STATE OF ILLINOIS DEPARTMENT OF REGISTRATION AND EDUCATION



STRIPPABLE COAL RESERVES OF ILLINOIS

Part 4–Adams, Brown, Calhoun, Hancock, McDonough, Pike, Schuyler, and the southern parts of Henderson and Warren Counties

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ABSTRACT

Strippable coal is defined as coal 18 or more inches in thickness that has an overburden thickness of up to 150 feet. This report, one of a series concerning strippable coal reserves in Illinois, describes and evaluates the reserves in Adams, Brown, Calhoun, Hancock, McDonough, Pike, and Schuyler Counties and the southern parts of Henderson and Warren Counties. The counties considered in this report have a unique geographical position. They lie between the Mississippi and Illinois Rivers, and therefore, have the advantage of access to water transportation.

For the Colchester (No. 2) and the Springfield (No. 5) Coals, maps are on a scale of one-half inch to the mile and show the data used in estimating the strippable coal reserves. The map for each coal shows the outcrops, mined-out areas, structure contours, and thickness data of the coal. Isopach lines divide the overburden into thickness categories of 0 to 50, 50 to 100, and 100 to 150 feet. Primary and secondary reliability categories are used in estimating the reserves. Tonnage estimates, tabulated by township and county, are based on coal thickness classes for each overburden thickness and reliability of estimate category. The stratigraphic relations of the Pennsylvanian strata in the region are shown on two northsouth cross section diagrams.

Approximately 2 3/4 billion tons of strippable coal reserves have been estimated for these counties; about 4 percent of the total is No. 5 Coal, and 96 percent of the total is No. 2 Coal. Minor areas that possibly contain strippable coal reserves of these coals and also stratigraphically higher and lower coals are described, but no reserves estimates have been made for them.

INTRODUCTION

For convenience in preparing reports and maps of strippable coal reserves, Illinois has been divided into eight areas. The area encompassed by each part of the study is shown in figure 1. This report (Part 4) summarizes published and unpublished information pertaining to strippable coal reserves in the southern part of the western Illinois coal field and embraces all or portions of Adams, Brown, Calhoun, Hancock, Henderson, McDonough, Pike, Schuyler, and Warren Counties. In the southern part of Henderson and Warren Counties, only the Colchester (No. 2) Coal is included in this report. Other coals that occur in these two counties are considered in reports 5A and 5B. Areas 1 through 7 (fig. 1) include the limits of the Eastern Region of the Interior Coal Province, where the minable coals of the McCormick and Kewanee Groups crop out within the state. Part 8 concerns the central part of the state, where strippable coal reserves are restricted to locally minable coals of the McLeansboro Group.

Estimated reserves of approximately 2 3/4 billion tons of strippable coal are classified and mapped for the Colchester (No. 2) Coal (plate 1; table 1) and the Springfield (No. 5) Coal (fig. 6; table 2). In addition, small areas containing strippable coals that appear to be correlative with these two coals and also stratigraphically higher and lower coals are discussed. Because of the lack of reliable information, no reserve estimates were compiled for them. County averages, by coal seam, are given in table 3. Table 4 is a more detailed summary of these reserves by county, township, and thickness for each of the reliability categories.

Previous Investigations

Worthen (1866; 1868; 1870; 1873; 1883) first described the geology of the coal-bearing strata for the region of this report. Morse and Rich (in Morse and Kay, 1915) plotted the No. 2 Coal structure for parts of Schuyler, Brown, Adams, and Hancock Counties in order to help in their investigations for oil in this area. Hinds (1919) mapped the outcrop of the No. 2 Coal and projected its structure for the Colchester and Macomb Quadrangles. Savage (1921) and Savage and Nebel (1921) studied the areal extent and structure of the No. 2 Coal in the Avon, Good Hope, and LaHarpe Quadrangles. Currier (1922) used the No. 2 Coal in northeastern Adams County as one of the key horizons in constructing a structure map to aid in oil explorations.

Culver (1925a, 1925b) described coal stripping possibilities in Adams, Brown, Hancock, Schuyler, and Warren Counties and coal reserves for all of the counties in the area of this report. Cady (1937) recommended investigation of certain areas in western Illinois that might be suitable for strip mining. Although Cady and others (1952) estimated total coal reserves for most of the area of this report and discussed criteria for delimiting strippable coal, they did not differentiate strippable coal reserves from the total coal reserves in their computations.

Rubey (1952), in his study of the geology and mineral resources of the Hardin and Brussels Quadrangles mapped the approximate outcrop of the No. 2 Coal. The structure and areal extent of the No. 2 Coal in Adams, Brown, Schuyler, and Mc-Donough Counties were studied by Andrews (1957). Wanless (1957) described the geology and mineral resources in the portion of Schuyler County that lies within the limits of the Beardstown Quadrangle. He provided structure maps on the Colchester (No. 2) and Springfield (No. 5) Coals and briefly mentioned general areas where the coals could be strip mined.

STRIPPABLE COAL RESERVES OF ILLINOIS

Acknowledgments

The author is indebted to the mining companies operating in the area and the various individuals who have been most helpful in furnishing information regarding old mining operations in their localities. The author wishes to thank Mr. U. E. Williams of Golden Eagle for his field assistance in the southern part of Calhoun County.

Jack A. Simon, Head of the Coal Section of the Survey, has supervised the series of strippable coal reserve studies. W. H. Smith, senior author on parts 1, 2, 3, and 5 of this series of reports (fig. 1), gave many helpful suggestions for map and manuscript preparation. Mr. R. H. Heicke, Supervisor of the Statistical Service Unit of the University of Illinois, calculated the reserves and prepared the tabulations.

METHOD OF PREPARING RESERVE ESTIMATES

Sources of Information

In compiling the maps and coal reserve estimates, data were assembled from earlier published and unpublished reports and maps pertaining to the area. Informa-



Figure 1 - Index map showing boundary of the Pennsylvanian strata of Illinois, location of area of this report, published reports, reports in progress, and reports planned to complete the mapping of strippable coal reserves of the state.

tion from these sources was augmented by field notes and drill hole records in the Survey files. New data, primarily in the form of field observations, which were collected during work on this project, considerably altered the older maps in some areas.

Bedrock surface contour maps compiled by Horberg (1950) and modified in part by other workers were extremely useful in projecting the extent of coals concealed beneath glacial deposits.

Mined-out area information from previous studies includes all mining up to July 1, 1959.

Definition of Strippable Coal

Strippable coal reserve estimates are based primarily upon coal and overburden thicknesses. In these reports strippable coal reserves include coal seams that are 18 inches or more in thickness and that have an overburden of 150 feet or less.

Certain portions of the reserves will not be recoverable because they lie beneath limiting factors, such as towns, cities, and highways. The scale on which the coal is mapped, however, does not allow the omission of such nonrecoverable coal from the estimates.

Although 1,770 tons of coal per acre foot is probably a more realistic estimate for coals in Illinois, the tonnage estimates in this report, as in previous reports (Cady, 1952; Smith, 1957, 1958, 1961; Smith and Berggren, 1963), are based on an assumption of 1,800 tons of coal per acre foot. This latter figure is the one used by the United States Geological Survey in estimating reserves of high-volatile coal. The estimates are based on total coal in place, exclusive of mined-out areas, and no estimates of recoverable coal are presented.

Mapping of Coal Outcrops

The term "outcrop" is used broadly herein to describe the border of a coal whether it is exposed at the surface or concealed beneath unconsolidated surface materials.

The accuracy with which the outcrop boundaries of coal seams can be mapped depends on the number and distribution of visible outcrops, mines, and test holes; the nature of the topography; and the amount of unconsolidated material covering the area. The more plentiful the data, the easier it is to define the outer limit of the coal. Faults of very small displacement and other structural features, erosional cutouts, and areas in which the coal is lenticular or lacks persistence make it difficult to map the coal outcrop accurately.

Bedrock is covered by varying thicknesses of glacial drift and loess (windblown silt) throughout most of the area of this report. Wherever sufficient data were available, provisional lines were drawn to represent the edge of the coal beneath the unconsolidated deposits. These provisional outcrop lines have been derived from the contours of coal structure, bedrock surface, and surface topography. Additional drilling information will modify these provisional outcrop lines.

Overburden Categories

Isopach lines divide the overburden into three thickness categories: 0 to 50, 50 to 100, and 100 to 150 feet. Reserves tabulated in tables 1 through 4 show the amount of strippable coal in each of these categories. Although 100 feet of overbur-

den removal represents approximately the maximum limit of most strip mining in Illinois to date, strip mining has exceeded 100 feet in some places. Future economic and technologic factors that may influence the ultimate recovery of classified coal reserves are, however, beyond the scope of this report.

