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Coal Reserve Study

New River Gorge, West Virginia

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16. Abstracts The report is an appraisal of coal reserves in the New River Gorge area of West Virginia. It contains a description of the minable coalbeds in the area, an assessment of their reserves, and a study of the feasibility of mining from entries outside proposed boundaries of either a wild and scenic river area or a national park.

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COAL RESERVE STUDY

NEW RIVER GORGE, WEST VIRGINIA

by

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Bureau of Mines Open File Report 96-77

Submitted to the Senate Appropriations Subcommittee

by

United States Department of the Interior

Bureau of Mines

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INTRODUCTION

INTRODUCTION

This report on the coal reserves of the New River Gorge area, West Virginia, was prepared at the request of the Senate Interior Appropriations Subcommittee.

In compliance with a request in the Senate Committee report on the Department of the Interior Appropriations Act for FY 1975, the Bureau of Outdoor Recreation assessed the physical capabilities for national designation of the New River Gorge in West Virginia as a unit within the National Park System. The Bureau of Outdoor Recreation in its study report of May 1, 1975, recommended inclusion of the New River Gorge in the National Wild and Scenic Rivers System to be administered under the provisions of the Wild and Scenic Rivers Act of 1968 (P.L. 90-542 as amended). An alternative to the recommendation was designation of a larger area as a national park. The Department of the Interior Appropriations Act of FY 1976 authorized a 1-year mineral appraisal of the New River Gorge area to be done by the Bureau of Mines and the Geological Survey.

The findings of the joint mineral study are presented in two parts. This part, by the Bureau of Mines, is a description of the minable coalbeds in the area, an assessment of their reserves, and a study of the feasibility of mining from entries outside the proposed boundaries. The Geological Survey part presents, on a series of maps, the geology, geophysics, geochemistry, and resources of coal, oil and gas, and nonmetallic minerals in the area (Englund and others, 1977).[1/]

Bureau of Mines estimates of coal tonnages were made independently from the Geological Survey estimates. After first determining the mined-out areas, the Bureau calculated the coal reserve base (the in-place tonnage of minable coal remaining in the study area) by using an engineering method of geometrically defining areas of influence for sample thickness points. This reserve base was then used to determine coal reserves (the coal that could be recovered by mining). The Geological Survey used a geologic method of isopaching coal thicknesses and calculating tonnages within isopach lines. There are minor differences in the reserve base estimates determined by the Bureau and the equivalent resource estimates determined by the Survey. Geological Survey resources include four coalbeds not included in the Bureau reserve base. Coal from the Hernshaw, Eagle, Little Raleigh, and Fire Creek Rider is either mined out, inferred, or is too thin to be included in the reserve base. The Survey estimates also include coal under Grandview State Park. This coal has been excluded from Bureau estimates because West Virginia regulations prohibit mining under State park land. With the exclusion of this coal, the two estimates vary by less than 2 percent.

The Bureau of Mines made every effort to contact all companies and individuals having mineral interests in and near the New River Gorge area. Mineral ownership in the area was determined through a grant to West Virginia University, Department of Geology and Geography. Notices of the study were published in the Federal Register (June 24, 1976) and in local newspapers.

Excellent cooperation was received from industry, mineral owners, and the Corps of Engineers, Huntington District, West Virginia, who conducted core drilling under a Bureau of Mines contract. Other assistance was obtained from

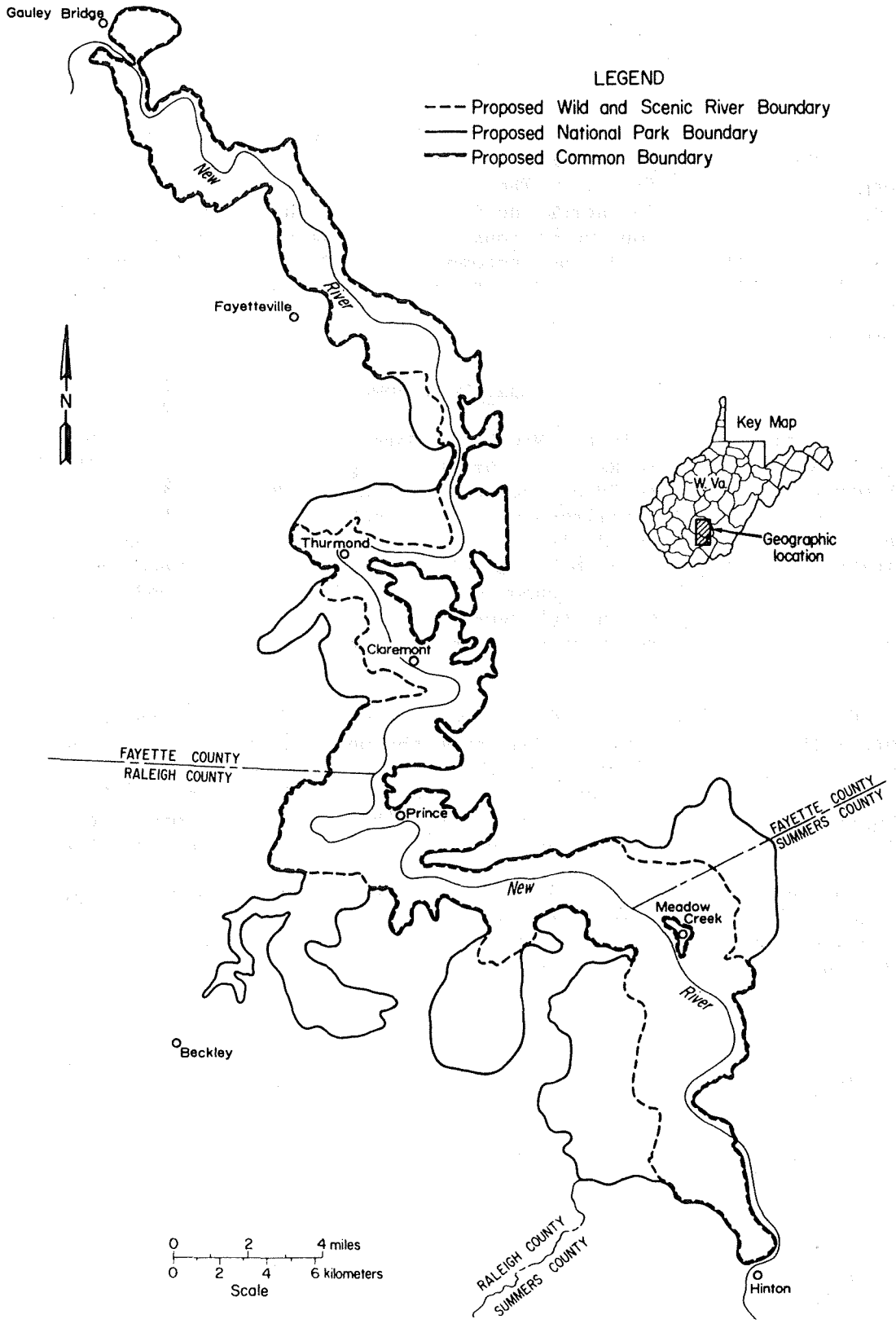

FIGURE 1. - New River Gorge Study Area

Federal and State agencies. Although the coal reserve estimates were made with the best information available, persons with additional information are requested to contact Robert D. Thomson, Chief, Eastern Field Operations Center, Bureau of Mines, 4800 Forbes Ave., Pittsburgh, Pa. 15213.

The study area is in south central West Virginia and extends north from Hinton, Summers County, to Gauley Bridge, Fayette County, a distance of 66 miles along the New River (fig. 1). The proposed wild and scenic river boundary, which encompasses about 58,000 acres, delineates a corridor of variable width along the New River. The proposed national park boundary includes eight additional areas outside this corridor and encompasses 88,000 acres. Boundaries were furnished by the Bureau of Outdoor Recreation with agreement by the National Park Service.

Coal Development

Coal mining began in the New River Gorge with completion of what is now the Chesapeake and Ohio Railroad through the gorge. The first New River coal was mined from the Fire Creek coalbed by Joseph L. Beury in 1873. Coal mines proliferated along the railroad and its branch lines until the early 1930's when the coal market was deflated during the Depression. By then, much of the original coal reserves had been depleted. The coal market recovered during World War II and a brief coal boom ensued, leading to peak production in the late 1940's. Active mining subsequently declined until new interest in coal from the New River Gorge area was stimulated by the current energy shortage, increased demand for low-sulfur coal, and increased foreign markets.

