DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

MISCELLANEOUS FIELD STUDIES MAP
MF-1271-E
SHEET 2 OF 2
PAMPHLET ACCOMPANIES MAP

Figure 14.—U.S. Bureau of Mines sample localities.

Figure 15.—Fire Creek(?) coal bed restricted reserve base.

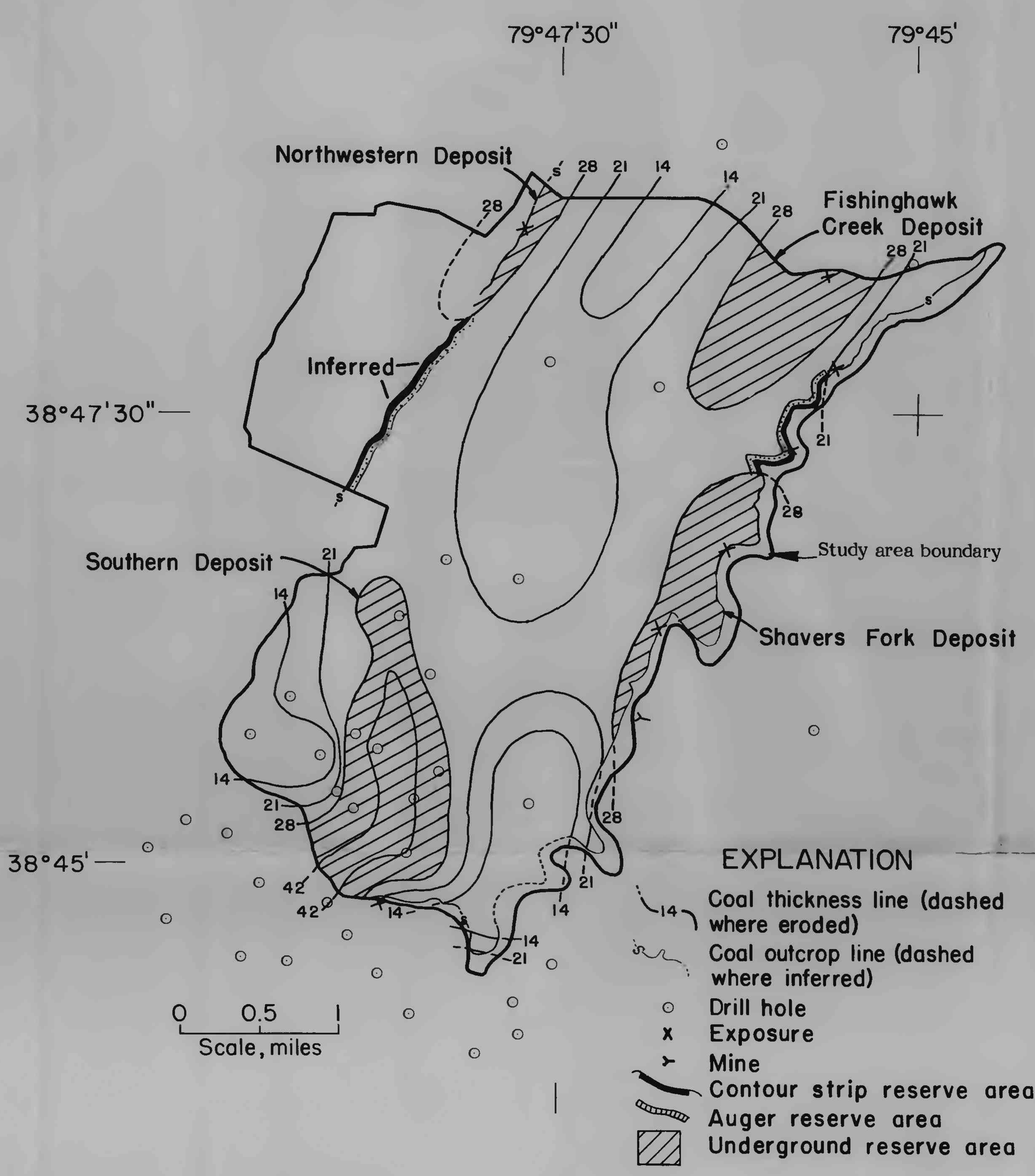

Figure 16.—Sewell(?) coal bed restricted reserve base.