Isopach lines that delineate the various overburden thickness categories on the maps were constructed by interpreting intervals between contours of surface topography and coal elevation. Surface topography was obtained from United States Geological Survey topographic maps, published on a scale of 1:62,500. Coal structure data for the No. 2 (pl. 1) and No. 5 (fig. 2) Coals were obtained by revising earlier published and unpublished maps and reports in the light of new field investigations.

STRIPPABLE COAL RESERVES

Classification of Reserves

On the maps and tables of this report, coal reserves are divided into primary and secondary reserve classes to designate the reliability of estimate.

Class I - Primary Reserves

Class I reserves include coal in areas where there is enough information to establish its presence with reasonable certainty. This class ordinarily includes all coal within two miles of the last point of reliable information of coal thickness (mines, outcrops, diamond drill holes, and churn drill coal test holes). This is equivalent to the proved (Class I-A) and probable (Class I-B) categories for reserves in the statewide inventory of coal reserves compiled by Cady (1952). Where the available data indicate uncertainty regarding the persistence of the coal or marked variations in its thickness, the limits defined above have been reduced in appraising the area.

Class II - Secondary Reserves

Class II reserve estimates are based on projections of geologic knowledge from the Class I areas, outward into areas in which only scattered information is available from records of test holes drilled for oil, gas, or water, and in which data concerning coal thickness are not reliable enough to classify the coals as primary reserves. Ordinarily all coal included in this class is 2 miles or more beyond datum points that are used in delimiting the primary reserves. In areas adjacent to places where the coal is lenticular or erratic in its occurrence or where there is doubt regarding the continuity of the coal in the thickness indicated, the coal is included in the Class II reserves. This is done even though it lies within 2 miles of the last reliable thickness datum point and normally would be included with the Class I reserves.

The primary purpose for determining Class II reserves is to indicate areas where indirect evidence and geologic interpretation suggest that coal may be present at the thickness shown on the maps. In these areas, exploration for strippable coal reserves might be advantageous.

The Class II reserves of this report correspond to those classified by Cady (1952) as II-A (strongly indicated) and II-B (weakly indicated).

6

Thickness of Coal

Coal thickness is indicated on the maps (pl. 1, fig. 6) by isopach lines and average thickness categories. Where datum points were spaced closely enough to permit isopach lines to be drawn, they are shown. Over most of the area, however, it was not practical to construct isopach lines, and only estimated average coal thickness values are shown. Where convenient average thickness values have been divided along township boundaries; elsewhere, the boundary between average thickness categories is shown by line symbols. Average thickness values thus derived were used to calculate the coal tonnage within each of the overburden and reliability classifications delineated.



Figure 2 - Springfield (No. 5) Coal structure map.

STRIPPABLE COAL RESERVES OF ILLINOIS

In the study of minable coal reserves of Illinois by Cady and others (1952), lower thickness limits of 28 inches for underground mining and 24 inches for strip mining were used. Except for a lower thickness limit of 18 inches, the average thickness values and isopach intervals used in the strippable coal series are the same as those used in the 1952 study.

For some areas in the report, there are no reliable coal thickness data. However, there is enough information from records of oil or water test drilling to make a coal structure map and to classify the coal into the various overburden thickness categories outlined for this study.

Mined-out Coal

In 1948, work was begun on a series of coal data maps for Illinois. These maps were used for the coal reserve reports by Cady (1952), Smith (1957; 1958; 1961), Smith and Berggren (1963), and for the present study. Areas of mined-out coal in Illinois were included on the maps. This information has been revised by various individuals to show all known mining up to July 1, 1959. These mined-out areas are shown on plate 1 and figure 6 of this report.

In certain areas, coal reserves have been depleted by numerous small, local mines. There is no record of the area mined-out by most of these small operations. The locations of known local mines are shown on plate 1 and figure 6, except where they are too numerous to be shown conveniently. Mined-out areas, shown on the maps, have been excluded in computing the reserve tonnages. Until July 1, 1959, probably less than five square miles of coal had been mined-out for all the counties of this report. Since that time, approximately 2,895,000 tons have been mined, including about 2,712,000 tons produced by Key Mine, Peabody Coal Company, near Pleasantview.

Quality of the Coals

The quality of the coals described in this report is summarized in table 5, which lists the county average values for the various analytical properties of each coal. Most of these values have been obtained from reports of analyses of Illinois coals by Cady (1935, 1948). Analyses of samples taken in recent years have been incorporated into the tables.

For rank determination, at least three face channel samples are required from one or closely adjacent mines. The Calhoun County average is based on less than three samples, but the approximate quality of the coal is indicated. No analyses are available for Henderson, Pike, and Warren Counties.

GEOLOGY AND STRATIGRAPHY

The counties in this report comprise part of the western limit of the Eastern Region of the Interior Coal Province. Structurally, this area lies northwest of the deeper part of the Illinois Basin and is a part of the shelf area between the Lincoln Fold and the LaSalle Anticlinal Belt (fig. 3).

Erosion and deformation of the underlying Mississippian strata produced an irregular surface. The first Pennsylvanian sediments accumulated in the valleys and low areas of this pre-Pennsylvanian surface and thus did not blanket broad areas,

8



Figure 3 - Tectonic map showing the relation of the report area to regional structural features.

COMPOSITE FORMATION SECTION GROUP NAMED MEMBERS McLEANSBORO Feet **MODESTO** 0 Farmington Shale 25 Danville (No.7) Coal Pokeberry Limestone Brereton Limestone J 50 Herrin (No.6) Coal Canton Shale St. David Limestone Springfield (No.5) Coal Hanover Limestone Summum (No. 4) Coal ш CARBONDAL Pleasantview Sandstone Purington Shale KEWANEE Oak Grove Limestone Francis Creek Shale Colchester (No.2) Coal Browning Sandstone Abingdon Coal Isabel Sandstone Greenbush Coal SPOON Wiley Coal Seahorne Limestone DeLong Coal Brush Coal Hermon Coal Seville Limestone Rock Island (No.I) Coal Bernadotte Sandstone Pope Creek Coal Mc CORMICK BBOTT Tarter Coal Manley Coal ┛ Babylon Sandstone

Figure 4 - Composite section of Pennsylvanian strata in the area of this report. as did some of the later deposits. For this reason, the Rock Island (No. 1) Coal, other coals that occur below the No. 2 Coal, and additional sedimentary units vary in thickness from place to place and are not present in large parts of the area. As sedimentation continued, these lower areas were filled and the depositional surface became more level. By the time that Colchester (No. 2) Coal accumulated, deposition over the entire area was relatively uniform.

In Illinois, Pennsylvanian strata are classified into formations and groups on the basis of variations in their gross lithologic character (Kosanke et al., 1960). The nomenclature and correlation of coals in each formation represented in this area are discussed below with emphasis on the geological characteristics of the coals and their associated strata. Figure 4, a generalized stratigraphic column, is representative of the area of this study. Cross section diagrams (fig. 5) show the correlations of key Pennsylvanian members in the area.

McCormick Group

The McCormick Group includes strata between the top of the underlying Mississippian sediments and the top of the Bernadotte Sandstone Member. This group is subdivided into the Caseyville (lowermost) and Abbott Formations. The Caseyville Formation, which lies between the base of the Pennsylvanian and the top of the Pounds Sandstone Member, has not been recognized in this area.

Abbott Formation

The Abbott Formation constitutes the oldest known Pennsylvanian deposits in this area and occurs between the top of the Bernadotte Sandstone Member and the base of the Pennsylvanian strata. These rocks appear to be restricted to the eastern part of Schuyler County in outcrop and lie unconformably upon Mississippian strata. Three characteristically thin and







discontinuous coals, the Pope Creek, Tarter, and Manley Coal Members, occur in the Abbott Formation. Thickness variability, nonpersistent occurrence, and scarcity of data made it impossible to calculate reserve estimates for them. Along Mill Creek ($SE_4^1 NW_4^1 NE_4^1$ sec. 31, T. 2 N., R. 1 E., Schuyler County) the Pope Creek Coal Member varies from 16 to 30 inches in thickness and the Tarter Coal Member is about 2 feet thick. These coals have been observed with localized thicknesses of up to 3 feet in Fulton County, which is adjacent to a portion of the area of this report (Wanless, 1957).

Thick coal pockets of uncertain stratigraphic correlation, probably in sink holes in the Mississippian surface, have been reported from various localities in Pike, Adams, and Hancock Counties (Worthen, 1870; Culver, 1925b). Undoubtedly there are other pockets for which we have no record. In Pike County near Hadley, $(SE_4^1 NW_4^1 \text{ sec. 10, T. 4 S., R. 5 W.})$ one of these "pocket" coals, which was strip mined a number of years ago, had a reported thickness of 13 feet 8 inches. At this locality, the coal accumulated on the uneven pre-Pennsylvanian surface in a small basin, which had a diameter of about 200 to 250 yards.