Coal is presently being mined from one underground mine and two strip mines within the study area. Coal from the underground mine is washed at the Claremont coal-preparation plant within the study area, and another plant is proposed at the town of Meadow Creek. Several mines within the study area are temporarily closed. Five other underground mines, one strip mine, and a preparation plant are operating within a mile of the study area.

The main east-west line of the Chesapeake and Ohio Railroad that passes through the New River Gorge provides the principal link to coal markets outside the region. More than half of the coal produced in the region is exported from Newport News, Va. Other New River coal markets include the Great Lakes region.

1/ Englund, K. J., King, E. R., Lesure, F. G., Perry, W. J., Jr., and others, 1977, Mineral Resource, Geological, and Geophysical Maps of the New River Gorge Area, Fayette, Raleigh, and Summers Counties, West Virginia: U.S. Geological Survey open-file rept. OF-77-76.

COAL RESERVES

COAL RESERVES

The importance of the coal in the study area is derived from its metallurgical quality. The coal is mainly low in ash (less than 6 percent) and sulfur (less than 1 percent) or it can be upgraded by washing to reduce these impurities. Calorific values (Btu per pound) range from 14,000 to 15,000 on a moist, mineral-matter-free basis.

Coalbeds within the study area that have some economic potential are as follows: No. 2 Gas, Powellton, Hughes Ferry, Sewell, Beckley, Fire Creek, Pocahontas No. 6, Pocahontas No. 3, and Pocahontas No. 2. In the study area, these beds vary considerably in lateral extent, thickness, and quality. The Fire Creek, Pocahontas No. 3, and Pocahontas No. 6 coalbeds are particularly important, not only because they occur in large quantities, but mainly because they are premium-quality, low-volatile coking coals, which are currently in great demand for the production of metallurgical coke and for export.

Reserves of coal recoverable by deep mining or strip methods within the proposed wild and scenic river area are 11,569,000 tons (table 1). Reserves within the proposed national park, which include those within the wild and scenic river area, are 32,565,000 tons. Based on the mining feasibility studies, at least 2,638,000 tons are economically recoverable from new mine entries outside the wild and scenic river boundary, and at least 16,620,000 tons are economically recoverable from mine entries outside the national park boundary. Additional tonnages may be minable in conjunction with the possible mining of adjacent coal; these reserves are discussed in the individual coalbed sections.

No reserves were determined for the Hernshaw, Eagle, Little Raleigh, and Fire Creek Rider coalbeds. Within the study area, these coalbeds are either mined out, too thin to be reserves, or lack economically recoverable coal.

Procedure for Determining Reserves

The extent of past underground mining was plotted from about 575 mine maps in the Bureau's Eastern Field Operations Center Mine Map Repository and 75 maps obtained from private companies. There are a few areas known to be mined for which maps were not available.

Coalbed thicknesses were based on about 1,700 data points compiled from mine maps, 110 company drill logs, five Bureau of Mines drill holes, and selected measurements from the West Virginia Geological and Economic Survey County Reports. Additional thickness data and maps showing the coalbed outcrops were provided by the Branch of Coal Resources, U.S. Geological Survey.

The reserve base was determined for areas of unmined coal in beds 28 inches or more in thickness and thinner beds currently being mined. It was not possible to fully assess some local areas of coalbed thinning. Only coal in the measured and indicated reliability categories was considered as the reserve base. All coalbeds included are less than 1,000 feet below the surface. A factor of 1,800 tons per acre-foot of coal was used in tonnage calculations.

TABLE 1. - Summary of estimated coal reserves[1/]

Coalbed	Acres of coal 28 inches or more thick		Acres of reserve base		Reserve base (thousands of short tons)						Reserves (thousands of short tons of recoverable coal)	
					Measured		Indicated		Total			
	Prior to mining (total study area)	Mined (total study area)	Wild and scenic river	National park (total study area)	Wild and scenic river	National park (total study area)	Wild and scenic river	National park (total study area)	Wild and scenic river	National park (total study area)	Wild and scenic river	National park (total study area)
No. 2 Gas.....	351	278	73	73	456	456	0	0	456	456	228	228
Powellton.....	417	0	417	417	1,895	1,895	636	636	2,531	2,531	1,266	1,266
Hughes Ferry....	458	204	0	254	0	181	0	409	0	590	0	472
Sewell.....	8,363	7,365	998	998	4,928	4,928	0	0	4,928	4,928	2,464	2,464
Beckley.....	363	29	0	334	0	676	0	929	0	1,605	0	803
Fire Creek.....	8,349	5,431	1,731	2,918	6,097	11,426	2,551	3,242	8,648	14,668	4,324	7,475
Pocahontas No. 6	441	103	251	338	1,643	2,086	291	323	1,934	2,409	1,093	1,331
Pocahontas No. 3	4,559	200	629	4,359	1,385	7,694	2,018	22,931	3,403	30,625	1,764	17,087
Pocahontas No. 2	607	8	177	599	301	669	559	2,209	860	2,878	430	1,439
				Total tonnages:	16,705	30,011	6,055	30,679	22,760	60,690	11,569	32,565

1/ Definitions of terms:

Reserve base - Includes beds of bituminous coal 28 inches (70 cm) or more thick that occur at depths to 1,000 feet (300 m). Includes also thinner and/or deeper beds that presently are being mined or for which there is evidence that they could be mined commercially at this time (U.S.G.S. Bull. 1450-B). The reserve base includes only coal from the measured and indicated categories of reliability.

Reserve - That portion of the reserve base that can be economically mined at the time of determination. The reserve is derived by applying a recovery factor to the reserve base.

Recovery factor - The percentage of total tons of coal estimated to be recoverable from a given area in relation to the total tonnage estimated to be in the reserve base in the ground.

A

B

Blocks of coal having a reserve base of at least 1.8 million tons were evaluated to determine if they could be mined economically from entries outside the study area. These blocks are shown on the individual coalbed maps and are discussed in the mining feasibility section of this report.

A 50-percent-recovery factor was used to derive reserves from the reserve base. An average 57-percent-recovery factor was estimated for determining the feasibility of mining those blocks containing at least 1.8 million tons of reserve base. The recovery factor used for strip mining in the Hughes Ferry coalbed was estimated at 80 percent.

Detailed information on the individual coalbeds is presented in the following section.

INDIVIDUAL COALBEDS

No. 2 Gas Coalbed

The No. 2 Gas coalbed is a metallurgical quality coal that underlies the study area only near the town of Gauley Bridge. Most of the No. 2 Gas within the area has been mined.

Wild and scenic river area:	
Coal reserve base	456,000 tons
Coal reserves	228,000 tons
National park area:	
Coal reserve base	456,000 tons
Coal reserves	228,000 tons

Of the 351 acres within the study area underlain by the No. 2 Gas, available mine maps show that at least 278 acres have been mined. The remaining 73 acres overlie 237,000 tons of recoverable coal that occur in four separate blocks. One 22-acre block containing 77,000 tons of coal reserves is part of a larger block of coal outside the proposed boundaries and may be minable in conjunction with this larger block. The other three blocks, with a total of 160,000 tons of reserves, cannot be mined from outside the study area.

The No. 2 Gas, which has been mined extensively in Fayette County, occurs within the study area only on ridge crests near the town of Gauley Bridge. In this area, the proposed wild and scenic river and national park boundaries coincide. The No. 2 Gas, the youngest coalbed considered, occurs 35 to 50 feet above the Powellton coalbed.

In and near the study area, the No. 2 Gas averages 45 inches in thickness, varying between 30 and 54 inches. It is a high-volatile A bituminous coal with low ash and sulfur, averaging 5 percent and 1 percent, respectively.