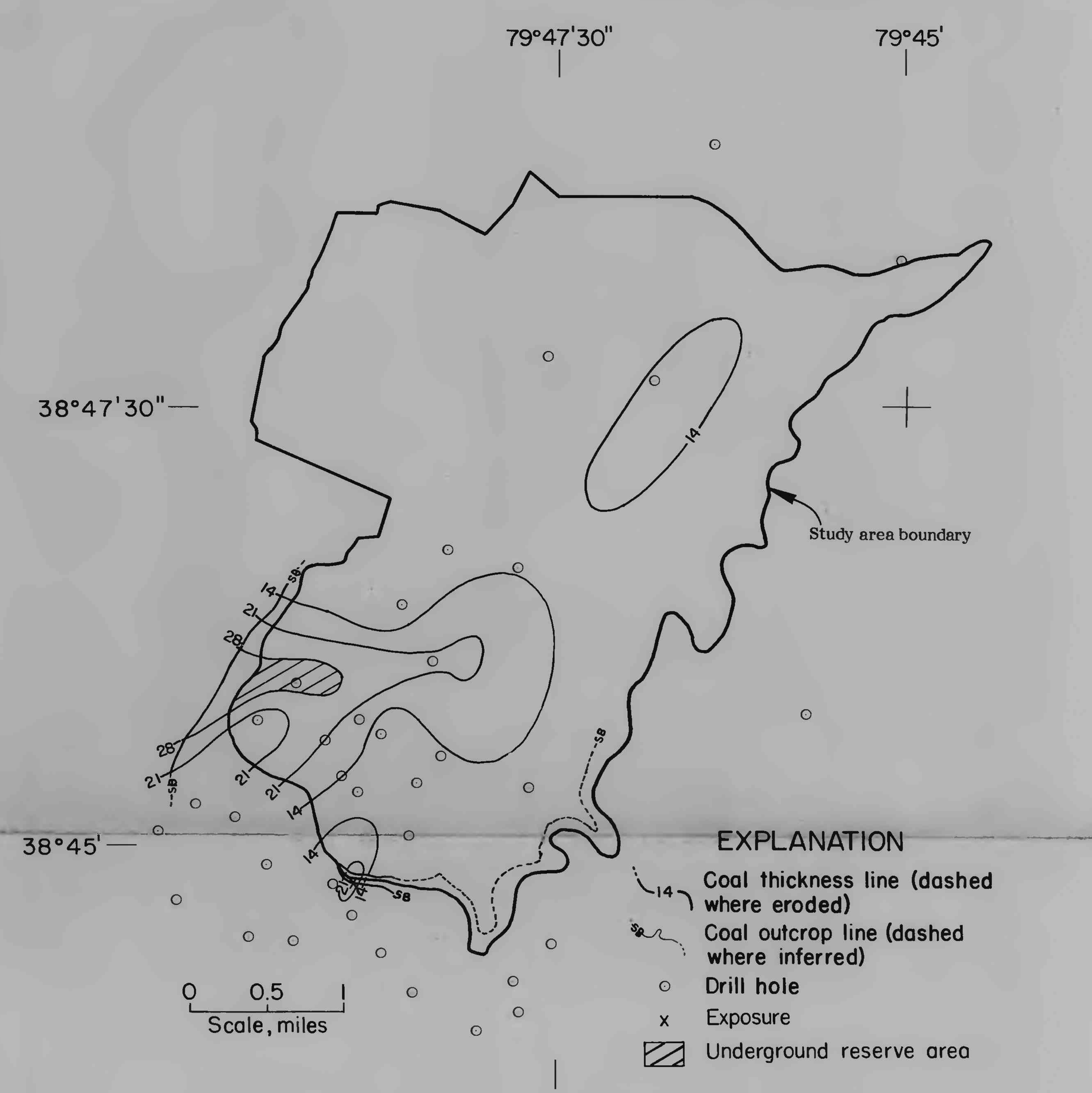

Figure 17.—Sewell B(?) coal bed restricted reserve base.

