	4854						7063	12713		
"	"	429	1	2	1	832	3946	4352	870	338	553	6542	138	1559	6502	11704	25
					2	4304	4747	949	369	503	7136	150	893	7092	12766		
					3	4755	5245		408	556	7883	166	987	7836	14105		
					4	4652	5348							7968	14343		
					5	938	4215	4847						7221	12998		
LOWER KITTANNING																	
CARROLL	WASHINGTON	580	4	1	2	295	4243	5017	445	190				7700	13860		
					3	4372	5169	459	196					7934	14281		
					4	4582	5418		205					8316	14968		
					5	4530	5470							8386	15094		
					5	313	4388	5299						8122	14620		
COLUMBIANA	CENTER	314	1	2	1	253	4366	4624	757	502	538	7064	113	1026	7372	13270	21
					2	4480	4744	776	515	524	7248	117	820	7564	13615		
					3	4857	5143		558	568	7658	127	889	8200	14760		
					4	4744	5256							8358	15044		
					5	285	4608	5107						8121	14618		
"	KNOX	313	1	2	1	455	4260	4533	752	424	538	6857	124	1305	7119	12815	21
					2	4463	4750	787	444	511	7184	150	944	7458	13425		
					3	4844	5156		482	555	7797	141	1025	8095	14572		
					4	4741	5259							8236	14825		
					5	508	4501	4991						7819	14074		
"	LIVERPOOL	140	1	1	1	266	4173	4399	1152	803				7085	12753	16	
					2	4287	4519	1194	825					7278	13100		
					3	4868	5132		825					8265	14876		
					4	4677	5323		937					8537	15366		
					5	320	4527	5153						8264	14875		
"	ST. CLAIR	136	1	1	1	403	3659	5303	625	261	546	7465	164	939	7496	13493	16
					2	3823	5526	651	272	522	7779	171	605	7811	14060		
					3	4089	5911		291	558	8321	183	647	8355	15039		
					4	4003	5997							8457	15222		
					5	439	3828	5733						8086	14554		
"	"	315	1	2	1	367	3758	5381	684	250	531	7313	120	1102	7414	13345	21
					2	3912	5378	710	260	509	7591	125	805	7696	13853		
					3	4211	5799		280	548	8170	135	867	8284	14912		
					4	4127	5873							8387	15096		
					5	402	3951	5637						8050	14490		
"	YELLOW CREEK	142	1	1	1	267	3846	5019	858	571				7340	13212	16	
					2	3951	5157	892	587					7541	13574		
					3	4338	5662		644					8280	14903		
					4	4183	5817							8467	15241		
					5	305	4056	5639						8209	14776		
"	"	143	1	1	1	446	4086	4973	495	352				7540	13572	16	
					2	4277	5205	518	368					7892	14206		
					3	4511	5489		388					8323	14982		
					4	4426	5574							8432	15178		
					5	481	4212	5307						8027	14448		
COSHOCTON	LAFAYETTE	390	1	2	1	560	3459	4643	1328	487	495	6159	108	1423	6222	11200	2
					2	3675	4918	1407	516	459	6524	114	980	6591	11864		
					3	4277	5723		601	534	7592	133	1140	7670	13807		
					4	4094	5906							7866	14159		
					5	675	3818	5507						7336	13204		
HOLMES	KILLBUCK	312	1	2	1	758	4077	4358	807	394	558	6588	133	1520	6693	12048	28
					2	4411	4716	873	426	513	7128	144	916	7242	13036		
					3	4833	5167		457	562	7809	158	1004	7935	14283		
					4	4727	5273							8074	14534		
					5	851	4325	4824						7388	13298		
"	WALNUT CREEK	311	1	2	1	634	4321	4406	639	365				6973	12551	28	
					2	4613	4705	682	390					7444	13400		
					3	4951	5049		419					7989	14381		
					4	4863	5135							8107	14593		
					5	696	4527	4777						7543	13578		
JACKSON	MILTON	310	1	2	1	839	3518	4901	742	255	547	6663	137	1646	6772	12189	7
					2	3840	5350	810	289	496	7273	150	982	7392	13306		
					3	4178	5822		314	540	7914	163	1069	8044	14479		
					4	4082	5918							8155	14679		
					5	927	3703	5370						7399	13318		
"	"	561 D	1	1	1	938	3674	4626	762	408				6610	11898	5	
					2	4054	5105	841	450					7294	13129		
					3	4426	5574		491					7964	14335		
					4	4304	5696							8106	14590		
					5	1048	3853	5099						7257	13062		

County	Township	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis					Heat value		Year
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories	B. t. u.	
LOWER KITTANNING (CON.)																	
JACKSON	MILTON	561 E	1	1	1	895	3782	4389	934	441							5
					2		4154	4820	1026	484							
					3		4629	5371		539							
					4		4496	5504									
					5	1023	4036	4941									
JEFFERSON	KNOX	309	1	2	1	246	3848	5156	740	382	538	7420	127	793	7591	13664	7
					2		3945	5296	759	392	524	7607	130	588	7782	14008	
					3		4259	5731		424	567	8232	141	636	8421	15159	
					4		4158	5842							8559	15407	
					5	274	4044	5632							8325	14985	
"	SALINE	144	1	1	1	344	3717	4671	1268	730					6907	12433	16
					2		3849	4838	1313	756					7154	12873	
					3		4431	5569		870					8233	14823	
					4		4214	5786							8503	15306	
					5	418	4039	5543							8147	14665	
"	"	145	1	1	1	221	3963	4750	1066	496	528	7104	134	672	7236	13025	16
					2		4053	4857	1090	507	514	7265	137	487	7400	13320	
					3		4549	5451		569	577	8153	154	547	8305	14949	
					4		4404	5596							8496	15293	
					5	258	4290	5452							8277	14899	
LAWRENCE	ELIZABETH	308	1	2	1	807	3454	4768	971	213	544	6554	123	1595	6626	11926	7
					2		3757	5187	1056	232	494	7129	134	955	7207	12973	
					3		4201	5799		259	552	7971	150	1068	8058	14505	
					4		4100	5900							8180	14724	
					5	913	3726	5361							7433	13379	
"	"	617 A9	1	1	1	75	367	412	146	29	53	614	12	146	6172	11110	57
					2		396	446	158	31	48	664	13	86	6672	12010	
					3		471	529		37	58	789	16	100	7927	14270	
					4		457	543							8108	14594	
					5	91	416	493							7372	13269	
"	UPPER	146	1	2	1	757	3851	4513	879	320	559	6671	127	1444	6777	12199	7
					2		4166	4883	951	346	514	7218	137	834	7332	13197	
					3		4604	5396		382	568	7977	151	922	8103	14584	
					4		4499	5501							8238	14829	
					5	853	4116	5031							7537	13566	
MUSKINGUM	NEWTON	306	1	2	1	796	3918	4687	599	240	554	6840	137	1630	6893	12407	17
					2		4257	5092	651	261	506	7431	149	1002	7489	13480	
					3		4553	5447		279	541	7949	159	1072	8010	14419	
					4		4480	5520							8102	14584	
					5	853	4093	5044							7403	13325	
"	WASHINGTON	305	1	2	1	505	3975	4743	777	480	537	6807	118	1281	6983	12569	2
					2		4186	4996	818	506	507	7169	124	876	7354	13237	
					3		4559	5441		551	552	7808	135	954	8009	14416	
					4		4433	5567							8162	14691	
					5	568	4182	5250							7699	13858	
"	WAYNE	304	1	2	1	587	4152	4391	870	479	538	6667	116	1330	6771	12188	7
					2		4411	4665	924	509	502	7083	123	859	7193	12947	
					3		4860	5140		561	553	7804	136	946	7925	14265	
					4		4739	5261							8084	14552	
					5	667	4423	4910							7546	13583	
PERRY	PIKE	302	1	2	1	674	3705	4909	712	258	547	6834	124	1525	6885	12393	2
					2		3973	5264	763	277	506	7328	133	993	7382	13288	
					3		4301	5699		300	548	7933	144	1075	7992	14386	
					4		4212	5788							8096	14572	
					5	742	3900	5358							7496	13493	
"	"	303	1	2	1	685	3522	4777	1016	472	526	6478	122	1386	6591	11864	2
					2		3781	5128	1091	507	483	6954	131	834	7075	12735	
					3		4244	5756		569	542	7806	147	936	7941	14295	
					4		4086	5914							8117	14610	
					5	793	3762	5445							7474	13453	
STARK	SANDY	301 A ²¹	1	2	1	381	4434	4580	605	344					7268	13083	26
					2		4609	4761	630	368					7556	13601	
					3		4919	5081		382					8064	14515	
					4		4840	5160							8174	14713	
					5	416	4639	4945							7833	14099	
TUSCARAWAS	"	562 A	1	1	1	561	3625	4942	872	289							6
					2		3840	5236	924	306							
					3		4231	5769		337							
					4		4125	5875									
					5	630	3865	5505									
"	"	562 B	1	1	1	446	3989	4711	854	373					7136	12845	6
					2		4175	4931	894	390					7469	13444	
					3		4581	5415		428					8262	14764	
					4		4476	5524							8346	15022	
					5	503	4250	5247							7926	14267	
"	"	562 C	1	2	1	530	3873	4826	771	325	546	6975	118	1265	7168	12902	7
					2		4090	5096	814	343	514	7366	125	838	7569	13624	
					3		4452	5548		373	560	8019	136	912	8240	14831	
					4		4352	5648							8367	15061	
					5	590	4095	5315							7874	14173	

COAL RESOURCES OF OHIO

County	Township	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis					Heat value		Year
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories	B. t. u.	
CLARION																	
JACKSON	BLOOMFIELD	371	1	2	1	531	3733	4382	1354	608	498	6205	123	1212	6394	11509	99
					2	3942	4628	1430	642	464	6553	130	781	6753	12154		
					3	4600	5400		749	541	7647	152	911	7880	14182		
					4	4407	5593							8113	14604		
					5	647	4122	5231						7588	13659		
	MADISON	370	1	2	1	490	3575	4565	1370	614	489	6257	123	1147	6460	11628	99
					2	3759	4800	1441	646	457	6579	129	748	6793	12227		
					3	4392	5608		755	534	7686	151	874	7937	14286		
					4	4185	5815							8176	14717		
					5	599	3935	5466						7686	13835		
	MILTON	366	1	2	1	471	4051	4617	861	373	544	6751	126	1345	6911	12440	99
					2	4251	4845	904	391	516	7085	132	972	7253	13055		
					3	4673	5327		430	567	7789	145	1069	7974	14352		
					4	4566	5434							8111	14599		
					5	531	4324	5145						7679	13822		
"	367	1	2	1	533	4101	4526	840	372	550	6652	128	1458	6825	12285	99	
				2	4332	4781	857	393	519	7026	135	1040	7209	12976			
				3	4754	5246		431	570	7710	148	1141	7911	14239			
				4	4650	5350							8044	14480			
				5	600	4371	5029						7562	13612			
"	369	1	2	1	561	3892	4738	809	370	547	6730	128	1416	6863	12353	99	
				2	4123	5020	857	392	514	7129	136	972	7271	13087			
				3	4509	5491		429	562	7797	149	1063	7953	14314			
				4	4400	5600							8084	14552			
				5	629	4123	5248						7576	13637			
"	561 A	1	1	1	750	3925	4274	1051	544							5	
				2	4243	4621	1136	588									
				3	4787	5213		663									
				4	4636	5364											
				5	876	4230	4894										
"	561 B	1	1	1	845	4127	4355	673	310					6805	12249	5	
				2	4508	4757	735	359					7433	13379			
				3	4866	5134		366					8023	14440			
				4	4782	5218							8136	14645			
				5	928	4339	4733						7381	13286			
"	561 C	1	2	1	498	3971	4551	980	408	539	6614	128	1331	6801	12242	99	
				2	4179	4790	1031	429	509	6961	135	935	7157	12883			
				3	4659	5341		478	568	7761	151	1042	7980	14364			
				4	4537	5463							8136	14645			
				5	571	4278	5151						767	1380			
"	607 A	1	3	1	365	4347	4501	787	492					6911	12440	54	
				2	4512	4671	817	511					7173	12911			
				3	4913	5087		556					7811	14060			
				4	4801	5199							7957	14322			
				5	411	4603	4986						7629	13733			
"	607 B ²²	1	3	1	364	4210	4353	1073	486					6691	12045	54	
				2	4369	4577	1114	504					6944	12500			
				3	4917	5083		567					7815	14067			
				4	4787	5213							7987	14376			
				5	425	4583	4992						7647	13765			
"	608	1	3	1	336	4075	4547	1042	307					6800	12240	54	
				2	4217	4705	1078	388					7036	12666			
				3	4727	5273		356					7886	14196			
				4	4623	5377							8023	14441			
				5	386	4444	5170						7713	13883			
LAWRENCE	DECATUR	363	1	2	1	611	3843	4552	994	361	542	6553	122	1428	6643	11957	1
					2	4093	4848	1059	385	505	6979	130	942	7075	12735		
					3	4578	5422		431	565	7808	145	1054	7913	14243		
					4	4459	5541							8061	14509		
					5	700	4147	5153						7496	13493		
	"	364	1	2	1	634	3530	4095	1741	529	491	5792	107	1340	5967	10741	1
					2	3769	4372	1859	565	449	6184	114	829	6371	11468		
					3	4630	5370		694	552	7596	140	1018	7826	14087		
					4	4419	5581							8090	14562		
					5	810	4061	5129						7434	13382		
	"	365	1	2	1	586	3725	4161	1528	536	506	6022	118	1290	6185	11133	1
					2	3957	4420	1623	569	469	6396	125	819	6570	11826		
					3	4724	5276		679	559	7635	149	978	7937	14117		
					4	4537	5463							8082	14547		
					5	728	4206	5066						7494	13489		
"	WASHINGTON	362	1	2	1	600	3916	4298	1186	510	526	6332	122	1324	6519	11734	1
					2	4166	4572	1262	543	488	6736	130	841	6933	12483		
					3	4758	5232		622	558	7709	149	962	7937	14286		
					4	4615	5385							8136	14645		
					5	711	4286	5003						7557	13603		

County	Township	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis				Heat value		Year	
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories		B. t. u.
CLARION (CON.)																	
MUSKINGUM	HOPEWELL	361	1	2	1	689	4149	4292	870	302	557	6728	119	1424	6706	12071	17
					2	4456	4610	4929	934	324	516	7226	128	872	7202	12964	
					3	4915	5085	4929		357	569	7971	141	962	7944	14300	
					4	4824	5176	4929							8070	14526	
					5	775	4450	4775							7446	13402	
SCIOTO	BLOOM	360	1	2	1	680	3792	4594	934	345	533	6530	123	1535	6577	11839	1
					2	4069	4929	4929	1002	370	491	7006	132	999	7057	12703	
					3	4522	5478	4522		411	546	7786	147	1110	7829	14118	
					4	4407	5593	4407							7981	14365	
					5	773	4066	5181							7364	13255	
VINTON	ELK	359	1	2	1	495	3917	4656	932	353	540	6717	130	1328	6914	12445	1
					2	4121	4898	4121	981	371	510	7067	137	934	7274	13093	
					3	4569	5431	4569		411	565	7836	152	1036	8065	14517	
					4	4457	5543	4457							8208	14774	
					5	563	4206	5231							7746	13943	
"	MADISON	357	1	2	1	502	3990	4611	897	332	548	6792	133	1298	6960	12528	1
					2	4201	4855	4201	944	350	518	7151	140	897	7328	13190	
					3	4639	5361	4639		386	572	7896	155	991	8092	14565	
					4	4535	5465	4535							8228	14810	
					5	567	4278	5155							7762	13971	
"	"	358	1	2	1	480	4056	4221	1243	351	496	6556	121	1233	6567	11821	22
					2	4260	4454	4260	1306	369	465	6887	127	846	6898	12417	
					3	4900	5100	4900		424	535	7922	146	973	7934	14282	
					4	4779	5221	4779							8103	14586	
					5	567	4508	4925							7643	13758	
"	SWAN	356	1	2	1	490	3916	4579	1015	425	540	6626	123	1271	6845	12321	2
					2	4118	4815	4118	1067	447	511	6967	129	879	7198	12956	
					3	4610	5390	4610		500	572	7800	144	984	8058	14504	
					4	4480	5520	4480							8223	14802	
					5	565	4227	5208							7759	13966	
"	VINTON	354	1	2	1	502	4031	4652	815	287	549	6852	128	1369	6961	12530	99
					2	4244	4898	4244	858	302	519	7214	135	972	7329	13192	
					3	4642	5358	4642		330	568	7891	148	1063	8017	14430	
					4	4552	5448	4552							8134	14641	
					5	560	4297	5143							7678	13821	
"	"	355	1	2	1	461	4135	4294	1110	528	536	6491	130	1205	6760	12168	99
					2	4335	4501	4335	1164	554	508	6805	136	833	7087	12756	
					3	4906	5094	4906		627	575	7701	154	943	8021	14436	
					4	4764	5236	4764							8216	14789	
					5	522	4506	4952							7771	13987	
"	WILKESVILLE	119 A	1	1	1	69	4001	4554	766	334					6952	12514	5
					2	4292	4886	4292	822	358					7458	13424	
					3	4676	5324	4676		390					8126	14626	
					4	4580	5420	4580							8253	14856	
					5	755	4235	5010							7631	13736	
"	"	119 B	1	1	1	738	4160	4486	616	277							5
					2	4492	4843	4492	665	299							
					3	4812	5388	4812		320							
					4	4737	5263	4737									
					5	804	4356	4840									
"	"	352	1	2	1	452	4010	4653	885	423	544	6717	128	1303	6904	12427	99
					2	4200	4873	4200	927	443	517	7035	134	944	7231	13015	
					3	4629	5371	4629		488	570	7754	148	1040	7970	14345	
					4	4510	5490	4510							8118	14612	
					5	513	4278	5209							7702	13863	
"	"	353	1	2	1	472	3988	4419	1121	416	536	6504	128	1295	6744	12139	99
					2	4186	4638	4186	1176	437	508	6826	134	919	7078	12740	
					3	4744	5256	4744		495	576	7736	152	1041	8021	14438	
					4	4614	5386	4614							8194	14749	
					5	561	4360	5089							7743	13937	
WINTERS																	
JACKSON	MILTON	203	1	2	1	931	3678	4778	613	200	570	6780	127	1710	6976	12557	14
					2	4056	5268	4056	676	221	514	7476	140	973	7692	13846	
					3	4310	5650	4310		237	551	8018	150	1044	8250	14850	
					4	4278	5722	4278							8341	15014	
					5	1009	3846	5145							7499	13499	
VINTON	ELK	201	1	2	1	669	3556	4395	1380	134	498	6404	121	1463	6250	11251	22
					2	3811	4710	3811	1479	144	454	6863	130	930	6698	12058	
					3	4472	5528	4472		169	533	8054	153	1091	7861	14151	
					4	4367	5633	4367							8000	14400	
					5	793	4021	5186							7366	13258	
"	MADISON	200	1	2	1	606	3874	4638	882	181	512	6854	125	1446	6750	12151	22
					2	4124	4937	4124	939	192	474	7296	133	966	7185	12935	
					3	4551	5449	4551		212	523	8052	147	1066	7930	14275	
					4	4473	5527	4473							8032	14458	
					5	677	4170	5153							7488	13479	

COAL RESOURCES OF OHIO

County	Township	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis					Heat value		Year
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories	B. t. u.	
		1	2	3	4												
BROOKVILLE																	
JACKSON	JEFFERSON	379	1	2	1	10.64	38.26	44.43	6.67	11.7	5.94	65.67	1.53	19.02	64.77	116.59	28
					2		42.81	49.73	7.46	13.1	5.33	73.49	1.71	10.70	72.48	130.47	
					3		46.26	53.74		14.2	5.76	79.41	1.85	11.56	78.32	140.99	
					4		45.70	54.30							79.06	142.31	
					5	11.55	40.43	48.02							69.93	125.88	
"	MILTON	378	1	2	1	3.53	40.05	38.36	17.96	9.5	5.36	63.86	1.21	10.66	64.07	115.33	28
					2		41.56	39.80	18.64	9.9	5.15	66.26	1.25	7.71	66.48	119.67	
					3		51.08	48.92		12.2	6.33	81.43	1.54	9.48	81.71	147.09	
					4		50.01	49.99							83.47	150.24	
					5	4.53	47.75	47.72							79.68	143.42	
SCIOTO	VERNON	377	1	2	1	9.03	37.94	44.17	8.86	3.35					64.17	115.51	28
					2		41.71	48.55	9.74	3.68					70.54	126.97	
					3		46.21	53.79		4.08					76.15	140.67	
					4		45.12	54.88							79.49	143.08	
					5	10.19	40.52	49.29							71.39	128.50	
STARK	CANTON	376	1	2	1	5.18	39.90	43.62	11.30	3.62	5.21	65.29	1.19	13.39	65.93	118.67	26
					2		42.09	46.01	11.90	3.82	4.90	68.88	1.26	9.24	69.53	125.15	
					3		47.78	52.22		4.34	5.56	78.18	1.43	10.49	78.92	142.05	
					4		46.57	53.43							80.51	144.91	
					5	6.04	43.76	50.20							75.66	136.19	
VINTON	ELK	374	1	2	1	6.95	38.49	45.81	8.75	18.4	4.94	68.03	1.23	15.21	66.84	120.31	22
					2		41.36	49.24	9.40	1.98	4.48	73.11	1.32	9.71	71.83	129.30	
					3		45.55	54.35		2.19	4.94	80.69	1.46	10.72	79.28	142.72	
					4		44.86	55.14							80.31	144.56	
					5	7.76	41.39	50.85							74.08	133.34	
"	"	375	1	2	1	6.08	36.75	44.77	12.40	1.65	4.83	66.45	1.16	13.51	64.60	116.28	22
					2		39.3	47.67	13.20	1.76	4.42	70.75	1.23	8.64	68.78	123.81	
					3		45.08	54.92		2.03	5.09	81.51	1.42	9.95	79.24	142.64	
					4		44.08	55.92							80.56	145.01	
					5	7.09	40.96	51.95							74.84	134.72	
"	MADISON	373	1	2	1	4.37	37.99	44.04	13.60	2.01	4.85	66.01	1.21	12.32	64.74	116.54	22
					2		39.73	46.05	14.22	2.10	4.86	69.03	1.27	8.82	67.71	121.87	
					3		46.52	53.88		2.45	5.32	80.47	1.48	10.28	78.93	142.07	
					4		45.22	54.78							80.40	144.72	
					5	5.19	42.87	51.94							76.22	137.20	
WAYNE	FRANKLIN	372	1	2	1	6.81	42.64	40.54	10.01	3.28	5.55	64.53	7.6	15.87	65.48	117.87	9.9
					2		45.76	43.50	10.74	3.52	5.14	69.24	8.1	10.55	70.27	126.49	
					3		51.27	48.73		3.94	5.76	77.57	9.1	11.82	78.73	141.71	
					4		50.50	49.70							80.14	144.26	
					5	7.79	46.38	45.53							73.89	133.01	
TIONESTA																	
MUSKINGUM	WAYNE	217	1	2	1	8.50	36.44	45.89	9.17	1.30	5.49	65.31	1.13	17.60	65.11	117.20	17
					2		39.83	50.15	10.02	1.42	4.97	71.38	1.23	10.98	71.16	128.09	
					3		44.27	55.73		1.58	5.52	79.33	1.37	12.20	79.08	142.35	
					4		43.51	56.49							80.06	144.10	
					5	9.51	39.37	51.12							72.44	130.40	
BEDFORD																	
COSHOCTON	BEDFORD	382	1	2	1	1.54	46.57	35.42	16.47	3.74	4.95	64.63	1.67	8.54	65.91	118.64	26
					2		47.29	35.97	16.74	3.80	4.86	65.61	1.70	7.29	66.94	120.49	
					3		56.80	43.20		4.56	5.84	78.80	2.04	8.76	80.40	144.72	
					4		56.66	44.84							82.53	148.55	
					5	1.92	54.59	43.49							80.93	145.68	
HOLMES	PRAIRIE	380	1	2	1	8.02	40.97	44.93	6.08	2.53	5.00	67.58	1.41	17.40	68.37	123.06	28
					2		44.54	48.85	6.61	2.75	4.47	73.47	1.53	11.17	74.33	133.79	
					3		47.69	52.31		2.94	4.79	78.67	1.64	11.96	79.59	143.26	
					4		46.98	53.02							80.53	144.96	
					5	8.71	42.89	48.40							73.52	132.33	
MUSKINGUM	LICKING	381	1	2	1	5.56	39.49	44.93	10.02	2.82	5.32	67.35	1.25	13.24	67.19	120.94	17
					2		41.81	47.58	10.61	2.99	4.98	71.31	1.32	8.79	71.15	128.06	
					3		46.77	53.33		3.34	5.57	79.78	1.48	9.83	79.60	143.26	
					4		45.76	54.24							80.92	145.65	
					5	6.35	42.86	50.79							75.78	136.41	

County	Township	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis				Heat value		Year	
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories		B. t. u.
UPPER MERCER																	
JACKSON	JEFFERSON	284	1	2	1	951	3898	4681	470	106					6752	12154	28
					2		4307	5174	519	117				7462	13431		
					3		4543	5457		123				7870	14166		
					4		4500	5500						7924	14264		
					5	1008	4047	4945						7126	12827		
LAWRENCE	HAMILTON	282	1	2	1	717	4250	3967	1066	354					6554	11798	28
					2		4578	4274	1148	381				7060	12709		
					3		5172	4828		430				7976	14357		
					4		5068	4932						8133	14640		
					5	829	4648	4523						7460	13428		
SCIOTO	BLOOM	283	1	2	1	1022	4082	4569	327	91	539	6928	153	1962	6894	12409	28
					2		4546	5090	364	101	473	7716	170	1176	7679	13822	
					3		4718	5282		105	491	8008	176	1220	7969	14344	
					4		4687	5313							8010	14418	
					5	1055	4188	4747							7157	12883	
MIDDLE MERCER																	
STARK	TUSCARAWAS	285	1	2	1	354	4038	4235	1373	245	517	6322	87	1396	6401	11521	26
					2		4186	4391	1423	254	494	6617	90	1122	6636	11944	
					3		4880	5120		296	576	7715	105	1308	7737	13926	
					4		4770	5230							7887	14197	
					5	422	4570	5008							7554	13598	
BEAR RUN																	
SCIOTO	BLOOM	383	1	2	1	1044	3620	4484	852	103					6352	11434	28
					2		1042	5007	951	115				7092	12767		
					3		4467	5533		127				7837	14109		
					4		4400	5600						7925	14265		
					5	1157	3891	4952						7008	12615		
QUAKERTOWN																	
HOLMES	MONROE	229	1	2	1	643	4059	4684	604	248					7024	12643	28
					2		4348	5006	646	265				7506	13511		
					3		4648	5352		283				8024	14444		
					4		4576	5424						8117	14611		
					5	698	4257	5045						7551	13591		
JACKSON	COAL	228	1	2	1	1128	3641	5064	167	64	558	7052	139	2020	6761	12171	25
					2		4104	5708	188	72	488	7949	157	1146	7621	13719	
					3		4183	5817		73	497	8102	160	1168	7767	13982	
					4		4161	5839						7791	14023		
					5	1153	3681	5166						6892	12406		
"	MILTON	226	1	2	1	929	3296	5426	349	125					6960	12528	14
					2		3633	5982	385	138				7673	13811		
					3		3778	6222		144				7980	14364		
					4		3730	6270						8029	14453		
					5	972	3369	5659						7248	13047		
"	"	227	1	2	1	974	3550	4924	552	128	536	6754	143	1987	6553	11796	25
					2		3933	5455	612	142	474	7483	158	1131	7260	13069	
					3		4189	5811		151	505	7971	168	1205	7733	13921	
					4		4133	5867						7797	14035		
					5	1044	3701	5255						6983	12570		
MUSKINGUM	JACKSON	225	1	2	1	980	3512	4910	598	137	579	6878	121	1687	6745	12142	17
					2		3894	5443	663	152	521	7625	134	905	7478	13460	
					3		4171	5829		163	558	8166	144	969	8009	14416	
					4		4109	5891						8082	14547		
					5	1056	3675	5269						7229	13012		
VINTON	ELK	171	3	4	1	666	3440	5400	494	128					7462	13431	27
					2		3686	5785	529	137				7994	14389		
					3		3892	6108		145				8441	15193		
					4		3837	6163						8506	15311		
					5	709	3564	5727						7903	14226		
"	"	224	1	2	1	1112	3690	4642	556	58	575	6734	152	1925	6623	11921	25
					2		4152	5222	626	65	509	7577	171	1052	7452	13413	
					3		4429	5571		69	543	8084	182	1122	7950	14309	
					4		4388	5612						8003	14406		
					5	1187	3867	4946						7053	12695		

COAL RESOURCES OF OHIO

County	Township	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis				Heat value		Year			
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories		B. t. u.		
VINTON	HARRISON	223	1	2	1	1	11.38	38.79	45.73	41.0	8.6	5.78	6.735	1.52	20.39	6553	11795	25	
						2	4.377	51.60	4.63	9.7	5.10	7.600	1.72	11.58	7394	13310			
						3	4.589	5.411	10.2	5.35	7.969	1.80	12.14	7753	13956				
						4	4.553	5.447						7799	14038				
						5	11.97	40.08	47.95					6866	12358				
JACKSON	LIBERTY	178 A	1	1	1	1	13.60	31.75	50.42	42.3	8.6				6491	11684	7		
						2	3.675	58.35	4.90	9.9				7513	13523				
						3	3.864	61.36		10.4				7900	14220				
						4	3.819	61.81						7949	14309				
						5	14.32	32.72	52.96					6811	12259				
	"	"	178 B	1	1	1	1	12.77	31.51	47.94	7.78	9.7				6259	11266	7	
							2	3.612	54.96	8.92	1.11				7175	12915			
							3	3.966	60.34		1.22				7878	14180			
							4	3.895	61.05						7959	14327			
							5	14.02	33.50	52.48					6843	12318			
"	LICK	221	1	2	1	1	11.58	33.03	48.74	6.55	4.7	5.27	6.625	1.30	20.06	6337	11407	25	
						2	3.736	55.12	7.52	5.3	4.50	7.493	1.47	11.05	7167	12901			
						3	4.040	59.60		5.7	4.87	8.102	1.59	11.95	7750	13950			
						4	3.990	60.10						7809	14057				
						5	12.51	34.91	52.58					6833	12299				
"	"	222	1	2	1	1	10.75	35.38	48.88	4.99	4.7	5.33	6.797	1.42	19.82	6496	11692	25	
						2	3.964	54.77	5.59	5.3	4.64	7.616	1.59	11.49	7278	13100			
						3	4.199	58.01		5.6	4.91	8.068	1.68	12.17	7709	13876			
						4	4.161	58.59						7754	13957				
						5	11.59	36.88	51.73					6871	12367				
PORTAGE	DEERFIELD	115 A	1	4	1	1	7.4	3.69	4.94	6.3	1.5	5.6	7.02	1.3	1.51	7000	12600	43	
						2	3.99	5.33	6.8	1.7	5.1	7.58	1.4	9.2	7561	13610			
						3	4.28	5.72		1.8	5.5	8.14	1.5	9.8	8111	14600			
						4	4.21	5.79						8189	14740				
						5	8.0	3.88	5.32					7533	13560				
	"	"	115 B	1	4	1	1	8.9	3.39	4.98	7.4	1.6	5.5	6.82	1.4	1.59	6778	12200	43
							2	3.73	5.46	8.1	1.7	5.0	7.49	1.5	8.8	7439	13390		
							3	4.06	5.94		1.9	5.4	8.15	1.6	9.6	8094	14570		
							4	3.97	6.03						8189	14740			
							5	9.8	3.58	5.44					7389	13300			
"	PALMYRA	220	1	2	1	1	15.19	34.49	47.53	2.79	6.2	6.23	6.733	9.6	22.07	6687	12036	26	
						2	4.067	56.04	3.29	7.3	5.55	7.939	11.3	10.11	7884	14192			
						3	4.205	57.95		7.5	5.53	8.210	11.7	10.45	8152	14675			
						4	4.177	58.23						8188	14738				
						5	15.72	35.20	49.08					6901	12422				
STARK	LAWRENCE	219	1	2	1	1	6.56	4.009	4.972	3.63	8.7				7336	13205	26		
						2	4.290	5.321	3.89	9.3				7850	14130				
						3	4.464	5.566		9.7				8168	14702				
						4	4.430	5.570						8211	14780				
						5	6.86	4.127	5.187					7648	13767				
"	TUSCARAWAS	218	1	2	1	1	5.29	4.226	4.867	3.78	7.6	5.62	7.255	1.08	16.21	7152	12874	26	
						2	4.462	5.138	4.00	7.9	5.31	7.660	1.14	12.16	7551	13593			
						3	4.648	5.352		8.2	5.3	7.979	1.19	12.67	7866	14159			
						4	4.618	5.382						7906	14230				
						5	5.54	4.362	5.084					7467	13441				

1. Explanation of file numbers: A basic 6-digit sample number is used. Suffix 'A' through 'I' indicates samples taken at different points in the same location; 'K' denotes composite of these samples. Suffix '1' through '8' indicates samples taken vertically or in benches at same point; number '9' denotes composite of these samples. When samples have been taken vertically at one point only, letter suffix is not needed or used.