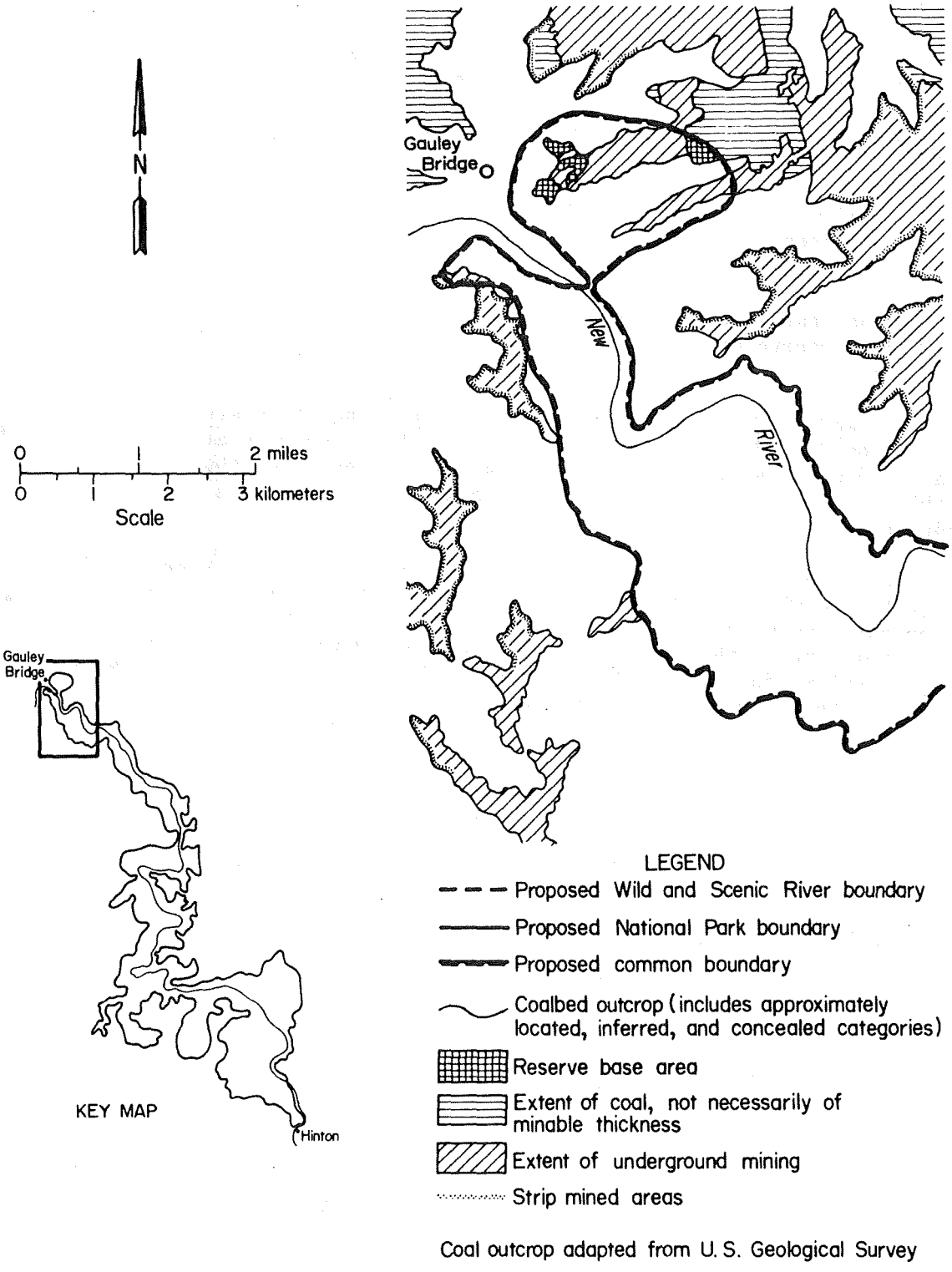

FIGURE 2. - Portion of the Study Area Underlain by the No. 2 Gas Coalbed, Showing Reserve Base and Mined-Out Areas

Powellton Coalbed

Within the study area, the Powellton coalbed averages 36 inches in thickness, but contains numerous shale partings and is high in ash. The coal has been used on a small scale locally for steam and house coal. In other areas of Fayette County, the Powellton is a high-volatile A bituminous coal, low in ash and sulfur.

Wild and scenic river area:	
Coal reserve base	2,531,000 tons
Coal reserves	1,266,000 tons
National park area:	
Coal reserve base	2,531,000 tons
Coal reserves	1,266,000 tons

The 417 acres of the Powellton coalbed within the study area contain a total of 1,266,000 tons of recoverable coal in three separate areas. One area of 34 acres containing 113,000 tons of reserves and parts of the other two might be minable from outside the study area in conjunction with possible mining of adjacent coal.

The Powellton coalbed is present within the study area only near the town of Gauley Bridge where it crops out just below the No. 2 Gas. Although the Powellton has been mined recently northwest of Gauley Bridge, the only evidence of mining in the study area is an old abandoned mine opening. There are proposed plans for mining the 34 acres of Powellton coal west of the New River from an entry outside the study area.

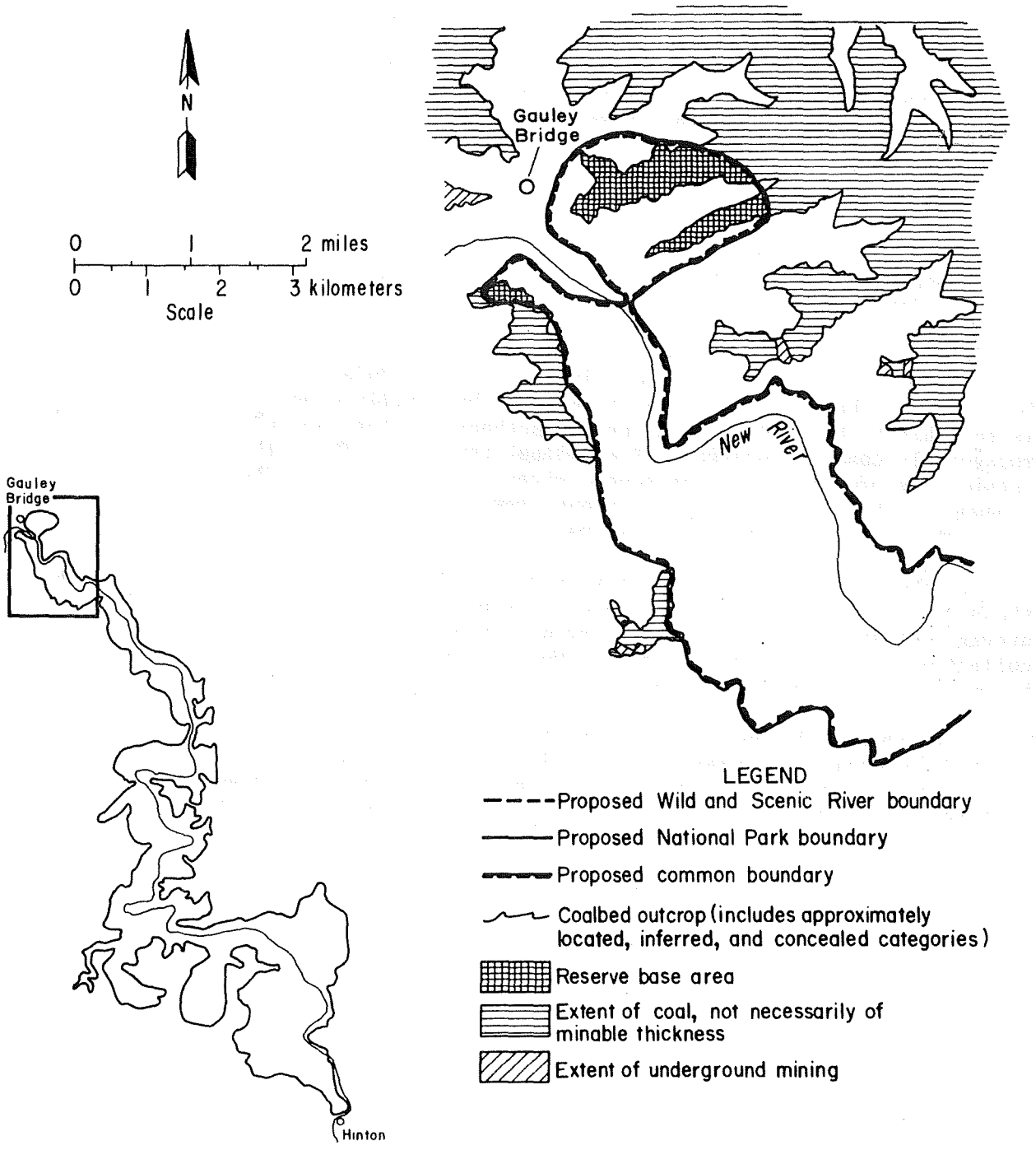

FIGURE 3. - Portion of the Study Area Underlain by the Powellton Coalbed, Showing Reserve Base and Mined-Out Areas

Hughes Ferry Coalbed

Limited reserves of Hughes Ferry coal are present within the proposed national park boundary just north of Thurmond. The coal is of metallurgical quality and is currently being strip mined.