In Adams County north of Mendon $(NW_4^1 NE_4^1 \sec. 36, T. 2 N., R. 8 W.)$, coal was strip mined from one of these pockets. The coal was reportedly from 3 to 9 feet thick and of rather poor quality. These coals are thicker than usual for the area and are either single coals or more than one coal. It is possible that they are older than any of the known coals from the Abbott Formation. Although examination of plant spores extracted from the coal would probably permit identification of the coal or coals present, no samples of the coal are now available (Kosanke, 1950).

Kewanee Group

The Kewanee Group includes all strata from the top of the Bernadotte Sandstone Member to the top of the Danville (No. 7) Coal Member and is divided into the Spoon Formation, which is the oldest, and the Carbondale Formation, which is the youngest.

Spoon Formation

The Spoon Formation includes all strata from the top of the Bernadotte Sandstone Member to the base of the Colchester (No. 2) Coal Member. The irregular surface and slope of the underlying rocks has controlled, to a certain extent, the deposition of the members of this formation. Its thickness ranges from a few inches to about 130 feet. The formation is thinnest in part of the western fringes of the area and thickest in northeastern McDonough County. In much of Warren, McDonough, and northeastern Schuyler Counties, the average thickness of the Spoon Formation is about 45 feet.

The Abingdon, Greenbush, Wiley, DeLong, Brush, Hermon, and Rock Island (No. 1) Coal Members are in the Spoon Formation. Usually these members are very thin and discontinuous, although locally they have been reported to be of minable thickness in nearby parts of Fulton County (Wanless, 1957). Available information indicates that these members are restricted in their occurrence in this report area to the eastern parts of McDonough and Schuyler Counties.

Rock Island (No. 1) Coal Member. - The No. 1 Coal, which is the lowermost of the coals in the Spoon Formation, is quite sporadic in its occurrence throughout the area of this report. It has been observed up to several inches thick in outcrop. Thicknesses of 2 to 3 feet have been reported from deep wells in Brown, McDonough, and Schuyler Counties. Its occurrence and stripping possibilities in southern Warren County will be included in Part 5B of the study of strippable coal reserves of Illinois. No. 1 Coal usually is found in elongated, lenticular bodies, which may represent old stream channels that have been partially filled. Because of a lack of data, no reserves estimates have been computed for No. 1 Coal in the area, since it has been observed and mined in adjacent areas, it seems desirable to note its mode of occurrence.

The Seahorne Limestone Member occurs in the upper part of the Spoon Formation and is an important stratigraphic marker in the area of its occurrence in Brown, McDonough, Schuyler, and Warren Counties. It is fossiliferous, dark bluish gray, and nodular. These nodules have a conglomeratic or brecciated appearance. Usually this limestone is relatively thin; however, it does attain a thickness of a little over 4 feet in eastern Schuyler County. Where it is thin, it commonly occurs as nodular limestone masses in a clay matrix.

Carbondale Formation

Strata from the base of the Colchester (No. 2) Coal Member to the top of the Danville (No. 7) Coal Member constitute the Carbondale Formation. Due to the very limited areal extent of the No. 7 Coal, there is only one known locality in this area where the total thickness of the formation can be ascertained. Along Mill Creek, near Pleasantview in Schuyler County, the Carbondale Formation is approximately 160 feet in thickness. The Danville (No. 7), Herrin (No. 6), and Summum (No. 4) Coal Members are very thin and nonpersistent in this area. The Springfield (No. 5) and the Colchester (No. 2) Coal Members are the important minable coals of this formation in the area of this report.

<u>Colchester (No. 2) Coal Member</u>. - The No. 2 Coal has the largest areal extent of all coals, not only in the area of this report, but also in the entire Eastern Region of the Interior Coal Province. Wanless (1955) correlated it with the Whitebreast (Iowa) and Croweburg (Missouri) Coals of the Western Region of the Interior Coal Province and tentatively correlated it with the Lower Kittaning Coal of the Appalachian Region of the Eastern Coal Province.

The type area of No. 2 Coal is in secs. 12 and 13, T. 5 N., R. 4 W., Mc-Donough County (Worthen, 1868; Wanless, 1956). This coal is named for the town of Colchester which is located in the type area. At one time in this vicinity, No. 2 Coal was mined extensively in conjunction with the clays and shales used in the brick and tile industry.

In the area of this report, the No. 2 Coal commonly averages from 24 to 30 inches in thickness. The interval between the No. 2 and No. 1 Coals, in the areas in which both are present, varies from about 18 feet in parts of Brown County up to 50 feet in eastern Schuyler and southeastern Warren Counties. In some parts of eastern McDonough County, the interval is about 80 feet. Along its western outcrop, the No. 2 Coal is separated from the underlying Mississippian limestones by less than 1 foot of underclay. In eastern McDonough County, the interval from the No. 2 Coal to the base of the Pennsylvanian has a maximum development of approximately 130 feet.

Wanless (1957) has examined the strata occurring above the No. 2 Coal and found them to be remarkably uniform over widespread areas of western Illinois. The Francis Creek Shale Member, a lenticular, nonpersistent, gray shale, may occur between the coal and the overlying black shale. Although locally this gray shale has a maximum thickness of about 30 feet, it usually ranges in thickness from a few

inches to 3 or 4 feet. In those areas where the Francis Creek Shale Member is absent, the black shale lies directly on the No. 2 Coal. Sheets of the black fissile shale commonly have distinctive pimply surfaces, due to a zone of small, gray, limy concretions. In some areas, large, dark gray to black, limy concretions, which may be up to 2 feet in thickness, occur at the base of the shale. This shale ranges from 1 to over 3 feet in thickness. It is persistent throughout the area of this report and is one of the best stratigraphic markers in the lower portion of the Carbondale Formation.

The Oak Grove Limestone Member consists of a remarkably persistent and distinctive series of thin shale and limestone units (Wanless, 1931; 1957). The composite thickness of the member ranges from a few inches to a little over 20 feet. Not all of these units are persistent throughout this area, but some are widespread. The basal siliceous limestone of the series is discontinuous and is commonly 1 foot thick or less, but along Mill Creek (sec. 31, T. 2 N., R. 1 E.), where it is cherty, it attains a thickness of 10 feet. The Oak Grove Limestone Member is overlain by the Purington Shale Member, a light to medium gray shale that contains flattened ironstone concretions. Although it is not well exposed in outcrops in this area, where present it probably has a thickness of up to 50 feet.

The Pleasantview Sandstone Member lies unconformably on the Purington Shale Member. It was named after the town of Pleasantview, Schuyler County, by Searight (1929). The type section is exposed east of Pleasantview, along Mill Creek (sec. 31, T. 2 N., R. 1 E.). This widely developed member occurs either as a sheet type sandstone, up to about 20 feet thick, or as a channel type sandstone, up to about 70 feet thick. These channels locally have been eroded through the underlying strata to the top of the No. 2 Coal; but none have been known to cut through the coal.

Summum (No. 4) Coal Member. - Although the No. 4 Coal is reported to be only a few inches thick in this area, it does attain minable thicknesses in adjacent areas. Where it is present in the area of this report, it is used as a stratigraphic marker. It lies about 105 feet above the No. 2 Coal.

A few feet of dark gray shale is present between the No. 4 Coal and the overlying Hanover Limestone Member. The Hanover Limestone Member is composed of dark bluish gray limestone masses in a light gray limestone matrix; this gives the unit a conglomeratic appearance. The limestone appears to attain its maximum thickness of about 4 feet near Pleasantview. It is not persistent and therefore does not constitute a good stratigraphic marker for most of this area.

Springfield (No. 5) Coal Member. - Stratigraphically, the No. 5 Coal occurs in the upper part of the Carbondale Formation. This coal lies from $6\frac{1}{2}$ to at least 11 feet above the No. 4 Coal. The coal normally ranges from about 90 to 110 feet above No. 2 Coal, although locally it lies up to 130 feet above. Although it is areally restricted in occurrence, it has been reported from three separate areas, which will be discussed in greater detail later in the report. The No. 5 Coal occurs for the most part in the Pleasantview-Rushville region, where it averages about 60 inches in thickness.