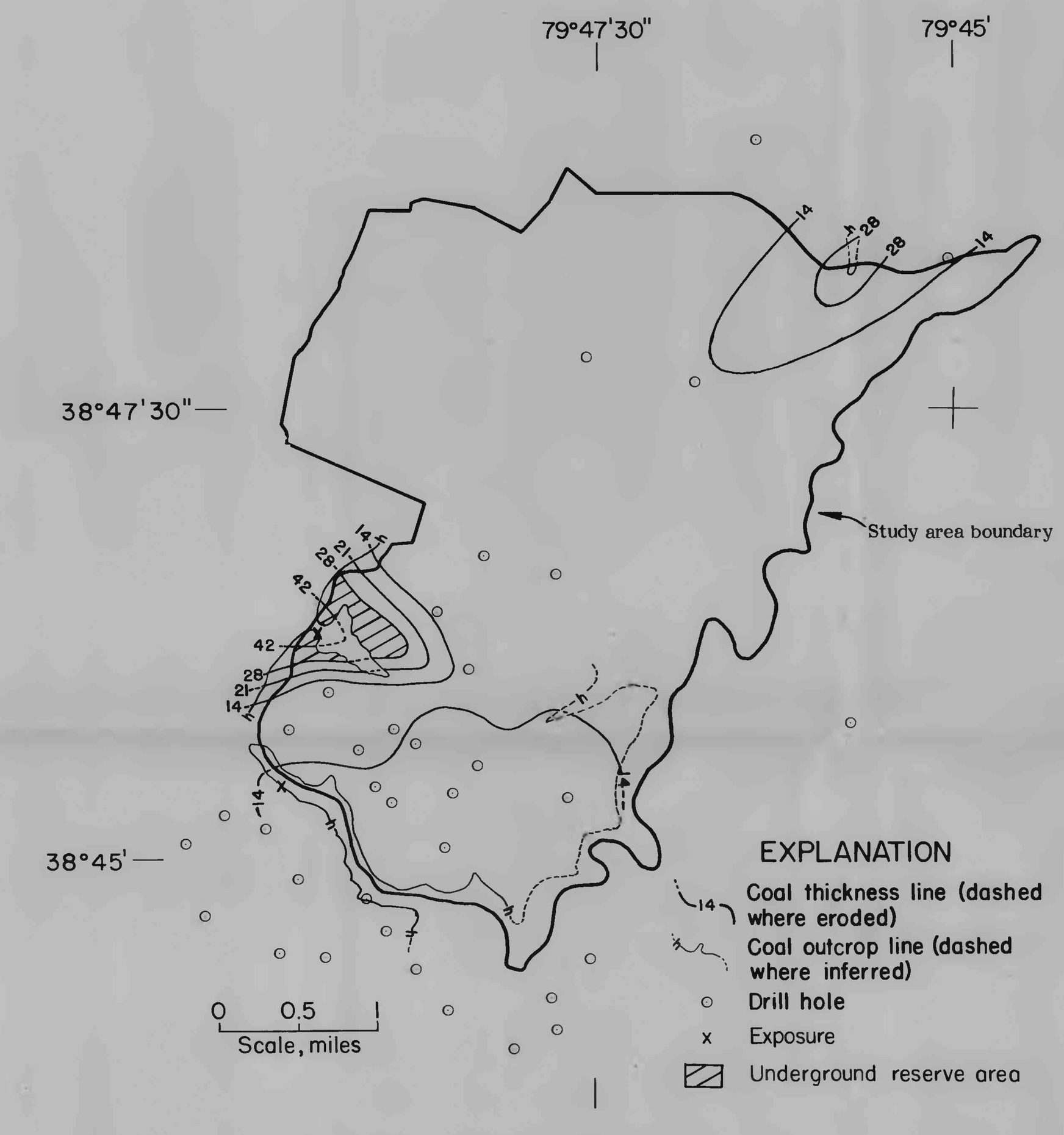

Figure 18.—Hughes Ferry(?) coal bed restricted reserve base.