Wild and scenic river area:	
Coal reserve base	0 tons
Coal reserves	0 tons
National park area:	
Coal reserve base	590,000 tons
Coal reserves	472,000 tons

Of the 458 acres in the study area originally underlain by the Hughes Ferry reserve base, 204 acres have recently been strip mined. The Hughes Ferry is too thin to be mined by underground methods. A total of 472,000 tons of recoverable coal is located in 9 erosional remnants. These reserves are outside the proposed wild and scenic river area, but inside the national park boundary. The coal occurs as erosional remnants and therefore cannot be mined from outside the proposed national park area.

The Hughes Ferry crops out just north of Thurmond about 200 feet above the Sewell coalbed. In the area presently being strip mined, the Hughes Ferry averages 16 inches in thickness, varying between 13 and 20 inches. Samples collected at the strip mine show the Hughes Ferry to be a medium-volatile bituminous coal, low in ash and sulfur.

Even though the Hughes Ferry coalbed averages only 16 inches in thickness in the study area, the remaining coal is included in the reserve base because it is presently being recovered. The mining operation is combined with reclamation of older Sewell coalbed benches and a sanitary landfill for Fayette County.

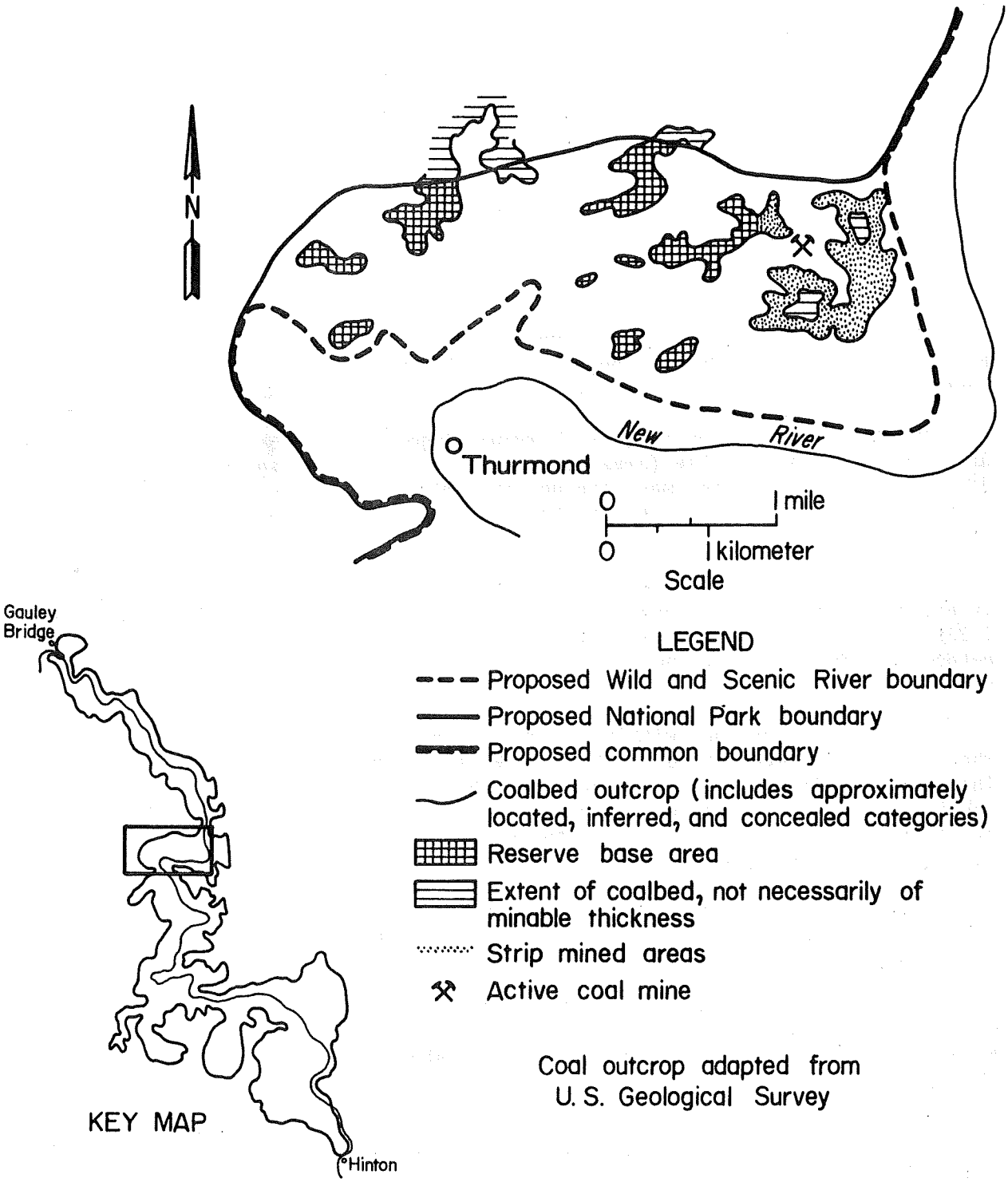

FIGURE 4. - Portion of the Study Area Underlain by the Hughes Ferry Coalbed, Showing Reserve Base and Mined-Out Areas

Sewell Coalbed

The Sewell coalbed has been mined extensively within the study area. The coal is of metallurgical quality and uniform thickness.

Wild and scenic river area:	
Coal reserve base	4,928,000 tons
Coal reserves	2,464,000 tons
National park area:	
Coal reserve base	4,928,000 tons
Coal reserves	2,464,000 tons

The study area was originally underlain by 8,363 acres of Sewell coal, but at least 7,365 acres have been mined. The unmined area contains 2,464,000 tons of recoverable coal located in several separate blocks.

Production data from the West Virginia Department of Mines for a reserve area south of Fayetteville (area A, fig. 5) indicate that the area has been deep mined, although mine maps are not available. For this reason the extent of mining cannot be delineated, although no reserves have been estimated for this area.

North of Fayetteville, the Sewell coalbed thins irregularly and consequently has been mined less extensively than to the south. Area B (fig. 5) contains 2,259,000 tons of reserve base which is currently being mined by underground methods and was therefore not considered in the mining feasibility section of this report.

The Sewell crops out within the entire central portion of the study area where it lies between the older Fire Creek and younger Hughes Ferry coalbeds. The Sewell is from 300 to 400 feet above the Fire Creek. In a few localities, the Beckley coalbed crops out between the Sewell and the Fire Creek. Because of the northwestward regional dip, the Sewell ranges in elevation from about 1,000 feet in the north to about 2,400 feet in the south.

Within the study area, the Sewell coalbed has a thickness of 36 to 48 inches, except where it thins north of Fayetteville. The Sewell is metallurgical quality, medium-volatile coal, low in ash and sulfur.

One mine is operating within the study area in the Sewell coalbed. This mine is an underground operation located at area B. The Sewell coalbed is being restripped just outside the study area about 2 miles southeast of Thurmond.

Mining is being considered for the large area of coal outside the study area and east of the old mine workings across the New River from Fayetteville. Access would be either by shaft from outside the study area or through the old mine workings within the study area.