2. Kind of sample: 1- channel (mine); 2- channel (outcrop); 3- column or core; 4- gross mine sample; 7- tippie.

3. Source: 1- U.S. Bureau of Mines and/or U.S. Geological Survey; 2- Ohio Geological Survey; 3- Engineering Experiment Station, O.S.U.; 4- Special or miscellaneous.

4. Condition: 1- as received; 2- moisture-free; 3- moisture- and ash-free; 4- dry unit coal; 5- moist unit coal.

5. Sample wet; moisture probably 2% high.

6. Condition 1 'air-dried'; composite (9) weighted average calculated upon thickness in 4 component units, 585 (1-4).

7. Condition 1 'air-dried'; composite (9) total or average calculated upon thickness.

8. Not in composite 587-9.

9. Not in composite 598-B-9.

10. Not in composite 596-A-9.

11. Equilibrated values available in files of Ohio Geological Survey.

12. Condition 1 'air-dried'. Boghead coal.

13. Ultimate and calorific value tests made several weeks after preparation of sample. Calories probably 100° high.

14. Duplicate sample taken 10 months after 604-B.

15. Coal sample crushed to -60 mesh and stored for some time; probably somewhat weathered before B.t.u. determination.

16. Not in composite 170-K.

17. No exact location or thickness available. Use as general purpose sample.

18. Not in composite 486-K.

19. Average values calculated upon weight of individual sections.

20. See also 301-A in Lower Kiptanning from the same mine on the same date.

21. See also 301-B in Middle Kiptanning from the same mine on the same date.

22. Duplicate sample taken 15 days after 607-A.

APPENDIX B

ANALYSES OF OHIO COAL, BY COUNTY

Township	Seam	File number	Kind	Source	Condition	Proximate analysis			Ultimate analysis					Heat value		Year	
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories		B. t. u.
ATHENS COUNTY																	
ALEXANDER	PITTSBURGH	188	1	2	1	713	4151	4259	927	452	540	6440	96	1545	6559	11807	28
					2		4470	4532	998	487	497	6934	103	981	7062	12713	
					3		4956	5034		541	552	7703	114	1090	7846	14122	
					4		4848	5152							8004	14408	
					5	815	4452	4733							7353	13235	
ATHENS	MIDDLE KITTANNING	298	1	2	1	617	3640	4961	782	90	543	6922	130	1533	6868	12362	2
					2		3880	5287	833	96	505	7377	139	1050	7319	13174	
					3		4233	5767		105	551	8047	152	1145	7984	14371	
					4		4172	5828							8060	14508	
					5	678	3889	5433							7514	13526	
BERN	PITTSBURGH	277	1	2	1	650	3505	4815	1020	341	513	6661	93	1372	6607	11893	7
					2		3753	5155	1092	365	471	7132	100	840	7074	12733	
					3		4213	5787		410	529	8006	112	943	7941	14293	
					4		4083	5917							8088	14559	
					5	758	3773	5469							7476	13457	
"	"	277	2	1	2	451	3824	4576	1149	488	510	6592	99	1162	6636	11945	7
					1		4005	4792	1203	511	482	6903	104	797	6949	12508	
					3		4553	5447		581	548	7847	118	906	7899	14218	
					4		4400	5600							8084	14552	
					5	531	4166	5303							7656	13780	
"	"	278	1	1	2	594	4015	4526	855	335	532	6782	128	1358	6774	12194	28
					1		4268	4812	920	356	496	7210	136	882	7202	12964	
					3		4700	5300		392	546	7941	150	971	7932	14277	
					4		4599	5401							8062	14512	
					5	669	4292	5039							7522	13540	
"	"	278	2	1	2	556	4396	4352	686	410	546	6825	108	1425	6939	12491	28
					1		4660	4613	727	435	512	7234	114	978	7355	13240	
					3		5025	4975		469	552	7801	123	1055	7932	14278	
					4		4933	5067							8060	14508	
					5	627	4624	4749							7556	13600	
"	"	279	A	1	2	578	3743	4879	800	419	514	6755	95	1417	6833	12299	7
					1		3973	5178	849	445	478	7169	101	58	7252	13053	
					3		4342	5658		486	522	7835	110	1047	7925	14264	
					4		4217	5783							8064	14516	
					5	649	3943	5408							7542	13575	
"	"	279	B	1	2	352	4484	4469	685	374					6980	12564	29
					1		4652	4637	711	388					7242	13036	
					3		5008	4922		418					7796	14033	
					4		4923	5077							7911	14239	
					5	400	4726	4874							7594	13669	
"	"	279	C	1	2	370	4385	4461	784	424					6949	12508	29
					1		4553	4633	814	440					7216	12989	
					3		4956	5044		479					7855	14139	
					4		4856	5144							7989	14381	
					5	415	4655	4930							7658	13784	
"	"	281	1	1	2	587	4193	4339	881	401	535	6706	105	1372	6806	12251	28
					1		4454	4610	936	426	500	7124	112	902	7230	13015	
					3		4914	5086		470	552	7859	124	995	7977	14359	
					4		4807	5193							8123	14622	
					5	665	4488	4847							7583	13650	
"	"	281	2	1	2	631	4316	4295	758	375	549	6723	152	1438	6879	12383	28
					1		4607	4594	809	400	511	7181	162	937	7342	13217	
					3		5013	4987		435	556	7814	176	1019	7988	14380	
					4		4920	5080							8119	14615	
					5	703	4574	4723							7549	13588	
"	"	583	1	5	1	72	4748	401	4779	649					1783	3209	52
					1		4782	404	4814	654					1796	3232	
					3		9221	779		1261					3463	6232	
					4		9311	689							3634	6541	
					5	161	9161	678							3576	6436	
"	"	583	2	5	1	153	2821	2554	4472	248				4068	7322	52	
					1		2885	2594	4541	252					4131	7436	
					3		5248	4752		462					7567	13622	
					4		4843	5157							8192	14746	
					5	304	4696	5000							7944	14299	
"	"	583	3	5	1	177	4399	4434	1070	631				6934	12482	52	
					1		4397	4514	1059	642					7059	12707	
					3		4934	5066		720					7922	14260	
					4		4785	5212							8123	14622	
					5	208	4685	5107							7954	14318	
"	"	605	1	1	3	580	3804	4383	1233	654				6344	11419	54	
					1		4088	4653	1309	694					6735	12122	
					3		4646	5384		799					7749	13948	
					4		4486	5544							7973	14352	
					5	698	4145	5157							7417	13550	

COAL RESOURCES OF OHIO

Township	Seam	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis				Heat value		Year		
						Mois-ture	Vola-tile	Fixed carbon	Ash	Sulphur	Hydro-gen	Carbon	Nitro-gen	Oxygen	Calo-ries		B. t. u.	
ATHENS COUNTY (CON.)																		
BERN	PITTSBURGH	605	2	1	3	1	651	3783	4399	1167	632					6307	11354	54
						2	4047	4705	1248	676					6746	12145		
						3	4624	5376		772					7708	13877		
						4	4440	5560							7922	14259		
						5	776	4095	5129						7307	13153		
CANAAN	"	275	1	2	1	1	737	3902	4253	1108	420					6407	11533	28
						2	4212	4592	1196	454					6917	12451		
						3	4784	5216		516					7857	14142		
						4	4652	5348							8028	14451		
						5	860	4252	4888						7338	13208		
"	MIDDLE KITTANNING	297	1	2	1	1	636	3419	5096	849	51	540	6925	143	1492	6919	12454	7
						2	3655	5442	907	54	501	7395	153	990	7389	13300		
						3	4015	5985		59	551	8133	168	1089	8126	14626		
						4	3956	6044							8201	14762		
						5	702	3679	5619						7625	13725		
DOVER	UPPER FREEPORT	488	1	2	1	1	811	3744	5011	434	121	562	6232	123	2528	6885	12393	29
						2	4074	5453	473	132	514	6782	134	1965	7493	13487		
						3	4276	5724		139	540	7118	141	2062	7865	14156		
						4	4230	5770							7918	14252		
						5	857	3858	5275						7238	13030		
"	"	492	1	2	1	1	697	3958	4735	610	278					6936	12485	30
						2	4254	5090	656	299					7458	13425		
						3	4553	5447		320					7982	14368		
						4	4472	5528							8081	14545		
						5	759	4133	5108						7465	13437		
"	MIDDLE KITTANNING	299	1	2	1	1	714	3422	5192	672	165	556	6932	130	1545	6863	12353	2
						2	3685	5591	724	178	514	7465	139	980	7390	13302		
						3	3973	6027		192	554	8048	150	1056	7967	14340		
						4	3899	6101							8049	14488		
						5	777	3596	5627						7423	13361		
"	"	486 A	1	1	1	1	93	354	500	53	9					6850	12330	30
						2	390	551	59	10					7552	13594		
						3	414	586		11					8026	14446		
						4	409	591							8078	14540		
						5	99	369	532						7278	13100		
"	"	486 B	1	1	1	1	88	355	503	54	6					6900	12420	30
						2	389	552	59	7					7566	13618		
						3	413	587		7					8040	14472		
						4	410	590							8094	14570		
						5	94	371	535						7333	13200		
"	"	486 C	1	1	1	1	98	354	487	61	8					6717	12090	30
						2	392	540	68	9					7447	13404		
						3	421	579		10					7990	14382		
						4	416	584							8050	14490		
						5	105	372	523						7200	12960		
"	"	486 D ⁶	1	2	1	1	602	3928	4974	496	81	441	7132	98	1752	7067	12720	30
						2	4180	5293	527	86	398	7588	104	1297	7518	13532		
						3	4413	5577		91	420	8010	110	1369	7936	14285		
						4	4372	5627							7986	14375		
						5	639	4094	5267						7478	13460		
"	"	486 K	1	1	1	1	85	353	500	61	8	56	694	14	167	6817	12270	30
						2	386	548	66	9	51	759	15	100	7456	13420		
						3	413	587		10	54	813	17	106	7989	14380		
						4	409	591							8056	14500		
						5	93	370	537						7306	13150		
"	"	606	1	3	3	1	411	3687	5194	708	68					6962	12532	54
						2	3845	5417	738	71					7260	13069		
						3	4151	5849		77					7838	14110		
						4	4100	5900							7902	14223		
						5	447	3917	5636						7549	13588		
"	"	606	2	3	3	1	333	3455	4518	1694	211					6197	11156	54
						2	3574	4674	1752	238					6410	11940		
						3	4333	5667		264					7772	13991		
						4	4190	5810							7950	14310		
						5	413	4017	5570						7622	13720		
"	"	606	3	3	3	1	277	3908	4086	1729	348					6267	11281	54
						2	4019	4203	1778	358					6446	11602		
						3	4888	5112		435					7840	14111		
						4	4736	5264							8051	14491		
						5	349	4571	5080						7770	13986		
"	"	606	9	3	3	1	343	3673	4602	1382	196					6455	11620	54
						2	3803	4766	1431	203					6684	12033		
						3	4438	5562		237					7800	14042		
						4	4324	5676							7945	14301		
						5	408	4148	5444						7621	13717		
LODI	PITTSBURGH	274	1	1	2	1	852	3915	4244	989	306	541	6419	160	1585	6442	11595	28
						2	4279	4640	1081	354	487	7017	175	906	7042	12675		
						3	4798	5202		374	546	7868	196	1016	7896	14211		
						4	4693	5307							8034	14462		
						5	972	4238	4790						7253	13056		

Township	Seam	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis					Heat value		Year	
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories	B. t. u.		
																		COUNTY (CON.)
LODI	PITTSBURGH	274	2	1	2	1	673	4120	4099	1108	278	534	6457	113	1510	6500	11700	28
						2	4417	4395	1188	298	492	6923	121	978	6969	12544		
						3	5012	4988		338	558	7857	137	1110	7909	14235		
						4	4914	5086							8051	14492		
						5	778	4532	4690						7425	13365		
TRIMBLE	UPPER FREEPORT	489	1	2	1	1	678	4087	4587	648	246	534	6007	91	2474	6842	12315	29
						2	4311	5289	695	264	493	6444	98	2006	7339	13211		
						3	4711	5289		284	530	6925	105	2156	7887	14395		
						4	4638	5362							7981	14366		
						5	740	4295	4965						7391	13303		
"	"	491	1	2	1	1	626	4119	4656	599	227	483	6963	110	1618	7016	12629	29
						2	4394	4967	639	242	441	7428	117	1133	7486	13475		
						3	4694	5306		259	471	7935	125	1210	7997	14395		
						4	4627	5373							8084	14582		
						5	678	4314	5008						7534	13562		
"	"	526 A	1	1	1	1	69	405	444	82	51	55	664	12	136	6739	12130	48
						2	435	477	88	55	51	713	13	80	7239	13030		
						3	478	522		61	56	782	14	87	7938	14290		
						4	465	535							8100	14580		
						5	78	428	494						7467	13440		
"	"	526 B	1	1	1	1	65	402	455	76	52	55	673	12	132	6800	12240	48
						2	430	489	81	56	52	721	13	77	7278	13100		
						3	468	532		61	56	785	14	84	7919	14270		
						4	456	544							8083	14550		
						5	74	422	504						7483	13470		
"	MIDDLE KITTANNING	295	1	2	1	1	728	3238	5361	673	86	545	6946	134	1616	6894	12409	2
						2	3492	5782	726	93	500	7491	145	1045	7435	13383		
						3	3765	6235		100	539	8078	156	1127	8017	14431		
						4	3706	6294							8084	14582		
						5	789	3414	5797						7447	13404		
WATERLOO	"	293	1	2	1	1	670	3536	5119	675	228	549	6921	118	1509	6921	12458	2
						2	3790	5487	723	244	509	7418	126	980	7418	13352		
						3	4085	5915		263	549	7996	136	1056	7996	14393		
						4	4001	5999							8091	14563		
						5	733	3707	5560						7498	13497		
"	"	294	1	2	1	1	680	3690	4825	805	214	549	6740	137	1555	6794	12229	2
						2	3959	5177	864	230	507	7232	147	1020	7290	13122		
						3	4333	5667		252	555	7916	161	1116	7979	14363		
						4	4248	5752							8083	14549		
						5	754	3928	5318						7472	13450		
YORK	UPPER FREEPORT	528	1	1	1	1	83	395	478	44	19	58	701	13	165	6944	12500	48
						2	430	522	48	21	53	765	14	99	7572	13630		
						3	452	548		22	55	803	15	105	7954	14310		
						4	446	554							8022	14440		
						5	88	408	504						7316	13168		
"	"	528	2	1	1	1	87	354	457	102	22	55	644	12	165	6372	11470	48
						2	388	501	111	24	49	706	13	97	6978	12560		
						3	437	565		27	55	794	15	109	7849	14130		
						4	425	574							7972	14350		
						5	99	384	517						7190	12942		
"	"	528	3	1	1	1	49	353	445	153	55	48	604	12	128	6133	11040	48
						2	371	469	160	57	45	635	13	90	6450	11610		
						3	442	558		68	54	757	15	106	7678	13830		
						4	421	579							7906	14230		
						5	61	396	543						7434	13381		
"	LOWER FREEPORT	524	1	1	1	1	54	406	456	84	29	55	679	13	140	6822	12280	48
						2	429	482	89	30	52	718	14	97	7211	12980		
						3	471	529		33	57	788	15	107	7915	14240		
						4	462	538							8032	14458		
						5	60	434	506						7547	13584		
"	"	524	2	1	1	1	53	413	467	67	29	55	695	12	142	7000	12600	48
						2	435	493	71	31	52	735	13	98	7394	13310		
						3	470	530		33	56	791	14	106	7959	14350		
						4	461	539							8064	14516		
						5	58	434	508						7589	13661		
"	MIDDLE KITTANNING	485	1	2	1	1	740	3928	4792	540	97	447	6985	98	1833	7029	12652	30
						2	4242	5175	583	104	395	7544	105	1269	7591	13663		
						3	4505	5495		110	419	8011	112	1348	8061	14509		
						4	4460	5540							8119	14615		
						5	790	4108	5102						7478	13460		
BELMONT COUNTY																		
COLERAIN	WAYNESBURG	214	1	2	1	1	527	3742	4261	1470	219	497	6445	144	1225	6434	11581	27
						2	3950	4498	1552	231	462	6804	152	799	6792	12225		
						3	4676	5324		273	547	8054	180	946	8040	14471		
						4	4555	5445							8207	14773		
						5	636	4265	5099						7686	13835		

COAL RESOURCES OF OHIO

Township	Seam	File number	Kind	Source	Condition	Proximate analysis			Ultimate analysis					Heat value		Year	
						Mois-ture	Vola-tile	Fixed carbon	Ash	Sulphur	Hydro-gen	Carbon	Nitro-gen	Oxygen	Calo-ries		B. t. u.
BELMONT COUNTY (CON.)																	
COLERAIN	PITTSBURGH	273	1	2	1	379	3637	5084	900	416	514	7041	109	1020	7145	12861	7
					2	3780	5284	936	432	491	7318	113	710	7426	13367		
					3	4170	5830		477	542	8073	125	783	8193	14747		
					4	4036	5964							8348	15027		
					5	431	3862	5707						7989	14380		
FLUSHING	MEIGS CREEK	149	1	1	1	463	3384	5250	903	218						6	
					2	3548	5505	947	229								
					3	3919	6081		253								
					4	3819	6181										
					5	520	3621	5859									
"	"	177	1	1	1	551	3595	4989	865	231						6	
					2	3805	5280	915	244								
					3	4188	5822		269								
					4	4094	5906										
					5	616	3841	5543									
"	"	423	1	2	1	498	3330	4890	1282	241	495	6631	119	1232	6652	11974	7
					2	3505	5146	1349	253	463	6979	125	831	7001	12602		
					3	4052	5638		292	555	8068	144	961	8093	14567		
					4	3922	5678							8247	14845		
					5	587	3691	5722						7763	13973		
"	PITTSBURGH	272	1	2	1	423	3634	5022	921	417	514	6875	109	1164	7003	12605	7
					2	3794	5244	962	435	488	7178	114	823	7312	13162		
					3	4198	5802		481	540	7942	126	911	8090	14563		
					4	4062	5938							8246	14842		
					5	482	3867	5651						7848	14126		
"	"	574	1	1	1	19	392	495	94	47					7194	12950	23
					2	399	505	96	48					7328	13190		
					3	441	559		53					8106	14591		
					4	428	572							8270	14886		
					5	22	419	559						8095	14571		
COSHEN	WAYNESBURG	213	1	1	1	451	3532	4415	1622	353	498	6410	120	997	6447	11605	14
					2	3691	4614	1695	369	470	6698	125	643	6737	12127		
					3	4444	5356		444	566	8065	151	774	8112	14586		
					4	4278	5722							8122	14602		
					5	535	4049	5416						8328	14991		
"	UNIONTOWN	155	1	1	1	470	3421	4575	1554	285	495	6371	133	1182	6479	11662	14
					2	3590	4800	1610	299	465	6685	140	801	6799	12238		
					3	4279	5271		356	554	7968	167	955	8104	14586		
					4	4227	5373							8294	14930		
					5	574	3890	5556						7817	14071		
"	"	216	1	2	1	83	4121	4429	1367	259					6747	12145	26
					2	4156	4466	1378	261					6803	12246		
					3	4820	5180		303					7890	14203		
					4	4710	5290							8043	14478		
					5	99	4663	5238						7964	14336		
"	MEIGS CREEK	148	1	1	1	423	3641	4791	1145	316						6	
					2	3802	5002	1196	330								
					3	4318	5682		375								
					4	4192	5808										
					5	492	3986	5522									
"	"	422	1	2	1	340	3572	4594	1494	439	486	6477	108	996	6578	11840	7
					2	3698	4756	1546	454	464	6705	112	719	6809	12256		
					3	4374	5626		537	549	7932	132	850	8054	14497		
					4	4199	5801							8270	14886		
					5	417	4024	5559						7926	14267		
KIRKWOOD	PITTSBURGH	271	1	2	1	375	3799	4742	1084	476	509	6741	111	1079	6865	12357	7
					2	3947	4927	1126	495	485	7004	115	775	7132	12838		
					3	4448	5552		558	547	7892	130	873	8037	14467		
					4	4299	5701							8218	14792		
					5	438	4110	5452						7858	14145		
MEAD	WAYNESBURG	212	1	2	1	351	3768	4194	1687	359	470	6318	125	1041	6320	11377	27
					2	3905	4347	1748	372	447	6548	129	756	6550	11791		
					3	4732	5268		451	542	7935	156	916	7937	14289		
					4	4573	5427							8153	14676		
					5	440	4372	5188						7795	14031		
"	FISHPOT	351	2	2	1	254	4081	4092	1573	500					6522	11739	26
					2	4187	4199	1614	513					6692	12045		
					3	4993	5007		612					7980	14363		
					4	4831	5169							8212	14782		
					5	316	4679	5005						7952	14314		
"	PITTSBURGH	270 A	1	2	1	291	3794	5115	800	431	511	7295	104	859	7340	13212	7
					2	3908	5268	824	444	493	7513	107	619	7560	13608		
					3	4259	5741		484	537	8187	117	675	8239	14830		
					4	4133	5867							8388	15098		
					5	327	3998	5675						8114	14605		
"	"	270 B	1	2	1	184	3898	4664	1254	482					7005	12609	5
					2	3971	4751	1278	491					7136	12845		
					3	4553	5447		563					8182	14727		
					4	4398	5602							8383	15090		
					5	220	4301	5479						8199	14758		

Township	Seam	File number	Kind	Source	Condition	Proximate analysis			Ultimate analysis					Heat value		Year	
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories		B. t. u.
PEASE	MEIGS CREEK	421	1	2	1	4 55	36 19	4297	1619	313	472	62 63	12 6	12 07	6265	11278	27
					2	37 95	4507	1698	328	441	65 68	13 2	8 33	6571	11828		
					3	45 71	5429		395	531	79 12	15 9	10 03	7915	14247		
					4	44 18	5582							8114	14606		
					5	41 54	5260							7647	13765		
	" PITTSBURGH	158 A	1	1	1	40	39 6	483	81	34					7222	13000	20
					2	41 3	503	84	35					7523	13541		
					3	45 1	549		38					8213	14783		
					4	44 1	559							8343	15017		
					5	42 0	535							7974	14354		
	" "	158 B	1	1	1	39	38 9	480	92	36					7144	12860	20
					2	40 5	499	96	49					7434	13381		
					3	44 8	552		41					8223	14802		
					4	43 7	563							8369	15064		
					5	44 17	539							7997	14395		
" "	158 C	1	1	1	39	38 7	493	81	33					7244	13040	20	
				2	40 3	513	84	34					7538	13569			
				3	44 0	560		37					8229	14813			
				4	43 0	570							8358	15045			
				5	41 0	546							7998	14396			
" "	158 K	1	1	1	39	39 6	480	85	34	53	71 2	13	10 3	7200	12960	20	
				2	41 2	499	89	36	50	74 1	14	7 0	7494	13490			
				3	45 2	548		39	55	81 3	15	7 8	8222	14800			
				4	44 2	558							8362	15051			
				5	42 2	534							7988	14379			
" "	269	1	2	1	39 9	36 84	5191	7 86	2 97	5 21	71 45	1 24	11 27	7217	12991	7	
				2	38 13	5373	81 4	3 07	5 01	73 95	1 28	8 55	7470	13446			
				3	41 51	5849		3 54	5 45	80 51	1 39	9 31	8132	14637			
				4	40 49	5951							8249	14849			
				5	38 97	5726							7938	14289			
PULTNEY	MEIGS CREEK	419	1	2	1	38 8	38 84	4396	1 332						6643	11958	27
					2	40 41	4573	1 386						6911	12441		
					3	46 91	5309							8023	14443		
					4	45 73	5427							8186	14734		
					5	46 1	5177							7808	14054		
	" "	420	1	2	1	41 3	39 58	4247	1 382	3 38	5 03	65 61	1 21	10 95	6584	11852	27
					2	41 29	4430	1441	3 52	4 77	68 44	1 26	7 60	6868	12363		
					3	48 24	5176		4 11	5 57	79 97	1 47	8 88	8024	14444		
					4	46 94	5306							8207	14772		
					5	44 61	5043							7799	14039		
	" PITTSBURGH	160 A	1	1	1	39 9	38 77	4917	8 07	3 49					7279	13102	5
					2	40 38	5122	8 40	3 64					7582	13648		
					3	44 08	5592		3 97					8277	14900		
					4	43 02	5698							8413	15143		
					5	44 6	5444							8037	14466		
" "	160 B	1	1	1	40 6	39 45	5005	6 44	3 35							5	
				2	41 12	5217	6 71	3 49									
				3	44 08	5592		3 74									
				4	43 14	5686											
				5	44 5	4122	5433										
" "	268	1	2	1	38 0	37 18	5007	8 95	4 27	5 23	70 57	1 20	9 78	7103	12785	7	
				2	38 65	5205	9 30	4 44	5 00	73 36	1 25	6 65	7383	13289			
				3	42 61	5739		4 90	5 51	80 88	1 38	7 33	8140	14652			
				4	41 28	5872							8295	14931			
				5	39 50	5618							7938	14288			
" "	575 A	1	1	1	33 2	40 80	4911	6 77	3 55							6	
				2	42 20	5080	7 00	3 67									
				3	45 38	5462		3 95									
				4	44 43	5557											
				5	36 6	4280	5354										
" "	575 B	1	1	1	31 0	40 76	5011	6 03	3 42					7553	13595	6	
				2	42 06	5172	6 22	3 53					7795	14031			
				3	44 85	5515		3 76					8312	14962			
				4	43 96	5604							8427	15168			
				5	33 8	4248	5414						8141	14654			
" "	575 C	1	2	1	35 1	38 55	5098	6 86	3 76	5 45	72 06	1 17	10 70	7325	13185	7	
				2	40 06	5283	7 11	3 90	5 24	74 68	1 21	7 86	7591	13664			
				3	43 13	5687		4 20	5 64	80 40	1 30	8 46	8172	14709			
				4	42 06	5794							8298	14936			
				5	38 8	4043	5569						7977	14358			
RICHLAND	WAYNESBURG	211	1	2	1	36 8	37 36	4589	1 307	1 75				6678	12020	27	
					2	38 78	4765	1 357	1 82					6933	12479		
					3	44 87	5513		2 11					8022	14438		
					4	43 83	5617							8160	14688		
					5	43 3	4194	5373						7806	14051		
	" MEIGS CREEK	417	1	2	1	55 1	38 18	4401	1 230	2 60					6642	11956	27
					2	40 41	4657	1 302	2 75					7029	12653		
					3	46 46	5354		3 16					8081	14547		
					4	45 33	5467							8236	14824		
					5	42 39	5115							7703	13866		

COAL RESOURCES OF OHIO

Township	Seam	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis					Heat value		Year
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calo-ries	B. t. u.	
BELMONT COUNTY (CON.)																	
RICHLAND	MEIGS CREEK	418	1	2	1	467	3986	4326	1221	336					6672	12010	27
					2		4181	4538	1281	352					6999	12598	
					3		4795	5205		404					8027	14449	
					4		4675	5325							8193	14748	
					5	550	4418	5032							7743	13937	
"	"	600	1	3	1	314	3599	4411	1676	321	480	6417	101	1005	6415	11547	53
					2		3716	4554	1730	332	460	6625	104	749	6623	11921	
					3		4493	5507		401	556	8011	126	906	8008	14415	
					4		4333	5667							8216	14788	
					5	392	4154	5444							7894	14209	
"	PITTSBURGH	500 A	1	1	1	33	385	496	86	33					7239	13030	40
					2		398	513	89	34					7483	13470	
					3		437	563		37					8217	14790	
					4		426	574							8350	15030	
					5	37	411	552							8039	14470	
"	"	500 B	1	1	1	32	387	479	102	36					7100	12780	40
					2		407	495	105	37					7339	13210	
					3		447	553		41					8200	14760	
					4		434	565							8356	15040	
					5	37	419	544							8044	14480	
"	"	500 C	1	1	1	35	375	483	106	33					7050	12690	40
					2		389	501	110	34					7317	13170	
					3		437	563		38					8217	14790	
					4		425	575							8372	15070	
					5	42	407	551							8022	14440	
SMITH	WAYNESBURG	209	1	2	1	178	3916	4355	1541	268	487	6515	118	1071	6505	11709	26
					2		3987	4444	1569	273	475	6633	120	930	6623	11921	
					3		4729	5271		324	563	7868	142	1103	7856	14139	
					4		4601	5399							8028	14450	
					5	217	4501	5282							7853	14136	
"	"	210	1	2	1	572	3586	4431	1411	250					6439	11590	27
					2		3803	4701	1496	265					6830	12293	
					3		4472	5528		312					8032	14456	
					4		4342	5658							8200	14760	
					5	686	4045	5269							7638	13749	
"	MEIGS CREEK	416	1	2	1	352	3474	4990	1184	367	502	6736	105	1106	6884	12391	7
					2		3601	5172	1227	380	480	6982	109	822	7135	12843	
					3		4105	5895		433	547	7959	124	937	8133	14639	
					4		3958	6042							8303	14946	
					5	413	3794	5793							7961	14329	
"	PITTSBURGH	265	1	2	1	600	4119	4399	882	432	576	6902	116	1092	6990	12583	27
					2		4382	4680	938	460	542	7342	123	595	7436	13386	
					3		4836	5164		508	598	8101	136	657	8206	14772	
					4		4721	5279							8368	15063	
					5	681	4399	4920							7799	14038	
"	"	266	1	2	1	321	3682	5271	726	428	514	7149	106	1077	7297	13135	7
					2		3804	5446	750	442	495	7386	109	818	7539	13570	
					3		4112	5888		478	535	7985	118	884	8150	14670	
					4		3987	6013							8289	14920	
					5	357	3845	5798							7993	14388	
SOMERSET	WAYNESBURG	153	1	1	1	446	3660	4419	1475	302	510	6532	116	1065	6553	11795	14
					2		3831	4625	1544	316	481	6837	121	701	6859	12346	
					3		4531	5469		374	569	8085	143	829	8111	14600	
					4		4389	5611							8299	14939	
					5	541	4152	5307							7850	14130	
"	PITTSBURGH	264 A	1	2	1	408	3708	4823	1061	495	489	6877	110	968	6931	12476	7
					2		3866	5028	1106	516	463	7169	115	631	7226	13006	
					3		4347	5653		580	521	8061	129	709	8125	14623	
					4		4191	5809							8311	14959	
					5	475	3992	5533							7916	14249	
"	"	264 B	1	1	1	372	4101	4578	949	457					7089	12760	14
					2		4259	4755	986	475					7363	13253	
					3		4725	5275		527					8168	14703	
					4		4600	5400							8336	15005	
					5	426	4405	5169							7981	14365	
UNION	WAYNESBURG	619	3	3	1	42	349	447	162	30					6430	11574	57
					2		364	467	169	31					6712	12081	
					3		438	562		37					8077	14538	
					4		422	578							8277	14899	
					5	52	401	547							7849	14129	
"	MEIGS CREEK	414	1	2	1	417	3509	5114	950	311	497	6990	109	1133	7001	12602	7
					2		3662	5356	1002	324	470	7294	114	796	7306	13150	
					3		4070	5930		360	522	8106	127	885	8120	14614	
					4		3950	6050							8256	14861	
					5	474	3763	5763							7864	14156	
"	"	415	1	2	1	431	3247	5154	1168	194	509	6832	111	1186	6837	12307	7
					2		3393	6186	1221	203	482	7140	115	839	7145	12861	
					3		3865	6135		231	549	8133	131	956	8139	14650	
					4		3751	6249							8272	14889	
					5	499	3564	5937							7858	14145	