A fossiliferous, sheety, hard, black shale lies directly on top of the No. 5 Coal. The shale contains limy and phosphatic nodules and concretions (Wanless, 1957). In the area of this report, the thickness ranges from 1 foot to slightly over 2 feet. The St. David Limestone Member overlies the black shale and seems to be persistent within the outcrop area of No. 5 Coal. The thickness of this limestone varies considerably. Along Mill Creek, near Pleasantview, it reaches the maximum known thickness, slightly less than 6 feet. The Canton Shale Member lies above the St. David Limestone. The shale is bluish gray to gray, contains numerous flattened ironstone concretions, and probably is not more than about 10 feet thick in the area of its known development, near Pleasantview (Wanless, 1957, p. 106).

<u>Herrin (No. 6) Coal Member.</u> - In the area of this report, the No. 6 Coal has a maximum thickness of a few inches and is nonpersistent. It is restricted to small areas near Mt. Sterling, Pleasantview, and Golden Eagle. This coal is 15 to 20 feet above the No. 5 Coal. A preliminary examination of plant spores, isolated from samples of a coal exposed in Adams County near Kingston $(SW_4^1 SW_4^1 SW_4^1 sec. 25, T.$ 3 S., R. 6 W.), suggests that this coal may be correlated with the No. 6 Coal. Where the sample was taken, the coal was 21 inches thick with a glacial drift cover; elsewhere, however, it usually ranged in thickness from 12 to 16 inches, as observed in the outcrop. In the past, some of this thin coal has been mined at several localities, but the remainder of available data indicates that the coal is too thin to be classified in this reserve study.

A few inches of gray shale occur between the No. 6 Coal and the overlying Brereton Limestone Member. Although the limestone is very thin and discontinuous in distribution, it does have a distinctive fauna and thus is a good stratigraphic marker. It has a maximum thickness of about 1 foot in the Pleasantview-Rushville region. A limestone that is correlated with the Brereton Limestone is 3 to 4 feet thick in the southern part of Calhoun County. The type section of the Pokeberry Limestone Member is in the NW_4^1 sec. 26, T. 2 N., R. 1 E. It is restricted to the vicinity of Pleasantview where it is separated from the underlying Brereton Limestone Member by about 13 feet of shale, sandstone, and thin limestone bands (Wanless, 1957, p. 189). The Pokeberry Limestone is a bluish gray, dense, hard, fossiliferous limestone that has a conglomeratic or brecciated appearance and a very knobby upper surface. It ranges in thickness from about 18 inches to 2 feet.

Danville (No. 7) Coal Member. - The No. 7 Coal is the topmost member of the Carbondale Formation and the Kewanee Group. Data indicate that this coal is restricted to a small area northwest of Pleasantview, where it ranges from 1 to 4 inches in thickness and lies about 24 feet above the No. 6 Coal.

McLeansboro Group

The McLeansboro Group includes all Pennsylvanian strata above the Danville (No. 7) Coal Member. It is divided into the Modesto, Bond, and Mattoon Formations. Of these three, only the Modesto Formation is present in the area of this report.

Modesto Formation

Although this formation includes strata from the top of No. 7 Coal to the base of the Shoal Creek Limestone Member, only the lower part is present in this area. The formation is principally represented by shales that attain known thicknesses of about 25 feet. These shales appear to be restricted to the area near Pleasantview.

The No. 7 Coal is overlain by black shale that may be up to $2\frac{1}{2}$ feet in thickness. The lower part of the shale is soft, and the upper part is hard and slaty. Very small limestone concretions are found in the shale. In the vicinity of Pleasantview, soft red shale lies above the black shale. The red shale is up to 5 feet in thickness and constitutes an important marker for the upper units of the stratigraphic section in this area. The Farmington Shale Member overlies the red shale and appears to be the topmost Pennsylvanian stratigraphic unit in the area of this report. It is gray and

contains limy concretions that are larger than those found in the Purington and Canton Shale Members (Wanless, 1957, p. 116).

DESCRIPTIONS OF COALS AND STRIPPABLE RESERVES

Colchester (No. 2) Coal

The No. 2 Coal is the most widespread coal encountered in the area of this report. It has the largest estimated reserves of strippable coal. Over $2\frac{1}{2}$ billion tons of strippable coal are distributed among the counties (table 1). Coal and overburden thickness details for counties and townships are given in table 4.

Although many small local mines have operated in this coal for a number of years, there has been very little large scale mining. The average thickness of coal is 24 to 30 inches, which has limited the potential of this coal for large scale mining. Recently, however, technical advances have increased the feasibility of mining No. 2 Coal profitably. The lack of shale partings and the low ash content have caused increased interest in this coal.

Adams County

In most of the county, the data for No. 2 Coal are sparse and are confined mainly to widely separated localities. South and east of Liberty, outcrops and old mines indicate an average thickness of about 18 inches. At a few exposures of the coal, about $2\frac{1}{2}$ miles northwest of Camp Point, and in a few water wells, east and north of Clayton, the coal appears to average 24 inches in thickness. Scattered information from the area northwest of Golden and LaPrairie indicates an average thickness of 30 to 36 inches. East and northeast of LaPrairie, the coal appears to average from 28 to 30 inches in thickness.

As shown on plate 1, the location of the outcrop over large areas of this county is conjectural having been based on an extrapolation of the bedrock and topographic surfaces with known well, mine, and outcrop information. Glacial drift and pre-existing valleys have masked the outcrop in these areas.

In the northeastern part of Adams County, No. 2 Coal is being strip mined for the local market by the Triple S Mines, Inc.

				(211 - 111 -		- /				
		Class I overburden	Reserves at thickness (ft.)		Class II overburden	.)	Total	Mined out (square	
Coal	0-50	50-100	100-150	Total	0-50	50-100	100-150	Total	I&II	miles)
NO.2 COAL										
ADAMS	68,327	159,100	44,259	271,686	20,009	169,415	158,165	347,589	619,275	•24
BROWN	65,969	115,290	86,466	267,725	14,557	45,325	58,889	118,771	386,496	•08
CALHOUN	4,422	4,759	5,834	15,015					15,015	
HANCOCK	11,887	17+157		29.044	112	672		784	29,828	•14
HENDERSON					3,991	48,963	157	53,111	53,111	
MC DONOUGH	111,851	238,568	2,392	352,811	27,900	149,063	54,546	231,509	584,320	•05
PIKE	43.678	42,623	24,885	111,186	7,567	13,782	11,866	33,215	144,401	
SCHUYLER	176,176	265,452	94,602	536,230	10,304	19,337	40,279	69,920	606,150	•22
WARREN	24,032	52,275	9,019	85,326	18,391	89,287	10,903	118,581	203,907	
TOTAL	506,342	895,224	267,457	1,669,023	102,831	535,844	334,805	973,480	2,642,503	• 73
TOTAL	506+342	895,224	267,457	1,669,023	102,831	535,844	334,805	9/3+480	2,642,503	_

TABLE 1 - SUMMARY OF STRIPPABLE RESERVES OF NO. 2 COAL

Brown County

In Brown County most of the estimated strippable coal reserves average about 24 inches in thickness. Information is limited principally to exposures and old mines along the larger stream valleys located in the south and north of the county. There are little reliable data on areas that are distant from the major streams.

Calhoun County

The No. 2 Coal is restricted to the extreme southern part of Calhoun County. In the southwestern portion of this area, the coal probably averages from 24 to 30 inches in thickness, but according to Rubey (1952), the coal appears to thin eastward and northward. Exposures are not common since slumping of the overlying materials has covered most of the exposures. The rugged topography of this county would limit strip mining to small operations in some valleys.

Hancock County

The strippable coal reserves estimated for Hancock County are located principally in the southeastern part of the county, where No. 2 Coal averages 30 to 36 inches in thickness. About 40 percent of the reserves are beneath overburden thicknesses of 50 feet or less. A small area in the northeastern part of the county has limited coal reserves that probably average 24 inches in thickness with an overburden of up to 50 feet thick.

South and east of Dallas City in northern Hancock County (secs. 4, 5, 7, and 18, T. 7 N., R. 6 W., and secs. 12, 13, and 14, T. 7 N., R. 7 W.), coal has been reported from some of the wells and old, small mines. The coal ranged in thickness from 22 to 36 inches and had an overburden of 18 to 92 feet thick. The coal, which resembles No. 2 Coal, lies in a small outlier and dips to the east. However, since there were no data regarding its areal extent, it was not included in the reserves computations.

Other outcrops of coal have been reported from scattered locations in the county. Some of these may be correlative with the No. 2 Coal.

Henderson County

Available information indicates that strippable reserves of the No. 2 Coal are confined to the southeastern corner of Henderson County. Data from old water wells indicate an average thickness of about 24 inches. Most of this coal lies at depths from 50 to 100 feet.