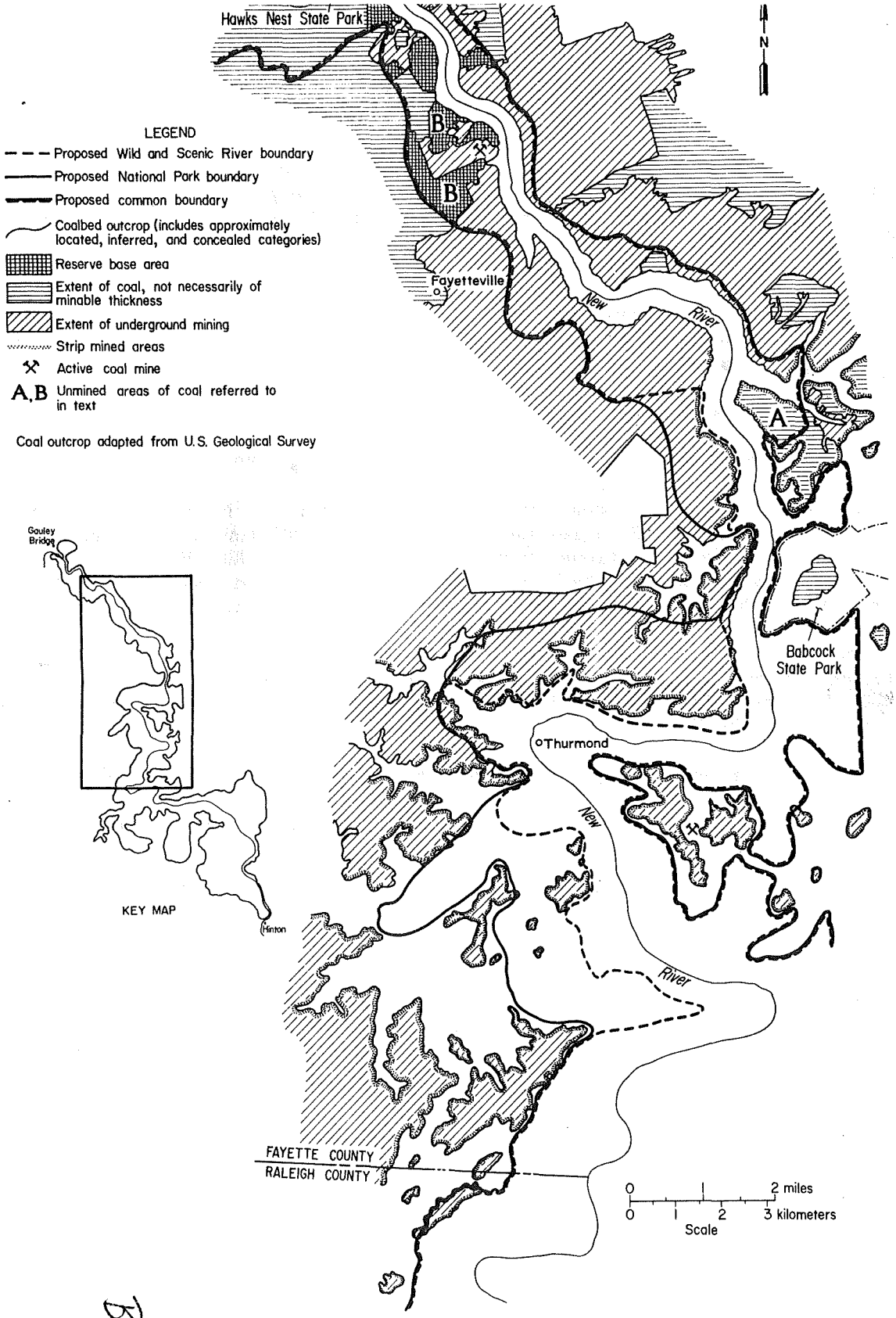

FIGURE 5. - Portion of the Study Area Underlain by the Sewell Coalbed, Showing Reserve Base and Mined-Out Areas

Beckley Coalbed

The Beckley coalbed is a metallurgical quality coal that has been extensively mined southwest of the study area in Raleigh County; however, only 29 acres are known to have been deep mined within the proposed national park. No reserves could be calculated for the Beckley coalbed in Fayette County because of the lack of thickness data.

Wild and scenic river area:	
Coal reserve base	0 tons
Coal reserves	0 tons
National park area:	
Coal reserve base	1,605,000 tons
Coal reserves	803,000 tons

In Raleigh County, no coal reserves exist within the proposed wild and scenic river boundary; 334 acres underlain by 1,605,000 tons of reserve base lie within the proposed national park. Coal reserves of 803,000 tons are present in separate blocks that could be economically recovered only by drift mining from within the study area.

The Beckley is present in the southern portion of the study area, but thins and becomes irregular in thickness toward the north and east from the town of Beckley. The coalbed lies about 250 feet below the Sewell and 100 feet above the Fire Creek.

Within the proposed study boundary, the Beckley coalbed ranges in thickness from 0 to 44 inches. In areas near the study area where it has been mined, the coal is low- to medium-volatile, low in ash and sulfur, and of metallurgical quality.

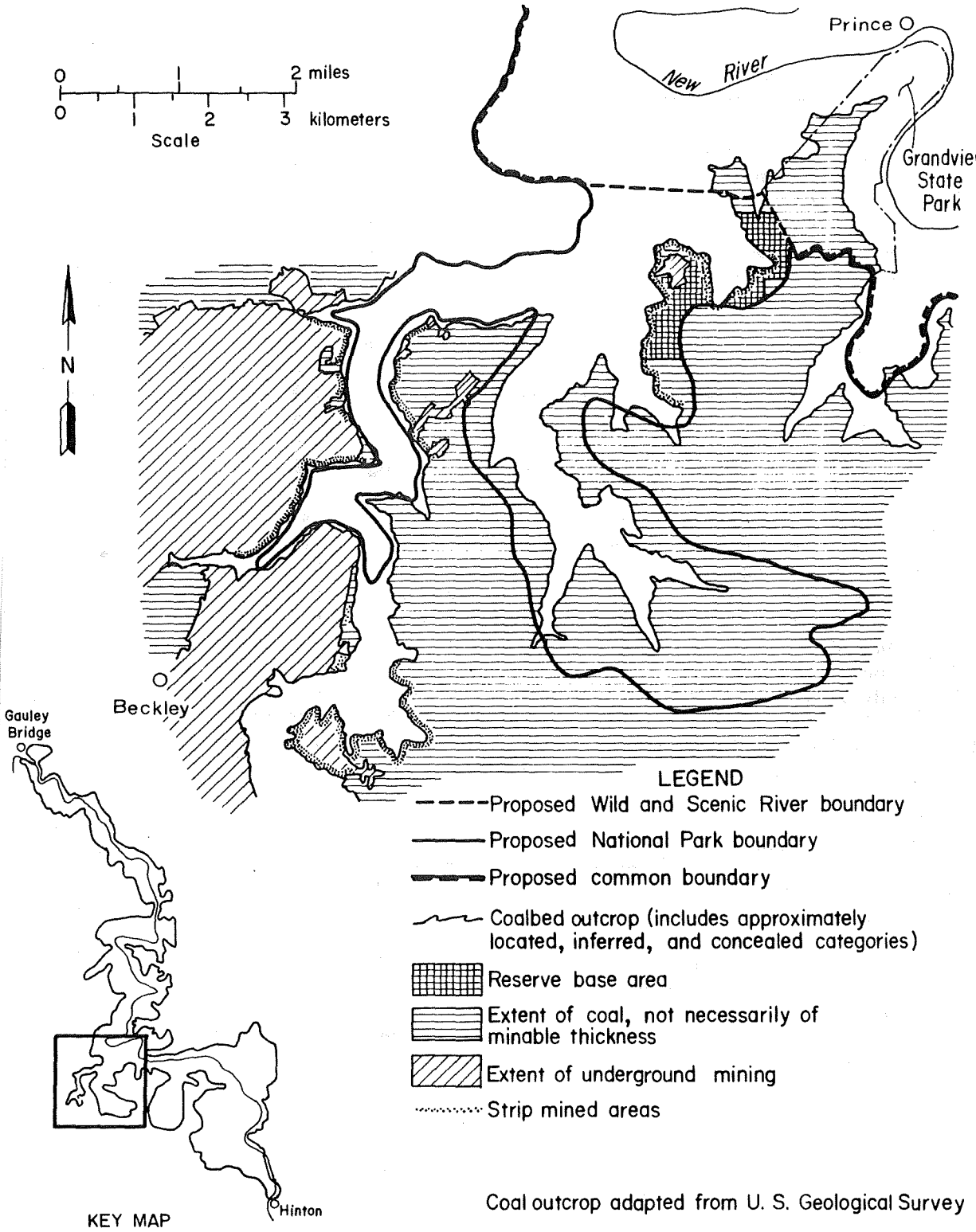

FIGURE 6. - Portion of the Study Area Underlain by the Beckley Coalbed, Showing Reserve Base and Mined-Out Areas

Fire Creek Coalbed

Historically, the Fire Creek coalbed is second in production to the Sewell coalbed within the study area. The coal is low- to medium-volatile, low in ash and sulfur, and of metallurgical quality.

Wild and scenic river area:	
Coal reserve base	8,648,000 tons
Coal reserves	4,324,000 tons
National park area:	
Coal reserve base	14,668,000 tons
Coal reserves	7,475,000 tons

Based on available mine maps, the Fire Creek has been deep mined from beneath 5,431 acres in the study area. Unmined Fire Creek coal of minable thickness underlies 2,918 acres of the proposed national park; of these, 1,731 acres are inside the wild and scenic river portion.

One large block (A, fig. 7), having a reserve base of more than 1.8 million tons, occurs within the national park area and has reserves totaling 1,146,000 tons. This block is discussed separately in the mining feasibility section. An area about 4 miles east of Thurmond and about 1 mile south of Babcock State Park contains 164,000 tons of recoverable coal that might be minable in conjunction with a larger block of adjacent coal outside the study area. Based on a Bureau of Mines drill hole about 12 miles northwest of Thurmond, an estimated 1,556,000 tons of reserves lie below river level. The remaining 4,609,000 tons of reserves occur in separate areas not economically minable from entries outside the study area; 2,600,000 tons of these reserves lie within the proposed wild and scenic river boundary. The Fire Creek has been extensively mined under Grandview State Park in Raleigh County, but the unmined coal is not included in the reserve base since West Virginia State regulations prohibit further mining on State park land.