APPENDIX "B"

Township	Seam	File number	Kind	Source	Condition	Proximate analysis			Ultimate analysis						Heat value		Year
						Mois-ture	Vola-tile	Fixed carbon	Ash	Sulphur	Hydro-gen	Carbon	Nitro-gen	Oxygen	Calo-ries	B. t. u.	
BELMONT COUNTY (CON.)																	
UNION	PITTSBURGH	262	1	2	1	446	3600	4878	1076	445	485	6824	110	1060	6903	12425	7
					2	3768	5106	1126	466	456	7142	115	695	7225	13005		
					3	4246	5754		525	514	8048	130	783	8142	14655		
					4	4094	5906							8321	14977		
					5	519	3882	5599						7889	14200		
"	"	263	1	2	1	422	4186	4400	992	456				6973	12551	27	
					2	4370	4594	1036	476					7280	13104		
					3	4875	5125		531					8121	14618		
					4	4763	5247							8293	14927		
					5	486	4522	4992						7889	14201		
WARREN	MEIGS CREEK	157	1	1	1	434	3895	4750	1121	365	531	6817	120	1046	6890	12402	14
					2	4072	4756	1172	382	505	7126	125	690	7203	12965		
					3	4613	5387		433	572	8071	142	782	8159	14686		
					4	4488	5512							8326	14986		
					5	505	4261	5234						7904	14228		
"	"	413	1	2	1	447	3531	4715	1307	327	499	6583	113	1171	6668	12002	7
					2	3696	4956	1368	342	471	6091	118	810	6980	12564		
					3	4282	5718		396	546	7984	136	938	8086	14555		
					4	4139	5861							8261	14870		
					5	532	3919	5549						7822	14079		
"	PITTSBURGH	151 A	1	1	1	413	4271	4383	933	446				7074	12733	14	
					2	4455	4572	973	465					7379	13282		
					3	4935	5065		515					8174	14714		
					4	4821	5179							8339	15011		
					5	472	4594	4934						7946	14302		
"	"	151 B	1	1	1	372	4325	4440	853	445				7193	12947	14	
					2	4492	4612	896	462					7471	13447		
					3	4934	5066		507					8206	14770		
					4	4825	5175							8364	15055		
					5	422	4621	4957						8012	14422		
"	"	151 K	1	1	1	388	4309	4396	907	436	546	6997	127	987	7132	12838	14
					2	4483	4573	944	454	523	7280	132	667	7420	13356		
					3	4950	5050		501	578	8038	146	737	8193	14748		
					4	4840	5160							8354	15038		
					5	442	4626	4932						7985	14373		
"	"	261	1	2	1	447	3753	4699	1101	467	517	6764	108	1043	6875	12375	7
					2	3929	4919	1152	489	490	7080	113	676	7196	12953		
					3	4441	5559		553	554	8001	128	764	8133	14639		
					4	4290	5710							8319	14974		
					5	523	4066	5411						7886	14194		
WASHINGTON	WASHINGTON	152	1	1	1	408	3369	4123	2100	286	476	5993	109	1036	6012	10822	14
					2	3512	4298	2190	298	449	6248	114	701	6268	11282		
					3	4497	5503		382	575	8000	146	897	8026	14446		
					4	4307	5693							8279	14902		
					5	539	4075	5386						7833	14098		
"	WAYNESBURG	164	1	1	1	457	3681	4417	1445	259				6574	11833	14	
					2	3867	4629	1514	271					6889	12400		
					3	4545	5555		319					8118	14612		
					4	4415	5585							8293	14928		
					5	551	4172	5277						7837	14106		
"	MEIGS CREEK	165	1	1	1	351	3715	4153	1781	405				6396	11513	14	
					2	3850	4304	1846	420					6629	11932		
					3	4722	5278		515					8130	14633		
					4	4586	5454							8376	15076		
					5	447	4342	5211						8001	14401		
"	PITTSBURGH	260	1	2	1	279	3788	4991	942	509	525	6976	109	939	7215	12987	7
					2	3897	5134	969	524	508	7176	112	711	7422	13360		
					3	4315	5685		580	563	7946	124	787	8218	14793		
					4	4166	5834							8397	15115		
					5	321	4032	5647						8128	14631		
WAYNE	WAYNESBURG	154	1	1	1	440	3710	4306	1544	290				6476	11657	14	
					2	3881	4504	1615	303					6774	12193		
					3	4629	5371		361					8079	14541		
					4	4488	5512							8270	14886		
					5	538	4247	5215						7825	14085		
"	"	208	2	2	1	559	3838	3970	1633	320				6110	10999	26	
					2	4066	4205	1729	339					6472	11650		
					3	4916	5084		410					7825	14085		
					4	4772	5228							8027	14448		
					5	694	4440	4866						7471	13447		
"	MEIGS CREEK	412	1	2	1	421	3951	4386	1242	281				6786	12214	27	
					2	4125	4578	1297	294					7084	12751		
					3	4740	5260		338					8140	14651		
					4	4627	5373							8299	14938		
					5	495	4397	5108						7887	14197		
WHEELING	"	4117	1	2	1	752	3175	4949	1124	211	514	6641	111	1399	6589	11860	7
					2	3433	5352	1215	228					7125	12824		
					3	3908	6092		260					8110	14598		
					4	3789	6211							8246	14843		
					5	3461	5672							7532	13558		

COAL RESOURCES OF OHIO

Township	Seam	File number	Kind	Source	Condition	Proximate analysis			Ultimate analysis					Heat value		Year			
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories		B. t. u.		
BELMONT COUNTY (CON.)																			
WHEELING	MEIGS CREEK	585	1 ⁸	1	3	1	235	3143	4181	2441	234					5757	10363	49	
						2	3219	4281	2500	240					5897	10615			
						3	4292	5708		320					7863	14153			
						4	4078	5922							8134	14641			
						5	325	3945	5730						7868	14162			
	"	"	585	2 ⁸	1	3	1	245	3457	5273	1025	261					6937	12488	49
							2	3544	5405	1051	268					7111	12801		
							3	3950	6040		299					7946	14304		
							4	3846	6154							8073	14531		
							5	280	3738	5932						7847	14124		
	"	"	585	3 ⁸	1	3	1	242	3453	5233	1072	193					6962	12533	49
							2	3578	5363	1099	198					7135	12844		
							3	3975	6025		222					8016	14430		
							4	3873	6027							8134	14642		
							5	277	3766	5957						7909	14236		
"	"	585	4 ⁸	1	3	1	219	3945	4959	877	335					7149	12869	49	
						2	4033	5070	897	343					7309	13157			
						3	4430	5570		377					8029	14453			
						4	4325	5675							8158	14685			
						5	247	4218	5535						7957	14322			
"	"	585	9 ⁸	1	3	1	237	3476	4941	1346	245					6710	12078	49	
						2	3550	5061	1379	261					6872	12371			
						3	4129	5871		291					7971	14350			
						4	4000	6000							8126	14626			
						5	282	3888	5830						7896	14213			
"	PITTSBURGH	150	A	1	1	1	396	3809	4891	904	425						6		
						2	3965	5094	941	443									
						3	4377	5623		489									
						4	4248	5752											
						5	451	4057	5492										
"	"	150	B	1	1	1	413	3922	4869	796	415						6		
						2	4091	5079	830	430									
						3	4451	5539		469									
						4	4345	5655											
						5	453	4143	5394										
"	"	259	9	1	2	1	425	3353	5187	1035	395	519	6817	109	1125			7	
						2	3502	5417	1081	413	493	7119	114	780					
						3	3926	6074		463	553	7981	128	875					
						4	3777	6223											
						5	490	3592	5918										
YORK	WAYNESBURG	207	1	2	1	1	284	4007	4375	1334	491						26		
						2	4124	4503	1373	506									
						3	4780	5220		587									
						4	4627	5373											
						5	343	4458	5189										
	"	MEIGS CREEK	410	1	2	1	1	326	4094	4432	1098	386	506	6907	119	984			27
							2	4232	4634	1134	400	486	7139	123	718				
							3	4773	5227		451	548	8052	139	810				
							4	4654	5346										
							5	379	4478	5143									
	"	PITTSBURGH	257	1	2	1	1	311	4181	4774	734	345						27	
							2	4315	4928	757	356								
							3	4668	5332		385								
							4	4576	5424										
							5	345	4418	5237									
"	"	258	1	2	1	1	226	4253	4843	688	318	520	7424	140	930			27	
						2	4352	4955	683	326	506	7595	143	747					
						3	4682	5318		350	543	8152	153	802					
						4	4599	5401											
						5	248	4485	5267										
CARROLL COUNTY																			
LEE	HARLEM	316	1	2	1	1	707	3655	5034	604	67	549	7104	122	1564			26	
						2	3933	5417	650	61	508	7644	131	1006					
						3	4206	5794		65	543	8176	140	1076					
						4	4163	5837											
						5	759	3847	5394										
ORANGE	MIDDLE KITTANNING	296	1	2	1	1	376	3911	5034	679	306	536	7199	140	1140			2	
						2	4054	5231	705	318	513	7480	146	838					
						3	4372	5628		342	552	8047	157	902					
						4	4281	5719											
						5	413	4105	5482										
WASHINGTON	LOWER KITTANNING	580	4	1	2	1	295	4243	5017	445	190						2		
						2	4372	5169	459	196									
						3	4582	5418		205									
						4	4530	5470											
						5	313	4388	5299										

Township	Seam	File number	Kind	Source	Condition	Proximate analysis			Ultimate analysis					Heat value		Year	
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories		B. t. u.
COLUMBIANA COUNTY																	
CENTER	LOWER KITTANNING	314	1	2	1	253	4366	4624	757	502	538	7064	113	1026	7372	13270	21
					2	4480	4744	776	515	524	7248	117	820	7564	13615		
					3	4857	5243		558	558	7858	127	889	8200	14760		
					4	4744	5253							8358	15044		
					5	285	4608	5107						8121	14618		
KNOX	"	313	1	2	1	455	4260	4533	752	424	538	6857	124	1305	7119	12815	21
					2	4453	4750	787	444	511	7184	130	944	7458	13425		
					3	4844	5156		482	555	7797	141	1025	8095	14572		
					4	4741	5259							8236	14825		
					5	508	4501	4991						7819	14074		
LIVERPOOL	MIDDLE KITTANNING	125	1	1	1	479	3483	5295	743	179	539	7399	138	1002	7329	13192	16
					2	3658	5562	780	188	510	7771	145	606	7698	13856		
					3	3957	6033		204	553	8429	157	657	8349	15028		
					4	3888	6112							8444	15200		
					5	526	3684	5790						8000	14400		
"	"	126	1	1	1	483	3675	5431	461	146					7589	13660	16
					2	3841	5677	482	153					7933	14279		
					3	4056	5964			161				8335	15002		
					4	3982	6018							8398	15117		
					5	460	3799	5741						8012	14421		
"	"	127	1	1	1	508	3578	5315	599	207					7412	13342	16
					2	3769	5600	631	218					7809	14056		
					3	4023	5977			233				8335	15003		
					4	3948	6052							8423	15162		
					5	550	3751	5719						7961	14329		
"	"	292	1	2	1	360	3616	5564	460	176	546	7706	138	974	7789	14020	7
					2	3751	5772	477	183	525	7994	143	678	8080	14544		
					3	3939	6061		192	551	8395	150	712	8485	15272		
					4	3878	6122							8556	15401		
					5	383	3730	5887						8228	14811		
"	LOWER KITTANNING	140	1	1	1	266	4173	4399	1162	803					7085	12753	16
					2	4287	4519	1194	825					7278	13100		
					3	4858	5152			937				8265	14876		
					4	4677	5323							8537	15366		
					5	320	4527	5153						8264	14875		
MADISON	MAHONING	425	1	2	1	318	3647	5221	814	153	531	7292	134	1076	7347	13224	21
					2	3757	5392	841	158	513	7531	139	818	7587	13657		
					3	4113	5887		173	560	8222	152	893	8284	14911		
					4	4038	5962							8377	15079		
					5	352	3896	5752						8083	14549		
"	UPPER FREEPORT	132 A	1	1	1	337	3789	5158	706	292					7471	13448	16
					2	3921	5348	731	302					7731	13916		
					3	4250	5770			326				8341	15013		
					4	4137	5863							8455	15219		
					5	371	3984	5645						8142	14655		
"	"	132 B	1	1	1	377	3832	4993	798	365					7398	13316	16
					2	3982	5189	829	379					7688	13838		
					3	4342	5658		413					8383	15089		
					4	4251	5769							8523	15342		
					5	422	4053	5525						8164	14695		
"	"	132 K	1	1	1	360	3780	5122	738	321	535	7368	185	853	7439	13390	16
					2	3921	5313	766	333	513	7643	192	553	7716	13889		
					3	4246	5754		361	556	8276	208	599	8356	15041		
					4	4145	5855							8481	15265		
					5	399	3980	5621						8142	14656		
"	"	344	1	2	1	245	3697	4995	1063	380	507	6939	121	990	7152	12874	21
					2	3789	5122	1089	389	492	7112	124	794	7331	13196		
					3	4252	5748		437	552	7981	139	891	8227	14809		
					4	4119	5881							8389	15101		
					5	283	4004	5713						8153	14676		
MIDDLETON	MAHONING	424	1	2	1	322	3676	5238	764	198	526	7310	142	1060	7368	13263	21
					2	3798	5413	789	205	507	7554	147	798	7614	13705		
					3	4323	5877		223	550	8201	160	866	8266	14879		
					4	4043	5977							8364	15055		
					5	355	3900	5745						8067	14520		
"	"	547	1	4	1	415	3620	4715	1250	206						99	
					2	3777	4919	1304		215							
					3	4343	5657			247							
					4	4233	5767										
					5	486	4027	5487									
"	UPPER FREEPORT	343	1	2	1	317	3696	5427	560	204	535	7563	133	1005	7674	13813	21
					2	3817	5604	579	211	516	7811	137	746	7926	14266		
					3	4052	5948		224	548	8291	145	792	8413	15143		
					4	3981	6019							8497	15294		
					5	341	3846	5813						8206	14770		

COAL RESOURCES OF OHIO

Township	Seam	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis					Heat value		Year
						Moisture	Volatiles	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories	B. t. u.	
COLUMBIANA COUNTY (CON.)																	
ST. CLAIR	UPPER FREEPORT	133	1	1	1	427	3643	4765	1164	304					6977	12559	16
					2	3805	4979	1216	318					7288	13118		
					3	4332	5658		362					8297	14934		
					4	4207	5793							8458	15225		
					5	3998	5504							8038	14468		
"	"	134	1	1	2	527	3628	4951	894	401					7118	12812	16
					3	3850	5226	944	423					7514	13525		
					4	4229	5771		467					8297	14935		
					5	4098	5902							8455	15219		
					5	3853	5549							7949	14309		
"	LOWER FREEPORT	129	1	1	2	358	3847	4748	1047	449	539	7004	156	805	7138	12848	16
					3	3990	4924	1086	466	518	7264	162	504	7403	13325		
					4	4476	5524		523	581	8149	182	565	8305	14948		
					5	4326	5654							8486	15275		
					5	4156	5429							8134	14641		
"	LOWER KITTANNING	136	1	1	2	403	3659	5303	625	261	546	7465	164	939	7496	13493	16
					3	3823	5526	651	272	522	7779	171	605	7811	14060		
					4	4089	5911		291	558	8521	183	647	8355	15039		
					5	4003	5997							8457	15222		
					5	3828	5733							8086	14554		
"	"	315	1	2	1	367	3768	5181	684	250	531	7313	120	1102	7414	13345	21
					2	3912	5378	710	260	509	7591	125	805	7696	13853		
					3	4211	5789		280	548	8170	135	867	8284	14912		
					4	4127	5873							8387	15096		
					5	402	3961	5637						8050	14490		
WASHINGTON	UPPER FREEPORT	342	1	2	2	342	3866	4918	874	361	517	7045	132	1071	7221	12998	21
					3	4003	5226	905	373	486	7294	136	796	7477	13459		
					4	4401	5599		410	545	8020	150	875	8221	14938		
					5	4285	5711							8363	15053		
					5	386	4123	5491						8039	14471		
WEST	"	341	1	2	1	718	3496	4891	895	252	515	6672	125	1541	6705	12069	21
					2	3766	5269	965	272	469	7188	134	972	7224	13003		
					3	4168	5832		301	519	7956	148	1076	7996	14392		
					4	4064	5936							8116	14608		
					5	807	3737	5456						7459	13427		
YELLOW CREEK	MAHONING	120	1	1	2	315	3932	5115	656	355	556	7535	135	781	7548	13586	16
					3	4060	5281	659	367	538	7780	139	517	7793	14027		
					4	4346	5654		393	576	8329	149	553	8343	15017		
					5	4249	5751							8464	15235		
					5	4101	5553							8172	14709		
"	UPPER FREEPORT	135	1	1	2	513	3801	4858	828	378					7200	12960	16
					3	4007	5120	873	398					7590	13662		
					4	4390	5610		436					8316	14969		
					5	4275	5725							8463	15233		
					5	4027	5396							7974	14353		
"	"	137	1	1	2	346	3674	4887	1093	428	524	6989	138	828	7073	12731	16
					3	3806	5062	1132	443	503	7239	143	540	7326	13187		
					4	5336	4664		500	567	8163	161	609	8261	14870		
					5	4146	5854							8441	15193		
					5	403	3979	5618						8101	14582		
"	"	141	1	1	2	343	3781	5128	748	286	553	7431	148	834	7425	13365	16
					3	3915	5310	775	296	533	7695	153	548	7689	13840		
					4	4244	5756		321	578	8341	166	594	8355	15003		
					5	4189	5851							8452	15213		
					5	380	3992	5628						8130	14634		
"	LOWER FREEPORT	130	1	1	2	594	3273	4981	1152	149	528	6830	135	1206	6726	12107	17
					3	3480	5295	1225	158	491	7262	144	720	7151	12872		
					4	3966	6034		180	560	8275	164	821	8149	14669		
					5	3864	6136							8274	14893		
					5	3598	5717							7707	13872		
"	MIDDLE KITTANNING	128	1	1	2	341	3465	5118	1075	70	522	7162	145	1026	7128	12830	16
					3	3588	5299	1113	72	501	7415	150	749	7380	13284		
					4	4037	5963		81	564	8343	169	843	8304	14948		
					5	3962	6038							8403	15126		
					5	3807	5804							8077	14539		
"	LOWER KITTANNING	142	1	1	2	267	3846	5019	858	571					7340	13212	16
					3	3951	5157	892	587					7541	13574		
					4	4338	5662		644					8280	14903		
					5	4183	5817							8467	15241		
					5	4056	5639							8209	14776		
"	"	143	1	1	2	446	4086	4973	495	352					7540	13572	16
					3	4277	5205	518	368					7892	14206		
					4	4511	5489		388					8323	14982		
					5	4266	5579							8432	15178		
					5	481	4212	5307						8027	14448		

Township	Seam	File number	Kind	Source	Condition	Proximate analysis			Ultimate analysis					Heat value		Year	
						Mois-ture	Vola-tile	Fixed carbon	Ash	Sulphur	Hydro-gen	Carbon	Nitro-gen	Oxygen	Calo-ries		B. t. u.
COSHOCTON COUNTY																	
ADAMS	MIDDLE KITTANNING	291	1	2	1	4 58	39 18	47 49	87 5	5 36	5 40	6 7 5 1	1 2 4	11 7 4	6 8 7 8	1 2 3 8 0	2
					2	41 0 6	49 7 7	9 1 7	5 6 2	5 1 2	7 0 7 5	1 3 0	8 0 4	7 2 0 8	1 2 9 7 4		
					3	45 2 1	5 4 7 9		6 1 9	5 5 4	7 7 8 9	1 4 3	8 8 5	7 9 3 6	1 4 2 8 4		
					4	43 7 7	5 6 2 3							8 1 0 5	1 4 5 8 9		
					5	5 2 3	4 1 4 8	5 3 2 9						7 6 8 1	1 3 8 2 6		
BEDFORD	BEDFORD	382	1	2	1	1 5 4	4 6 5 7	3 5 4 2	1 6 4 7	3 7 4	4 9 5	6 4 6 3	1 6 7	8 5 4	6 5 9 1	1 1 8 6 4	26
					2	4 7 2 9	3 5 9 7	1 6 7 4	3 8 0	4 8 6	6 5 6 1	1 7 0	7 2 9	6 6 9 4	1 2 0 4 9		
					3	4 3 2 0	4 4 3 0		4 5 6	5 8 4	7 8 8 0	2 0 4	8 7 6	8 0 4 0	1 4 4 7 2		
					4	4 4 7 4	4 3 4 9							8 2 5 3	1 4 8 5 5		
					5	1 9 2	5 4 5 9	4 3 4 9						8 0 9 3	1 4 5 6 8		
CLARK	MIDDLE KITTANNING	290	1	2	1	5 3 0	3 9 0 8	4 9 4 7	6 1 5	3 7 2	5 5 0	6 9 5 9	1 1 2	1 3 9 2	7 0 8 4	1 2 7 5 1	2
					2	4 1 2 7	5 2 2 4	6 4 9	3 9 3	5 1 8	7 3 4 8	1 1 8	9 7 4	7 4 8 0	1 3 4 6 4		
					3	4 4 1 3	5 5 8 7		4 2 0	5 5 4	7 8 5 8	1 2 6	1 0 4 2	7 9 9 9	1 4 3 9 8		
					4	4 3 1 3	5 6 8 7							8 1 1 5	1 4 6 0 7		
					5	5 8 0	4 0 5 3	5 3 5 7						7 6 4 5	1 3 7 6 1		
"	"	340	1	2	1	6 4 0	3 7 9 2	5 2 4 9	3 1 9	2 0 1	5 6 7	7 2 7 2	1 2 5	1 5 1 6	7 3 2 5	1 3 1 8 5	2
					2	4 0 5 1	5 6 0 8	3 4 1	2 1 5	5 3 0	7 7 6 9	1 3 3	1 0 1 2	7 8 2 6	1 4 0 8 6		
					3	4 1 9 4	5 8 0 6		2 2 3	5 4 9	8 0 4 2	1 3 8	1 0 4 8	8 1 0 2	1 4 5 8 3		
					4	4 1 3 9	5 8 6 1							8 1 6 3	1 4 6 9 3		
					5	6 7 1	3 8 6 1	5 4 6 8						7 6 1 6	1 3 7 0 8		
CRAWFORD	"	289	1	2	1	4 7 0	3 9 2 0	4 4 8 1	1 1 2 9	5 6 0	5 2 3	6 4 7 8	1 1 2	1 1 9 8	6 5 9 4	1 1 8 6 9	2
					2	4 1 1 3	4 7 0 2	1 1 8 5	5 9 8	4 9 4	6 7 9 7	1 1 8	8 1 8	6 9 1 9	1 2 4 5 4		
					3	4 6 5 6	5 3 8 4		6 6 7	5 6 0	7 7 1 1	1 3 4	9 2 8	7 8 4 9	1 4 1 2 8		
					4	4 5 0 5	5 4 9 5							8 0 4 6	1 4 4 8 2		
					5	5 5 5	4 2 5 5	5 1 9 0						7 5 9 9	1 3 6 7 8		
FRANKLIN	"	393	1	2	1	4 3 3	4 1 1 1	4 8 9 7	5 5 9	4 0 0	5 4 1	7 1 4 2	1 2 2	1 2 3 6	7 2 6 9	1 3 0 8 4	2
					2	4 2 9 7	5 1 1 9	5 8 4	4 1 8	5 1 5	7 4 6 5	1 2 8	8 9 0	7 5 9 8	1 3 6 7 6		
					3	4 5 6 4	5 4 3 6		4 4 4	5 4 7	7 9 2 8	1 3 6	9 4 5	8 0 6 9	1 4 5 2 4		
					4	4 4 5 8	5 5 3 2							8 1 8 6	1 4 7 3 5		
					5	4 7 2	4 2 5 7	5 2 7 1						7 8 0 1	1 4 0 4 1		
JACKSON	"	392	1	2	1	5 3 2	4 0 9 3	4 7 4 5	6 3 0	4 2 2	5 5 0	6 9 2 9	1 2 4	1 3 4 5	7 0 8 6	1 2 7 5 5	2
					2	4 3 2 3	5 0 1 2	6 6 5	4 4 6	5 1 9	7 3 1 8	1 3 1	9 2 1	7 4 8 4	1 3 4 7 1		
					3	4 6 3 1	5 3 6 9		4 7 8	5 5 6	7 8 3 9	1 4 0	9 8 7	8 0 1 7	1 4 4 3 1		
					4	4 5 2 8	5 4 7 2							8 1 4 5	1 4 6 6 1		
					5	5 8 5	4 2 6 3	5 1 5 2						7 6 6 9	1 3 8 0 4		
KEENE	"	391	1	2	1	5 4 0	3 9 9 2	4 9 5 0	5 0 8	3 1 8	5 5 8	7 0 9 0	1 2 4	1 4 0 2	7 1 9 4	1 2 9 4 9	2
					2	4 2 2 0	5 2 4 3	5 3 7	3 3 6	5 2 6	7 4 9 5	1 3 1	9 7 5	7 6 0 5	1 3 6 8 9		
					3	4 4 5 9	5 5 4 1		3 5 5	5 5 6	7 9 2 1	1 3 8	1 0 3 0	8 0 3 7	1 4 4 6 6		
					4	4 3 7 7	5 6 2 3							8 1 3 4	1 4 6 4 1		
					5	5 8 2	4 1 2 3	5 2 9 5						7 6 6 0	1 3 7 8 8		
LAFAYETTE	LOWER KITTANNING	390	1	2	1	5 6 0	3 4 5 9	4 6 4 3	1 3 2 8	4 8 7	4 9 5	6 1 5 9	1 0 8	1 4 2 3	6 2 2 2	1 1 2 0 0	2
					2	3 6 7 5	4 9 1 8	1 4 0 7	5 1 6	4 5 9	6 5 2 4	1 1 4	9 8 0	5 5 9 1	1 1 8 6 6		
					3	4 2 7 7	5 7 2 3		6 0 1	5 3 4	7 5 9 2	1 3 3	1 1 4 0	7 6 7 0	1 3 8 0 7		
					4	4 0 9 4	5 9 0 6							7 8 6 6	1 4 1 5 9		
					5	6 7 5	3 8 1 8	5 5 0 7						7 3 3 6	1 3 2 0 4		
LINTON	MIDDLE KITTANNING	388	1	2	1	4 3 7	4 0 9 7	4 9 3 0	5 3 6	3 6 1	5 5 6	7 1 3 4	1 2 8	1 2 8 5	7 2 4 7	1 3 0 4 5	2
					2	4 2 8 9	5 1 5 5	5 6 1	3 7 7	5 3 0	7 4 6 0	1 3 4	9 3 8	7 5 7 8	1 3 6 4 0		
					3	4 3 3 9	5 3 4 1		3 9 9	5 6 2	7 9 0 3	1 4 2	9 9 4	8 0 2 2	1 4 4 7 6		
					4	4 4 5 0	5 5 5 0							8 1 3 4	1 4 6 4 2		
					5	4 7 4	4 2 3 9	5 2 8 7						7 7 4 9	1 3 9 4 9		
"	"	389	1	2	1	1 0 9 3	3 4 0 0	4 8 4 3	6 6 4	2 0 3	5 3 7	6 3 0 8	1 1 5	2 1 7 3	6 1 3 3	1 1 0 3 9	2
					2	3 8 1 7	5 4 3 7	7 4 6	2 2 8	4 6 7	7 0 8 1	1 2 9	1 3 4 9	6 8 8 5	1 2 3 9 3		
					3	4 1 2 5	5 8 7 5		2 4 6	5 0 5	7 6 5 2	1 3 9	1 4 5 8	7 4 4 0	1 3 3 9 2		
					4	4 0 4 3	5 9 5 7							7 5 2 2	1 3 5 4 0		
					5	1 1 9 2	3 5 5 1	5 2 4 7						6 6 2 6	1 1 9 2 6		
OXFORD	"	387	1	2	1	4 4 4	4 0 7 1	5 0 4 0	4 4 5	3 5 4	5 5 3	7 2 6 5	1 3 5	1 2 4 8	7 3 5 1	1 3 2 3 1	2
					2	4 2 5 0	5 2 7 4	4 5 6	3 7 0	5 2 7	7 6 0 3	1 4 1	8 9 3	7 6 9 3	1 3 8 4 7		
					3	4 4 6 8	5 5 3 2		3 8 8	5 5 3	7 9 7 4	1 4 8	9 3 7	8 0 6 9	1 4 5 2 4		
					4	4 3 8 5	5 6 1 5							8 1 6 7	1 4 7 0 1		
					5	4 7 6	4 1 7 6	5 3 4 8						7 7 7 7	1 3 9 9 9		
VIRGINIA	"	386	1	2	1	5 1 2	3 8 9 9	4 8 8 7	7 0 2	3 8 7	5 4 5	6 9 4 9	1 2 0	1 2 9 7	7 0 6 6	1 2 7 1 9	2
					2	4 1 0 9	5 1 5 1	7 4 0	4 0 8	5 1 4	7 3 2 4	1 2 7	8 8 7	7 4 4 7	1 3 4 0 5		
					3	4 4 3 7	5 5 5 3		4 4 1	5 5 5	7 9 0 9	1 3 7	9 5 8	8 0 4 2	1 4 4 7 6		
					4	4 3 3 0	5 6 7 0							8 1 7 0	1 4 7 0 6		
					5	5 6 7	4 0 8 5	5 3 4 8						7 7 0 7	1 3 8 7 3		
WHITE EYES	"	472	1	2	1	5 3 2	3 7 3 9	4 8 6 9	8 5 0	4 3 6	5 3 2	6 7 4 1	1 1 8	1 3 1 3	6 8 2 8	1 2 2 9 0	2
					2	3 9 4 9	5 1 4 3	9 0 8	4 6 0	5 0 0	7 1 2 0	1 2 5	8 8 7	7 2 1 2	1 2 9 8 2		
					3	4 3 4 3	5 6 5 7		5 0 6	5 5 0	7 8 3 1	1 3 7	9 7 6	7 9 3 2	1 4 2 7 8		
					4	4 2 1 2	5 7 8 8							8 0 8 2	1 4 5 4 7		
					5	6 0 2	3 9 5 9	5 4 3 9						7 5 9 4	1 3 6 6 9		
"	"	484	1	2	1	4 5 0	3 8 7 3	5 0 8 0	5 9 7	3 6 3	5 5 3	7 0 9 4	1 3 0	1 2 6 3	7 1 7 3	1 2 9 1 1	2
					2	4 0 5 5	5 3 2 0	6 2 5	3 8 0	5 2 7	7 4 2 8	1 3 6	9 0 4	7 5 1 1	1 3 5 1 9		
					3	4 3 2 5	5 6 7 5		4 0 5	5 6 2	7 9 2 4	1 4 5	9 6 4	8 0 1 2	1 4 4 2 0		
					4	4 2 2 7	5 7 7 3							8 1 2 3	1 4 6 2 2		
					5	4 9 2	4 0 1 9	5 4 8 9						7 7 2 4	1 3 9 0 4		