McDonough County

About one-fourth of the total strippable coal reserves estimated for McDonough County is under a cover of 50 feet or less. These narrow, elongate areas principally occur along stream valleys. Slightly over 90 percent of the total strippable coal reserves is under an overburden of 100 feet or less. The majority of coal under the thickest overburden is found in the northwest portion of the county.

Mine and outcrop information is concentrated along the larger stream valleys in widely separated areas. Coal data from test holes in the intervening areas are sparse.

There are larger areas of coal with a relatively thin overburden west and southwest of Industry and west of Vermont. This coal averages 24 to 30 inches in thickness. In the vicinity of Colchester, the coal ranges in average thickness from

18 to 30 inches. More coal may have been removed in conjunction with the brick and tile operations than is indicated on the map (plate 1).

North of Colchester in the NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 12, T. 5 N., R. 4 W., the coal is split into two or more benches across the face of the exposure. There appear to be two main benches, 13 to 16 inches in thickness, separated by four feet or more of gray underclay. The aggregate thickness of the benches of coal is similar to the total thickness of the coal where it occurs as one bench. The maximum development of this interval may be observed over a horizontal distance of 200 to 300 feet. Although this appears to be a local development, it could occur elsewhere. Test drilling should extend several feet below the bottom of the coal, especially in areas of apparent thin coal development, in order to ascertain the total thickness of the coal.

Pike County

In Pike County, 90 percent of the estimated reserves of No. 2 Coal average 18 inches in thickness. One-third of these reserves lies beneath an overburden of 50 feet or less. Most of this shallower coal occurs in rather narrow bands along the outcrop.

Most of the information in Pike County was obtained from outcrops and abandoned mines in stream valleys along the outcrop. Drill hole data for coal in the intervening areas are meager.

Schuyler County

In the No. 2 Coal of Schuyler County, almost two-thirds of the total estimated strippable reserves averages 28 inches in thickness. Although the largest portion of the reserves that are beneath an overburden up to 50 feet is in a sinuous pattern restricted to stream valleys, some scattered areas are larger and more broad.

The thickest estimated reserves are found in the southeastern part of the county, near Pleasantview. However, this region has the roughest topography and greatest overburden. Only small areas are under a cover of 50 feet or less.

Warren County

The strippable coal reserves estimated for the area of this report include those found in the southern portion of Warren County. However, these reserves do not constitute all of the minable No. 2 Coal reserves in this county since part of the reserves for this county were included in Part 5A of the strippable coal reserves series (Smith and Berggren, 1963). In addition to these calculated reserves, there are small outliers, apparently of No. 2 Coal, between Monmouth and the northern limits of the outcrop (plate 1). Since the coal in the southern part of the county is contiguous with that in other counties of this study, it was felt that the occurrence and distribution of this coal would be better understood if included in this report rather than as widely separated discontinuous areas in Part 5A.

In the southern part of the county, over two-thirds of the classified reserves averages 24 inches in thickness. About 20 percent of the total reserves has an overburden thickness of 50 feet or less. Outcrop and old mine data are most abundant for areas about three miles southeast of Roseville and from one-half to three miles west of Avon. Scattered data from water wells are available in the intervening areas.

Springfield (No. 5) Coal

Although No. 5 Coal is restricted in distribution, it supports the largest strip mine operation in the area of this report. Because of the lack of reliable data for the other counties, reserves of No. 5 Coal were estimated only for Schuyler County. However, drilling may result in the discovery of additional No. 5 Coal reserves under relatively shallow cover in some of the other counties.



Figure 6 - Strippable Coal Reserves of Illinois, Part 4. Springfield (No. 5) Coal.

Although a number of mines have been operated in the No. 5 Coal, these were restricted to localized areas. Only a relatively small part of the total reserves was depleted (fig. 6).

No regular, persistent partings are present in the No. 5 Coal, but it does contain a few thin shale bands and varying amounts of pyrite as discontinuous thin lenses and coatings on joint faces. Irregular clay-filled cracks, called "horsebacks," are numerous in some places (Cady, 1921; Culver, 1925a; 1925b; Wanless, 1957). The "horsebacks" are of variable thickness and inclination but are usually nearly vertical and may extend either through the entire coal or only a part of it. The clay filling may contain fragments of roof strata (Savage, 1915; Clegg, 1961).

Adams County

Along the creek west of the road two and one-half miles northeast of Clayton $(NE_{\frac{1}{4}}^{1} NW_{\frac{1}{4}}^{1} sec. 24, T. 1 N., R. 5 W.)$, No. 5 Coal was reported to be 22 inches in thickness. Formerly it was strip mined from a small area along this stream. This area had an elevation of about 682 feet above sea level. However, because of the lack of adequate data, no reserves were estimated.

Brown County

In Brown County, southeast of Timewell (SW^{$\frac{1}{4}$} NW^{$\frac{1}{4}$} NE^{$\frac{1}{4}$} sec. 9, T. 1 S., R. 4 W.), 24 inches of No. 5 Coal was dug at one time. North of Mt. Sterling (NE $\frac{1}{4}$ sec. 8 and NW_{4}^{1} sec. 9, T. 1 S., R. 3 W.), numerous drifts are located in No. 5 Coal with reported thicknesses ranging from 18 to 24 inches along the north side of the creek. Since no data are available as to the amount of coal removed or the lateral extent of the coal in this locality, strippable reserve estimates were not calculated.

Schuyler County

In Schuyler County, total strippable reserves of 113, 394,000 tons are estimated for the No. 5 Coal. These reserves are divided into overburden and reliability categories, as shown in table 2. Over 80 percent of the reserves has an average thickness of 60 inches, and a little less than 75 percent has an overburden thickness of 50 feet or less. Overburden thickness and coal reliability categories are given by townships in table 4.

The coal formerly was mined by stripping from relatively small areas in this county near Rushville and Pleasantview (secs. 7, 15, 16, 18, 19, 23, 26, and 36, T. 2 N., R. 1 W., and sec. 6, T. 1 N., R. 1 E.). Recently the Peabody Coal Company has opened the Key Mine (fig. 7), a larger stripping operation in the No. 5 Coal near Pleasantview. This mine hauls the coal by truck to its barge loading facilities on the Illinois River.

TABLE 2 - SUMMARY OF STRIPPABLE RESERVES OF NO. 5 COAL (In thousands of tons)												
Cool	0.50	Total I & II	Mined out (square									
Coal	0_50	50-100	100-150	Total	0-50	50-100	100-150	Total	1 @ 11	miles)		
NO.5 COAL												
SCHUYLER	79,664	23,204	2,186	105,054	8,340			8,340	113,394	1.03		
TOTAL	79,664	23,204	2.186	105,054	8,340			8,340	113,394	1.03		

SUMMARY

Based on the data from the maps, slighty more than 2 3/4 billion tons of strippable coal have been estimated for the area of this report. The estimated strippable reserves of the two principal minable coals of this area are: Colchester (No. 2) Coal, 2,642,500,000 tons; Springfield (No. 5) Coal, 113,394,000 tons. This report describes small areas of strippable coal in seams that locally attain minable thicknesses but does not give reserve estimates for them because of the lack of reliable data. Table 3 summarizes the distribution of reserves by county and coal seam. Table 4 presents a tabulated summary of the reserves by county, township, and thickness for each of the overburden and reliability categories shown on the maps.

Over 1 3/4 billion tons of these reserves are in the Class I category of reliability, and slightly less than 1 billion tons are in the Class II category. A little more than 2 billion tons, or 79 percent, of the total estimated strippable reserves are composed of coal that is 24 to 30 inches in thickness. Of the remaining 21 percent of the reserves, roughly three-fourths of the coal averages 18 inches in thickness, and one-fourth averages 36 to 60 inches in thickness. About 440 million tons of coal has an estimated overburden thickness of 50 feet or less. Eighty-four percent of the total No. 5 Coal reserves estimated has an average of 60 inches in thickness. Total estimated strippable coal reserves are divided into overburden categories as follows: 0 to 50 feet, 25 percent; 50 to 100 feet, 53 percent; and 100 to 150 feet, 22 percent.



Figure 7 - Strip mining with a 39-cubic yard drag line in No. 5 Coal near Pleasantview, Schuyler County.