The Fire Creek coalbed crops out in the central portion of the study area. It lies from 300 to 400 feet below the Sewell and about 180 feet above the Pocahontas No. 6. Thicknesses are irregular and range from 0 to 72 inches within the New River Gorge area.

There are no active mines in the Fire Creek inside the proposed study boundaries, but two deep mines operating in this coalbed are within 1 mile of the boundary in Raleigh County. The coal from both operations is trucked into the New River Gorge to a tipple just south of Prince. From there, the coal is transported by rail to the Claremont coal-preparation plant downriver.

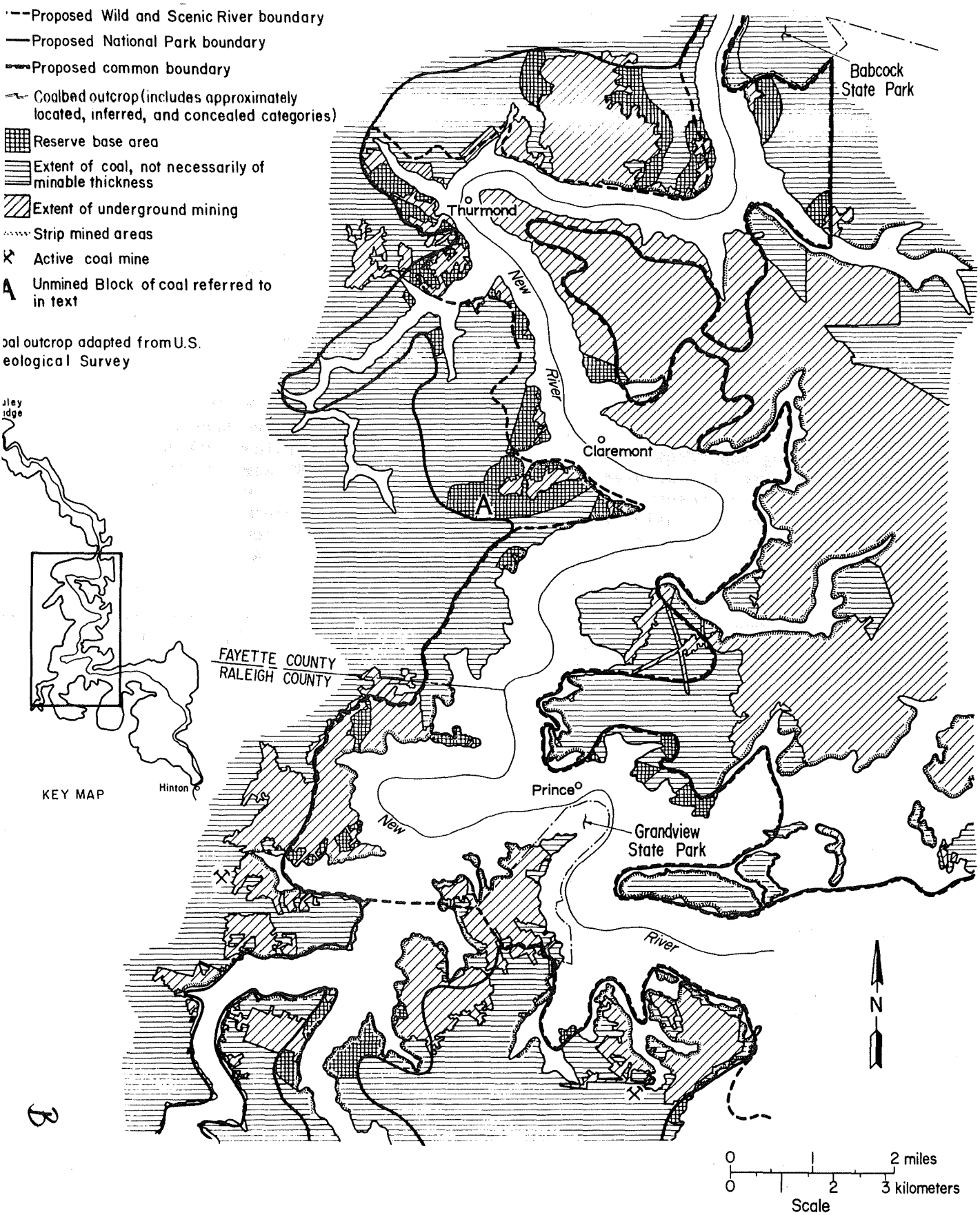

FIGURE 7. - Portion of the Study Area Underlain by the Fire Creek Coalbed, Showing Reserve Base and Mined-Out Areas

Pocahontas No. 6 Coalbed

Limited mining has taken place in the Pocahontas No. 6 coalbed within the study area. Regionally, the coal is of metallurgical quality, predominately low-volatile, and low in ash and sulfur.

Wild and scenic river area:	
Coal reserve base	1,934,000 tons
Coal reserves	1,093,000 tons
National park area:	
Coal reserve base	2,409,000 tons
Coal reserves	1,331,000 tons

Within the study area, only 441 acres are underlain by the Pocahontas No. 6 coal of minable thickness. Mine maps show that 103 acres have been deep mined. The remaining 338 acres within the proposed park area contain 2,409,000 tons of reserve base; the wild and scenic river portion has 251 acres underlain by 1,934,000 tons of reserve base. Block A (fig. 8), 3.5 miles west of the town of Meadow Creek and inside the proposed common boundary, contains reserves of 1,027,000 tons and is discussed in the mining feasibility section. The remaining reserves are in small isolated blocks not minable from entries outside the study area.

The Pocahontas No. 6 coalbed has been mapped in the southern portion of the study area. It lies about 180 feet below the Fire Creek and 120 feet above the Pocahontas No. 3. Thickness for this bed is irregular and ranges from 0 to 60 inches within the study area.