COAL RESOURCES OF OHIO

Township	Seam	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis				Heat value		Year	
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories		B. t. u.
GALLIA COUNTY																	
CHESHIRE	REDSTONE	237	1	2	1	821	3423	4610	1146	218	548	6295	102	1691	6387	11497	7
					2	3729	5022	1249	237	498	6858	111	1047	6958	12524		
					3	4251	5739			271	569	7837	127	1196	7951	14312	
					4	4148	5852							8088	14559		
					5	950	3754	5296						7321	13177		
GREEN	PITTSBURGH	256	1	2	1	673	3434	4590	1303	437	511	6230	114	1405	6356	11441	7
					2	3682	4921	1397	468	468	6680	122	865	6814	12266		
					3	4280	5720			544	544	7765	142	1005	7920	14258	
					4	4109	5891							8118	14613		
					5	806	3777	5417						7464	13436		
GREENFIELD	MIDDLE KITTANNING	483	1	2	1	808	3753	4597	852	364	548	6571	138	1547	6717	12091	6
					2	4083	4990	927	386	498	7149	138	902	7307	13153		
					3	4500	5500			436	549	7880	141	994	8054	14497	
					4	4385	5615							8196	14753		
					5	910	3986	5104						7451	13412		
HARRISON	PITTSBURGH	254	1	2	1	783	3415	4826	976	389	518	6459	109	1549	6544	11779	7
					2	3705	5236	1059	422	468	7007	118	926	7099	12778		
					3	4144	5856			472	523	7837	132	1036	7940	14291	
					4	4002	5998							8096	14572		
					5	897	3643	5460						7371	13267		
"	"	255	1	2	1	698	3614	4785	903	521	524	6491	101	1460	6583	11849	7
					2	3885	5144	971	560	481	6977	108	903	7076	12737		
					3	4303	5697			620	533	7727	120	1000	7837	14107	
					4	4146	5854							8007	14412		
					5	799	3814	5387						7368	13262		
OHIO	"	253	1	2	1	580	3676	4738	1006	434	516	6494	110	1440	6551	11792	7
					2	3903	5050	1058	460	480	6894	117	981	6954	12517		
					3	4369	5631			515	537	7719	131	1098	7785	14014	
					4	4227	5773							7943	14298		
					5	669	3944	5387						7413	13343		
WALNUT	UPPER FREEPORT	339	1	2	1	752	3285	4714	1259	181	519	6348	128	1585	6371	11468	2
					2	3556	5003	1341	196	470	6871	139	933	6896	12413		
					3	4107	5893			226	543	7935	161	1135	7964	14335	
					4	3991	6009							8102	14584		
					5	890	3656	5474						7382	13288		
GUERNSEY COUNTY																	
CENTER	UPPER FREEPORT	147 A	1	1	1	580	3689	5073	658	262						5	
					2	3916	5385	699	278								
					3	4210	5790			299							
					4	4123	5877										
					5	634	3862	5504									
"	"	147 B	1	1	1	628	3581	5061	730	355				7056	12701	5	
					2	3821	4400	779	379					7529	13552		
					3	4144	5856			411				8165	14697		
					4	4030	5970							8294	14930		
					5	697	3749	5554						7717	13890		
"	"	337	1	2	1	647	3590	5185	578	113	541	7259	141	1368	7076	12736	25
					2	3838	5544	618	121	501	7761	151	848	7565	13617		
					3	4091	5909			129	534	8272	161	904	8063	14514	
					4	4036	5964							8128	14630		
					5	695	3756	5549						7563	13614		
MILLWOOD	PITTSBURGH	173 A	1	1	1	45	405	465	83	46	54	703	11	103	7111	12800	27
					2	425	488	87	49	52	736	12	64	7444	13400		
					3	465	535			53	57	807	13	70	8156	14680	
					4	454	546							8311	14960		
					5	51	430	519						7889	14200		
"	"	173 B	1	1	1	47	404	463	85	42				7072	12730	27	
					2	424	485	91	44					7422	13360		
					3	466	534			49				8167	14700		
					4	454	546							8311	14960		
					5	53	430	517						7867	14160		
"	"	173 C	1	1	1	39	398	468	95	49	52	699	12	93	7028	12650	27
					2	415	486	99	51	50	727	12	61	7311	13160		
					3	460	540			55	55	807	14	68	8117	14610	
					4	446	554							8289	14920		
					5	45	425	529						7917	14250		
"	"	173 K	1	1	1	43	403	465	89	46	55	729	12	69	7072	12730	27
					2	421	486	93	48	52	761	13	33	7389	13300		
					3	464	536			53	58	840	14	35	8150	14670	
					4	452	548							8311	14960		
					5	49	430	521						7906	14230		

APPENDIX "B"

Township	Seam	File number	Kind	Source	Condition	Proximate analysis			Ultimate analysis					Heat value		Year	
						Mois-ture	Volat-ile	Fixed carbon	Ash	Sulphur	Hydro-gen	Carbon	Nitro-gen	Oxygen	Calo-ries		B. t. u.
GUERNSEY COUNTY (CON.)																	
MILLWOOD	PITTSBURGH	174	1	1	1	436	4114	4576	874	485	537	6930	126	1048	7061	12710	14
					2		4302	4784	914	507	511	7246	132	690	7383	13289	
					3		4735	5265		558	562	7976	145	759	8126	14626	
					4		4610	5390							8221	14925	
					5	496	4380	5124							7881	14185	
RICHLAND	UPPER FREEPORT	167 A	1	1	1	609	3522	5176	693	162					7077	12739	14
					2		3750	5512	738	172					7536	13565	
					3		4049	5951		186					8136	14646	
					4		3977	6023							8221	14798	
					5	665	3712	5623							7675	13815	
"	"	167 B	1	1	1	595	3573	5037	795	215					7034	12661	14
					2		3799	5386	845	228					7479	13462	
					3		4150	5850		249					8169	14705	
					4		4062	5938							8274	14894	
					5	659	3794	5547							7729	13913	
"	"	167 K	1	1	1	607	3504	5156	733	195	537	7124	139	1272	7062	12712	14
					2		3750	5490	780	208	500	7584	148	780	7518	13532	
					3		4046	5954		226	542	8225	161	846	8154	14677	
					4		3984	6086							8249	14849	
					5	657	3700	5633							7700	13860	
"	"	175 A	1	1	1	537	3580	5078	805	164					7102	12784	14
					2		3783	5366	851	173					7505	13509	
					3		4135	5865		189					8203	14766	
					4		4057	5943							8299	14938	
					5	594	3816	5590							7806	14050	
"	"	175 B	1	1	1	638	3377	5214	781	216					7015	12627	14
					2		3596	5570	834	231					7493	13487	
					3		3923	6077		252					8175	14714	
					4		3831	6169							8279	14903	
					5	706	3561	5733							7696	13852	
"	"	175 K	1	1	1	600	3422	5195	783	198	538	7138	132	1211	7067	12721	14
					2		3640	5527	833	211	501	7593	140	722	7518	13532	
					3		3971	6089		230	547	8282	153	788	8201	14762	
					4		3883	6117							8302	14944	
					5	653	3627	5710							7752	13954	
"	"	338	1	2	1	498	3642	5156	724	138	527	7199	143	1269	7094	12769	25
					2		3833	5405	762	145	497	7576	150	870	7466	13438	
					3		4149	5851		157	538	8201	162	942	8082	14546	
					4		4083	5917							8162	14692	
					5	545	3860	5595							7718	13892	
"	"	591	3	4	1	257	3944	4576	1213	319					6816	12268	52
					2		4052	4702	1246	328					7003	12605	
					3		4629	5371		375					7999	14399	
					4		4509	5491							8157	14682	
					5	314	4368	5318							7901	14221	
"	"	592	3	4	1	266	3281	5092	1361	125					6679	12022	52
					2		3371	5231	1398	128					6862	12351	
					3		3919	6081		149					7977	14358	
					4		3810	6190							8107	14593	
					5	314	3690	5996							7852	14134	
"	"	593	3	4	1	273	3464	5319	944	125					7056	12701	52
					2		3551	5468	971	129					7254	13057	
					3		3944	6056		143					8034	14461	
					4		3854	6136							8128	14631	
					5	306	3747	5947							7879	14182	
"	"	594	3	4	1	275	3471	5079	1175	182					6917	12450	52
					2		3569	5223	1208	187					7112	12802	
					3		4059	5941		213					8089	14561	
					4		3954	6046							8217	14790	
					5	319	3828	5853							7955	14319	
"	"	595	3	4	1	257	3531	4919	1293	230					6786	12215	52
					2		3624	5049	1327	236					6965	12537	
					3		4178	5822		272					8031	14455	
					4		4058	5942							8178	14720	
					5	303	3935	5762							7929	14273	
VALLEY	ANDERSON	169	1	1	1	433	4021	4507	1039	375	537	6830	150	1069	6940	12492	14
					2		4203	4711	1086	392	511	7139	157	715	7254	13057	
					3		4715	5285		440	573	8009	176	802	8138	14648	
					4		4598	5402							8297	14935	
					5	499	4368	5133							7883	14189	
"	UPPER FREEPORT	170 A	1	1	1	688	3407	5330	575	84					7104	12787	14
					2		3658	5724	618	90					7628	13732	
					3		3899	6101		96					8130	14637	
					4		3848	6152							8191	14744	
					5	737	3565	5698							7587	13656	
"	"	170 B	1	1	1	625	3616	5229	530	88					7224	13003	14
					2		3857	5578	565	94					7705	13869	
					3		4089	5912		100					8166	14700	
					4		4042	5958							8223	14802	
					5	666	3773	5561							7676	13817	

COAL RESOURCES OF OHIO

Township	Seam	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis					Heat value		Year
						Mois-ture	Vola-tile	Fixed carbon	Ash	Sulphur	Hydro-gen	Carbon	Nitro-gen	Oxygen	Calo-ries	B. t. u.	
GUERNSEY COUNTY (CON.)																	
VALLEY	UPPER FREEPORT	170 C ¹⁰	1	2	1	578	3645	5138	639	177	531	7219	130	1304	7106	12790	25
					2		3859	5453	678	188	496	7662	138	838	7542	13575	
					3		4150	5850		202	532	8219	148	899	8091	14562	
					4		4081	5919							8172	14710	
					5		3825	5548							7659	13787	
"	"	170 K	1	1	1	649	3541	5257	553	88	549	7341	137	1332	7199	12940	14
					2		3787	5222	591	94	510	7850	147	808	7688	13838	
					3		4025	5975		100	542	8343	156	859	8171	14707	
					4		3976	6024							8229	14813	
					5		3700	5606							7659	13786	
"	"	335	1	2	1	507	3865	4831	797	284	520	7032	158	1209	6976	12556	25
					2		4071	5089	840	299	489	7408	167	797	7348	13226	
					3		4444	5556		326	534	8088	182	870	8022	14439	
					4		4350	5550							8137	14646	
					5		564	4106							7677	13819	
"	"	336	1	2	1	532	3686	5145	637	139	532	7236	141	1315	7133	12840	25
					2		3893	5434	673	147	500	7643	149	888	7534	13561	
					3		4174	5826		158	536	8194	160	952	8078	14540	
					4		4113	5887							8152	14673	
					5		576	3876							7682	13827	
HARRISON COUNTY																	
ATHENS	MEIGS CREEK	409	1	2	1	535	3309	5127	1089	220	521	6867	125	1238	6885	12393	7
					2		3496	5417	1087	232	488	7274	132	906	7274	13093	
					3		3922	6078		260	548	8140	148	904	8191	14690	
					4		3813	6187							8288	14919	
					5		610	3580							7783	14009	
"	"	521	1	1	3	1	193	3913	4989	905	419				7074	12733	49
					2		3990	5087	923	427					7213	12983	
					3		4396	5604		470					7946	14303	
					4		4271	5729							8091	14563	
					5		220	4177							7913	14244	
"	"	521	2	1	3	1	173	3698	4753	1376	310				6810	12259	49
					2		3763	4836	1401	315					6930	12475	
					3		4376	5624		366					8059	14508	
					4		4240	5760							8231	14816	
					5		207	4152							8059	14507	
"	"	521	3	1	3	1	193	3470	4921	1416	405				6737	12126	49
					2		3538	5018	1444	413					6869	12365	
					3		4135	5855		483					8028	14452	
					4		3966	6034							8224	14803	
					5		234	3873							8031	14456	
"	"	521	4	1	3	1	186	3734	5214	866	242				7203	12966	49
					2		3805	5313	882	247					7340	13212	
					3		4173	5827		271					8050	14490	
					4		4080	5820							8159	14687	
					5		208	3995							7989	14381	
"	"	521	5	1	3	1	172	3938	5087	803	242				7306	13151	49
					2		4007	5176	817	246					7434	13381	
					3		4363	5637		268					8095	14571	
					4		4279	5721							8200	14760	
					5		191	4197							8043	14478	
"	"	521	9	1	3	1	187	3718	5000	1095	341				6993	12588	49
					2		3789	5095	1116	347					7126	12828	
					3		4265	5735		391					8021	14439	
					4		4139	5861							8171	14708	
					5		217	4048							7994	14389	
"	"	523	1	1	3	1	190	3813	4986	1011	367				7031	12656	49
					2		3887	5083	1050	374					7167	12901	
					3		4333	5667		417					7990	14382	
					4		4210	5790							8136	14644	
					5		218	4118							7959	14326	
"	"	523	2	1	3	1	202	3358	5014	1426	179				6674	12014	49
					2		3427	5118	1455	183					6812	12261	
					3		4011	5989		214					7972	14349	
					4		3887	6113							8118	14613	
					5		242	3794							7923	14261	
"	"	523	3	1	3	1	216	3476	5478	830	145				7163	12894	49
					2		3553	5599	848	148					7321	13178	
					3		3882	6118		162					7999	14399	
					4		3805	6195							8087	14556	
					5		239	3715							7893	14208	
"	"	523	4	1	3	1	190	3171	4752	1887	111				6294	11329	49
					2		3232	4845	1923	113					6416	11548	
					3		4001	5999		140					7944	14297	
					4		3858	6142							8121	14618	
					5		240	3767							7927	14268	

APPENDIX "B"

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Township	Seam	File number	Kind	Source	Condition	Proximate analysis			Ultimate analysis					Heat value		Year			
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories		B. t. u.		
ATHENS	MEIGS CREEK	523	5	1	3	1	206	3582	5517	595	135					7277	13099	49	
						2	3657	5633	710	138					7430	13374			
						3	3936	6064		149					7998	14396			
						4	3871	6129							8072	14529			
						5	225	3784	5991						7891	14203			
	"	"	523	6	1	3	1	220	3488	5131	1161	256				6803	12246	49	
							2	3586	5247	1187	262				6957	12522			
							3	4046	5954		297				7894	14209			
							4	3926	6074						8029	14452			
							5	266	3826	5918					7823	14082			
	"	"	523	9	1	3	1	203	3528	5143	1126	221				6910	12438	49	
							2	3601	5250	1149	228				7053	12696			
							3	4068	5932		255				7969	14344			
							4	3959	6041						8096	14572			
							5	234	3867	5899					7906	14231			
"	PITTSBURGH	252	1	2	1	1	598	3435	5370	597	135	544	7222	131	1371	7202	12964	7	
						2	3653	5712	635	144	508	7681	139	893	7660	13788			
						3	3901	6099		154	542	8202	148	954	8179	14723			
						4	3838	6162							8251	14852			
						5	644	3592	5764					7720	13896				
CADIZ	"	251	1	2	1	1	383	3670	4859	1088	438	509	6770	127	1068	6864	12355	7	
						2	3816	5053	1131	465	485	7040	132	757	7137	12847			
						3	4303	5697		513	547	7937	149	854	8047	14485			
						4	4155	5845							8221	14797			
						5	446	3970	5584					7854	14138				
FREEPORT	UPPER FREEPORT	333	A	1	2	1	617	3818	4772	793	362	528	6951	141	1225	7002	12604	25	
						2	4069	5086	845	386	489	7408	150	722	7462	13432			
						3	4445	5555		422	534	8091	164	789	8151	14672			
						4	4335	5665							8287	14917			
						5	690	4036	5274					7716	13889				
	"	"	333	B	1	4	1	61	359	501	79	29	54	703	14	121	6983	12570	24
							2	382	534	84	31	50	749	15	71	7439	13390		
							3	417	585		34	55	818	16	77	8122	14620		
							4	407	593							8241	14834		
							5	68	379	555					7681	13825			
	"	"	529	12	3	1	1	33	340	537	90	31	50	717	13	99	7061	12710	23
							2	352	555	95	32	48	741	14	72	7300	13140		
							3	388	612		36	53	817	15	79	8050	14490		
							4	376	624							8176	14717		
							5	37	362	601					7874	14174			
"	"	530	1	1	1	1	67	348	508	77	23	53	704	14	129	6972	12550	24	
						2	373	545	82	25	49	754	15	75	7472	13450			
						3	406	594		27	54	821	16	82	8139	14650			
						4	397	603							8247	14844			
						5	74	368	558					7641	13753				
"	"	532	3	4	1	1	295	3709	5305	691	289				7538	13569	23		
						2	3822	5466	712	298				7767	13981				
						3	4115	5885		321				8362	15053				
						4	4021	5979						8475	15255				
						5	324	3891	5785					8201	14761				
"	"	533	3	4	1	1	254	3772	5294	680	361				7439	13390	23		
						2	3870	5432	698	370				7633	13739				
						3	4160	5840		398				8206	14770				
						4	4054	5946						8327	14989				
						5	280	3941	5779					8094	14569				
"	"	534	3	4	1	1	249	3825	5183	743	362				7325	13185	23		
						2	3923	5315	762	371				7512	13522				
						3	4247	5753		402				8132	14637				
						4	4139	5861						8257	14863				
						5	277	4023	5700					8028	14451				
"	"	535	3	4	1	1	216	3926	5120	738	283				7706	13871	14		
						2	4013	5233	754	289				7876	14177				
						3	4340	5660		313				8518	15333				
						4	4251	5749						8636	15545				
						5	239	4149	5612					8431	15175				
GERMAN	PITTSBURGH	118	1	1	1	1	36	395	492	77	38	54	717	14	100	7206	12970	38	
						2	409	511	80	39	52	744	14	71	7472	13450			
						3	445	555		42	57	809	16	76	8117	14610			
						4	435	565							8256	14860			
						5	40	417	543					7922	14260				
MONROE	UPPER FREEPORT	332	1	2	1	1	684	3601	4688	1027	263	516	6722	142	1330	6650	11970	25	
						2	3865	5032	1103	282	472	7216	152	775	7138	12848			
						3	4234	5766		317	531	8110	171	871	8023	14441			
						4	4234	5766							8158	14684			
						5	782	3903	5315					7520	13536				
SHORT CREEK	PITTSBURGH	249	7	1	2	1	654	3548	5124	674	219	570	7049	122	1366	7061	12710	7	
						2	3796	5483	721	234	532	7542	131	840	7555	13599			
						3	4091	5999		252	573	8129	141	905	8142	14656			
						4	4008	5992							8237	14827			
						5	715	3722	5563					7649	13769				

COAL RESOURCES OF OHIO

Township	Seam	File number	Kind	Source	Condition	Proximate analysis			Ultimate analysis					Heat value		Year	
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories		B. t. u.
HARRISON COUNTY (CON.)																	
SHORT CREEK	PITTSBURGH	250	1	2	1	4.18	36.95	50.65	8.22	2.83	5.36	71.20	1.26	11.13	7160	12888	7
					2	38.56	52.86	8.58	2.95	5.11	74.31	1.31	7.74	7472	13450		
					3	42.18	57.82		3.23	5.59	81.28	1.43	8.47	8173	14712		
					4	41.18	58.82							8293	14928		
					5	45.7	59.25	56.08						7906	14231		
HOCKING COUNTY																	
GREEN	MIDDLE KITTANNING	482	1	2	1	6.55	37.30	49.18	6.97	2.57	5.45	68.40	1.18	15.43	6901	12422	2
					2	39.91	52.63	7.46	2.75	5.05	73.19	1.26	10.29	7385	13293		
					3	43.13	56.87		2.97	5.46	79.09	1.36	11.12	7980	14365		
					4	42.26	57.74							8082	14548		
					5	7.19	39.22	53.59						7501	13501		
STARR	"	481	1	2	1	6.52	38.30	47.15	8.03	3.52	5.49	67.33	1.20	14.43	6850	12330	2
					2	40.97	50.44	8.59	3.77	5.10	72.03	1.28	10.23	7328	13390		
					3	44.82	55.18		4.12	5.58	78.80	1.40	10.10	8017	14429		
					4	43.74	56.26							8148	14666		
					5	7.29	40.56	52.15						7553	13596		
WARD	"	478	1	2	1	7.40	34.17	53.43	5.00	1.06	5.55	70.58	1.32	16.49	7027	12649	2
					2	36.90	57.70	5.40	1.14	5.11	76.22	1.43	10.70	7589	13660		
					3	39.01	60.99		1.21	5.40	80.57	1.51	11.31	8022	14440		
					4	38.50	61.50							8079	14542		
					5	7.87	35.47	56.66						7443	13398		
"	"	479	1	2	1	7.45	35.01	52.73	4.81	6.6	5.53	71.04	1.43	16.53	7057	12703	2
					2	37.83	56.97	5.20	7.1	5.08	76.76	1.54	10.71	7625	13725		
					3	39.91	60.09		7.5	5.36	80.97	1.62	11.30	8043	14478		
					4	39.50	60.50							8091	14564		
					5	7.89	36.38	55.73						7453	13416		
"	"	480	1	2	1	7.55	34.03	52.57	5.85	7.7	5.52	70.05	1.42	16.39	6950	12510	2
					2	40.81	50.66	6.33	8.3	5.06	75.77	1.54	10.47	7518	13390		
					3	39.30	60.70		8.9	5.40	80.89	1.64	11.18	8026	14446		
					4	38.80	61.20							8084	14552		
					5	8.10	35.65	56.25						7429	13373		
"	"	527	1	1	1	10.2	35.4	49.1	5.8	6	5.7	68.6	1.4	18.4	6717	12090	48
					2	39.4	54.7	5.9	6.7	5.1	76.5	1.6	10.5	7478	13479		
					3	41.9	58.1							7947	14310		
					4	41.5	58.5							7997	14395		
					5	10.9	36.9	52.2						7132	12837		
"	"	527	2	1	1	9.2	33.3	46.9	10.6	5	5.5	65.2	1.3	16.9	6367	11460	48
					2	36.6	51.7	11.7	4.9	5	71.8	1.4	9.7	7011	12620		
					3	41.6	58.5		6	5.5	81.3	1.6	11.0	7940	14290		
					4	40.7	59.5							8034	14462		
					5	10.4	36.6	53.0						7197	12954		
"	"	527	3	1	1	10.4	35.5	46.5	7.5	14	5.5	64.5	1.4	19.6	6283	11310	48
					2	39.6	51.9	8.5	1.5	4.9	71.9	1.6	11.6	7011	12620		
					3	43.3	56.7		1.7	5.3	78.6	1.7	12.7	7662	13790		
					4	42.6	57.4							7744	13940		
					5	11.4	37.7	50.9						6861	12349		
"	"	568	1	1	1	9.72	32.44	53.41	4.43	5.4	5.70	69.50	1.25	18.58	6804	12247	7
					2	35.93	59.16	4.91	6.0	5.12	76.99	1.38	11.00	7537	13567		
					3	37.79	62.21			6.3	5.38	80.97	1.45	11.57	7926	14268	
					4	37.40	62.60							7970	14345		
					5	10.24	33.58	56.18						7152	12874		
HOLMES COUNTY																	
CLARK	"	477	1	2	1	5.84	40.29	48.60	5.27	2.65					7093	12767	28
					2	42.79	51.61	5.60	2.82					7533	13559		
					3	45.33	54.67		2.99					7980	14363		
					4	44.60	55.40							8067	14521		
					5	6.29	41.80	51.91						7559	13607		
KILLBUCK	LOWER KITTANNING	312	1	2	1	7.58	40.77	43.58	8.07	3.94	5.58	65.88	1.33	15.20	6693	12048	28
					2	44.11	47.16	8.73	4.26	5.13	71.28	1.44	9.16	7242	13036		
					3	48.33	51.67		4.67	5.62	78.09	1.58	10.04	7935	14283		
					4	47.27	52.73							8074	14534		
					5	8.51	43.25	48.24						7388	13298		
MONROE	QUAKERTOWN	229	1	2	1	6.43	40.69	46.84	6.04	2.48					7024	12643	28
					2	43.48	50.06	6.46	2.65					7506	13511		
					3	46.48	53.52		2.83					8024	14444		
					4	45.76	54.24							8117	14611		
					5	6.98	42.57	50.45						7551	13591		
PRAIRIE	BEDFORD	380	1	2	1	8.02	40.97	44.93	6.08	2.53	5.00	67.58	1.41	17.40	6837	12306	28
					2	44.54	48.85	6.61	2.75	4.47	73.47	1.53	11.77	7433	13379		
					3	47.69	52.31		2.94	4.79	78.67	1.64	11.96	7959	14326		
					4	46.98	53.02							8053	14496		
					5	8.71	42.89	48.40						7352	13233		

Township	Seam	File number	Kind	Source	Condition	Proximate analysis			Ultimate analysis					Heat value		Year	
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories		B. t. u.
HOLMES COUNTY (CON.)																	
WALNUT CREEK	MIDDLE KITTANNING	476	1	2	1	751	3492	5356	421	100	542	7062	144	1731	6952	12514	2
					2		3758	5778	454	108	497	7619	156	1166	7500	13500	
					3		3947	6053		113	521	7982	163	1221	7857	14142	
					4		3903	6097							7904	14228	
					5	770	3602	5628							7296	13133	
"	LOWER KITTANNING	311	1	2	1	634	4321	4406	639	365					6973	12551	28
					2		4613	4705	682	390					7444	13400	
					3		4951	5049		419					7989	14381	
					4		4865	5155							8107	14593	
					5	696	4527	4777							7543	13578	
JACKSON COUNTY																	
BLOOMFIELD	CLARION	371	1	2	1	531	3733	4382	1354	608	498	6205	123	1212	6394	11509	99
					2		3942	4628	1430	642	464	6553	130	781	6753	12154	
					3		4600	5400		749	541	7647	152	911	7880	14182	
					4		4407	5593							8113	14604	
					5	647	4122	5231							7588	13659	
COAL	QUAKERTOWN	228	1	2	1	1128	3641	5064	167	64	558	7052	139	2020	6761	12171	25
					2		4104	5708	188	72	488	7949	157	781	7621	13719	
					3		4183	5817		73	497	8102	160	1168	7767	13982	
					4		4161	5839							7791	14023	
					5	1153	3681	5166							6892	12406	
JEFFERSON	BROOKVILLE	379	1	2	1	1064	3826	4443	657	117	594	6567	153	1902	6477	11659	28
					2		4281	4973	746	131	533	7349	171	1070	7248	13047	
					3		4626	5374		142	576	7941	185	1156	7832	14099	
					4		4570	5430							7906	14231	
					5	1155	4043	4802							6993	12588	
"	UPPER MERCER	284	1	2	1	951	3898	4681	470	106					6752	12154	28
					2		4307	5174	519	117					7462	13431	
					3		4543	5457		123					7870	14166	
					4		4500	5500							7924	14264	
					5	1008	4047	4945							7126	12827	
LIBERTY	SHARON	178 A	1	1	1	1350	3175	5042	423	86					6491	11684	7
					2		3675	5835	490	99					7513	13523	
					3		3864	6136		104					7900	14220	
					4		3819	6181							7949	14309	
					5	1432	3272	5296							6811	12259	
"	"	178 B	1	1	1	1277	3151	4794	778	97					6259	11266	7
					2		3612	5496	892	111					7175	12915	
					3		3966	6034		122					7878	14180	
					4		3895	6105							7959	14327	
					5	1402	3350	5248							6843	12318	
LICK	"	221	1	2	1	1158	3303	4874	655	47	527	6625	130	2006	6337	11407	25
					2		3736	5512	752	53	450	7493	147	1105	7167	12901	
					3		4040	5950		57	487	8102	159	1195	7750	13950	
					4		3990	6010							7809	14057	
					5	1251	3491	5258							6833	12299	
"	"	222	1	2	1	1075	3538	4888	499	47	533	6797	142	1982	6496	11692	25
					2		3964	5477	559	53	464	7616	159	1149	7278	13100	
					3		4199	5801		56	491	8068	168	1217	7709	13876	
					4		4161	5839							7754	13957	
					5	1139	3688	5173							6871	12367	
MADISON	CLARION	370	1	2	1	490	3575	4855	1370	614	489	6257	123	1147	6460	11628	99
					2		3759	4800	1441	646	457	6379	129	748	6793	12227	
					3		4392	5608		755	534	7686	151	874	7937	14286	
					4		4185	5815							8176	14717	
					5	599	3935	5466							7686	13835	
MILTON	LOWER KITTANNING	310	1	2	1	839	3518	4901	742	265	547	6663	137	1646	6772	12189	7
					2		3840	5350	810	289	496	7273	150	982	7392	13306	
					3		4178	5822		314	540	7914	163	1069	8044	14479	
					4		4082	5918							8155	14679	
					5	927	3703	5370							7399	13318	
"	"	561 D	1	1	1	938	3674	4626	752	408					6610	11898	5
					2		4054	5105	841	450					7294	13129	
					3		4426	5574		491					7964	14335	
					4		4304	5696							8106	14590	
					5	1048	3853	5099							7257	13062	
"	"	561 E	1	1	1	895	3782	4389	934	441							5
					2		4134	4820	1026	484							
					3		4629	5371		539							
					4		4496	5504									
					5	1023	4036	4941									
"	CLARION	366	1	2	1	471	4051	4617	851	373	544	6751	126	1345	6911	12440	99
					2		4251	4845	904	391	516	7085	132	972	7253	13055	
					3		4673	5327		450	567	7789	145	1069	7974	14352	
					4		4566	5434							8111	14599	
					5	531	4324	5145							7679	13822	