		Class I Reserves at				Class II			Mined out	
Coal	0-50	50-100	100-150	Total	0-50	50-100	100-150	Total	I & II	(square miles)
				ADAM	s co	UNTY				
NO.2 COAL	68,327	159,100	44,259	271,686	20,009	169,415	158,165	347,589	619,275	•24
тот	AL 68,327	159,100	44,259	271,686	20,009	169,415	158,165	347,589	619,275	•24
				BROW	N CO	UNTY				
NO.2 COAL	65,969	115,290	86,466	267,725	14,557	45,325	58,889	118,771	386,496	•08
TOT	AL 65,969	115+290	86,466	267,725	14.557	45,325	58,889	118,771	386,496	•08
				CALH	oun co	UNTY				
NO.2 COAL	4,422	4,759	5,834	15,015					15.015	
TOT	AL 4+422	4,759	5,834	15+015					15,015	
				HANC	оск со	UNTY				
NO.2 COAL	11,887	17,157		29,044	112	672		784	29,828	•14
TOT	AL 11,887	17,157		29,044	112	672		784	29,828	•14
				HEND	ERSON CO	UNTY				
NO.Z COAL					3,991	48,963	157	53,111	53,111	
TOT	AL				3,991	48,963	157	53+111	53,111	
				MC D	олоидн со	UNTY				
NO.2 COAL	111,851	238,568	2,392	352,811	27,900	149,063	54,546	231,509	584,320	•05
TOT	AL 111+851	238,568	2,392	352,811	27,900	149,063	54,546	231,509	584,320	.05
				PIKE	co	UNTY				
NO.2 COAL	43,678	42+623	24+885	111,186	7,567	13,782	11,866	33,215	144,401	
TOT	AL 43+678	42+623	24,885	111,186	7,567	13,782	11,866	33,215	144,401	
				SCHU	YLER CO	UNTY				
NO.5 COAL	79,664	23,204	2,186	105+054	8,340			8,340	113,394	1.03
NO.2 COAL	176,176	265+452	94,602	536,230	10:304	19,337	40,279	69,920	606,150	•22
TOT	AL 255,840	288,656	96,788	641,284	18,644	19,337	40+279	78+260	719,544	1.25
				WARR	EN CO	UNTY				
NO.2 COAL	24,032	52,275	9,019	85,326	18,391	89,287	10,903	118,581	203,907	
TOT	AL 24+032	52,275	9,019	85,326	18,391	89,287	10,903	118,581	203,907	
GRAND TOTA	L 586,006	918,428	269,643	1,774,077	111,171	535,844	334,805	981,820	2,755,897	1.76

TABLE 3 - SUMMARY OF STRIPPABLE COAL RESERVES BY COUNTY, COAL BED, AND RELIABILITY CLASSIFICATION (In thousands of tons)

Coal,		Class I	Reserves at	<u></u>		Class II)	Total	Mined out	
Township, Thickness (inches)	0-50	50-100	100-150) Total	0-50	50-100	100-150	Total	I & II	miles)
				ADAMS	COL	INTY				
NO+2 COAL										
1N-5W										
24					1,502	6,188	43+358	51,048	51,048	
28	915	1,543	1,622	4,080					4+080	
30						7,146	17,683	24,829	24,829	
TOTAL	915	1:543	1,622	4,080	1,502	13,334	61,041	75,877	79+957	.05
1N-6W										
24	12,263	21,903	2,354	36,520	269	9+080	23,629	32,978	69+498	
30					1,065	10,088		11,153	11,153	
TOTAL	12,263	21,903	2+354	36,520	1,334	19,168	23,629	44+131	80+651	
1N-7W										
24	3,318	4+282		7,600	516	673		1,189	8,789	
TOTAL	3,318	4,282		7+600	516	673		1,189	8 . 789	
2N-5W										
24					22	6,703	3,273	9,998	9,998	
28	5,676	18,230	366	24,272					24,272	
30	1,569	5+296		6,865	2+634	47,192	5,605	55+431	62+296	
TOTAL	7,245	23+526	366	31,137	2+656	53,895	8+878	65+429	96,566	•19
2N-6W										
24						3,968		3,968	3,968	
30	2+242	23,063	1,681	26,986	84	31,583	224	31+891	58+877	
36		5,112		5,112					5+112	
TOTAL	2+242	28+175	1+681	32,098	84	35+551	224	35.859	67,957	
2N-7W										
30	196	897		1,093					1,093	
TOTAL	196	897		1+093					1,093	
15-5W										
18	1,396	1,362	488	3+246	3,346	8,642	16,495	28,483	31,729	
24					560	6,972	29,974	37,506	37,506	
TOTAL	1,396	1,362	488	3+246	3,906	15,614	46,469	65.989	69+235	
15-6W										
18	5,986	12,543		18,529	1,211	3,783	1,480	6+474	25,003	
24	829	874		1,703	1,704	8,699	6,143	16,546	18,249	
TOTAL	6.815	13+417		20,232	2,915	12,482	7,623	23,020	43,252	
15-7W										
18						17		17	17	
24	1.031			1+031					1.031	
TOTAL	1.031			1.031		17		17	1:048	
25-54						• •		• '		
18	9.181	11.792	3.312	23.725	2.152	5.448	3.548	11.148	34.873	
TOTAL	9,183	11.233	3+312	23.725	2.152	5.448	3.548	11.148	34.873	
75-68	· • 101		J7J86	*****	*****	27770	2,240	**/140	2	
19	10.677	20.870	8.760	49.316	473	7.079	7.847	10.392	59.70	
10	10,011	279019	0,700	471310	4/1	11017	£9042	101276	279100	

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TABLE 4 - DETAILED SUMMARY OF STRIPPABLE COAL RESERVES SHOWING THICKNESS OF OVERBURDEN, THICKNESS OF COAL, AND RELIABLIIT CLASSIFICATION, BY COUNTY AND TOWNSHIP (In thousands of tons)

Coal,		Class I H	Reserves at			Class II	Reserves at			Mined out
Township, Thickness (inches)	0-50	overburden t 50-100	hickness (ft. 100-150) Total	0-50	overburden t 50-100	hickness (ft.) 100-150) Total	Total I & II	(square miles)
TOTAL	10,677	29,879	8,760	49.316	471	7+079	2,842	10,392	59,706	
2S-7W										
18	303	17		320	4,473	5,196		9,669	9+989	
TOTAL	303	17		320	4,473	5,196		9,669	9,989	
35-5W										
18	8,844	16,007	17,134	41,985		521	2,219	2,740	44,725	
24						67	448	515	515	
TOTAL	8 . 844	16:007	17,134	41.985		588	2,667	3+255	45,240	
35-6W										
18	3,901	6,860	8, 242	19,303		370	1,244	1,614	20,917	
TOTAL	3,901	6,860	8,542	19,303		370	1,244	1:614	20,917	
COAL BED	68,327	159,100	44,259	271+686	20,009	169,415	158,165	347,589	619,275	•24
COUNTY	68,327	159,100	44+259	271,686	20,009	169,415	158,165	347,589	619,275	• 24
				BROWN	CO	UNTY				
NO.2 COAL										
1N-2W										
24	2,219	2,354		4,573					4,573	
TOTAL	2,219	2,354		4,573					4,573	•02
1N-3W										
24	15,738	23,316	15,738	54,792					54,792	
28	837	1,203	6,356	8,396					8+396	
30	364	645	729	1,738					1,738	
TOTAL	16,939	25,164	22+823	64,926					64.926	
1N-4W										
24						45	1,323	1,368	1.368	
28	16,530	20+506	27,280	64,316					64+316	
30	2,214	2,914	168	5+296					5+296	
TOTAL	18,744	23,420	27+448	69+612		45	1.323	1+368	70.980	-04
15-1W										
24	157	224	583	964					964	
TOTAL	157	224	583	964					964	
15-2W									204	
24	2,354	3,766		6+120	7.264	16+007		23.271	20.201	
TOTAL	2,354	3,766		6+120	7.264	16:007		23.271	29.291	
15-3W								257211	277572	
24	5,089	19,392	12,756	37,237	1.211	15+155	28.494	44.860	82.097	
TOTAL	5+089	19,392	12,756	37+237	1,211	15.155	28.494	44.860	82.097	
15-4W								447000	027071	
18	370	1,530	4,103	6+003	50	1.177	4.960	6.187	12.180	
24	807	2,309	5+425	8.541	45	3.475	23.921	27.441	26.007	
TOTAL	1,177	3,839	9.528	14.544	45	4+652	28.881	33.678	49-172	
25-2W					,,,	77052	207001	557020	403112	
24					919	1.345		2.244	3, 344	
TOTAL					919	1.345		2.244	2,364	
2S-3W					<i>,,,,</i>			27204	21204	
18	7,650	11,366	588	19+604	2.758	2.135	84	4.977	34.691	
24	1,188	3,296	195	4.619	2.175	5.170	0 7	7	10 04 1	
								/ 9444	12+063	