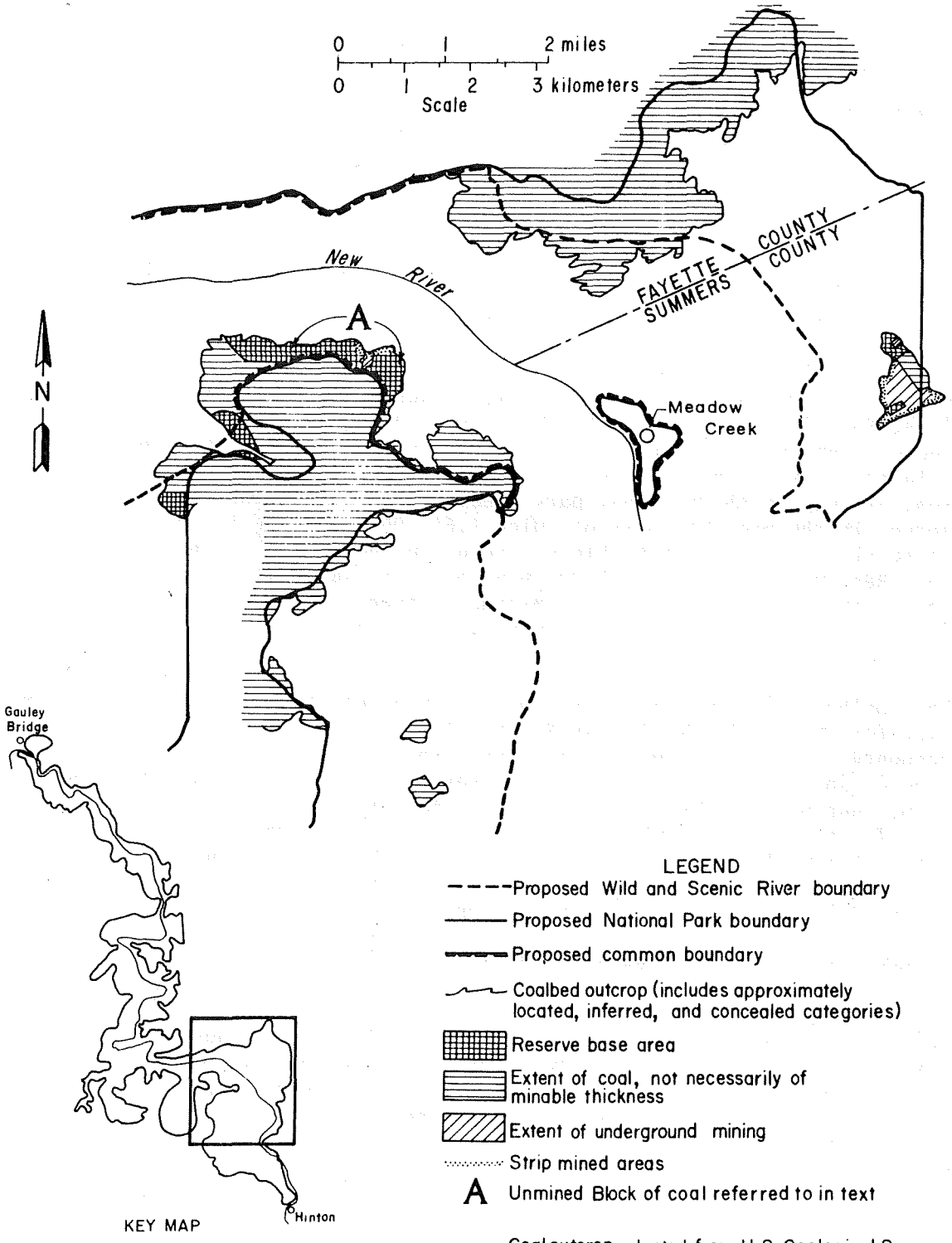

FIGURE 8. - Portion of the Study Area Underlain by the Pocahontas No. 6 Coalbed, Showing Reserve Base and Mined-Out Areas

Pocahontas No. 3 Coalbed

The Pocahontas No. 3 coalbed, which has been extensively mined in West Virginia, has long been regarded as a premium low-volatile metallurgical coking coal. Based on reserves and quality, this coalbed is considered to be the most important coal in the study area.

Wild and scenic river area:	
Coal reserve base	3,403,000 tons
Coal reserves	1,764,000 tons
National park area:	
Coal reserve base	30,625,000 tons
Coal reserves	17,087,000 tons

Within the proposed park boundary, 4,359 acres are underlain by the Pocahontas No. 3 coalbed of minable thickness; 629 acres lie within the smaller proposed wild and scenic river boundary. The vast majority of the reserves occur in two large blocks (A and B, fig. 9). Block A contains 7,328,000 tons of reserves, all within the national park area. Block B contains 7,119,000 tons of reserves in the proposed park of which 1,611,000 tons are inside the wild and scenic river portion. Both blocks are discussed in the mining feasibility section. Reserves totaling 1,233,000 tons occur in small isolated blocks that might be minable in conjunction with mining adjacent coal outside the study area. The remaining 1,407,000 tons of reserves, also in small isolated blocks, could only be mined from within the proposed boundary.

The coalbed crops out in the southern portion of the study area and occurs about 120 feet below the Pocahontas No. 6. Throughout much of the study area, the Pocahontas No. 3 is actually a zone that consists of two or more coal beds separated by shaly material. The thicknesses of both the zone and the beds are irregular, ranging from 0 to about 96 inches for the whole zone and from 0 to 60 inches for the coal. Depending on local conditions either the entire zone or a single bed is being mined. For this study, the entire zone is considered minable when the coal totals 28 inches or more in thickness and the rock partings are less than 50 percent of the zone.

Company data and field samples indicate that the Pocahontas No. 3 near the study area is low-volatile with highly variable amounts of ash and sulfur.

No active mines in the Pocahontas No. 3 are within the proposed study boundary. Several mines that operated about 2.5 miles east of Meadow Creek within the proposed national park have recently been closed temporarily. Three underground mines operating in this coalbed are located 2 miles east of Beckley. The coal presently being mined is washed prior to shipping.

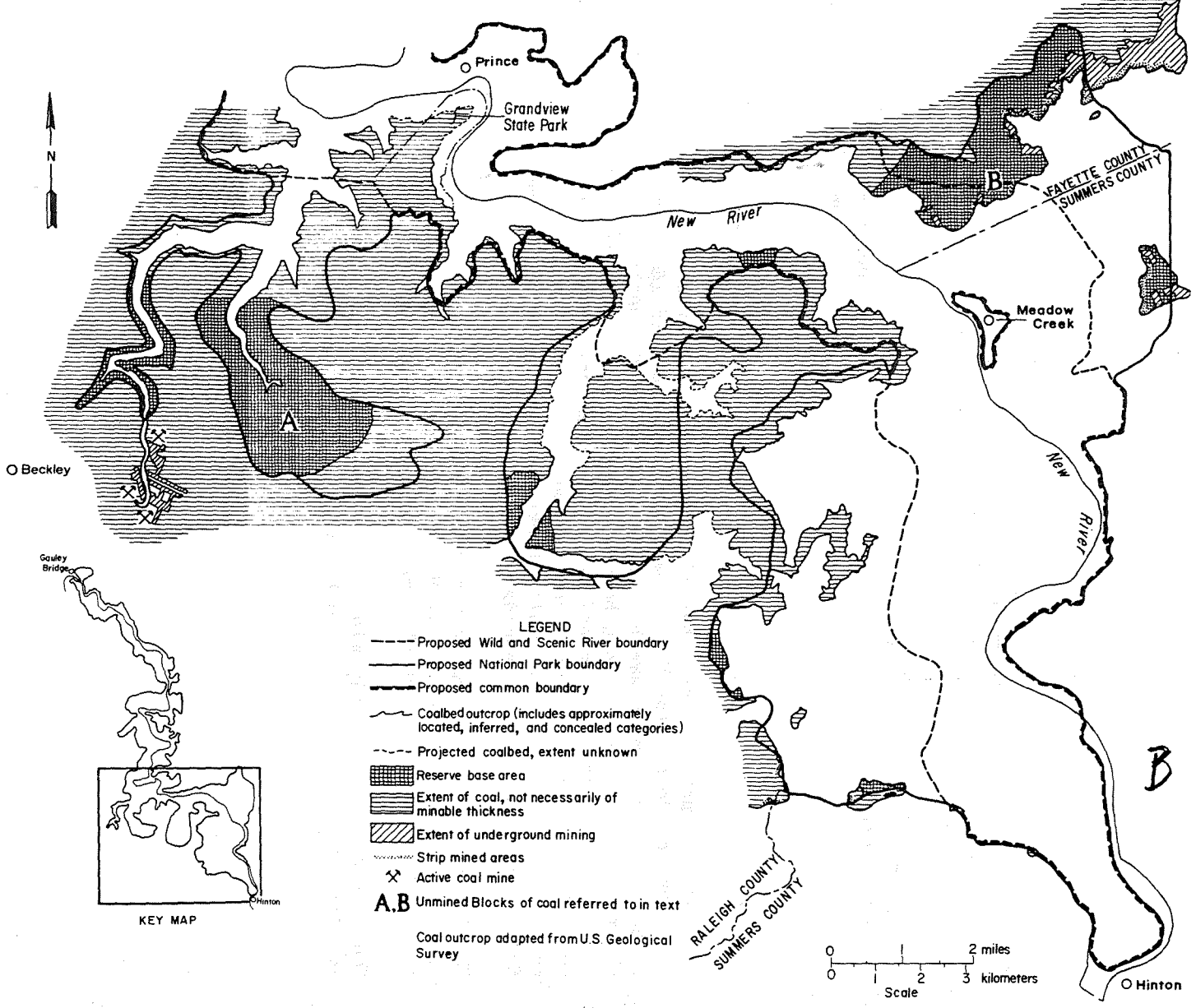

FIGURE 9. - Portion of the Study Area Underlain by the Pocahontas No. 3 Coalbed, Showing Reserve Base and Mined-Out Areas

Pocahontas No. 2 Coalbed

The Pocahontas No. 2 coalbed within the study area has only been strip mined. Based on limited data available, the coal is low-volatile with moderate amounts of ash and sulfur.

Wild and scenic river area:	
Coal reserve base	860,000 tons
Coal reserves	430,000 tons
National park area:	
Coal reserve base	2,878,000 tons
Coal reserves	1,439,000 tons

The proposed national park has 599 acres underlain by a reserve base of 2,878,000 tons of Pocahontas No. 2 coal; the proposed wild and scenic river portion has 177 acres underlain by a reserve base of 860,000 tons. Two separate blocks within the proposed common boundary contain total reserves of 430,000 tons. These blocks could be accessible by drift mining from outside the proposed boundary. The national park area contains an additional 1,009,000 tons of reserves. This coal occurs in small blocks that are accessible to mining only from within the proposed boundary.