COAL RESOURCES OF OHIO

Township	Seam	File number	Kind	Source	Condition	Proximate analysis			Ultimate analysis					Heat value		Year	
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories		B. t. u.
JACKSON COUNTY (CON.)																	
MILTON	CLARION	367	1	2	1	533	4101	4526	840	372	550	6652	128	1458	6825	12285	99
					2	4332	4781	887	393	519	7026	135	1040	7209	12976		
					3	4754	5246		431	570	7710	148	1141	7911	14239		
					4	4650	5350							8044	14480		
					5	600	4371	5029						7562	13612		
"	"	369	1	2	1	561	3892	4738	809	370	547	6730	128	1416	6863	12353	99
					2	4123	5020	867	392	514	7129	136	972	7271	13087		
					3	4509	5491		429	562	7797	149	1063	7953	14314		
					4	4400	5600							8084	14552		
					5	629	4123	5248						7576	13637		
"	"	561 A	1	1	1	750	3925	4274	1051	544						5	
					2	4243	4621	1136	588								
					3	4787	5213		663								
					4	4636	5364										
					5	876	4230	4894									
"	"	561 B	1	1	1	845	4127	4355	673	310				6805	12249	5	
					2	4508	4757	735	339					7433	13379		
					3	4866	5134		366					8023	14440		
					4	4782	5218							8136	14645		
					5	928	4339	4753						7381	13286		
"	"	561 C	1	2	1	498	3971	4551	980	408	539	6614	128	1331	6801	12242	99
					2	4179	4790	1031	429	509	6961	135	935	7157	12883		
					3	4659	5341		478	588	7761	151	1042	7980	14364		
					4	4537	5463							8136	14645		
					5	571	4278	5151						767	1380		
"	"	607 A	1	3	1	355	4347	4501	787	492				6911	12440	54	
					2	4512	4671	817	511					7173	12911		
					3	4913	5087		556					7811	14060		
					4	4801	5199							7957	14322		
					5	411	4603	4986						7629	13733		
"	"	607 B ¹³	1	3	1	354	4210	4353	1073	486				6691	12045	54	
					2	4369	4517	1114	504					6944	12500		
					3	4917	5083		567					7815	14067		
					4	4787	5213							7987	14376		
					5	425	4583	4992						7647	13765		
"	"	608	1	3	1	356	4075	4547	1042	307				6800	12240	54	
					2	4217	4705	1078	318					7036	12666		
					3	4727	5273		356					7886	14196		
					4	4623	5377							8023	14441		
					5	386	4444	5170						7713	13883		
"	WINTERS	203	1	2	1	931	3678	4778	613	200	570	6780	127	1710	6976	12557	14
					2	4056	5268	676	221	514	7476	140	973	7692	13846		
					3	4360	5650		237	551	8018	150	1044	8250	14850		
					4	4278	5722							8341	15014		
					5	1009	3846	5145						7499	13499		
"	BROOKVILLE	378	1	2	1	363	4005	3836	1796	95	536	6386	121	1066	6407	11533	28
					2	4113	3980	1864	99	515	6626	125	771	6548	11967		
					3	5108	4892		122	633	8143	154	948	8171	14709		
					4	5001	4999							8347	15024		
					5	453	4775	4772						7968	14342		
"	QUAKERTOWN	226	1	2	1	929	3296	5426	349	125				6960	12528	14	
					2	3633	5982	385	138					7673	13811		
					3	3778	6222		144					7980	14364		
					4	3780	6270							8029	14453		
					5	972	3369	5659						7248	13047		
"	"	227	1	2	1	974	3550	4924	552	128	536	6754	143	1887	6553	11796	25
					2	3933	5455	612	142	474	7483	158	1131	7260	13069		
					3	4189	5811		151	505	7971	168	1205	7733	13921		
					4	4133	5867							7797	14035		
					5	1044	3701	5255						6983	12570		
JEFFERSON COUNTY																	
CROSS CREEK	PITTSBURGH	190	1	1	1	519	3459	5067	945	238						4	
					2	3659	5344	997	251								
					3	4064	5935		279								
					4	3900	6040										
					5	587	3727	5686									
ISLAND CREEK	MAHONING	189	1	1	1	389	3646	5225	740	353					4		
					2	3794	5436	770	378								
					3	4111	5889		410								
					4	3997	6003										
					5	452	3824	5744									
"	LOWER FREEPORT	349	1	2	1	310	3806	4891	993	360	514	7053	110	970	7222	12999	26
					2	3928	5047	1025	371	496	7279	114	715	7453	13415		
					3	4377	5623		413	553	8110	127	797	8304	14947		
					4	4256	5744							8459	15226		
					5	355	4104	5541						8158	14685		

Township	Seam	File number	Kind	Source	Condition	Proximate analysis			Ultimate analysis					Heat value		Year	
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories		B. t. u.
JEFFERSON COUNTY (CON.)																	
KNOX	PITTSBURGH	121	1	1	1	337	3786	4878	999	394					7178	12920	16
					2	3917	5049	1034	408					7429	13372		
					3	4369	5631		455					8286	14914		
					4	4240	5760							8449	15208		
					5	387	4077	5536						8121	14617		
"	"	186	1	1	1	318	3811	4935	936	402				7187	12937	16	
					2	3936	5097	967	415				7423	13361			
					3	4357	5643		459				8218	14791			
					4	4231	5769						8373	15072			
					5	363	4077	5560					8070	14526			
"	LOWER KITTANNING	309	1	2	1	246	3848	5166	740	382	538	7420	127	793	7591	13664	7
					2	3948	5296	759	392	524	7607	130	588	7782	14088		
					3	4269	5731		424	567	8232	141	636	8421	15159		
					4	4158	5842							8559	15407		
					5	274	4044	5682						8325	14985		
MOUNT PLEASANT	PITTSBURGH	248	1	2	1	310	3792	4946	952	383	522	6956	110	1077	7153	12875	7
					2	3913	5104	983	395	504	7178	113	827	7382	13287		
					3	4340	5660		458	559	7961	125	917	8187	14735		
					4	4215	5735							8338	15009		
					5	354	4056	5580						8043	14477		
"	"	604 A ¹⁴	1	3	1	188	3722	4685	1405	317				6835	12304	54	
					2	3793	4775	1432	323				6966	12540			
					3	4427	5573		377				8130	14636			
					4	4289	5711						8309	14957			
					5	226	4192	5582					8122	14619			
"	"	604 B ¹⁵	1	3	1	456	3667	4781	1096	283				6831	12296	54	
					2	3842	5010	1148	297				7157	12883			
					3	4340	5660		356				8085	14554			
					4	4224	5776						8229	14813			
					5	527	4002	5471					7797	14034			
SALINE	UPPER FREEPORT	138 A	1	1	1	475	3828	5191	506	176				7480	13464	16	
					2	4019	5450	531	185				7853	14135			
					3	4244	5756		195				8293	14135			
					4	4185	5815						8366	15059			
					5	508	3972	5520					7942	14296			
"	"	138 B	1	1	1	343	3626	4957	1074	505	515	6966	137	803	7068	12722	16
					2	3755	5133	1112	523	494	7213	142	516	7319	13174		
					3	4225	5775		588	556	8115	160	581	8235	14822		
					4	4061	5939						8428	15171			
					5	3898	5701						8091	14563			
"	"	139	1	1	1	373	3654	5124	849	287				7290	13122	16	
					2	3795	5323	882	298				7572	13630			
					3	4162	5858		327				8304	14948			
					4	4059	5942						8431	15175			
					5	418	3889	5693					8078	14541			
"	LOWER FREEPORT	131	1	1	1	426	3555	4810	1209	236				6941	12494	16	
					2	3713	5024	1263	246				7250	13050			
					3	4250	5750		282				8298	14936			
					4	4133	5867						8448	15207			
					5	497	3928	5575					8028	14450			
"	MIDDLE KITTANNING	122	1	1	1	254	3675	4946	1115	207	526	7104	149	899	7158	12884	16
					2	3775	5080	1145	213	510	7297	153	682	7352	13234		
					3	4263	5737		241	576	8240	173	770	8303	14945		
					4	4162	5838						8435	15183			
					5	304	4035	5661					8178	14721			
"	LOWER KITTANNING	144	1	1	1	344	3717	4671	1258	730				6907	12433	16	
					2	3849	4838	1313	756				7154	12877			
					3	4431	5569		870				8235	14823			
					4	4214	5786						8503	15306			
					5	418	4039	5543					8147	14665			
"	"	145	1	1	1	221	3963	4750	1066	496	528	7104	134	672	7236	13025	16
					2	4053	4857	1090	507	514	7265	137	487	7400	13320		
					3	4549	5451		569	577	8153	154	547	8305	14949		
					4	4404	5596						8496	15293			
					5	258	4290	5452					8277	14899			
SMITHFIELD	PITTSBURGH	162	1	1	1	545	3573	5422	460	84				7401	13322	13	
					2	3779	5735	486	89				7827	14089			
					3	3972	6028		94				8227	14809			
					4	3930	6070						8277	14899			
					5	576	3704	5720					7802	14043			
"	"	163	1	2	1	496	3451	5408	645	175	537	7243	133	1267	7277	13099	7
					2	3631	5690	679	184	507	7621	140	869	7656	13781		
					3	3896	6104		197	544	8177	150	932	8214	14785		
					4	3822	6178						8297	14935			
					5	539	3616	5845					7851	14132			
"	"	192	1	1	1	487	3663	5125	725	260	536	7191	138	1150	7248	12992	13
					2	3851	5387	752	273	507	7559	145	754	7588	13658		
					3	4169	5831		296	549	8182	157	816	8214	14785		
					4	4078	5922						8322	14979			
					5	3858	5605						7875	14175			

COAL RESOURCES OF OHIO

Township	Seam	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis					Heat value		Year	
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories	B. t. u.		
JEFFERSON COUNTY (CON.)																		
SMITHFIELD	PITTSBURGH	193	1	1	1	547	3577	5328	548	77						7324	13183	13
					2		3784	5636	580	81					7748	13946		
					3		4017	5983		86					8225	14805		
					4		3972	6028							8281	14906		
					5	584	3740	5676							7797	14035		
"	"	246	1	2	1	430	3528	5254	788	301	518	7134	120	1139	7144	12859	7	
					2		3687	5490	823	315	491	7455	125	791	7465	13437		
					3		4018	5982		343	535	8124	136	862	8134	14642		
					4		3910	6090							8254	14858		
					5	479	3723	5798							7859	14147		
"	"	573 A	1	1	1	406	3849	4970	775	367					7304	13147	5	
					2		4026	5180	808	322					7613	13703		
					3		4355	5635		416					8282	14908		
					4		4255	5745							8418	15153		
					5	463	4062	5485							8037	14466		
"	"	573 B	1	1	1	420	3716	5113	751	322						5		
					2		3879	5337	784	336								
					3		4209	5791		365								
					4		4105	5895										
					5	456	3914	5620										
SPRINGFIELD	LOWER FREEPORT	195 A	1	1	1	340	3801	5237	622	220					7518	13532	12	
					2		3935	5421	644	228					7783	14009		
					3		4206	5794		244					8319	14973		
					4		4131	5869							8410	15138		
					5	369	3979	5652							8099	14578		
"	"	195 B	1	1	1	350	3793	5063	794	314					7364	13255	12	
					2		3931	5246	823	325					7631	13736		
					3		4284	5716		354					8215	14968		
					4		4182	5818							8442	15192		
					5	390	4018	5592							8112	14602		
"	"	195 C	1	1	1	359	3703	5064	874	370	519	7130	139	968	7224	13003	12	
					2		3841	5252	907	384	497	7395	144	673	7493	13487		
					3		4224	5776		422	547	8133	158	740	8240	14832		
					4		4103	5897							8384	15092		
					5	406	3936	5658							8044	14479		
"	"	196 A	1	1	1	347	3861	4966	826	240					7346	13223	12	
					2		4000	5144	856	249					7610	13698		
					3		4374	5626		272					8322	14980		
					4		4287	5713							8436	15185		
					5	387	4121	5492							8110	14598		
"	"	196 B	1	1	1	358	3758	4917	967	308					7156	12881	12	
					2		3897	5100	1003	319					7421	13358		
					3		4334	5669		355					8248	14847		
					4		4220	5780							8389	15099		
					5	407	4049	5544							8047	14485		
"	"	196 C	1	1	1	404	3861	4893	842	295					7234	13021	12	
					2		4024	5099	877	307					7539	13570		
					3		4411	5589		337					8264	14874		
					4		4312	5688							8390	15102		
					5	452	4117	5431							8011	14419		
"	"	347	1	2	1	383	4100	4768	749	286	550	7176	117	1122	7269	13084	26	
					2		4254	4957	779	298	528	7462	122	811	7558	13604		
					3		4624	5376		323	573	8092	132	880	8197	14753		
					4		4539	5461							8311	14959		
					5	424	4346	5230							7958	14325		
"	"	571 A	1	1	1	366	3743	5123	768	307					7342	13216	12	
					2		3885	5318	797	319					7621	13718		
					3		4221	5779		347					8281	14906		
					4		4121	5879							8403	15126		
					5	407	3953	5640							8062	14511		
"	"	571 B	1	1	1	352	3831	5078	739	299					7363	13253	12	
					2		3971	5263	766	310					7632	13738		
					3		4300	5700		336					8265	14878		
					4		4205	5795							8383	15089		
					5	389	4042	5569							8055	14499		
"	"	571 C	1	1	1	327	3887	5037	749	323					7359	13246	12	
					2		4018	5208	774	334					7608	13694		
					3		4355	5645		362					8246	14843		
					4		4256	5744							8368	15063		
					5	363	4102	5535							8065	14517		
"	"	571 D	1	1	1	336	3756	5206	702	240						10		
					2		3887	5387	726	248								
					3		4191	5809		267								
					4		4108	5892										
					5	369	3956	5675										
"	MIDDLE KITTANNING	117 A	1	1	1	35	377	508	80	30					7367	13260	30	
					2		391	526	83	31					7634	13741		
					3		426	574		34					8325	14985		
					4		417	583							8450	15210		
					5	39	400	561							8117	14610		

APPENDIX "B"

Township	Seam	File number	Kind	Source	Condition	Proximate analysis			Ultimate analysis					Heat value		Year		
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories		B. t. u.	
JEFFERSON COUNTY (CON.)																		
SPRINGFIELD	MIDDLE KITTANNING	117 B	1	1	1	32	382	502	84	36					7300	13140	30	
						33	395	518	87	37					7541	13574		
						34	433	567		41					8259	14867		
						35	420	580							8394	15110		
						4	406	558							8094	14570		
	"	"	117 C	1	1	1	34	376	509	82	35					7367	13260	30
							35	388	527	85	36					7626	13727	
							36	424	576		39					8334	15002	
							37	413	587							8472	15250	
							38	397	565							8150	14670	
	"	"	117 D	1	1	1	39	376	504	82	21					7333	13200	30
							40	390	525	85	22					7631	13736	
							41	426	574		24					8340	15012	
							42	418	582							8450	15210	
							43	400	557							8083	14550	
"	"	117 E	1	1	1	36	381	500	83	25					7350	13230	30	
						37	395	519	86	26					7624	13724		
						38	432	568		28					8342	15015		
						39	424	575							8461	15220		
						40	407	553							8122	14620		
"	"	117 F	1	1	1	37	376	518	69	33					7428	13370	30	
						38	390	538	72	34					7713	13883		
						39	420	580		37					8311	14960		
						40	411	589							8428	15170		
						41	394	565							8083	14550		
"	"	117 K	1	1	1	35	377	507	80	29	56	717	14	104	7350	13230	30	
						36	391	525	83	30	54	743	15	75	7624	13724		
						37	426	574		33	59	810	16	82	8314	14966		
						38	416	584							8439	15190		
						39	400	560							8100	14580		
STUBENVILLE	PITTSBURGH	179	1	1	1	65	344	5036	851	262						4		
						66	3690	5389	921	270								
						67	4064	5936		297								
						68	3961	6039										
						69	3671	5596										
	"	LOWER FREEPORT	187 A	1	1	1	38	3539	5339	742	191					7344	13219	13
							39	3679	5550	771	199					7634	13741	
							40	3986	6014		216					8272	14889	
							41	3906	6094							8367	15060	
							42	3742	5840							8018	14432	
"	"	187 B	1	1	1	38	3590	5343	685	190	524	7420	145	1036	7418	13352	13	
						39	3733	5555	712	198	501	7715	151	723	7712	13882		
						40	4019	5981		213	539	8307	163	778	8303	14946		
						41	3943	6057							8394	15109		
						42	3778	5805							8044	14480		
WARREN	PITTSBURGH	159 A	1	1	1	46	3557	5373	601	154					7403	13325	5	
						47	3732	5637	631	162					7767	13981		
						48	3983	6017		173					8290	14923		
						49	3919	6081							8367	15061		
						50	3720	5774							7943	14297		
	"	"	159 B	1	1	1	49	3533	5398	570	95						5	
							50	3718	5682	600	100							
							51	3955	6045		106							
							52	3904	6096									
							53	3696	5759									
"	"	244	1	2	1	31	3788	5077	822	402	538	7103	126	1009	7233	13019	7	
						32	3910	5241	849	415	519	7332	130	755	7466	13439		
						33	4273	5727		454	567	8012	142	825	8159	14686		
						34	4151	5849							8302	14943		
						35	4006	5642							8009	14417		
"	"	245	1	2	1	45	3240	5403	900	155	506	7118	132	1189	7105	12789	7	
						46	3395	5662	943	162	477	7459	138	821	7445	13401		
						47	3748	6252		179	527	8236	152	906	8220	14796		
						48	3660	6340							8322	14979		
						49	3473	6016							7897	14214		
WAYNE	"	191 A	1	1	1	50	3615	5283	601	174					7327	13189	12	
						51	3806	5551	633	183					7713	13883		
						52	4063	5937		195					8234	14821		
						53	3996	6004							8314	14965		
						54	3779	5680							7864	14156		
	"	"	191 B	1	1	1	43	3709	4914	945	382					7072	12730	12
							44	3876	5136	988	399					7391	13304	
							45	4301	5699		443					8201	14763	
							46	4174	5826							8355	15039	
							47	3969	5538							7944	14299	
"	"	191 K	1	1	1	47	3660	5081	789	280	528	7172	135	1096	7195	12950	12	
						48	3840	5332	828	294	499	7523	142	714	7545	13580		
						49	4188	5812		320	544	8204	154	778	8228	14809		
						50	4088	5912							8344	15019		
						51	3874	5603							7913	14243		

COAL RESOURCES OF OHIO

Township	Seam	File number	Kind	Source	Condition	Proximate analysis			Ultimate analysis				Heat value		Year			
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen		Calories	B. t. u.	
JEFFERSON COUNTY (CON.)																		
WAYNE	PITTSBURGH	243	1	2	10	505	3588	5112	795	261	532	7068	125	1219	7147	12865	7	
							3779	5384	837	275	501	7444	132	811	7527	13549		
							4124	5876			300	547	8124	144	885	8215		14787
							4027	5973								8330		14994
							551	3801	5638							7863		14153
WELLS	"	180 A	1	1	11	379	3878	5003	740	384					7267	13081	13	
							4051	5200	769	399					7553	13595		
							4357	5633		432					8182	14728		
							4257	5743							8315	14967		
							422	4077	5501						7966	14338		
"	"	180 B	1	1	11	428	3741	5029	802	372					7201	12962	13	
							3908	5254	838	389					7523	13541		
							4265	5735		425					8211	14780		
							4150	5850							8349	15028		
							3951	5570							7949	14308		
"	"	180 K	1	1	11	411	3796	5023	770	384	523	7169	139	1015	7230	13014	13	
							3959	5238	803	400	497	7477	145	678	7540	13572		
							4305	5695		435	540	8130	158	737	8198	14757		
							4190	5810							8335	15003		
							459	3998	5543						7953	14315		
"	"	181	1	2	12	489	3310	5155	1046	409	503	6801	112	1129	6953	12515	7	
							3480	5480	1100	430	472	7151	117	730	7310	13158		
							3910	6090		483	530	8036	131	820	8213	14784		
							3755	6245							8385	15093		
							556	3542	5892						7911	14239		
"	"	182	1	1	12	527	3487	4916	1070	307						4		
							3681	5190	1129	324								
							4149	5851		365								
							4023	5977										
							607	3780	5613									
"	"	183	1	1	12	478	3593	5398	531	98	535	7413	146	1277	7417	13351	13	
							3773	5659	558	103	506	7785	153	895	7789	14020		
							3996	6004		109	536	8245	162	948	8249	14849		
							3947	6053							8308	14954		
							510	3746	5744						7884	14192		
"	"	184	1	1	12	452	3640	5110	798	333					7157	12883	13	
							3812	5352	836	349					7496	13493		
							4160	5840		381					8180	14724		
							4049	5951							8309	14956		
							505	3844	5651						7889	14200		
"	"	185	1	1	12	426	3661	5218	695	257					7307	13153	13	
							3824	5450	726	268					7632	13738		
							4123	5877		289					8229	14813		
							4035	5965							8334	15001		
							458	3845	5687						7944	14300		
LAWRENCE COUNTY																		
AID	UPPER FREEPORT	329	1	2	12	845	3125	4902	1128	93	510	6520	128	1621	6405	11529	1	
							3413	5355	1232	102	454	7122	140	950	6996	12593		
							3893	6107		116	518	8123	160	1083	7979	14362		
							3801	6199							8089	14561		
							958	3433	5599						7307	13152		
"	"	330	1	2	12	837	3180	5160	823	129	521	6694	131	1702	6596	11873	1	
							3470	5632	898	141	467	7305	143	1046	7198	12956		
							3812	6188		155	513	8026	157	1149	7908	14234		
							3733	6267							7996	14393		
							926	3388	5686						7257	13062		
"	"	331	1	2	12	785	3290	4707	1218	266	509	6303	125	1579	6305	11346	1	
							3570	5108	1322	289	458	6840	135	956	6842	12316		
							4114	5886		333	528	7881	156	1102	7884	14192		
							3980	6020							8037	14467		
							919	3615	5466						7298	13136		
DECATUR	CLARION	363	1	2	12	611	3843	4552	994	361	542	6553	122	1428	6643	11957	1	
							4093	4848	1059	385	505	6979	130	942	7075	12735		
							4578	5422		431	565	7808	145	1054	7913	14243		
							4459	5341							8061	14509		
							700	4147	5153						7496	13493		
"	"	364	1	2	12	634	3530	4095	1741	529	491	5792	107	1340	5967	10741	1	
							3769	4372	1859	565	449	6184	114	829	6371	11468		
							4630	5370		694	552	7596	140	1018	7826	14087		
							4419	5581							8090	14562		
							810	4061	5129						7434	13382		

Township	Seam	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis					Heat value		Year
						Mois-ture	Vola-tile	Fixed carbon	Ash	Sulphur	Hydro-gen	Carbon	Nitro-gen	Oxygen	Colo-ries	B. t. u.	
LAWRENCE COUNTY (CON.)																	
DECATUR	CLARION	365	1	2	1	586	3725	4161	1528	536	506	6022	118	1290	6185	11133	1
					2		3957	4420	1623	569	468	6396	125	819	6570	11826	
					3		4724	5276		679	559	7635	149	978	7843	14117	
					4		4537	5463							8082	14547	
					5	728	4206	5066							7494	13489	
ELIZABETH	LOWER KITTANNING	308	1	2	1	807	3454	4768	971	213	544	6554	123	1595	6626	11926	7
					2		3757	5187	1056	232	494	7129	134	955	7207	12973	
					3		4201	5799		259	552	7971	150	1068	8058	14505	
					4		4100	5900							8180	14724	
					5	913	3726	5361							7433	13379	
"	"	617 A 9	1	1	1	75	367	412	146	29	53	614	12	146	6172	11110	57
					2		396	446	158	31	48	664	13	86	7297	12019	
					3		471	529		37	58	789	16	100	7927	14270	
					4		457	543							8108	14594	
					5	91	416	493							7372	13269	
HAMILTON	UPPER MERCER	282	1	2	1	717	4250	3967	1066	354					6554	11798	28
					2		4578	4274	1148	381					7060	12709	
					3		5172	4828		430					7976	14357	
					4		5068	4932							8133	14640	
					5	829	4648	4523							7460	13428	
LAWRENCE	UPPER FREEPORT	328	1	2	1	720	3225	4988	1067	233	503	6503	125	1569	6556	11801	1
					2		3475	5375	1150	251	456	7007	135	1001	7065	12717	
					3		3927	6073		284	515	7917	153	1131	7983	14369	
					4		3808	6192							8115	14607	
					5	826	3494	5680							7444	13400	
MASON	WILGUS	204	1	2	1	695	3908	4642	755	360	543	6683	133	1526	6649	11968	28
					2		4200	4989	811	387	501	7182	143	976	7145	12862	
					3		4571	5429		421	545	7816	156	1062	7776	13997	
					4		4467	5533							7898	14216	
					5	773	4122	5105							7287	13117	
PERRY	MIDDLE KITTANNING	475	1	2	1	664	3428	4816	1092	332	516	6495	123	1442	6626	11927	7
					2		3672	5158	1170	355	473	6957	132	913	7097	12775	
					3		4159	5841		402	556	7879	149	1034	8037	14468	
					4		4023	5977							8194	14749	
					5	769	3713	5518							7564	13615	
SYMMES	WILGUS	206	1	2	1	815	3848	4590	747	283	540	6618	128	1684	6575	11835	28
					2		4189	4998	813	308	489	7205	139	1046	7158	12885	
					3		4560	5440		335	532	7843	151	1139	7791	14025	
					4		4469	5531							7901	14221	
					5	902	4066	5032							7188	12939	
"	UPPER FREEPORT	325	1	2	1	838	3145	5008	1009	184	518	6490	127	1672	6497	11695	1
					2		3433	5466	1101	201	464	7083	139	1012	7091	12764	
					3		3858	6142		226	521	7960	156	1137	7968	14343	
					4		3752	6248							8086	14555	
					5	951	3395	5654							7318	13172	
"	"	326	1	2	1	713	3365	5031	891	131	533	6709	128	1608	6716	12089	1
					2		3623	5417	960	141	489	7224	137	1049	7231	13016	
					3		4008	5992		156	541	7991	152	1160	7999	14398	
					4		3927	6073							8094	14569	
					5	795	3616	5589							7451	13411	
"	"	327	1	2	1	877	3170	5082	871	76	532	6688	125	1708	6586	11855	1
					2		3475	5700	955	83	477	7350	137	1018	7219	12994	
					3		3842	6158		92	527	8104	151	1126	7981	14366	
					4		3772	6228							8064	14516	
					5	973	3404	5623							7280	13104	
UPPER	LOWER KITTANNING	146	1	2	1	757	3851	4513	872	320	559	6671	127	1444	6777	12199	7
					2		4166	4883	951	346	514	7218	137	834	7332	13197	
					3		4804	5396		382	568	7977	151	922	8103	14584	
					4		4499	5501							8238	14829	
					5	853	4116	5031							7537	13566	
WASHINGTON	CLARION	362	1	2	1	600	3916	4298	1186	510	526	6332	122	1324	6519	11734	1
					2		4166	4572	1262	543	488	6736	130	841	6935	12483	
					3		4768	5232		622	558	7709	149	962	7937	14286	
					4		4615	5385							8136	14645	
					5	711	4286	5003							7557	13603	
MAHONING COUNTY																	
GREEN	MIDDLE KITTANNING	471	1	2	1	504	4014	5131	351	106	542	7414	141	1446	7426	13366	21
					2		4227	5403	370	112	513	7807	149	1049	7819	14075	
					3		4389	5561		116	533	8107	155	1089	8119	14616	
					4		4353	5647							8165	14697	
					5	527	4124	5349							7734	13922	
"	"	473	1	2	1	523	3686	5319	472	217	550	7384	141	1236	7502	13504	7
					2		3889	5613	498	229	519	7791	149	814	7916	14249	
					3		4093	5907		241	546	8199	157	857	8331	14996	
					4		4025	5975							8411	15139	
					5	558	3801	5641							7942	14295	