TABLE 4 - Continued

Casl		Class I	Pocorrier at			Class TT	Recerves at			Mined out
Township, Thickness (inches)	0-50	overburden 50-100	thickness (ft 100-150	.) Total	0-50	overburden t 50-100	hickness (ft. 100-150) Total	Total I & II	(square miles)
TOTAL	8,838	14,662	723	24,223	4,933	7,314	174	12+421	36+644	
25-48										
18	10,273	21,707	10,475	42,455	135	807	17	959	43,414	
24	179	762	2,130	3+071					3,071	
TOTAL	10,452	22,469	12,605	45,526	135	807	17	959	46+485	•02
COAL BED	65,969	115,290	86,466	267,725	14,557	45.325	58,889	118,771	386+496	•08
COUNTY	65+969	115,290	86+466	267,725	14,557	45,325	58,889	118,771	386+496	•08
				CALH		INTY				
NO.2 COAL										
135-1W										
24	1,300	1,323	3,116	5.739					5,739	
TOTAL	1,300	1,323	3,116	5,739					5,739	
13S-2W										
24	628	695	785	2,108					2,108	
30	2,270	2,382	1,597	6+249					6,249	
TOTAL	2,898	3,077	2,382	8,357					8,357	
145-1W										
24	112	135	67	314					314	
TOTAL	112	135	67	314					314	
145-2W										
24	112	224	269	605					605	
TOTAL	112	224	269	605					605	
COAL BED	4+422	4,759	5,834	15,015					15+015	
COUNTY	4.422	4,759	5.834	15.015					15,015	
				HANC	οςκ ςοι	JNTY				
NO+2 COAL										
3N-5W										
30	11,125	6:614		17,739	84	448		532	18,271	
TOTAL	11+125	6+614		17,739	84	448		532	18+271	•14
3N-6W										
30	112	8.996		9.108	28	224		252	9,360	
36		1.547		1.547					1.547	
TOTAL	112	10+543		10.655	28	224		252	10+907	
7N-5W		207242		10/022						
24	650			650					650	
TOTAL	650			650					650	
	11.887	17.157		29+044	112	672		784	29.828	-14
COUNTY	11.007	17,157		29.044	112	672		784	29.828	-14
COUNTI	11,807	1/015/		277044				104	277020	• • •
NO.2 COAL				nenu		21111				
AN_AW										
011-47 24					2.001	48-049	167	53-111	52-117	
24					3,991	49-942	127	52-111	52-111	
TUTAL					3.991	40,703	121	52-111	52-111	
COLL BED					3 001	40,763	197	57-111	52-113	
COUNTY					21771	401703	151	229111	111460	
				MC D	UNUUUN CUL	JINI T				

TABLE 4 - Continued

NO.2 COAL

Coal,		Class T I	Reserves at			Class TT 1	Reserves at			Minal
Township,	0.50	overburden	thickness (ft	.)	0.50	overburden th	veserves at nickness (ft.)		Total	Mined out (square
	0-50	50-100	100-150	IOTAL	0-50	50-100	100-150	Total	I&II	miles)
4N-1W										
24					3,049	46,721	1,973	51,743	51,743	
28					105	4,342		4+447	4+447	
30	20,009	8+323		28,332			_		28,332	
TOTAL	20+009	8+323		28,332	3,154	51,063	1,973	56,190	84:522	
4N-2W										
24	2,309	5,134		7,443					7+443	
28	8,841	34,551		43,392	1,099	23,278		24,377	67,769	
30	1,485	1,513		2,998					2+998	
TOTAL	12,635	41,198		53,833	1,099	23+278		24,377	78+210	
4N-3W										
24	2,152	538		2,690					2,690	
28	30,183	11,822		42,005					42,005	
30	1,205	1,233		2+438					2,438	
TOTAL	33,540	13,593		47,133					47+133	
5N-1W										
24					13,855	17,621		31,476	31,476	
TOTAL					13,855	17,621		31,476	31,476	
5N-2W										
24	964	1+637		2,601					2,601	
TOTAL	964	1,637		2,601					2 • 601	
5N-3W										
24	538	1,928		2+466		4,327		4.377	6.793	
28	26	732		758				47527	75.0	
30	2.214	5+661	476	8.351					0.251	
TOTAL	2.778	8+321	476	11.575		4-327		4.227	16 002	
5N-AW						40521		41521	13,702	
18	67	370		4 1 7						
24	0 00/			437					437	
24	99320	4,003		13,989					13,989	
30	1,205	2+074		3,219					3,279	
IUTAL	10,598	7,107		17,705					17,705	•05
6N-1W										
28	5,519	9,207	78	14,804					14,804	
TOTAL	5.519	9,207	78	14,804					14,804	
6N-3W										
18					1,765	ż		1,765	1,765	
24	2,937	20,805		23,742					23+742	
30	364	1+149		1,513					1+513	
TOTAL	3,301	21,954		25,255	1,765			1,765	27+020	
6N-4W										
24	9,819	63,401	381	73,601					73,601	
TOTAL	9,819	63,401	381	73,601					73,601	
7N-1W										
24	493	7,062		7,555	359	1,726		2+085	9.640	
TOTAL	493	7,062		7,555	359	1,726		2+085	9+640	
7N-2W										
24	2,376	14+819	179	17,374	5,717	21,814		27,531	44+905	

TABLE 4 - Continued

Coal		Class I H	Reserves at	51.6°C		Class II	Reserves at			Mined out
Township, Thickness (inches)	0-50	overburden 50-100	<u>hickness (ft</u> 100-150	.) Total	0-50	overburden ti 50-100	hickness (ft. 100-150) Total	Total I & II	(square miles)
TOTAL	2+376	14,819	179	17,374	5.717	21,814		27,531	44,905	
7N-3W										
24	22	964	897	1,883	1,099	17+128	38,628	56,855	58,738	
TOTAL	22	964	897	1,883	1,099	17,128	38,628	56,855	58,738	
7N-4W										
24	9,797	40,982	381	51,160	852	12,106	13,945	26,903	78,063	
TOTAL	9,797	40,982	381	51+160	852	12,106	13,945	26,903	78,063	
COAL BED	111,851	238,568	2,392	352,811	27,900	149,063	54,546	231,509	584,320	.05
COUNTY	111,851	238,568	2,392	352,811	27,900	149,063	54,546	231+509	584,320	•05
				PIKE	CO	UNTY				
NO.2 COAL										
35-3W										
18	50			50	454	34		488	538	
TOTAL	50			50	454	34		488	538	
35-4W										
18	16,596	13,653	7,516	37,765	2,320	1+698		4,018	41,783	
24					673	1,861	2,690	5,224	5,224	
TOTAL	16,596	13,653	7,516	37,765	2,993	3,559	2,690	9,242	47+007	
45-3W										
18	3,413	1,782	67	5,262	34	1+227	437	1,698	6+960	
24	3,408	1,345		4,753					4,753	
TOTAL	6,821	3,127	67	10,015	34	1,227	437	1,698	11,713	
45-4W										
18	3.279	11,484	12,846	27,609	3,245	8,441	6,070	17,756	45+365	
24						269	2,063	2:332	2+332	
TOTAL	3,279	11,484	12,846	27,609	3,245	8,710	8,133	20+088	47+697	
4 \$- 5W										
18	12,611	9,450	4,187	26,248			202	202	26+450	
24							404	404	404	
TOTAL	12,611	9+450	4,187	26,248			606	606	26+854	
55-3W										
18						168		168	168	
TOTAL						168		168	168	
55-4W										
18	4,086	4,842	269	9,197	841	84		925	10,122	
TOTAL	4,086	4,842	269	9,197	841	84		925	10,122	
5S-5W										
18	235	67		302					302	
TOTAL	235	67		302					302	
COAL BED	43,678	42+623	24,885	111,186	7+567	13,782	11,866	33,215	144,401	
COUNTY	43,678	42,623	24,885	111,186	7,567	13.782	11,866	33,215	144+401	
				SCHU	YLER CO	UNTY				
NO.5 COAL										
1N-1E										
60	785	953		1,738					1,738	
TOTAL	785	953		1,738					1,738	
1N-1W										