The Pocahontas No. 2 crops out northwest of Hinton and occurs from 80 to 140 feet below the Pocahontas No. 3. Inside the study boundary, the coalbed is generally thin with thicknesses ranging from 0 to 36 inches.

There is one active strip mine within the proposed national park area. The coal from this operation is trucked to a coal-preparation plant about 4 miles west of the mine site.

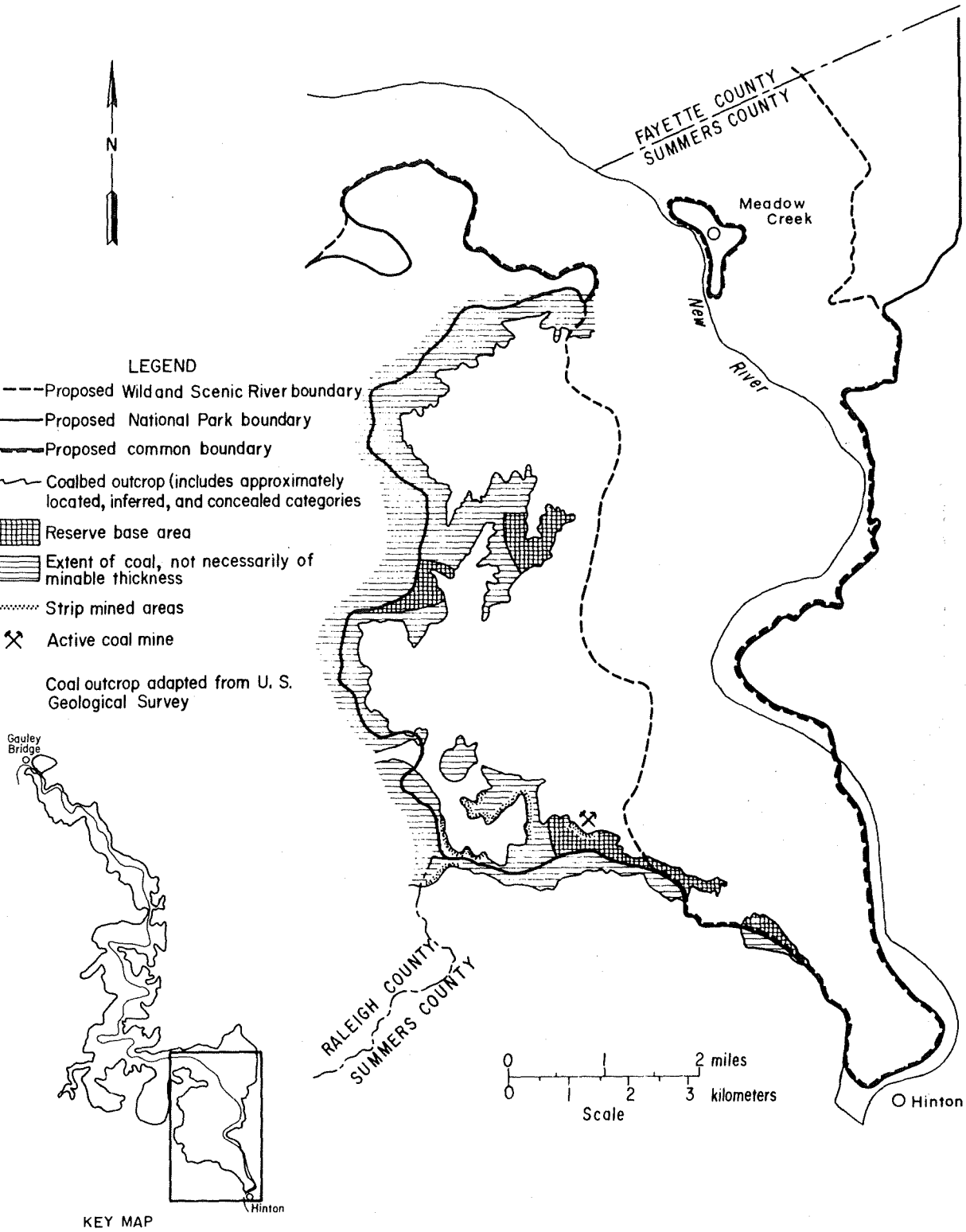

FIGURE 10. - Portion of the Study Area Underlain by the Pocahontas No. 2 Coalbed, Showing Reserve Base and Mined-Out Areas

MINING FEASIBILITY

MINING FEASIBILITY

Mining feasibility studies were conducted to determine which unmined blocks of coal within the study area might be economically mined from entries outside the study boundary. Most coal produced in the area is sold under contract, and contracts must be of long enough duration to assure a continuous supply. A minimum mine life of 8 years at a minimum production rate of 132,000 tons per year (600 tons per day) was assumed for the studies. Only blocks with a reserve base of at least 1.8 million tons of coal could sustain this production rate over an 8-year life. The following feasibility studies were made on blocks of 1.8 million tons or more. Mining proposed for these blocks would be by underground methods; this would require ventilation shafts which, in all cases, would be within proposed national park boundaries. Without ventilation shafts, no underground mining would be feasible. All mining would be by room and pillar method using continuous mining equipment. A 57-percent-recovery factor was used. This factor includes losses for coal remaining in whole and partial pillars or stumps, spillage, coal fines, and washery refuse.

The following tabulation presents current average costs and operation information used in the feasibility studies; these data were based on information obtained from coal companies operating in or near the study area:

Price per ton of clean coal (f.o.b. mine).....	$40/ton
Mining costs.....	30/ton
Shaft costs (large-diameter, fully lined).....	3,500/foot
Shaft costs (small-diameter, two compartment).....	2,400/foot
Slope costs.....	1,600/foot

Each mine would operate 5 days per week
220 days per year

The four feasibility studies itemized in this report are geared to companies willing to mine small reserve blocks resulting in low production rates with attendant higher production costs.

Feasibility Studies

Fire Creek Coalbed - Block A (fig. 7)

The mine plan for Block A consists of a single small-diameter shaft with one haulage entry. There would be two working sections in the mine with 18 men on a single production shift and one maintenance shift.

Reserve base.....	2,011,000 tons
Reserves (marketable coal).....	1,146,000 tons
Annual production.....	132,000 tons
Annual revenue @ $40/ton (f.o.b. mine).....	$5,280,000
Mine life.....	9 years
Average cost (mining and development).....	$31.00/ton

Assuming a $40 per ton selling price, it would be economically feasible to mine this block of coal from an entry outside the study boundary.

Pocahontas No. 6 Coalbed - Block A (fig. 8)

The mine plan for Block A consists of two small-diameter, two-compartment shafts with two haulage entries. There would be two working sections in the mine with 18 men on a single production shift and one maintenance shift.

Reserve base	1,802,000 tons
Reserves (marketable coal)	1,027,000 tons
Annual production	132,000 tons
Annual revenue @ $40/ton (f.o.b. mine)	$5,280,000
Mine life	8 years
Average cost (mining and development)	$32.25/ton

Assuming a $40 per ton selling price, it would be economically feasible to mine this block of coal from entries outside the study boundary. This operation is best suited for a small mining company.

Pocahontas No. 3 Coalbed - Block A (fig. 9)

The mining plan for Block A consists of five shafts, two of which would be large-diameter, fully lined, production shafts with complete hoisting facilities. Three small-diameter shafts would be for ventilation, escapeways, and equipment handling. There would be three haulage entries and three to four working sections in the mine with 27 men per each of two production shifts and one maintenance shift.

Reserve base	12,857,000 tons
Reserves (marketable coal)	7,328,000 tons
Annual production	396,000 tons
Annual revenue @ $40/ton (f.o.b. mine)	$15,840,000
Mine life	19 years
Average cost (mining and development)	$31.25/ton

Assuming a $40 per ton selling price, it would be economically feasible to mine this block of coal from entries outside the study boundary.

Pocahontas No. 3 Coalbed - Block B (fig. 9)

The mine plan for Block B consists of three large-diameter, fully lined, production shafts with three haulage entries. There would be three to four working sections in the mine with 27 men per each of two production shifts and one maintenance shift.

Reserve base	12,490,000 tons
Reserves (marketable coal)	7,119,000 tons
Annual production	396,000 tons
Annual revenue @ $40/ton (f.o.b. mine)	$15,840,000
Mine life	18 years
Average cost (mining and development)	$31.25/ton

Assuming a $40 per ton selling price, it would be economically feasible to mine this block of coal from entries outside the study boundary.