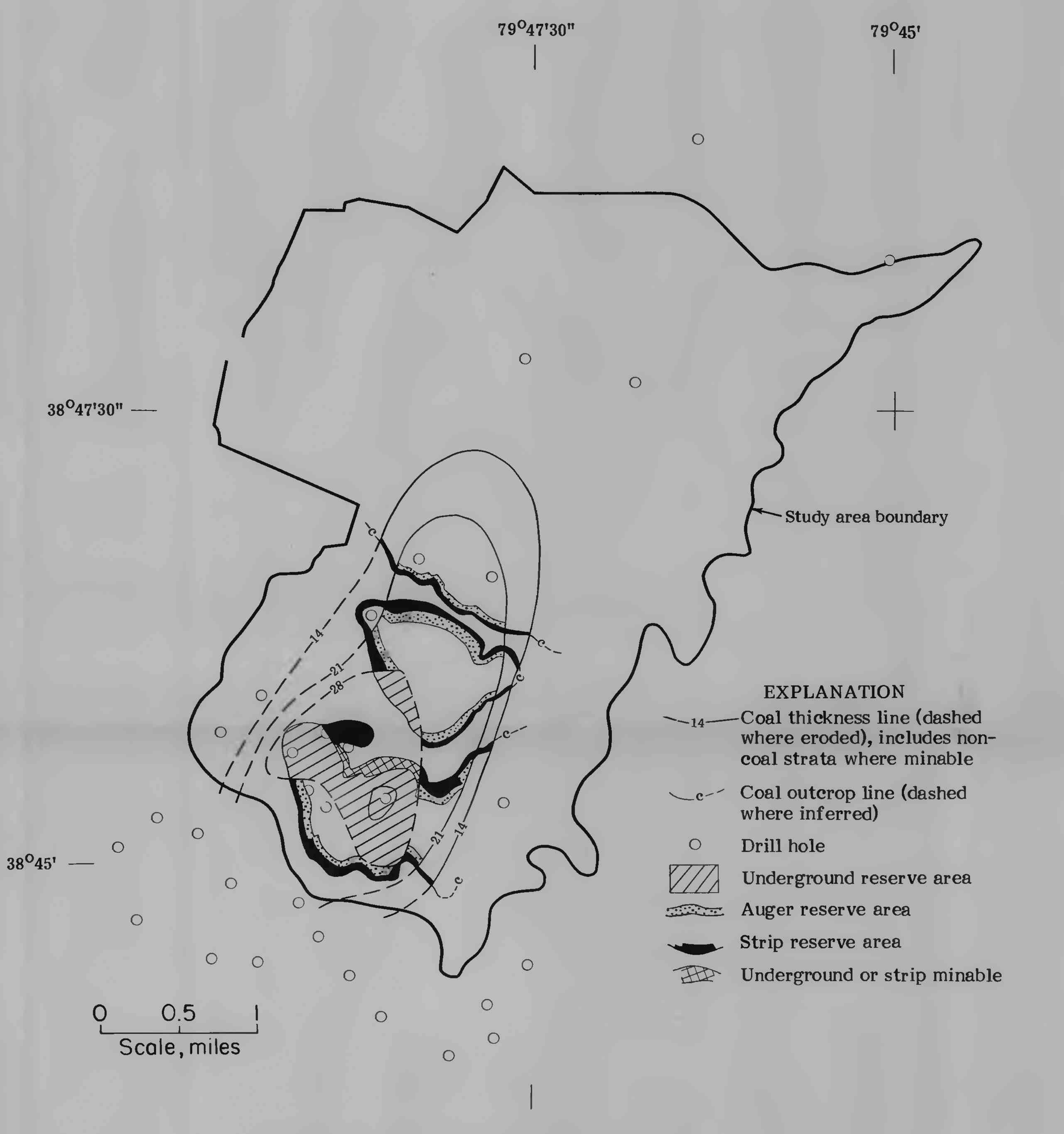

Figure 19.—C coal bed restricted reserve base.