COAL RESOURCES OF OHIO

Township	Seam	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis				Heat value		Year	
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories		B. t. u.
MEIGS COUNTY																	
BEDFORD	REDSTONE	236	1	2	1	702	3970	4287	1041	616					6463	11634	28
						2	4270	4611	1119	663					6951	12512	
						3	4808	5192		747					7827	14089	
						4	4646	5354							8030	14454	
						5	822	4255	4913						7371	13267	
"	PITTSBURGH	202	1	2	1	543	4240	4119	1098	680					6517	11731	28
						2	4483	4356	1161	719					6891	12404	
						3	5072	4928		813					7796	14033	
						4	4913	5087							8013	14423	
						5	643	4598	4759						7498	13496	
"	"	241	1	2	1	2145	3249	3680	926	164	532	4891	105	3382	4541	8173	28
						2	4136	4685	1179	209	375	6226	134	1877	5781	10407	
						3	4689	5311		237	425	7058	152	2128	6554	11798	
						4	4596	5404							6646	11963	
						5	2407	3490	4103						5045	9081	
RUTLAND	REDSTONE	234	1	2	1	753	3333	4811	1093	183	520	6529	103	1572	6512	11722	7
						2	3608	5209	1183	198	471	7068	112	968	7050	12690	
						3	4092	5908		225	534	8016	127	1098	7996	14393	
						4	3987	6013							8121	14618	
						5	875	3639	5486						7411	13339	
SALISBURY	"	197	1	2	1	551	3819	4572	1058	417	540	6555	95	1335	6661	11990	7
						2	4042	4838	1120	441	507	6937	101	894	7049	12688	
						3	4552	5448		497	571	7811	114	1007	7938	14288	
						4	4417	5583							8103	14586	
						5	639	4134	5227						7586	13655	
"	"	230	1	2	1	722	3282	5067	929	132	539	6647	110	1643	6668	12002	7
						2	3538	5461	1001	142	495	7164	119	1079	7187	12936	
						3	3932	6068		158	550	7961	132	1199	7986	14375	
						4	3847	6153							8084	14552	
						5	809	3535	5656						7431	13375	
"	"	231	1	2	1	733	3459	4939	869	205	553	6671	106	1596	6725	12105	7
						2	3732	5330	938	221	509	7199	114	1019	7257	13062	
						3	4118	5882		244	562	7944	126	1124	8008	14414	
						4	4025	5975							8116	14609	
						5	819	3696	5485						7452	13413	
"	"	232	1	2	1	605	4196	4376	823	261					6857	12342	28
						2	4466	4658	876	278					7298	13136	
						3	4895	5105		305					7999	14397	
						4	4814	5186							8112	14602	
						5	675	4489	4836						7565	13617	
SUTTON	"	235	1	2	1	485	3628	4635	1252	294	532	6529	117	1276	6624	11923	7
						2	3813	4871	1316	309	502	6862	123	888	6962	12531	
						3	4391	5609		356	578	7901	142	1023	8017	14430	
						4	4262	5738							8177	14719	
						5	572	4018	5410						7709	13877	
MONROE COUNTY																	
ADAMS	UNIONTOWN	156	1	1	1	485	3593	4390	1532	396	487	6359	119	1107	6412	11542	14
						2	3776	4614	1610	416	455	6683	125	711	6739	12130	
						3	4501	5499		496	542	7966	149	847	8032	14458	
						4	4333	5667							8246	14842	
						5	597	4075	5328						7754	13957	
"	"	215	1	2	1	257	4087	4282	1374	306	483	6596	137	1104	6573	11831	26
						2	4195	4394	1411	315	473	6768	140	893	6746	12143	
						3	4884	5116		367	551	7879	163	1040	7854	14138	
						4	4765	5235							8019	14435	
						5	308	4617	5075						7772	13989	
JACKSON	MIDDLE KITTANNING	581	1	3	3	122	2213	2200	5465	212					3439	6190	51
						2	2240	2228	5532	215					3482	6267	
						3	5013	4987		481					7793	14026	
						4	4380	5620							8758	15765	
						5	306	4248	5446						8490	15282	
"	"	581	2	3	3	127	2958	3770	3145	396					5508	9914	51
						2	2996	3719	3185	401					5578	10042	
						3	4396	5604		588					8185	14735	
						4	4071	5929							8624	15524	
						5	199	3990	5811						8453	15215	
"	"	581	3	3	3	135	3666	5022	1177	339					7336	13204	51
						2	3716	5091	1193	344					7436	13384	
						3	4219	5781		391					8443	15197	
						4	4087	5913							8613	15503	
						5	158	4023	5819						8477	15259	

Township	Seam	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis				Heat value		Year	
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories		B. t. u.
MONROE COUNTY (CON.)																	
MALAGA	FISHPOT	350	1	2	1	51.6	37.73	37.49	19.62	5.19	5.02	59.61	9.5	9.61	6068	10922	27
					2		39.78	39.53	20.69	5.48	4.70	62.85	1.00	5.28	6398	11516	
					3		50.16	49.84		6.91	5.93	79.24	1.26	6.66	8067	14520	
					4		48.14	51.86							8367	15061	
					5	67.9	44.88	48.33							779.9	1403.8	
PERRY	MEIGS CREEK	408	1	2	1	23.2	39.30	43.84	14.54	3.59	4.93	66.78	9.5	9.21	6759	12167	27
					2		40.23	44.89	14.88	3.68	4.78	68.37	9.7	7.32	6920	12456	
					3		47.26	52.74		4.32	5.62	80.32	11.4	8.60	8130	14633	
					4		45.87	54.13							8324	14983	
					5	28.2	44.58	52.60							8090	14562	
MORGAN COUNTY																	
BRISTOL	MEIGS CREEK	407	1	2	1	50.5	37.83	46.75	10.37	4.30	5.14	67.04	8.9	12.26	6730	12114	7
					2		39.84	49.24	10.92	4.53	4.82	70.61	9.4	8.18	7088	12758	
					3		44.72	55.28		5.09	5.41	79.26	10.6	9.18	7957	14322	
					4		43.35	56.65							8122	14620	
					5	58.4	40.82	53.34							7648	13766	
"	"	542	7	3	1	36.9	39.76	41.54	15.01	6.21					6497	11694	50
					2		41.28	43.13	15.59	6.45					6746	12142	
					3		48.90	51.10		7.54					7992	14385	
					4		47.04	52.96							8248	14846	
					5	45.9	44.89	50.52							746.8	1416.3	
"	"	597 A1	3	3	1	22.0	37.42	43.47	16.91	7.40					6386	11496	53
					2		38.26	44.45	17.29	7.57					6530	11755	
					3		46.26	53.74		9.15					7895	14212	
					4		43.87	56.13							8190	14743	
					5	28.3	42.63	54.54							7958	14325	
"	"	597 A2	3	3	1	21.2	39.11	44.67	14.10	6.98					6640	11953	53
					2		39.96	45.64	14.40	7.13					6784	12212	
					3		46.68	53.32		8.33					7926	14267	
					4		44.65	55.35							8180	14724	
					5	26.2	43.48	53.90							7965	14337	
"	"	597 A3	3	3	1	21.6	40.74	45.99	11.11	4.82					6929	12472	53
					2		41.54	47.00	11.36	4.93					7031	12747	
					3		46.98	53.02		5.56					7983	14380	
					4		45.59	54.41							8168	14703	
					5	25.3	44.43	53.04							7961	14330	
"	"	597 A4	3	3	1	19.4	34.40	39.70	23.96	3.85					5819	10474	53
					2		35.08	40.49	24.43	3.93					5934	10681	
					3		46.42	53.58		5.20					7852	14133	
					4		44.16	55.84							8151	14673	
					5	25.9	42.98	54.33							7932	14278	
"	"	597 A5	3	3	1	21.8	43.99	47.57	6.26	4.81					7312	13162	53
					2		44.97	48.63	6.40	4.92					7475	13455	
					3		48.04	51.96		5.25					7986	14375	
					4		47.01	52.99							8119	14615	
					5	24.1	45.88	51.71							7924	14263	
"	"	597 A6	3	3	1	19.2	40.91	46.60	10.57	3.78					7004	12608	53
					2		41.71	47.51	10.78	3.85					7141	12855	
					3		46.75	53.25		4.32					8004	14408	
					4		45.58	54.42							8157	14683	
					5	22.1	44.58	53.21							7976	14356	
"	"	597 A7	3	3	1	20.3	39.18	45.27	13.52	4.05					6660	11988	53
					2		39.99	46.21	13.80	4.13					6797	12236	
					3		46.39	53.61		4.79					7836	14195	
					4		44.96	55.04							8068	14524	
					5	24.4	43.86	53.70							7872	14170	
"	"	597 A8	3	3	1	18.5	39.57	43.10	15.48	3.39					6516	11729	53
					2		40.32	43.91	15.77	3.45					6639	11950	
					3		47.87	52.13		4.10					7882	14188	
					4		46.48	53.52							8070	14527	
					5	22.7	45.42	52.31							7887	14197	
"	"	597 A9	3	3	1	21.4	39.59	44.78	13.49	4.93	4.97	66.13	10.3	9.45	6704	12067	53
					2		40.46	45.76	13.78	5.04	4.84	67.58	10.5	7.71	6851	12331	
					3		46.93	53.07		5.85	5.61	78.38	12.2	8.94	7946	14302	
					4		45.35	54.65							8149	14669	
					5	25.9	44.17	53.24							7939	14290	
"	"	597 B1	3	3	1	19.2	38.25	42.43	17.40	4.91	4.74	62.09	9.6	9.90	6318	11373	53
					2		39.00	43.26	17.74	5.01	4.62	63.30	9.8	8.35	6442	11596	
					3		47.41	52.59		6.09	5.62	76.95	11.9	10.15	7831	14097	
					4		45.56	54.44							8072	14530	
					5	24.5	44.44	53.11							7874	14174	
"	"	597 B2	3	3	1	17.8	31.28	30.86	36.08	3.28					4720	8497	53
					2		31.85	31.42	36.73	3.34					4806	8651	
					3		50.34	49.66		5.28					7596	13673	
					4		47.14	52.86							8058	14504	
					5	30.1	45.72	51.27							7816	14069	

Township	Seam	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis					Heat value		Year	
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories	B. t. u.		
MORGAN COUNTY (CON.)																		
BRISTOL	MEIGS CREEK	597 B3	3	3	1	196	3646	3883	2275	531						5777	10399	53
					2	3719	3951	2320	542					5892	10607			
					3	4842	5158		706					7672	13811			
					4	4692	5391							7979	14363			
					5	270	4485	5245						7764	13975			
"	"	597 C1	3	3	1	235	3859	4580	1326	556						6641	11954	53
					2	3952	4690	1358	569					6801	12242			
					3	4573	5427		658					7870	14166			
					4	4399	5601							8081	14546			
					5	284	4274	5442						7851	14132			
"	"	597 C2	3	3	1	211	3379	3706	2704	316						5494	9889	53
					2	3452	3786	2762	323					5612	10102			
					3	4769	5231		446					7754	13957			
					4	4535	5455							8074	14534			
					5	306	4396	5298						7828	14091			
"	"	597 C3	3	3	1	232	3971	4409	1388	507						6560	11809	53
					2	4065	4514	1421	519					6716	12089			
					3	4738	5262		605					7828	14091			
					4	4577	5423							8034	14462			
					5	282	4448	5270						7808	14054			
"	"	597 C4	3	3	1	180	2908	3023	3889	250						4458	8024	53
					2	2951	3079	3950	255					4540	8171			
					3	4922	5098		422					7517	13528			
					4	4554	5446							8004	14407			
					5	318	4409	5273						7750	13950			
"	"	597 C9	3	3	1	236	3832	4366	1566	520	476	6315	97	1026	6430	11575	53	
					2	3925	4471	1604	533	461	6467	99	836	6585	11855			
					3	4675	5325		635	549	7702	118	996	7843	14120			
					4	4494	5506							8073	14532			
					5	294	4361	5345						7836	14104			
CENTER	"	495	1	2	1	253	4122	4240	1385	566						6680	12024	29
					2	4229	4350	1421	581					6853	12336			
					3	4929	5071		677					7988	14379			
					4	4757	5233							8215	14787			
					5	309	4619	5072						7962	14331			
HOMER	PITTSBURGH	239	1	2	1	480	4222	4303	995	519						6600	11880	29
					2	4443	4520	1045	545					6933	12479			
					3	4953	5047		609					7742	13935			
					4	4822	5178							7912	14241			
					5	556	4554	4890						7472	13450			
"	"	240	1	2	1	687	4055	4439	819	422	532	6739	90	1398	6722	12100	7	
					2	4354	4767	879	453	490	7236	96	846	7218	12992			
					3	4774	5226		497	537	7933	105	928	7914	14244			
					4	4681	5339							8058	14504			
					5	773	4301	4926						7435	13383			
MANCHESTER	MEIGS CREEK	406	1	2	1	407	3751	4766	1066	507	510	6619	87	1211	6779	12202	7	
					2	3921	4968	1111	529	484	6900	91	885	7067	12720			
					3	4411	5589		595	544	7763	102	996	7950	14310			
					4	4255	5745							8132	14638			
					5	475	4052	5473						7746	13942			
MEIGSVILLE	"	405	1	2	1	513	3607	4706	1174	489	506	6477	87	1267	6625	11925	7	
					2	3802	4980	1238	515	473	6827	92	855	6983	12569			
					3	4339	5661		588	540	7791	105	976	7970	14345			
					4	4173	5827							8162	14692			
					5	606	3920	5474						7668	13802			
WINDSOR	WAYNESBURG A	499	1	2	1	408	3854	5026	712	445	630	5840	108	2265	6197	11154	29	
					2	4018	5240	742	464	610	6088	113	1983	6460	11628			
					3	4340	5660		501	659	6576	122	2142	6978	12560			
					4	4219	5781							7079	12742			
					5	454	4027	5519						6758	12165			
MUSKINGUM COUNTY																		
ADAMS	MIDDLE KITTANNING	474	1	2	1	563	4470	4484	483	332	569	7141	125	1350	7206	12971	17	
					2	4737	4751	512	351	537	7567	133	900	7635	13743			
					3	4993	5007		370	566	7975	140	949	8047	14485			
					4	4923	5077							8145	14661			
					5	606	4624	4770						7653	13775			
BLUE ROCK	MEIGS CREEK	404	1	2	1	516	4012	4158	1314	507	522	6325	86	1246	6429	11572	17	
					2	4230	4384	1386	534	490	6269	90	831	6779	12202			
					3	4911	5089		620	569	7742	104	965	7870	14166			
					4	4757	5243							8077	14538			
					5	622	4461	4917						7574	13633			
BRUSH CREEK	UPPER FREEPORT	324	1	2	1	472	4347	4425	756	500	555	6827	132	1230	7046	12683	2	
					2	4552	4645	793	525	528	7165	158	851	7395	13311			
					3	4955	5045		570	573	7783	150	924	8032	14457			
					4	4843	5157							8187	14736			
					5	530	4587	4883						7753	13956			

Township	Seam	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis					Heat value		Year
						Mois-ture	Vola-tile	Fixed carbon	Ash	Sulphur	Hydro-gen	Carbon	Nitro-gen	Oxygen	Calo-ries	B. t. u.	
MUSKINGUM COUNTY (CON.)																	
BRUSH CREEK	MIDDLE KITTANNING	468	1	2	1	565	4436	4285	714	443	564	6835	102	1342	6960	12528	17
						470	4542	4542	757	470	531	7244	108	890	7377	13278	
						5086	4914			508	574	7838	117	963	7981	14365	
						4989	5011								8120	14616	
						629	4676	4695							7609	13696	
"	"	470	1	2	1	508	3975	4540	977	554	532	6574	114	1249	6802	12244	2
						4188	4783	1029	584	501	6925	120	841	7166	12899		
						4658	5352		651	558	7720	134	937	7988	14379		
						4520	5460							8175	14715		
						588	4254	5158						7694	13850		
"	"	558	1	1	1	410	3836	3817	1937	604	487	5831	105	1036	5962	10731	50
						4000	3950	2020	630	450	6080	110	700	6217	11190		
						5013	4987		789	576	7620	138	877	7791	14023		
						4800	5200							8086	14555		
						541	4540	4919						7648	13766		
CLAY	"	559	1	1	1	400	4070	4253	1277	518	505	6422	106	1172	6480	11664	50
						4240	4430	1330	540	480	6590	110	850	6750	12150		
						4890	5110		623	554	7716	127	980	7785	14014		
						4739	5261							7984	14371		
						480	4511	5009						7601	13682		
HARRISON	ANDERSON	385	1	2	1	566	4272	3992	1170	488	530	6361	103	1348	6579	11842	17
						4528	4232	1240	517	495	6743	109	896	6974	12552		
						5169	4831		590	565	7698	124	1023	7961	14329		
						5040	4960							8153	14676		
						658	4704	4628						7609	13696		
"	UPPER FREEPORT	322	1	2	1	489	4235	4498	778	436	553	6774	117	1342	6944	12499	2
						4453	4729	818	458	525	7122	123	954	7301	13142		
						4850	5150		499	572	7756	134	1039	7951	14313		
						4743	5257							8093	14567		
						548	4483	4959						7649	13768		
"	"	323	1	2	1	427	4563	4107	903	523	536	6798	112	1128	6967	12541	17
						4757	4290	943	546	511	7101	117	782	7278	13100		
						5263	4757		603	564	7841	129	863	8036	14464		
						5133	4847							8209	14776		
						489	4900	4611						7808	14054		
"	MIDDLE KITTANNING	469	1	2	1	467	4032	4518	983	410	538	6771	116	1182	6873	12371	2
						4230	4739	1031	430	510	7103	121	805	7210	12978		
						4716	5284		479	569	7919	135	898	8039	14470		
						4596	5404							8197	14755		
						536	4349	5115						7757	13963		
HOPEWELL	CLARION	361	1	2	1	639	4149	4292	870	302	557	6728	119	1424	6706	12071	17
						4456	4610	934	324	516	7226	128	872	7202	12964		
						4915	5085		357	569	7971	141	962	7944	14300		
						4824	5176							8070	14526		
						775	4450	4775						7446	13402		
JACKSON	QUAKERTOWN	225	1	2	1	980	3512	4910	598	137	579	6878	121	1687	6745	12142	17
						3899	5333	663	152	521	7625	134	905	7478	13460		
						4171	5829		163	558	8166	144	969	8009	14416		
						4109	5891							8082	14547		
						1056	3675	5269						7229	13012		
LICKING	BEDFORD	381	1	2	1	556	3949	4493	1002	282	532	6735	125	1324	6719	12094	17
						4151	4756	1061	294	499	7131	128	828	7115	13006		
						4677	5323		334	557	7978	148	983	7960	14326		
						4576	5424							8092	14565		
						635	4286	5079						7578	13641		
MADISON	LOWER FREEPORT	345	1	2	1	535	4446	4333	686	209	585	7003	140	1377	7099	12778	17
						4697	4578	725	220	556	7399	147	953	7500	13500		
						5054	4956		237	599	7977	159	1028	8086	14555		
						5003	4997							8178	14721		
						585	4711	4704						7700	13860		
"	MIDDLE KITTANNING	465	1	2	1	613	4425	4442	520	364	576	7002	122	1416	7108	12794	17
						4714	4732	554	388	541	7459	130	928	7572	13629		
						4990	5010		411	573	7896	138	982	8016	14428		
						4913	5087							8123	14622		
						654	4587	4749						7584	13652		
"	"	466	1	2	1	462	4095	4755	658	449	547	6958	130	1258	7126	12827	2
						4293	5017	690	471	520	7295	136	888	7471	13448		
						4611	5389		506	559	7835	146	954	8025	14445		
						4501	5499							8159	14687		
						511	4272	5217						7743	13937		
"	"	467	1	2	1	475	3988	4609	928	535	535	6669	128	1205	6854	12337	2
						4187	4859	974	562	506	7002	134	822	7196	12952		
						4639	5561		623	561	7757	148	911	7973	14350		
						4496	5204							8148	14667		
						546	4251	5203						7704	13867		
MONROE	"	462	1	2	1	588	4381	4651	380	298	574	7218	127	1403	7308	13154	17
						4655	4941	404	317	541	7668	135	935	7764	13975		
						4851	5149		330	564	7991	141	974	8091	14563		
						4788	5212							8175	14715		
						4489	4887							7665	13797		

COAL RESOURCES OF OHIO

Township	Seam	File number	Kind	Source	Condition	Proximate analysis			Ultimate analysis					Heat value		Year	
						Mois- ture	Vola- tile	Fixed carbon	Ash	Sulphur	Hydro- gen	Carbon	Nitro- gen	Oxygen	Calo- ries		B. t. u.
MUSKINGUM COUNTY (CON.)																	
MONROE	MIDDLE KITTANNING	463	1	2	1	552	4473	4512	463	350	566	7090	111	1420	7241	13034	17
					2		4734	4776	490	370	535	7504	118	983	7664	13795	
					3		4978	5022		389	563	7890	124	1034	8059	14506	
					4		4906	5094							8159	14686	
					5	593	4616	4791							7676	13816	
MUSKINGUM	"	464	1	2	1	555	4027	4895	523	363	557	7054	126	1377	7191	12944	2
					2		4263	5183	554	384	524	7469	133	936	7614	13705	
					3		4513	5487		407	555	7906	141	991	8061	14509	
					4		4423	5577							8168	14703	
					5	601	4158	5241							7677	13819	
NEWTON	"	461	1	2	1	502	3816	4726	956	597	529	6588	112	1218	6758	12164	2
					2		4018	4976	1006	629	498	6936	118	813	7115	12807	
					3		4467	5533		699	554	7712	131	904	7911	14239	
					4		4302	5698							8101	14581	
					5	581	4052	5367							7631	13735	
"	LOWER KITTANNING	306	1	2	1	796	3918	4687	599	240	554	6840	137	1630	6893	12407	17
					2		4257	5092	651	261	506	7431	149	1002	7489	13480	
					3		4533	5447		279	541	7949	159	1072	8010	14419	
					4		4480	5520							8102	14584	
					5	853	4093	5044							7403	13325	
PERRY	UPPER FREEPORT	321	1	2	1	988	3890	4363	819	362	560	6571	97	1591	6584	11851	17
					2		4288	4809	903	399	504	7243	107	844	7257	13063	
					3		4714	5286		439	554	7961	118	928	7977	14360	
					4		4606	5394							8116	14609	
					5	1041	4127	4832							7271	13088	
SALT CREEK	ANDERSON	384	1	2	1	661	3984	4496	859	208	561	6890	132	1350	6854	12337	17
					2		4266	4814	920	222	523	7377	141	817	7339	13210	
					3		4698	5302		244	576	8125	155	900	8083	14548	
					4		4619	5381							8191	14744	
					5	738	4278	4984							7587	13656	
UNION	PITTSBURGH	238	1	2	1	671	4017	4198	1114	520					6496	11693	27
					2		4306	4500	1194	568					6963	12334	
					3		4890	5110		634					7907	14233	
					4		4745	5255							8102	14583	
					5	788	4371	4841							7463	13433	
WASHINGTON	MIDDLE KITTANNING	460	1	2	1	544	3915	4613	928	377	534	6716	118	1327	6822	12280	2
					2		4140	4879	981	399	501	7102	125	892	7214	12955	
					3		4599	5440		442	555	7875	139	989	7999	14497	
					4		4474	5326							8144	14660	
					5	619	4198	5183							7642	13755	
"	LOWER KITTANNING	305	1	2	1	505	3975	4743	777	480	537	6807	118	1281	6983	12569	2
					2		4186	4966	818	506	507	7169	124	876	7354	13237	
					3		4559	5441		551	552	7808	135	954	8009	14416	
					4		4433	5567							8162	14691	
					5	558	4182	5250							7699	13858	
WAYNE	UPPER FREEPORT	320	1	2	1	511	3550	4679	1260	384	511	6481	125	1239	6558	11804	2
					2		3741	4991	1328	405	478	6830	132	827	6911	12440	
					3		4314	5686		467	551	7876	152	954	7999	14435	
					4		4152	5988							8149	14668	
					5	606	3911	5493							7654	13778	
"	MIDDLE KITTANNING	459	1	2	1	593	4569	4254	584	371	567	6721	124	1633	7067	12721	17
					2		4856	4523	621	394	532	7145	132	1176	7512	13522	
					3		5178	4822		420	567	7618	141	1254	8009	14417	
					4		5101	4899							8124	14623	
					5	647	4772	4591							7598	13677	
"	LOWER KITTANNING	304	1	2	1	587	4152	4391	870	479	538	6667	116	1330	6771	12188	7
					2		4411	4665	924	509	502	7083	123	859	7193	12947	
					3		4860	5140		561	553	7804	136	946	7925	14265	
					4		4739	5261							8084	14552	
					5	657	4423	4910							7546	13583	
"	TIONESTA	217	1	2	1	850	3644	4589	917	130	549	6531	113	1760	6511	11720	17
					2		3983	5015	1002	142	497	7138	123	1098	7116	12809	
					3		4427	5573		158	552	7933	137	1220	7908	14235	
					4		4351	5649							8006	14410	
					5	951	3937	5112							7244	13040	
NOBLE COUNTY																	
BEAVER	MEIGS CREEK	172	1	1	1	414	3842	4482	1262	361	522	6687	120	1048	6739	12130	14
					2		4008	4675	1317	377	497	6976	125	708	7030	12654	
					3		4616	5384		434	572	8035	144	815	8096	14573	
					4		4482	5518							8274	14893	
					5	491	4262	5247							7667	14161	
"	"	587	1	1	1	449	2897	3727	2927	1401					5118	9214	52
					2		3033	3902	3065	1467					5359	9647	
					3		4373	5627		2115					7727	13911	
					4		3741	6259							8417	15151	
					5	740	3465	5795							7794	14029	

Township	Seam	File number	Kind	Source	Condition	Proximate analysis			Ultimate analysis					Heat value		Year		
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories		B. t. u.	
NOBLE COUNTY (CON.)																		
BEAVER	MEIGS CREEK	587	2	1	3	1	456	3992	4444	1098	421					6869	12364	52
						2		4187	4661	1152	442					7205	12968	
						3		4732	5268		500					8143	14656	
						4		4603	5397							8319	14974	
						5	543	4353	5104							7867	14161	
"	"	587	3	1	3	1	396	3835	4416	1353	418				6700	12060	52	
						2		3993	4598	1409	435					6976		12557
						3		4648	5352		506					8121		14618
						4		4498	5502							8321		14977
						5	47	4284	5239							7924		14263
"	"	587	4	1	3	1	355	3850	4351	1434	500				6631	11936	52	
						2		3996	4516	1488	519					6882		12388
						3		4695	5305		610					8085		14553
						4		4526	5474							8311		14960
						5	446	4324	5230							7941		14293
"	"	587	9	1	3	1	397	3868	4406	1329	449	498	6430	102	1192	6686	12036	52
						2		4028	4588	1384	468	472	6696	106	874	6962	12534	
						3		4675	5375		543	548	7772	123	1014	8080	14547	
						4		4522	5478							8285	14913	
						5	477	4307	5216							7889	14200	
BROOKFIELD	"	402	1	2	1	1	485	3728	4805	982	559	526	6601	97	1235	6834	12301	7
						2		3918	5050	1032	587	496	6937	101	847	7182	12928	
						3		4369	5631		655	553	7735	113	944	8008	14416	
						4		4205	5795							8197	14755	
						5	562	3969	5469							7737	13927	
"	"	403	1	2	1	1	354	3741	4582	1323	621	512	6444	88	1012	6642	11956	7
						2		3878	4750	1372	644	490	6680	91	723	6886	12395	
						3		4495	5505		746	568	7743	105	838	7981	14366	
						4		4300	5700							8216	14788	
						5	430	4115	5455							7862	14151	
"	"	543	1	1	3	1	235	3758	4208	1789	750				6065	10918	49	
						2		3859	4309	1832	758					6211		11181
						3		4765	5272		940					7604		13689
						4		4481	5519							7893		14208
						5	307	4343	5350							7651		13772
"	"	543	2	1	3	1	275	3747	4646	1322	621				6334	11401	49	
						2		3853	4777	1370	639					6512		11723
						3		4465	5535		740					7546		13584
						4		4270	5730							7756		13960
						5	335	4126	5539							7496		13492
"	"	543	3	1	3	1	326	3816	5036	822	404				6920	12457	49	
						2		3944	5206	850	418					7153		12877
						3		4310	5690		457					7817		14073
						4		4190	5810							7951		14311
						5	357	4036	5597							7658		13785
"	"	543	4	1	3	1	323	3375	4433	1859	269				6079	10943	49	
						2		3488	4581	1931	278					6282		11308
						3		4323	5677		345					7785		14014
						4		4152	5848							7994		14390
						5	412	3981	5607							7666		13798
"	"	543	9	1	3	1	284	3721	4596	1399	550				6375	11476	49	
						2		3830	4730	1440	566					6561		11811
						3		4474	5526		661					7665		13798
						4		4289	5711							7874		14173
						5	347	4140	5513							7601		13682
"	"	598	A1	3	3	1	247	4116	4570	1067	358				6874	12373	53	
						2		4220	4686	1094	357					7048		12686
						3		4738	5262		412					7914		14244
						4		4626	5374							8061		14510
						5	286	4493	5221							7831		14096
"	"	598	A2	3	3	1	228	3843	4252	1677	528				6329	11392	53	
						2		3933	4351	1716	540					6477		11658
						3		4748	5252		652					7819		14073
						4		4560	5440							8060		14508
						5	289	4428	5283							7827		14089
"	"	598	A3	3	3	1	222	4155	4759	854	336				7151	12873	53	
						2		4260	4867	873	344					7313		13165
						3		4657	5333		377					8012		14424
						4		4570	5430							8140		14652
						5	250	4455	5295							7937		14282
"	"	598	A4	3	3	1	228	4124	4771	877	429				7052	12695	53	
						2		4220	4882	898	439					7217		12991
						3		4636	5364		482					7929		14273
						4		4520	5480							8073		14532
						5	259	4403	5338							7864		14155
"	"	598	A5	3	3	1	212	3443	3995	2350	588				5736	10326	53	
						2		3528	4082	2400	601					5860		10550
						3		4693	5371		791					7714		13689
						4		4360	5640							8046		14482
						5	297	4230	5473							7807		14053

COAL RESOURCES OF OHIO

Township	Seam	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis					Heat value		Year		
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories	B. t. u.			
BROOKFIELD	MEIGS CREEK	598 A9	3	3	3	1	241	3779	4325	1655	488	476	6288	101	992	6361	11450	53	
						2	3872	4432	1696	500	460	6443	104	797	6518	11733			
						3	4663	5357			602	554	7759	125	960	7849	14129		
						4	4480	5520								8082	14548		
						5	4345	5352								7837	14106		
		598 B1 ¹⁷	3	3	3	3	1	217	2438	3016	4329	1350					3846	6923	53
							2	2492	3083	4485	1380						3931	7077	
							3	4470	5330			2475					7051	12694	
							4	3555	5445								7952	14314	
							5	3386	6140								7575	13635	
		598 B2	3	3	3	3	1	255	3770	4120	1855	862					6120	11016	53
							2	3859	4228	1903	885						6280	11304	
							3	4778	5222			1093					7756	13961	
							4	4509	5491								8091	14564	
							5	4306	5305								7817	14071	
		598 B3	3	3	3	3	1	252	3948	4455	1335	435					6607	11894	53
							2	4054	4575	1371	447						6785	12214	
							3	4698	5302			518					7863	14155	
							4	4551	5449								8052	14493	
							5	4408	5277								7798	14036	
598 B4	3	3	3	3	1	246	3947	4489	1318	354					6700	12060	53		
					2	4047	4602	1351	373						6869	12364			
					3	4679	5321			431					7942	14295			
					4	4546	5454								8116	14609			
					5	4412	5294								7878	14180			
598 B5	3	3	3	3	1	221	3507	4025	2247	503					5805	10449	53		
					2	3586	4116	2298	535						5936	10685			
					3	4656	5344			695					7707	13873			
					4	4443	5587								8012	14421			
					5	4280	5417								7768	13983			
598 B9	3	3	3	3	1	264	3762	4250	1724	498	469	6255	93	961	6277	11299	53		
					2	3864	4365	1771	502	451	6425	95	746	6447	11605				
					3	4696	5304			622	548	7808	115	907	7834	14103			
					4	4506	5494								8077	14539			
					5	4355	5309								7806	14051			
598 C1	3	3	3	3	1	353	3713	4416	1538	594					6311	11361	53		
					2	3841	4568	1591	614						6528	11752			
					3	4568	5432			730					7763	13976			
					4	4366	5634								8004	14407			
					5	4184	5400								7672	13809			
598 C2	3	3	3	3	1	319	3667	4242	1772	556					6136	11045	53		
					2	3788	4382	1830	574						6338	11409			
					3	4636	5364			703					7758	13965			
					4	4427	5573								8016	14429			
					5	4245	5345								7688	13839			
598 C3	3	3	3	3	1	353	3988	4576	1083	422					6777	12199	53		
					2	4134	4743	1123	437						7025	12645			
					3	4657	5343			492					7914	14286			
					4	4527	5473								8077	14539			
					5	4341	5248								7746	13942			
598 C4	3	3	3	3	1	289	3261	3501	2949	733					5115	9208	53		
					2	3358	3605	3037	755						5267	9482			
					3	4823	5177			1084					7564	13618			
					4	4462	5538								8023	14441			
					5	4260	5289								7661	13789			
598 C9	3	3	3	3	1	314	3676	4184	1826	556					6124	11023	53		
					2	3795	4320	1885	574						6323	11380			
					3	4677	5323			707					7792	14023			
					4	4464	5536								8057	14503			
					5	4283	5310								7731	13915			
CENTER	"	401	1	2	1	1	452	4113	4401	1024	417					6791	12224	27	
						2	4312	4614	1074	437						7120	12816		
						3	4831	5169			490					7977	14358		
						4	4711	5289								8138	14649		
						5	533	4460	5007							7704	13867		
ELK	"	400	1	2	1	1	306	3843	4618	1233	600	511	6618	86	952	6865	12357	7	
						2	3964	4764	1272	619	492	6827	89	701	7082	12747			
						3	4542	5458			709	564	7822	102	803	8114	14605		
						4	4362	5638								8339	15011		
						5	4203	5430								8033	14460		
"	"	497	1	2	1	1	151	4509	4205	1135	545	412	6866	112	930	7063	12713	29	
						2	4578	4268	1164	553	401	6970	114	808	7171	12007			
						3	5175	4825			625	453	7880	129	913	8106	14591		
						4	5047	4953								8304	14948		
						5	4956	4866								8156	14680		