TABLE 4 - Continued

Coal,		Class I	Reserves at			Class II	Reserves at			Mined out
Township, Thickness (inches) 0-50	overburden 50-100	thickness (f 100-150	t.) Total	0-50	overburden 50-100	thickness (ft 100-150	.) Total	Total I & II	(square miles)
60	1,737	1,850	112	3,699					3,699	
TOTAL	1,737	1+850	112	3,699					3+699	
2N-1E										
60	2+354	112		2,466					2+466	
TOTAL	2,354	112		2,466					2+466	.10
2N-1W										
18	723			723	1,984			1,984	2,707	
36	1,042			1:042					1,042	
60	60,979	20+289	2,074	83,342					83,342	
TOTAL	62,744	20,289	2.074	85,107	1,984			1,984	87,091	•93
2N-2W										
18	17			17	6,356			6+356	6,373	
36	7,936			7,936					7,936	
60	4,091			4,091					4,091	
TOTAL	12.044			12,044	6,356			6+356	18:400	
COAL BED	79,664	23,204	2,186	105,054	8,340			8+340	113.394	1.03
NO.2 COAL										
1N-1E										
28	2,040	3,479	3,296	8,815					8+815	
36		34		34					34	
TOTAL	2+040	3,513	3,296	8,849					8.849	
1N-1W									0,04)	
28	14,935	29,582	6 • 277	50+794					50.794	
TOTAL	14,935	29,582	6+277	50+794					50+794	
1N-2W									201124	
24	12,667	23,360	5+806	41,833	1.009	45		1.054	42.897	
30	336	168		504				11034	42,007	
TOTAL	13.003	23+528	5+806	42.337	1.009	45		1.054	62.201	
2N-1E						45		1,004	43,371	
18	. 17	34	67	118					110	
28	3.060	4.760	2.720	10.540	2.642	1.726		4.380	11 000	
30	2.018	1.794	29120	3.812	2,000	19720		47267	14,829	
36	2.455	4 . 876	3.228	10.559					3,812	
TOTAL	7.550	11.464	6.015	25.029	2.5/2	1.904			10,559	
2N2F		117404	01015	277027	21000	10720		4+289	29,318	
30	5.969	6.614		17.583						
TOTAL	5,969	6.614		12,503					12,583	
2N-1W		07014		121505					12+583	
18	50	47	101	21.0						
28	5.848	10.00/	101	210					218	
TOTAL	5.595	10,070	30,349	54,900	602	7,324	25,841	33,767	88,667	
2N-2W	2,275	18,873	30,650	229119	602	7.324	25,841	33,767	88,885	
24	35.050	20.00	12 657	40						
29	129920	∠U\$491	12+936	49,277					49,277	
20		1.005				2,956	14:307	17,263	17+263	
50 TO741	16.652	1,205	12 654	2+018					2,018	
101AL	101003	21,070	14,936	51+295		2,956	14,307	17,263	68,558	
211-34										

TABLE 4 - Continued

Coal.		Class I	Reserves at			Class II	and an end of the second s	Min Tatal (a		
Township, Thickness (inches)	0-50	overburden 50-100	<u>thickness (ft.)</u> 100-150	Total	0-50	overburden t 50-100	hickness (ft.) 100-150	Total	Total I & II	(square miles)
24	1,300	90		1,390					1,390	
28	5,990	314		6+304	340			340	6,644	
30	2,046			2.046					2:046	
TOTAL	9,336	404		9,740	340			340	10,080	
2N-4W										
24	1,300	897	67	2,264					2+264	
28	17,576	27+306	26	44,908					44,908	
30	10,425	6,249		16+674	701			701	17.375	
TOTAL	29,301	34,452	93	63,846	701			701	64,547	•21
3N-1W										
24					5,089	5,403		10,492	10+492	
28	13,810	27,437	1,386	42,633					42,633	
30	10,677	13,563		24,240					24,240	
TOTAL	24,487	41,000	1,386	66,873	5,089	5+403		10,492	77+365	
3N-2W										
28	12,241	53,723	27,855	93,819		1,883	131	2,014	95,833	
TOTAL	12,241	53,723	27,855	93,819		1,883	131	2,014	95,833	
3N-3W										
28	11+404	13,653	288	25,345					25,345	
30	5.072	4.400		9,472					9+472	
TOTAL	16,476	18,053	288	34,817					34,817	.01
3N-4W										
30	18+580	2,550		21,130					21,130	
TOTAL	18,580	2,550		21,130					21+130	
COAL BED	176+176	265,452	94,602	536,230	10,304	19,337	40,279	69,920	606+150	•22
COUNTY	255.840	288,656	96,788	641,284	18,644	19,337	40,279	78,260	719,544	1.25
				WARR	EN COU	NTY				
NO.2 COAL										
8N-1W										
24	8.429	16.231	1+211	25,871	942	2,287		3+229	29,100	
TOTAL	8.429	16,231	1,211	25,871	942	2+287		3+229	29,100	
8N-2W										
24	5+851	21.993	5+986	33+830	538	10,245	3,004	13,787	47,617	
30	1.233	7,146	1+037	9,416					9,416	
TOTAL	7.084	29.139	7.023	43.246	538	10,245	3.004	13,787	57,033	
8N 3W										
24	247	5.089	785	6.121	874	27,441		28,315	34,436	
28				••••	366	46,243	7.899	54,508	54,508	
TOTAL	247	5+089	785	6.121	1.240	73+684	7.899	82+823	88,944	
98-28	241	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	102	•••••						
34 24	7.081	1.480		9.461	695			695	10.156	
1074	7.081	1,480		9-461	605			695	10,150	
ON-22	19401	19400		7,401	075			075	107130	
7N-2H	101	221		637	14.974	3.071		18+047	18-474	
24	291	330		621	149710	3,071		18:047	1010/4	
COAL 250	291	52 375	9.010	85,324	19.201	99,797	10.003	118,601	202-007	
COAL BED	24+032	52,215	94019	07,340	10,391	079401	10,903	110,201	2031907	
COUNTY	24,032	52+215	99019	03,320	101341	679281	10,903	1109201	2031907	

TABLE 4 - Continued

Samples			Pro	ximate	1	Heat Values				
County Number of Mines Coal	Condition ^a	Moisture	Volatile Matter	Fixed Carbon	Ash	Sulfur	Calories	British Thermal Units	Rank Index	Unit Coal Index
Adams 1 Mine Colchester (No. 2) Coal	1 2 3 4 5	14.5 16.1	39.4 46.1 50.1 41.2 49.1	39.2 45.9 49.8 42.7 50.9	6.9 8.1	3.9 4.6 5.0	6,308 7,382 8,030 6,855 8,172	11,355 13,289 14,454 12,339 14,710	123	147
Brown 2 Mines CoIchester (No. 2) Coal	1 2 3 4 5	14.7 16.7	37.4 43.9 48.7 39.5 47.4	39.3 46.2 51.3 43.8 52.6	8.5 10.0	4.6 5.4 6.1	6,202 7,274 8,079 6,882 8,260	11,164 13,093 14,542 12,388 14,867	124	149
Calhoun 2 Mines ^b Colchester (No. 2) Coal	1 2 3 4 5	10.1 16.7	37.9 42.2 48.3 41.0 46.6	40.6 45.1 51.6 47.1 53.4	11.4 12.7	6.1 6.8 7.8	6,282 6,985 7,998 7,253 8,236	11,308 12,573 14,396 13,055 14,824	131	148
Hancock 2 Mines ^c Colchester Coal	1 2 3 4 5	14.3 15.8	39.6 46.2 50.0 41.3 49.0	39.6 46.2 50.0 42.9 51.0	6.5 7.6	4.0 4.6 5.0	6,362 7,425 8,034 6,883 8,175	11,452 13,368 14,462 12,388 14,712	124	147
McDonough 2 Mines ^d Colchester (No.2) Coal	1 2 3 4 5	16.6 18.6	34.2 41.0 45.6 36.2 44.4	40.9 49.0 54.4 45.2 55.6	8.3 10.0	2.9 3.5 3.9	6,002 7,199 7,995 6,621 8,134	10,800 12,960 14,390 11,920 14,640	119	146
Schuyler 1 Mine ^d Colchester (No. 2) Coal	1 2 3 4 5	12.5 14.0	37.9 43.3 47.3 39.6 46.1	42.1 48.1 52.7 46.4 53.9	7.5 8.6	4.5 5.2 5.7	6,517 7,451 8,154 7,152 8,319	11,730 13,410 14,680 12,870 14,970	129	150
Schuyler 2 Mines Springfield (No. 5) Coal	1 2 3 4 5	14.0 16.0	36.1 42.0 47.6 39.1 46.5	39.8 46.3 52.5 45.0 53.5	10.2 11.8	2.8 3.2 3.6	6,035 7,013 7,954 6,811 8,101	10,861 12,625 14,315 12,260 14,583	123	146

TABLE 5 - COAL ANALYSES, COUNTY AVERAGES

^a Type of analysis is denoted as follows: 1-sample as received at laboratory 2-moisture-free 3-moisture and ash-free 4-moist mineral-matter-free 5-dry mineral-matter-free (unit coal)

b Only one sample from each mine; mines about two miles apart.

^c Data modified from Cady (1935) by additional unpublished analyses in the Illinois State Geological Survey files.

d Data from Cady (1935)

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