Township	Seam	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis					Heat value		Year	
						Mois-ture	Volat-ile	Fixed carbon	Ash	Sulphur	Hydro-gen	Carbon	Nitro-gen	Oxygen	Calo-ries	B. t. u.		
ELK	MEIGS CREEK	572	1	1	3	1	279	3633	4056	2032	593					6200	11160	51
						2	3737	4172	2091	610					6378	11480		
						3	4725	5275		771					8064	14515		
						4	4490	5510							8383	15089		
						5	373	4303	5304						8069	14525		
"	"	572	2	1	3	1	224	4036	4374	1366	627					6736	12125	51
						2	4128	4474	1398	641					6890	12403		
						3	4799	5201		745					8010	14419		
						4	4620	5380							8249	14848		
						5	274	4494	5232						8022	14440		
ENOCH	"	398	1	2	1	1	290	3724	4970	1016	427	522	6853	104	1078	7051	12690	7
						2	3835	5119	1046	440	505	7054	107	844	7261	13069		
						3	4283	5717		491	564	7883	119	943	8109	14596		
						4	4144	5856							8273	14892		
						5	335	4005	5660						7997	14394		
"	"	399	1	2	1	1	386	4491	3962	1161	535					6836	12304	27
						2	4671	4121	1208	556					7110	12799		
						3	5313	4607		632					8087	14558		
						4	5187	4813							8292	14923		
						5	457	4950	4593						7912	14241		
"	"	596	A1	1	3	1	466	3853	4355	1326	581					6550	11790	53
						2	4041	4568	1391	609					6870	12366		
						3	4694	5306		707					7980	14364		
						4	4516	5484							8209	14776		
						5	565	4261	5174						7746	13942		
"	"	596	A2	1	3	1	407	3787	4307	1499	535					6461	11631	53
						2	3948	4490	1562	558					6735	12124		
						3	4679	5321		661					7982	14368		
						4	4496	5504							8219	14795		
						5	503	4270	5227						7807	14052		
"	"	596	A3	1	3	1	406	3661	4304	1629	639					6344	11419	53
						2	3816	4486	1698	666					6612	11902		
						3	4596	5404		802					7964	14336		
						4	4377	5223							8240	14832		
						5	515	4151	5354						7816	14069		
"	"	596	A4 ¹⁸	1	3	1	367	1624	1342	6667	359					1756	3161	53
						2	1686	1393	6921	373					1823	3281		
						3	5476	4524		1211					5921	10656		
						4	4237	5263							7409	13337		
						5	1410	3640	4950						6366	11458		
"	"	596	A9	1	3	1	428	3782	4323	1467	574					6466	11640	53
						2	3951	4516	1533	500					6755	12160		
						3	4656	5334		709					7978	14362		
						4	4477	5523							8221	14798		
						5	528	4241	5251						7787	14016		
"	"	596	B1	1	3	1	570	3257	3906	2257	462					5644	10160	53
						2	3465	4142	2393	490					5985	10774		
						3	4555	5445		644					7868	14163		
						4	4307	5693							8186	14734		
						5	780	3970	5250						7548	13586		
"	"	596	B2	1	3	1	911	1204	794	7091	205					1084	1951	53
						2	1325	873	7802	226					1193	2147		
						3	6028	3972		1028					1528	9768		
						4	4211	5789							7796	14032		
						5	4087	2489	3424						4607	8293		
"	"	596	B3	1	3	1	513	3533	3799	2155	340					5778	10401	53
						2	3724	4004	2272	358					6090	10963		
						3	4819	5181		463					7880	14186		
						4	4625	5375							8152	14673		
						5	685	4308	5007						7593	13668		
"	"	596	B9	1	3	1	604	3042	3440	2914	396					5034	9062	53
						2	3238	3661	3101	421					5358	9645		
						3	4693	5307		610					7766	13980		
						4	4395	5605							8165	14697		
						5	910	3995	5095						7422	13359		
"	"	603	A1 ¹⁹	1	3	1	293	3851	4299	1557	611	490	6319	99	924	6494	11689	54
						2	3967	4429	1604	629	471	6510	102	684	6590	12042		
						3	4725	5275		749	561	7754	121	815	7968	14343		
						4	4528	5472							8224	14804		
						5	367	4362	5271						7923	14261		
"	"	603	A2 ¹⁹	1	3	1	330	3736	4052	1882	390	488	6144	108	988	6248	11247	54
						2	3854	4190	1946	403	467	6354	112	718	6461	11631		
						3	4798	5202		500	580	7889	159	892	8022	14441		
						4	4621	5379							8272	14889		
						5	426	4423	5151						7919	14255		
"	"	603	B1 ¹⁹	4	3	1	276	3653	4167	1894	630	465	6014	93	904	6197	11155	54
						2	3767	4285	1948	648	447	6184	96	677	6373	11472		
						3	4678	5322		805	555	7680	119	841	7915	14247		
						4	4446	5554							8214	14786		
						5	363	4284	5553						7916	14248		

COAL RESOURCES OF OHIO

Township	Seam	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis					Heat value		Year			
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories	B. t. u.				
ENOCH	MEIGS CREEK	603 B2	1	3	4	NOBLE COUNTY (CON.)														
						1	285	3486	3798	2431	381	457	5700	100	931	5821	10478	54		
						2		3588	3910	2502	392	438	5867	103	698	5992	10785			
						3		4785	5215		523	584	7825	137	931	7991	14384			
						4	398	4582	5438							8306	14951			
5		4381	5221							7977	14358									
JACKSON	"	397	1	2	1	1	452	4216	4126	1206	454	512	6608	88	1132	6722	12099	27		
						2		4416	4321	1263	475	484	6921		765	7040	12672			
						3		5054	4946		544	554	7921	105	876	8058	14504			
						4	535	4925	5075							8249	14848			
						5		4682	4803							7807	14053			
"	"	601 B1	3	3	1	1	196	4160	4453	1191	532					6916	12449	53		
						2		4243	4542	1215	543					7054	12698			
						3		4850	5170		618					8030	14454			
						4	233	4683	5317							8229	14813			
						5		4574	5193							8037	14467			
"	"	601 B2	3	3	1	1	192	4247	4498	1063	579					7037	12668	53		
						2		4350	4586	1084	590					7175	12916			
						3		4886	5144		662					8047	14486			
						4	225	4712	5288							8244	14840			
						5		4606	5169							8059	14506			
"	"	601 B3	3	3	1	1	216	3625	3968	2191	383					6051	10892	53		
						2		3705	4056	2239	391					6185	11132			
						3		4774	5226		504					7969	14343			
						4	291	4574	5426							8248	14846			
						5		4441	5268							8008	14415			
"	"	601 B4	3	3	1	1	235	4090	5006	659	262					7382	13288	53		
						2		4188	5127	685	258					7560	13608			
						3		4496	5504		277					8116	14609			
						4	257	4420	5580							8212	14782			
						5		4307	5436							8001	14402			
"	"	601 B9	3	3	1	1	224	4044	4532	1200	439	513	6776	105	967	6890	12402	53		
						2		4157	4686	1227	449	499	6931	108	786	7048	12686			
						3		4716	5284		512	569	7900	123	896	8034	14460			
						4	265	4579	5421							8214	14786			
						5		4457	5278							7998	14396			
"	"	601 C1	3	3	1	1	218	4195	4257	1350	563					6782	12209	53		
						2		4288	4382	1350	576					6933	12481			
						3		4983	5037		667					8024	14446			
						4	254	4807	5193							8246	14843			
						5		4681	5055							8028	14451			
"	"	601 C2	3	3	1	1	231	3662	4179	1928	462					6243	11238	53		
						2		3749	4278	1973	473					6391	11504			
						3		4670	5330		589					7962	14332			
						4	301	4471	5529							8227	14808			
						5		4306	5363							7979	14363			
"	"	601 C3	3	3	1	1	234	3902	5071	793	377					7247	13046	53		
						2		3995	5193	812	386					7421	13359			
						3		4348	5652		420					8077	14540			
						4	262	4287	5763							8208	14775			
						5		4127	5611							7993	14388			
"	"	601 C4	3	3	1	1	248	3597	4695	1460	374					6569	11825	53		
						2		3688	4815	1497	384					6736	12126			
						3		4337	5663		452					7922	14261			
						4	302	4178	5822							8113	14603			
						5		4053	5645							7868	14162			
"	"	601 C9	3	3	1	1	224	3851	4471	1454	459	481	6546	94	956	6624	11923	53		
						2		3959	4574	1487	470	477	6695	96	774	6776	12196			
						3		4627	5373		552	560	7466	113	909	7960	14326			
						4	274	4464	5536							8168	14702			
						5		4343	5383							7944	14300			
"	"	601 D1	3	3	1	1	218	4138	4435	1209	560					6861	12350	53		
						2		4230	4534	1236	572					7014	12625			
						3		4827	5173		653					8003	14406			
						4	250	4673	5327							8209	14776			
						5		4552	5188							7996	14393			
"	"	601 D2	3	3	1	1	214	3996	4427	1363	565					6678	12021	53		
						2		4083	4524	1393	577					6824	12284			
						3		4744	5256		670					7928	14272			
						4	250	4574	5426							8149	14668			
						5		4456	5284							7936	14285			
"	"	601 D3	3	3	1	1	212	3773	4240	1775	489					6409	11536	53		
						2		3855	4322	1813	500					6548	11786			
						3		4709	5291		611					7998	14396			
						4	271	4519	5481							8252	14853			
						5		4397	5332							8028	14450			
"	"	601 D4	3	3	1	1	244	4005	4568	1183	295					6969	12545	53		
						2		4105	4682	1213	302					7143	12859			
						3		4672	5388		344					8129	14634			
						4	285	4560	5380							8283	14909			
						5		4430	5285							8046	14483			

Township	Seam	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis					Heat value		Year	
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calo-ries	B. t. u.		
																		1
JACKSON	MEIGS CREEK	601 D9	3	3	1	2.10	39.46	44.02	NOBLE COUNTY (CON.)	1.442	4.855	4.97	6.570	9.4	9.12	665.9	119.86	53
					2	40.31	44.96	1.473	4.855	4.84	6.711	9.6	7.41	680.2	122.43			
					3	47.27	52.73		4.855	5.68	7.870	11.3	8.69	797.7	143.58			
					4	45.56	54.34		5.80					819.0	147.42			
					5	25.7	44.48	52.95						798.0	143.64			
JEFFERSON	"	584 A	1	1	1	7.9	36.0	4.31	1.30	5.1	5.3	6.29	9	12.8	64.28	115.70	52	
					2	39.1	4.68	1.41	5.5	4.8	6.83	10	6.3	698.3	125.70			
					3	45.6	5.44		6.4	5.5	7.95	12	7.4	812.9	146.20			
					4	43.8	5.62							835.6	150.40			
					5	39.6	5.09							755.9	136.07			
"	"	584 B1	1	1	1	3.2	37.6	4.47	1.45	4.8	5.0	6.58	11	8.8	66.61	119.90	52	
					2	38.8	4.63	1.49	5.0	4.8	6.79	11	6.3	687.8	123.80			
					3	45.6	5.44		5.9	5.7	7.98	13	7.3	808.2	145.50			
					4	43.9	5.61							830.3	149.46			
					5	42.3	5.38							799.0	143.82			
"	"	584 B2	1	1	1	3.4	35.3	4.13	2.00	4.0	4.8	6.08	11	9.3	61.44	110.60	52	
					2	36.5	4.28	2.07	4.1	4.6	6.29	11	6.6	636.1	114.50			
					3	46.0	5.40		5.2	5.8	7.93	14	8.3	802.1	144.40			
					4	44.0	5.60							828.7	149.16			
					5	42.1	5.34							791.8	142.52			
MARION	"	168	1	1	1	3.57	41.53	4.437	1.053	4.87	5.25	6.815	11.1	10.09	69.47	125.05	14	
					2	43.07	4.601	1.092	5.03	5.03	7.067	11.5	7.18	720.4	129.67			
					3	48.35	5.165		5.65	5.65	7.933	12.9	8.06	808.7	145.57			
					4	47.03	5.297							826.8	148.83			
					5	45.08	5.077							792.6	142.66			
"	"	396	1	2	1	31.2	37.36	4.667	1.285	5.60	5.09	6.561	9.2	9.93	67.39	121.30	7	
					2	38.56	4.818	1.326	5.78	4.90	6.772	9.5	7.39	695.6	125.21			
					3	44.45	5.555		6.66	5.65	7.807	11.0	8.52	801.9	144.35			
					4	42.65	5.735							823.7	148.27			
					5	37.6	4.105	5.519						792.8	142.70			
NOBLE	ANDERSON	493	1	2	1	3.29	40.84	4.657	9.20	2.67	3.84	6.990	9.2	13.47	70.60	127.08	29	
					2	42.23	4.826	9.51	2.76	3.59	7.229	9.5	10.90	730.1	131.42			
					3	46.67	5.333		3.05	3.97	7.988	10.5	12.05	806.8	145.23			
					4	45.76	5.424							819.0	147.42			
					5	37.1	4.406	5.223						788.5	141.93			
"	UPPER FREEPORT	166 A	1	1	1	4.88	37.76	4.893	8.43	2.95					707.3	127.31	13	
					2	39.70	5.144	8.86	3.10					743.6	133.85			
					3	43.60	5.644		3.40					815.9	146.82			
					4	42.55	5.745							828.4	149.11			
					5	54.7	4.022	5.431						783.1	140.96			
"	"	166 B	1	1	1	51.3	37.17	4.959	8.11	2.99					705.3	126.95	13	
					2	39.18	5.227	8.55	3.15					743.5	133.83			
					3	42.84	5.716		3.44					813.0	146.34			
					4	41.82	5.818							825.3	148.55			
					5	39.42	5.485							777.9	140.02			
"	"	166 K	1	1	1	51.5	37.34	4.900	8.51	2.94	5.42	7.051	15.0	11.12	707.4	127.33	13	
					2	39.37	5.166	8.97	3.10	5.12	7.434	15.8	6.89	745.9	134.26			
					3	43.25	5.675		3.41	5.62	8.166	17.4	7.57	819.4	147.49			
					4	42.22	5.778							832.1	149.77			
					5	39.79	5.444							783.9	141.11			
"	"	319	1	2	1	4.77	37.06	5.033	7.84	2.43	5.26	7.157	14.1	11.49	702.8	126.51	25	
					2	38.9	5.285	8.23	2.55	4.97	7.515	14.8	7.82	730.0	127.35			
					3	42.41	5.759		2.78	5.42	8.189	16.1	8.30	804.2	144.76			
					4	41.51	5.849							814.8	146.67			
					5	52.9	39.31	5.540						771.7	138.91			
OLIVE	MEIGS CREEK	395	1	2	1	4.36	41.06	4.126	1.332	4.73					657.4	118.33	27	
					2	42.93	4.314	1.393	4.95					687.4	123.72			
					3	49.88	5.012		5.75					798.7	143.74			
					4	48.44	5.156							819.1	147.44			
					5	58.5	4.885							776.1	139.70			
SENECA	"	176	1	1	1	4.53	39.56	4.559	1.032	4.12	5.27	6.800	11.7	11.12	68.46	123.23	14	
					2	41.44	4.775	1.081	4.32	5.00	7.122	12.3	7.42	717.1	129.08			
					3	46.46	5.354		4.84	5.61	7.985	13.8	8.32	804.0	144.72			
					4	45.20	5.480							820.4	147.67			
					5	52.3	4.283	5.194						777.4	139.94			
SHARON	"	498	1	2	1	2.00	42.75	4.320	1.205	5.03					693.5	124.83	29	
					2	43.9	4.408	1.230	5.29					737.5	127.35			
					3	49.92	5.026		5.85					806.9	145.21			
					4	48.38	5.162							826.3	148.74			
					5	25.7	4.723	5.040						806.8	145.23			
STOCK	"	288	1	2	1	2.55	38.40	4.754	1.141	5.79	5.11	6.750	9.2	9.27	69.52	125.14	7	
					2	39.40	4.889	1.171	5.94	4.96	6.926	9.4	7.19	713.4	128.41			
					3	44.53	5.537		6.73	5.62	7.845	10.6	8.14	808.0	145.44			
					4	42.92	5.738							828.8	149.18			
					5	30.2	4.152	5.536						803.8	144.68			
"	"	394	1	2	1	4.08	43.49	4.156	1.087	5.39	5.19	6.670	10.2	10.83	68.31	122.96	27	
					2	45.34	4.333	1.133	5.62	4.95	6.954	10.6	7.50	712.2	128.20			
					3	51.13	4.887		6.34	5.58	7.842	12.0	8.46	803.2	144.58			
					4	49.82	5.018							822.7	148.09			
					5	47.8	4.778							783.3	141.00			

COAL RESOURCES OF OHIO

Township	Seam	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis				Heat value		Year	
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories		B. t. u.
PERRY COUNTY																	
BEARFIELD	MIDDLE KITTANNING	458	1	2	1	590	3658	4742	1010	496	526	6543	122	1303	6686	12035	2
					2	3887	5040	1073	527	490	6953	129	828	7105	12789		
					3	4354	5646		590	549	7788	145	928	7959	14326		
CLAYTON	"	457	1	2	1	672	3830	4834	664	243	561	6845	129	1558	6903	12425	2
					2	4107	5182	711	260	522	7338	139	1030	7400	13320		
					3	4421	5579		280	562	7899	150	1109	7966	14340		
"	"	553 A	1	3	1	529	3993	3883	1595	172					6327	11389	51
					2	4216	4100	1684	182					6680	12025		
					3	5070	4930		219					8033	14460		
"	"	553 B	1	3	1	512	3466	3913	2109	124					5821	10478	51
					2	3653	4124	2223	131					6135	11043		
					3	4697	5303		168					7889	14200		
"	"	553 C	1	3	1	575	3354	3611	2450	317					5464	9834	51
					2	3559	3831	2610	336					5797	10434		
					3	4816	5184		455					7844	14119		
"	"	553 D	1	3	1	802	4596	5404							8152	14673	51
					2	4227	4971		179					7498	13497		
					3	3452	3896	2109	179					5811	10461		
"	"	553 K	1	3	1	540	3566	3826	2068	198					5856	10541	51
					2	3770	4044	2186	209					6190	11142		
					3	4825	5175		267					7922	14259		
"	"	602 A1	1	3	1	320	4385	4574	721	465					7067	12722	53
					2	4530	4725	745	480					7301	13143		
					3	4895	5105		519					7889	14201		
"	"	602 A2	1	3	1	270	4119	5104	507	180					7280	13105	53
					2	4233	5246	521	185					7482	13469		
					3	4466	5534		195					7893	14209		
"	"	602 A3	1	3	1	280	3717	4047	1956	155					6072	10931	53
					2	3824	4154	2012	159					6247	11246		
					3	4787	5213		199					7820	14079		
"	"	602 A9	1	3	1	320	4018	4577	1085	268					6761	12170	53
					2	4151	4728	1121	277					6985	12572		
					3	4675	5325		312					7867	14159		
"	"	602 B1	1	3	1	372	4056	3661	1911	1182					5909	10636	53
					2	4213	3802	1985	1228					6137	11047		
					3	5256	4744		1532					7657	13783		
"	"	602 B2	1	3	1	454	4004	4136	1396	379					6355	11439	53
					2	4199	4357	1464	397					6664	11996		
					3	4919	5081		465					7807	14053		
"	"	602 B3	1	3	1	304	3091	3093	3512	185					4721	8499	53
					2	3188	3190	3622	191					4869	8765		
					3	4998	5002							7634	13743		
"	"	602 B9 ²⁰¹	1	3	1	395	3871	3744	1990	707					5874	10575	53
					2	4030	3898	2072	737					6116	11010		
					3	5083	4917		928					7714	13887		
HARRISON	"	454	1	2	1	640	3800	4802	758	272	549	6806	126	1489	6867	12361	2
					2	4060	5150	810	290	511	7271	135	983	7337	13206		
					3	4418	5582		316	566	7911	147	1070	7984	14370		
"	"	709	1	2	1	709	4019	5272							7520	13536	

Township	Seam	File number	Kind	Source	Condition	Proximate analysis			Ultimate analysis					Heat value		Year	
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories		B. t. u.
PERRY COUNTY (CON.)																	
HARRISON	MIDDLE KITTANNING	455	1	2	1	570	3883	4702	845	358	537	6777	118	1385	6851	12332	2
					2	4118	4986	896	358	503	7187	125	931	7265	13077		
					3	4523	5477		353	553	7894	137	1023	7980	14364		
					4	4418	5582							8110	14598		
					5	640	4135	5225						7591	13664		
"	"	456	1	2	1	721	3750	4993	526	234	560	6977	126	1577	7008	12614	2
					2	4052	5381	567	252	517	7519	136	1009	7553	13595		
					3	4296	5704		267	548	7971	144	1070	8007	14412		
					4	4223	5777							8091	14563		
					5	775	3896	5329						7463	13433		
MONROE	UPPER FREEPORT	490	1	2	1	542	4174	4679	605	270					6971	12547	29
					2	4413	4948	639	285					7368	13263		
					3	4714	5286		304					7871	14168		
					4	4641	5359							7963	14334		
					5	589	4368	5043						7497	13494		
"	MIDDLE KITTANNING	450	1	2	1	679	3545	5185	591	100	549	7030	130	1600	6983	12569	2
					2	3804	5552	634	107	508	7542	139	1070	7492	13485		
					3	4051	5939		114	542	8054	148	1142	7999	14398		
					4	4009	5991							8061	14510		
					5	730	3715	5555						7473	13452		
"	"	487	1	2	1	650	4062	4520	758	260					6871	12367	30
					2	439	4939	812	278					7356	13241		
					3	4733	5267		303					8006	14411		
					4	4652	5348							8114	14606		
					5	750	4312	4958						7522	13539		
PIKE	"	123 A	1	1	1	887	3932	4781	400	174							5
					2	4315	5246	439	192								
					3	4513	5487		201								
					4	4462	5538										
					5	936	4044	5020									
"	"	123 B	1	1	1	82	3858	4655	585	300					6849	12328	5
					2	4236	5122	642	329					7520	13536		
					3	4527	5473		352					8036	14465		
					4	4441	5559							8141	14653		
					5	969	4011	5020						7351	13232		
"	"	452	1	2	1	525	3885	4604	986	343	538	6605	118	1410	6773	12191	2
					2	4100	4859	1041	362	507	6971	124	995	7148	12866		
					3	4576	5424		404	566	7781	138	1111	7979	14361		
					4	4462	5538							8122	14620		
					5	600	4195	5205						7634	13742		
"	"	453 A	1	2	1	700	3712	4893	695	233	558	6829	126	1559	6880	12384	2
					2	3991	5262	747	251	516	7343	135	1008	7358	13316		
					3	4333	5687		271	558	7936	146	1089	7995	14391		
					4	4233	5769							8093	14567		
					5	757	3907	5326						7472	13449		
"	"	453 B	1	1	1	48	437	467	48	25	57	716	14	140	7239	13030	28
					2	459	491	50	26	55	752	14	103	7600	13680		
					3	483	517		28	58	792	15	107	8006	14410		
					4	478	522							8089	14560		
					5	51	453	495						7672	13810		
"	LOWER KITTANNING	302	1	2	1	674	3705	4909	712	258	547	6834	124	1525	6885	12393	2
					2	3973	5264	753	277	506	7328	133	993	7382	13288		
					3	4301	5699		300	548	7933	144	1075	7992	14386		
					4	4212	5788							8096	14572		
					5	742	3900	5358						7496	13493		
"	"	303	1	2	1	685	3522	4777	1016	472	526	6478	122	1386	6591	11864	2
					2	3781	5128	1091	507	483	6954	131	834	7075	12735		
					3	4244	5756		569	542	7806	147	936	7941	14295		
					4	4086	5914							8117	14610		
					5	793	3752	5445						7474	13453		
SALT CREEK	MIDDLE KITTANNING	124 A	1	1	1	1078	3486	4823	613	111					6663	11993	5
					2	3907	5406	687	124					7468	13442		
					3	4195	5805		133					8019	14434		
					4	4135	5822							8089	14560		
					5	1152	3657	5181						7149	12868		
"	"	124 B	1	1	1	979	3574	4846	601	143						5	
					2	3952	5372	656	159								
					3	4245	5755		170								
					4	4193	5817										
					5	1056	3741	5203									
"	"	451	1	2	1	776	3350	5127	747	145	546	6830	118	1614	6772	12190	2
					2	3632	5558	810	157	489	7404	128	1002	7342	13216		
					3	3952	6048		171	543	8057	139	1090	7989	14381		
					4	3877	6123							8074	14534		
					5	851	3547	5602						7387	13296		

COAL RESOURCES OF OHIO

Township	Seam	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis				Heat value		Year	
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories		B. t. u.
PORTAGE COUNTY																	
DEERFIELD	SHARON	115 A	1	4	1	74	369	494	63	15	56	702	13	151	7000	12600	43
					2		399	533	68	17	51	758	14	92	7561	13610	
					3		428	572		18	55	814	15	98	8111	14600	
					4		421	579							8189	14740	
					5	80	388	532							7533	13560	
"	"	115 B	1	4	1	89	339	498	74	16	55	682	14	159	6778	12200	43
					2		373	546	81	17	50	749	15	88	7439	13390	
					3		405	594		19	54	815	16	96	8094	14570	
					4		397	603							8189	14740	
					5	98	358	544							7389	13300	
PALMYRA	"	220	1	2	1	1519	3449	4753	279	62	623	6733	96	2207	6687	12036	26
					2		4067	5604	329	73	535	7939	113	1011	7884	14192	
					3		4205	5795		75	553	8210	117	1045	8152	14675	
					4		4177	5823							8188	14738	
					5	1572	3520	4908							6901	12422	
SCIOTO COUNTY																	
BLOOM	CLARION	360	1	2	1	680	3792	4594	934	345	533	6530	123	1535	6577	11839	1
					2		4059	4929	1002	370	491	7006	132	999	7057	12703	
					3		4522	5478		411	546	7786	147	1110	7829	14118	
					4		4407	5593							7981	14365	
					5	773	4066	5161							7364	13255	
"	UPPER MERCER	283	1	2	1	1022	4082	4559	327	91	539	6928	153	1962	6894	12409	28
					2		4546	5090	354	101	473	7716	170	1176	7679	13822	
					3		4718	5282		105	491	8008	176	1220	7969	14344	
					4		4687	5313							8010	14418	
					5	1055	4188	4747							7157	12883	
"	BEAR RUN	383	1	2	1	1044	3620	4484	852	103					6352	11434	28
					2		1042	5007	951	115					7092	12767	
					3		4457	5533		127					7837	14109	
					4		4400	5600							7925	14265	
					5	1157	3891	4952							7008	12615	
VERNON	BROOKVILLE	377	1	2	1	903	3794	4417	886	335					6417	11551	28
					2		4171	4855	974	368					7054	12697	
					3		4621	5379		408					7815	14067	
					4		4512	5488							7949	14308	
					5	1019	4052	4929							7139	12850	
STARK COUNTY																	
CANTON	BROOKVILLE	376	1	2	1	518	3990	4352	1130	362	521	6529	119	1339	6593	11867	26
					2		4209	4601	1190	382	490	6888	126	924	6953	12515	
					3		4778	5222		434	556	7818	143	1049	7892	14205	
					4		4657	5343							8051	14491	
					5	604	4376	5020							7566	13619	
LAWRENCE	SHARON	219	1	2	1	656	4009	4972	363	87					7336	13205	26
					2		4290	5321	389	93					7850	14130	
					3		4454	5556		97					8168	14702	
					4		4430	5570							8211	14780	
					5	686	4127	5187							7648	13767	
LEXINGTON	MIDDLE KITTANNING	449	1	2	1	599	3905	5014	482	361	556	7182	133	1286	7314	13165	7
					2		4154	5333	513	384	521	7639	141	802	7780	14016	
					3		4379	5621		405	549	8052	149	845	8201	14761	
					4		4287	5713							8309	14957	
					5	645	4011	5344							7773	13991	
NIMISHILLEN	"	448	1	2	1	565	3851	4576	1008	413	529	6692	119	1239	6868	12362	7
					2		4082	4850	1058	438	494	7093	126	781	7279	13102	
					3		4570	5430		490	553	7942	141	874	8149	14669	
					4		4441	5559							8317	14970	
					5	651	4151	5198							7776	13997	
SANDY	"	301 B ²¹	1	2	1	649	4026	4654	651	153					6942	12495	26
					2		4303	5367	707	207					7423	13362	
					3		4633	5434		223					7988	14379	
					4		4566	5434							8074	14534	
					5	707	4244	5049							7503	13506	
"	"	446	1	2	1	656	3624	4888	822	256	537	6894	120	1361	6977	12559	7
					2		3882	5237	881	285	496	7386	128	824	7475	13455	
					3		4257	5743		313	544	8099	140	904	8197	14759	
					4		4158	5842							8318	14972	
					5	743	3850	5407							7699	13859	

Township	Seam	File number	Kind	Source	Condition	Proximate analysis			Ultimate analysis					Heat value		Year				
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories		B. i. u.			
STARK COUNTY (CON.)																				
SANDY	LOWER KITTANNING	301 A ²¹	1	2	1	381	4434	4580	605	344						7268	13083	26		
					2	4609	4751	630	358										7556	13601
					3	4919	5081												8064	14515
					4	4840	5160												8174	14713
					5	4639	4945												7833	14099
TUSCARAWAS	MIDDLE MERCER	285	1	2	1	354	4038	4235	1373	245	517	6382	87	1396	6401	11521	26			
					2	4186	4391	1423	254	494	6617	90	1122	6636	11944					
					3	4880	5120		296	576	7715	105	1308	7737	13926					
					4	4770	5230							7887	14197					
					5	422	4570	5008						7554	13598					
"	SHARON	218	1	2	1	529	4226	4857	378	76	562	7255	108	1621	7152	12874	26			
					2	4462	5138	400	79	531	7660	114	1216	7551	13593					
					3	4648	5352		82	553	7979	119	1267	7866	14159					
					4	4618	5322							7906	14230					
					5	554	4362	5084						7467	13441					
TUSCARAWAS COUNTY																				
AUBURN	MIDDLE KITTANNING	444	1	2	1	430	4007	4800	763	397	541	6939	128	1232	7001	12602	2			
					2	4287	5016	797	415	515	7251	134	888	7316	13169					
					3	4350	4480		451	560	7878	146	965	7950	14304					
					4	4441	5559							8081	14546					
					5	480	4228	5292						7693	13847					
BUCKS	"	443	1	2	1	519	4079	4815	597	355	559	7012	136	1351	7122	12820	2			
					2	4302	5079	619	374	529	7395	143	940	7512	13522					
					3	4586	5414		399	564	7883	152	1002	8008	14414					
					4	4496	5504							8118	14612					
					5	556	4242	5192						7659	13786					
CLAY	"	442	1	2	1	341	3973	4748	938	488	523	6877	130	1044	6971	12548	2			
					2	4114	4915	971	505	502	7120	135	767	7217	12991					
					3	4556	5444		559	556	7886	150	849	7993	14388					
					4	4421	5579							8159	14687					
					5	391	4247	5362						7840	14112					
DOVER	"	440	1	2	1	494	3620	4956	950	419	514	6754	130	1233	6856	12341	2			
					2	3808	5193	999	441	483	7107	137	853	7214	12985					
					3	4231	5769		490	537	7896	152	925	8015	14426					
					4	4092	5908							8171	14708					
					5	565	3862	5573						7708	13875					
"	"	441	1	2	1	352	4065	5022	601	317	541	7213	128	1200	7297	13135	2			
					2	4172	5205	623	329	520	7476	133	919	7563	13613					
					3	4449	5551		351	555	7972	142	980	8065	14517					
					4	4353	5637							8169	14704					
					5	384	4195	5421						7856	14141					
FAIRFIELD	"	438	1	2	1	715	3834	4995	456	262	564	7129	123	1466	7194	12949	7			
					2	4109	5380	491	282	522	7678	132	895	7748	13946					
					3	4342	5658		297	549	8074	139	941	8148	14666					
					4	4270	5730							8234	14821					
					5	764	3943	5293						7605	13689					
"	"	439	1	2	1	456	3925	4987	622	328	548	7080	128	1294	7097	12775	2			
					2	4117	5231	652	344	521	7426	134	923	7444	13399					
					3	4404	5596		368	557	7945	143	987	7963	14334					
					4	4313	5687							8069	14525					
					5	509	4093	5398						7659	13786					
GOSHEN	"	437	1	2	1	351	4160	4720	769	456	545	7026	122	1082	7153	12875	2			
					2	4311	4892	797	473	524	7282	126	798	7413	13343					
					3	4684	5316		514	569	7913	137	867	8055	14499					
					4	4570	5430							8201	14761					
					5	394	4390	5216						7878	14180					
JEFFERSON	"	436	1	2	1	472	4030	4951	547	405	553	7108	132	1255	7199	12958	2			
					2	4230	5196	574	425	526	7460	138	877	7555	13599					
					3	4488	5512		451	558	7915	146	930	8015	14427					
					4	4389	5611							8131	14636					
					5	514	4163	5323						7714	13885					
LAWRENCE	"	445	1	2	1	469	3957	4668	906	470	530	6759	124	1211	6881	12386	2			
					2	4153	4897	950	494	501	7092	130	833	7220	12996					
					3	4589	5411		546	554	7836	144	920	7978	14360					
					4	4458	5542							8139	14650					
					5	535	4219	5246						7703	13866					
MILL	UPPER FREEPORT	318	1	2	1	632	3766	4948	654	291	526	7078	143	1308	6985	12573	25			
					2	4020	5282	698	311	487	7566	153	795	7456	13421					
					3	4322	5678		334	524	8123	164	855	8015	14428					
					4	4231	5769							8121	14617					
					5	692	3938	5370						7559	13606					
"	MIDDLE KITTANNING	435	1	2	1	378	3827	4953	842	323	526	7031	122	1096	7101	12782	2			
					2	3977	5148	875	398	503	7367	127	790	7380	13284					
					3	4358	5642		436	551	8008	139	866	8088	14558					
					4	4241	5759							8227	14809					
					5	4061	5513							7877	14179					

COAL RESOURCES OF OHIO

Township	Seam	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis					Heat value		Year	
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calo-ries	B. t. u.		
																		1
TUSCARAWAS COUNTY (CON.)																		
RUSH	UPPER FREEPORT	317	1	2	1	638	3969	4702	691	313	535	6942	139	1380	7005	12609	25	
						2	4239	5022	739	334	496	7415	148	868	7482	13468		
						3	4577	5423			361	536	8006	160	937	8079		14543
						4	4487	5513								8194		14749
						5	703	4171	5126							7618		13712
SALEM	MIDDLE KITTANNING	434	1	2	1	345	4002	4886	767	522	530	7002	126	1053	7135	12843	2	
						2	4145	5061	794	541	509	7252	130	774	7390	13302		
						3	4502	5498			588	553	7877	141	841	8027		14449
						4	4370	5630								8185		14733
						5	388	4201	5411							7868		14162
SANDY	"	433	1	2	1	492	3813	4991	704	291	540	7045	128	1292	7082	12748	2	
						2	4030	5250	740	306	511	7410	134	899	7448	13406		
						3	4330	5670			330	552	8002	145	971	8043		14477
						4	4238	5762								8152		14673
						5	542	4099	5449							7711		13880
"	LOWER KITTANNING	562 A	1	1	1	551	3625	4942	872	289						6		
						2	3840	5236	924	306								
						3	4231	5759			357							
						4	4125	5875										
						5	630	3855	5505									
"	"	562 B	1	1	1	446	3989	4711	854	373						6		
						2	4175	4931	894	390							7136	12845
						3	4585	5415			428						7469	13444
						4	4476	5524									8202	14764
						5	503	4230	5247								8346	15022
"	"	562 C	1	2	1	530	3873	4886	771	325	546	6975	118	1265	7168	12902	7	
						2	4090	5096	814	343	514	7366	125	838	7569	13644		
						3	4452	5548			373	560	8019	136	912	8240		14831
						4	4352	5648								8567		15061
						5	590	4095	5315							7874		14173
UNION	MIDDLE KITTANNING	114 A	1	1	1	54	402	478	66	25						31		
						2	425	505	70	26							7150	12870
						3	457	543			28						7558	13605
						4	448	551									8127	14629
						5	59	423	518								8222	14800
"	"	114 B	1	1	1	47	411	474	68	29						31		
						2	431	498	71	30							7194	12950
						3	464	536			32						7549	13589
						4	456	544									8127	14628
						5	52	432	516								8239	14830
"	"	114 K	1	1	1	51	406	476	67	27	56	718	13	119	7189	12940	31	
						2	428	502	70	28	52	756	14	80	7572	13630		
						3	460	540			31	56	814	15	84	8150		14670
						4	452	548								8256		14860
						5	56	427	517							7794		14030
"	"	432	1	2	1	381	3871	5147	601	324	541	7230	136	1168	7306	13451	2	
						2	4024	5351	625	336	519	7516	141	863	7595	13671		
						3	4282	5708			358	554	8017	150	921	8101		14582
						4	4201	5799								8207		14773
						5	415	4027	5558							7867		14160
WARWICK	"	431	1	2	1	410	4164	4905	521	325	557	7245	142	1210	7331	13196	2	
						2	4342	5115	543	338	534	7555	148	882	7644	13759		
						3	4591	5403			357	565	7989	156	933	8063		14549
						4	4512	5488								8182		14727
						5	443	4312	5245							7821		14077
YORK	"	430	1	2	1	318	4356	4633	693	412	350	7113	128	1104	7305	13149	2	
						2	4499	4785	716	425	322	7346	132	849	7545	13581		
						3	4846	5154			458	573	7913	142	914	8127		14628
						4	4750	5250								8259		14866
						5	352	4593	5065							7967		14341
VINTON COUNTY																		
BROWN	MIDDLE KITTANNING	426	1	2	1	858	4053	4036	1053	407	555	6297	133	1555	6322	11379	25	
						2	4433	4453	1152	445	503	6888	145	867	6915	12447		
						3	5010	4990			503	568	7785	164	980	7815		14068
						4	4891	5109								7979		14363
						5	993	4406	4601							7187		12936
"	"	427	1	2	1	783	4171	4473	573	266	574	6868	153	1566	6779	12202	25	
						2	4525	4853	622	289	528	7451	166	944	7355	13239		
						3	4825	5125			308	563	7945	177	1007	7843		14117
						4	4755	5245								7934		14281
						5	848	4352	4800							7261		13069
"	"	428	1	2	1	989	3814	4358	852	325	559	6456	147	1674	6387	11496	25	
						2	4232	4836	932	361	498	7165	163	881	7088	12758		
						3	4667	5323			398	549	7901	180	972	7816		14069
						4	4563	5437								7945		14301
						5	1109	4057	4834							7063		12713

Township	Seam	File number	Kind	Source	Condition	Proximate analysis			Ultimate analysis					Heat value		Year	
						Mois-ture	Vola-tile	Fixed carbon	Ash	Sulphur	Hydro-gen	Carbon	Nitro-gen	Oxygen	Calo-ries		B. t. u.
VINTON COUNTY (CON.)																	
BROWN	MIDDLE KITTANNING	429	1	2	1	832	3946	4352	870	338	553	6542	138	1559	6502	11704	25
						3	4304	4747	949	369	503	7136	150	893	7092	12766	
						4	4755	5245		408	556	7883	166	987	7836	14105	
						5	4652	5348							7968	14343	
							938	4215	4847						7221	12998	
ELK	CLARION	359	1	2	1	495	3917	4656	932	353	540	6717	130	1328	6914	12445	1
						2	4121	4898	981	371	510	7067	137	934	7274	13093	
						3	4569	5431		411	565	7836	152	1036	8065	14517	
						4	4457	5543							8208	14774	
						5	563	4206	5231						7746	13943	
"	WINTERS	201	1	2	1	669	3556	4395	1380	134	498	6404	121	1463	6250	11251	22
						2	3811	4710	1479	144	454	6863	130	930	6698	12058	
						3	4472	5528		169	533	8054	153	1091	7861	14151	
						4	4367	5633							8000	14400	
						5	793	4021	5186						7366	13258	
"	BROOKVILLE	374	1	2	1	695	3849	4581	875	184	494	6803	123	1521	6684	12031	22
						2	4136	4924	940	198	448	7311	132	971	7183	12930	
						3	4565	5435		219	494	8069	146	1072	7928	14272	
						4	4486	5514							8031	14456	
						5	776	4139	5085						7408	13334	
"	"	375	1	2	1	608	3675	4477	1240	165	483	6645	116	1351	6460	11628	22
						2	3913	4767	1320	176	442	7075	123	864	6878	12381	
						3	4508	5492		203	509	8151	142	995	7924	14264	
						4	4408	5592							8056	14501	
						5	709	4096	5195						7484	13472	
"	QUAKERTOWN	171	3	4	1	666	3440	5400	494	128					7462	13431	27
						2	3686	5785	529	137					7994	14389	
						3	3892	6108		145					8441	15193	
						4	3867	6133							8506	15301	
						5	709	3564	5787						7903	14226	
"	"	224	1	2	1	1112	3690	4642	556	58	575	6734	152	1925	6623	11921	25
						2	4152	5222	626	65	509	7577	171	1052	7452	13413	
						3	4429	5571		69	543	8084	182	1122	7950	14309	
						4	4388	5612							8003	14406	
						5	1187	3867	4946						7053	12695	
HARRISON	"	223	1	2	1	1138	3879	4573	410	86	578	6735	152	2039	6553	11795	25
						2	4377	5160	463	97	510	7600	172	1158	7394	13310	
						3	4589	5411		102	535	7969	180	1214	7753	13956	
						4	4553	5447							7799	14038	
						5	1197	4008	4795						6866	12358	
MADISON	CLARION	357	1	2	1	502	3990	4611	897	332	548	6792	133	1298	6960	12528	1
						2	4201	4855	944	350	518	7151	140	837	7328	13190	
						3	4639	5361		386	572	7896	155	991	8092	14565	
						4	4535	5465							8228	14810	
						5	567	4278	5155						7762	13971	
"	"	358	1	2	1	480	4056	4221	1243	351	496	6556	121	1233	6567	11821	22
						2	4260	4454	1306	369	465	6887	127	846	6898	12417	
						3	4900	5100		424	535	7922	146	973	7934	14282	
						4	4779	5221							8103	14586	
						5	567	4508	4925						7643	13758	
"	WINTERS	200	1	2	1	606	3874	4638	882	181	512	6854	125	1446	6750	12151	22
						2	4124	4937	939	192	474	7296	133	966	7185	12935	
						3	4551	5449		212	523	8052	147	1066	7930	14275	
						4	4473	5527							8032	14458	
						5	677	4170	5153						7488	13479	
"	BROOKVILLE	373	1	2	1	437	3799	4404	1360	201	485	6601	121	1232	6474	11654	22
						2	3973	4605	1422	210	456	6903	127	882	6771	12187	
						3	4632	5368		245	532	8047	148	1028	7893	14207	
						4	4522	5478							8040	14472	
						5	519	4287	5194						7622	13720	
SWAN	CLARION	356	1	2	1	490	3916	4579	1015	425	540	6626	123	1271	6845	12321	2
						2	4118	4815	1067	447	511	6967	129	879	7198	12956	
						3	4610	5390		500	572	7800	144	984	8058	14504	
						4	4480	5520							8223	14802	
						5	565	4227	5208						7759	13966	
VINTON	"	354	1	2	1	502	4031	4652	815	287	549	6852	128	1369	6961	12530	99
						2	4244	4898	858	302	519	7214	135	972	7329	13192	
						3	4642	5358		330	568	7891	148	1063	8017	14430	
						4	4552	5448							8134	14641	
						5	560	4297	5143						7678	13821	
"	"	355	1	2	1	461	4135	4294	1110	528	536	6491	130	1205	6760	12168	99
						2	4335	4501	1164	554	508	6805	136	833	7087	12756	
						3	4906	5094		627	575	7701	154	943	8021	14436	
						4	4764	5236							8216	14789	
						5	542	4506	4952						7771	13987	
WILKESVILLE	"	119 A	1	1	1	679	4001	4554	766	334					6952	12514	5
						2	4292	4886	822	368					7458	13424	
						3	4676	5324		390					8126	14626	
						4	4580	5420							8253	14856	
						5	755	4235	5010						7631	13736	

COAL RESOURCES OF OHIO

Township	Seam	File number	Kind	Source	Condition	Proximate analysis				Ultimate analysis					Heat value		Year
						Moisture	Volatile	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen	Calories	B. t. u.	
VINTON COUNTY (CON.)																	
WILKESVILLE	CLARION	119 B	1	1	1	738	4160	4486	616	277							5
					2		4492	4843	665	269							
					3		4812	5188		320							
					4		4737	5263									
					5	804	4356	4840									
"	"	352	1	2	1	452	4010	4653	885	423	544	6717	128	1303	6904	12427	99
					2		4200	4873	927	443	517	7035	134	944	7231	13015	
					3		4629	5371		488	570	7754	148	1040	7970	14345	
					4		4510	5490							8118	14612	
					5	513	4278	5209							7702	13863	
"	"	353	1	2	1	472	3988	4419	1121	416	536	6504	128	1295	6744	12139	99
					2		4186	4638	1176	437	508	6826	134	919	7078	12740	
					3		4744	5256		495	576	7736	152	1041	8021	14438	
					4		4614	5386							8194	14749	
					5	551	4360	5089							7743	13937	
WASHINGTON COUNTY																	
ADAMS	MEIGS CREEK	287	1	2	1	295	3747	4669	1289	555	505	6588	92	971	6803	12245	4
					2		3861	4811	1328	572	486	6788	95	731	7010	12617	
					3		4452	5548		660	560	7827	110	843	8083	14549	
					4		4273	5727							8303	14945	
					5	355	4122	5523							8008	14414	
"	"	496	1	2	1	272	4116	4457	1155	448	683	6707	104	903	6850	12330	29
					2		4231	4582	1187	461	671	6895	107	679	7042	12675	
					3		4801	5199		523	761	7825	121	770	7990	14382	
					4		4668	5332							8168	14702	
					5	320	4519	5161							7907	14232	
AURELIUS	"	286	1	2	1	340	3795	4907	958	503	531	6833	90	1085	7083	12749	7
					2		3928	5080	942	521	510	7073	93	811	7332	13198	
					3		4361	5639		578	566	7853	103	900	8139	14651	
					4		4212	5788							8317	14970	
					5	391	4048	5561							7991	14384	
LUDLOW	PITTSBURGH	502	2	1	1	22	381	459	138	57	49	662	10	84	6744	12140	48
					2		389	470	141	58	47	677	10	67	6894	12410	
					3		453	547		68	55	788	12	77	8028	14450	
					4		435	565							8253	14856	
					5	27	423	550							8036	14464	
"	"	503	2	1	1	100	315	445	140	19	49	577	10	205	5472	9850	48
					2		350	494	156	21	42	641	11	129	6078	10940	
					3		415	585		25	50	759	13	153	7201	12950	
					4		401	599							7341	13214	
					5	119	353	528							6464	11636	
SALEM	"	494	1	2	1	219	4106	4600	1075	519	491	6837	70	1008	6972	12550	29
					2		4198	4703	1099	530	477	6991	71	832	7128	12831	
					3		4716	5284		595	536	7454	80	935	8008	14445	
					4		4574	5426							8192	14746	
					5	256	4457	5287							7983	14369	
WAYNE COUNTY																	
FRANKLIN	BROOKVILLE	372	1	2	1	631	4264	4054	1001	328	555	6453	76	1587	6548	11787	99
					2		4576	4350	1074	352	514	6924	81	1055	7027	12649	
					3		5127	4873		394	576	7757	91	1182	7873	14171	
					4		5030	4970							8014	14426	
					5	779	4638	4583							7389	13301	

- Explanation of file numbers: A basic 6-digit sample number is used. Suffix 'A' through 'I' indicates samples taken at different points in the same location; 'K' denotes composite of these samples. Suffix '1' through '8' indicates samples taken vertically or in benches at same point; number '9' denotes composite of these samples. When samples have been taken vertically at one point only, letter suffix is not needed or used.
- Kind of sample: 1- channel (mine); 2- channel (outcrop); 3- column or core; 4- gross mine sample; 7- tippie.
- Source: 1- U.S. Bureau of Mines and/or U.S. Geological Survey; 2- Ohio Geological Survey; 3- Engineering Experiment Station, O.S.U.; 4- Special or miscellaneous.
- Condition: 1- as received; 2- moisture-free; 3- moisture- and ash-free; 4- dry unit coal; 5- moist unit coal.
- Condition 1 'air-dried'. Boghead coal.
- Not in composite 486-K.
- Sample wet; moisture probably 2% high.
- Condition 1 'air-dried'; composite (9) weighted average calculated upon thickness in 4 component units, 585 (1-4).
- Ultimate and calorific value tests made several weeks after preparation of sample; calories probably 100° high.
- Not in composite 170-K.
- Condition 1 'air-dried'; composite (9) total or average calculated upon thickness.
- No exact location or thickness available. Use as general purpose sample.
- Duplicate sample taken 15 days after 607-A.
- Duplicate sample taken 10 months after 604-B.
- Coal sample crushed to -60 mesh and stored for some time; probably somewhat weathered before B.t.u. determination.
- Not in composite 587-9.
- Not in composite 598-B-9.
- Not in composite 596-A-9.
- Equilibrated values available in files of Ohio Geological Survey.
- Average values calculated upon weight of individual sections.
- Sample from same mine on same date but from two separate seams.

APPENDIX C

LIST OF U. S. GEOLOGICAL SURVEY TOPOGRAPHIC QUADRANGLE MAPS ON WHICH COAL OUTCROPS HAVE BEEN PLOTTED ¹

BROOKVILLE (No. 4) COAL BED

Coshocton County Brinkhaven Conesville Coshocton Frazeytsburg Newcomerstown	Jackson County Jackson Wilkesville	Stark County Canton Dover Navarre
Hocking County Logan New Lexington Zaleski	Muskingum County Conesville Frazeytsburg Thornville Zanesville	Tuscarawas County Dover Navarre Newcomerstown Uhrichsville
Holmes County Brinkhaven Coshocton Millersburg Navarre Newcomerstown	Perry County Logan New Lexington Thornville Zanesville	Vinton County Jackson Laurelville Wilkesville Zaleski
		Wayne County Navarre

CLARION (No. 4a) COAL BED

Gallia County Bidwell	Jackson County Bidwell Jackson Oak Hill Wilkesville	Lawrence County Ironton Oak Hill
Hocking County Laurelville Zaleski		Vinton County Jackson Laurelville Wilkesville Zaleski

¹ - These maps are in open file and are available for examination in the office of the State Geologist. They are available at cost in photostat form. See Publication List of the Ohio Division of Geological Survey for prices and procedure for ordering.

LOWER KITTANNING (No. 5) COAL BED

Athens County	Holmes County	Perry County
Athens	Brinkhaven	Logan
New Lexington	Coshocton	New Lexington
Zaleski	Loudonville	Thornville
	Millersburg	Zanesville
Carroll County	Navarre	
Carrollton	Newcomerstown	Scioto County
Dover		Ironton
	Jackson County	Greenup
Columbiana County	Bidwell	Oak Hill
Alliance	Jackson	
Columbiana	Oak Hill	Stark County
Lisbon	Wilkesville	Alliance
Wellsville		Canton
	Jefferson County	Carrollton
Coshocton County	Steubenville	Dover
Brinkhaven	Wellsville	Navarre
Cambridge		
Conesville	Lawrence County	Tuscarawas County
Coshocton	Ceredo	Cambridge
Frazesburg	Ironton	Dover
Newcomerstown	Greenup	Navarre
	Oak Hill	Newcomerstown
		Uhrichsville
Gallia County	Mahoning County	
Bidwell	Alliance	Vinton County
Oak Hill	Columbiana	Wilkesville
Wilkesville	Lisbon	Zaleski
	Warren	
Guernsey County	Youngstown	Wayne County
Cambridge		Massillon
	Muskingum County	Millersburg
Hocking County	Conesville	Navarre
Athens	Frazesburg	
Logan	Philo	
New Lexington	Zanesville	
Zaleski		

MIDDLE KITTANNING (No. 6) COAL BED

Athens County	Hocking County	Morgan County
Athens	Athens	New Lexington
New Lexington	Logan	
Zaleski	New Lexington	Muskingum County
Chesterhill	Zaleski	Cambridge
		Conesville
Carroll County	Holmes County	Frazeyburg
Carrollton	Coshocton	Philo
Dover	Loudonville	Zanesville
	Millersburg	
Columbiana County	Navarre	Perry County
Alliance	Newcomerstown	Logan
Carrollton		New Lexington
Columbiana	Jackson County	Zanesville
Lisbon	Bidwell	
Wellsville	Oak Hill	Stark County
	Wilkesville	Alliance
Coshocton County		Canton
Brinkhaven	Jefferson County	Carrollton
Cambridge	Steubenville	Dover
Conesville	Wellsville	
Coshocton		Tuscarawas County
Frazeyburg	Lawrence County	Antrim
Newcomerstown	Athalia	Cambridge
	Bidwell	Dover
Gallia County	Ceredo	Navarre
Athalia	Ironton	Newcomerstown
Bidwell	Oak Hill	Uhrichsville
Oak Hill		
Wilkesville	Mahoning County	Vinton County
	Alliance	Wilkesville
Guernsey County	Columbiana	Zaleski
Antrim	Lisbon	
Cambridge		

UPPER FREEPORT (No. 7) COAL BED

Athens County
Athens
New Lexington
Wilkesville
Zaleski

Carroll County
Carrollton
Dover
Salineville
Scio
Uhrichsville

Columbiana County
Alliance
Carrollton
Columbiana
Lisbon
Salineville
Wellsville

Coshocton County
Cambridge
Conesville
Coshocton
Newcomerstown

Gallia County
Athalia
Bidwell
Oak Hill
Wilkesville

Guernsey County
Antrim
Cambridge
Cumberland

Harrison County
Antrim
Scio
Uhrichsville

Hocking County
Athens
Logan
New Lexington
Zaleski

Jackson County
Bidwell
Oak Hill
Wilkesville

Jefferson County
Salineville
Steubenville
Wellsville

Lawrence County
Athalia
Bidwell
Ceredo
Ironton
Oak Hill

Meigs County
Wilkesville

Morgan County
New Lexington
Philo
Zanesville

Muskingum County
Cambridge
Conesville
Philo
Zanesville

Perry County
New Lexington
Zanesville

Stark County
Alliance
Carrollton
Dover

Tuscarawas County
Antrim
Cambridge
Dover
Navarre
Newcomerstown
Uhrichsville

Vinton County
Wilkesville
Zaleski

REDSTONE (No. 8a) COAL BED

Meigs County
Keno
Point Pleasant
Pomeroy
Ravenswood

Athens County
Pomeroy

Lawrence County
Athalia
Guyandot

Gallia County
Athalia
Glenwood
Point Pleasant
Pomeroy

PITTSBURGH (No. 8) COAL BED

Athens County
Athens
Chesterhill
Pomeroy

Belmont
Clarrington
Flushing
St. Clairsville
Wheeling
Woodsfield

Carroll County
Cadiz

Gallia County
Athalia
Glenwood
Point Pleasant
Pomeroy

Guernsey County
Antrim
Cumberland
Flushing
Summerfield

Harrison County
Antrim
Cadiz
Flushing
Scio
St. Clairsville

Jefferson County
Cadiz
St. Clairsville
Steubenville
Wellsville
Wheeling

Lawrence County
Athalia

Meigs County
Point Pleasant
Pomeroy
Ravenswood

Monroe County
Clarrington
Macksburg
New Martinsville
Summerfield

Morgan County
Athens
Chesterhill
McConnelsville
Philo

Muskingum County
Cumberland
Philo

Noble County
Caldwell
Cumberland
Macksburg
Summerfield
Woodsfield

Washington County
Caldwell
Chesterhill
Macksburg
Marietta
New Matamoras

MEIGS CREEK (No. 9) COAL BED

Athens County
Chesterhill

Belmont County
Clarington
Flushing
St. Clairsville
Woodsfield

Harrison County
Flushing
St. Clairsville

Jefferson County
St. Clairsville
Wheeling

Monroe County
Macksburg
New Matamoras
Summerfield
Woodsfield

Morgan County
Caldwell
Chesterhill
McConnelsville

Noble County
Caldwell
Cumberland
Macksburg
Summerfield

Washington County
Caldwell
Macksburg

WAYNESBURG (No. 11) COAL BED

Athens County
Chesterhill
Keno

Belmont County
Cameron
Clarington
Flushing
St. Clairsville
Wheeling
Woodsfield

Jefferson County
St. Clairsville
Wheeling

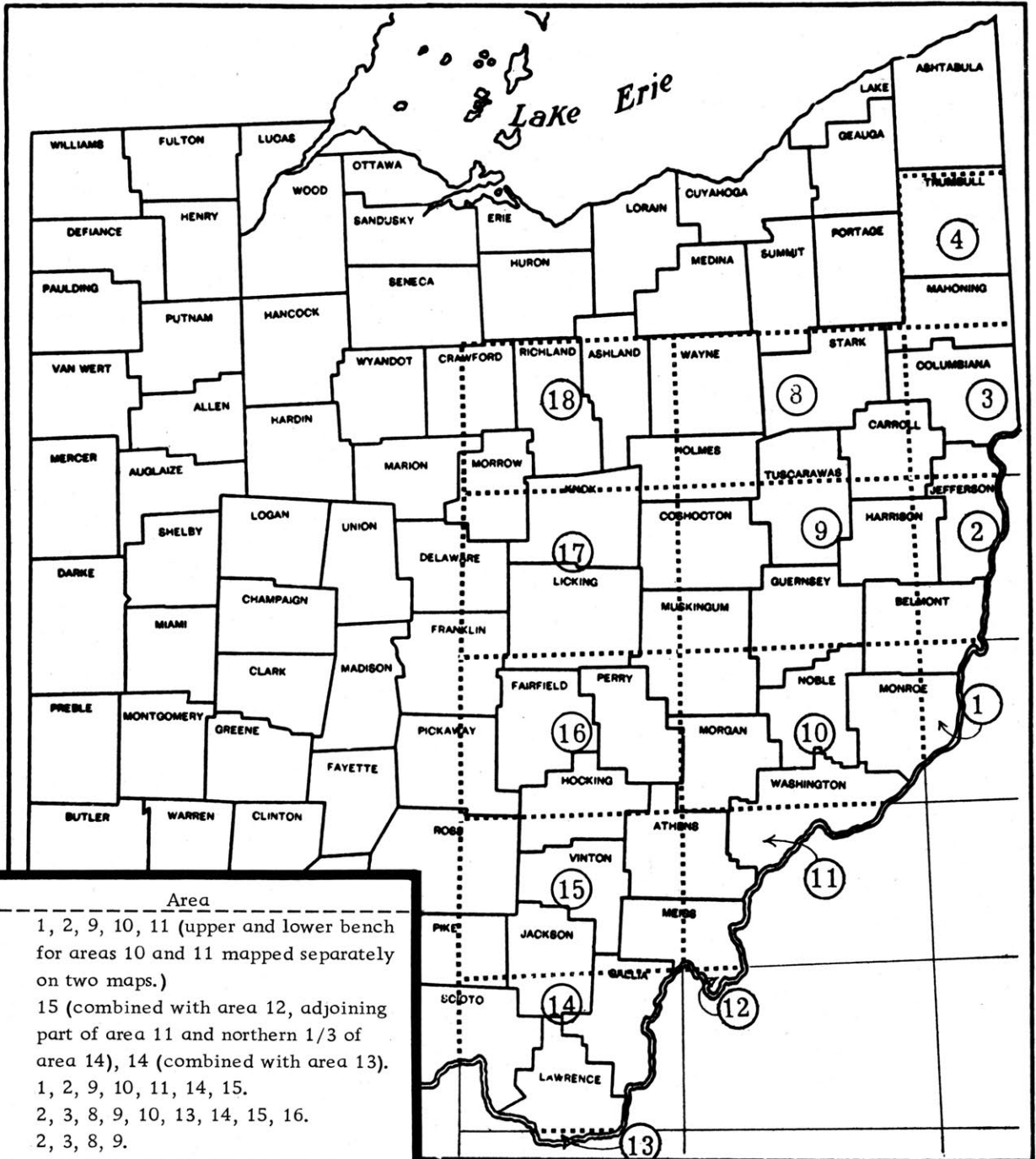
Meigs County
Keno
Ravenswood

Monroe County
Clarington
Macksburg
New Martinsville
New Matamoras
Summerfield
Woodsfield

Morgan County
Caldwell
Chesterhill
McConnelsville
Parkersburg

Noble County
Caldwell
Macksburg
Summerfield

Washington County
Belleville
Caldwell
Chesterhill
Macksburg
Marietta
New Matamoras
Parkersburg
St. Marys



Coal	Area
Meigs Creek # 9	1, 2, 9, 10, 11 (upper and lower bench for areas 10 and 11 mapped separately on two maps.)
Redstone # 8 A	15 (combined with area 12, adjoining part of area 11 and northern 1/3 of area 14), 14 (combined with area 13).
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