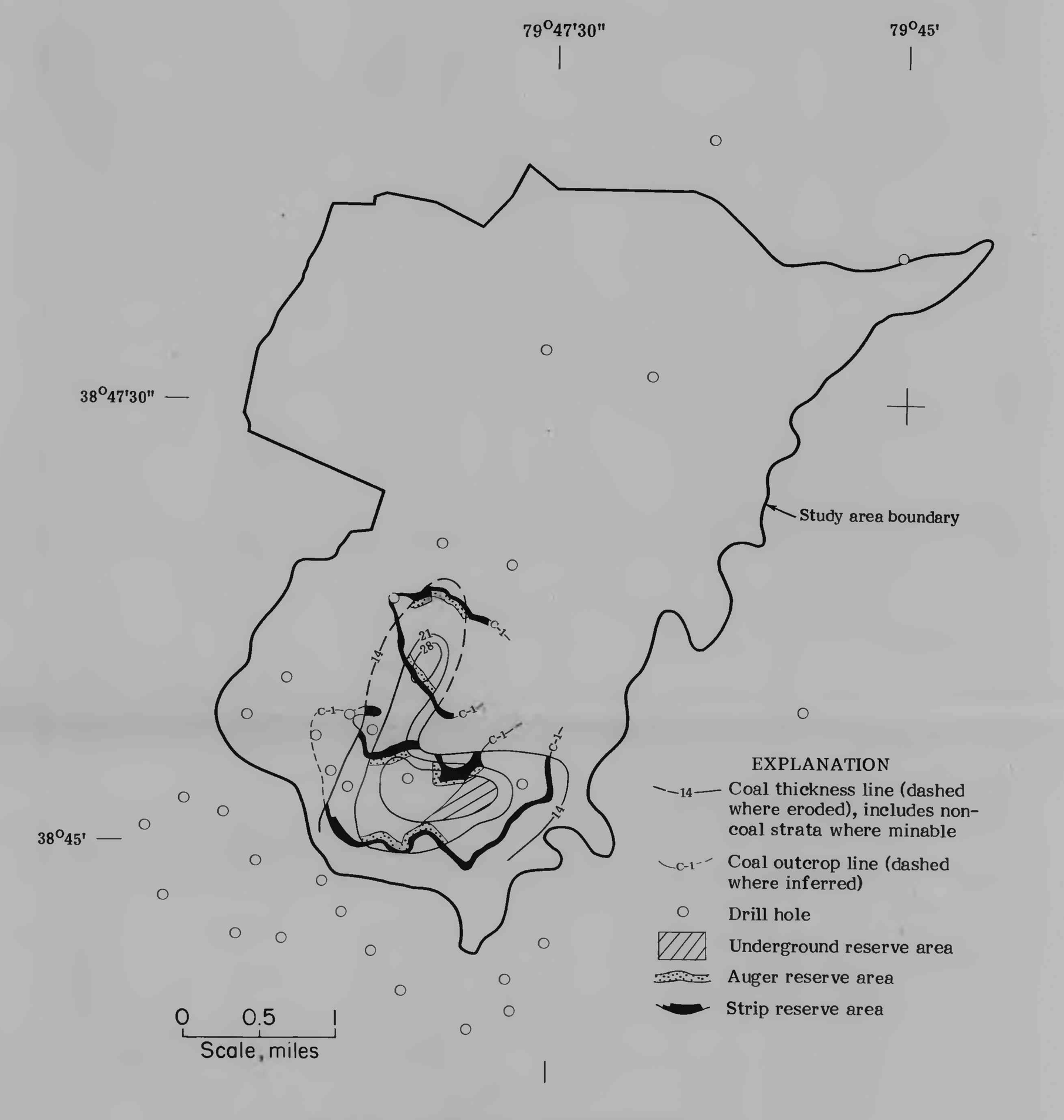

Figure 20.—C-1 coal bed restricted reserve base.

Figure 21.—C-2 coal bed restricted reserve base.

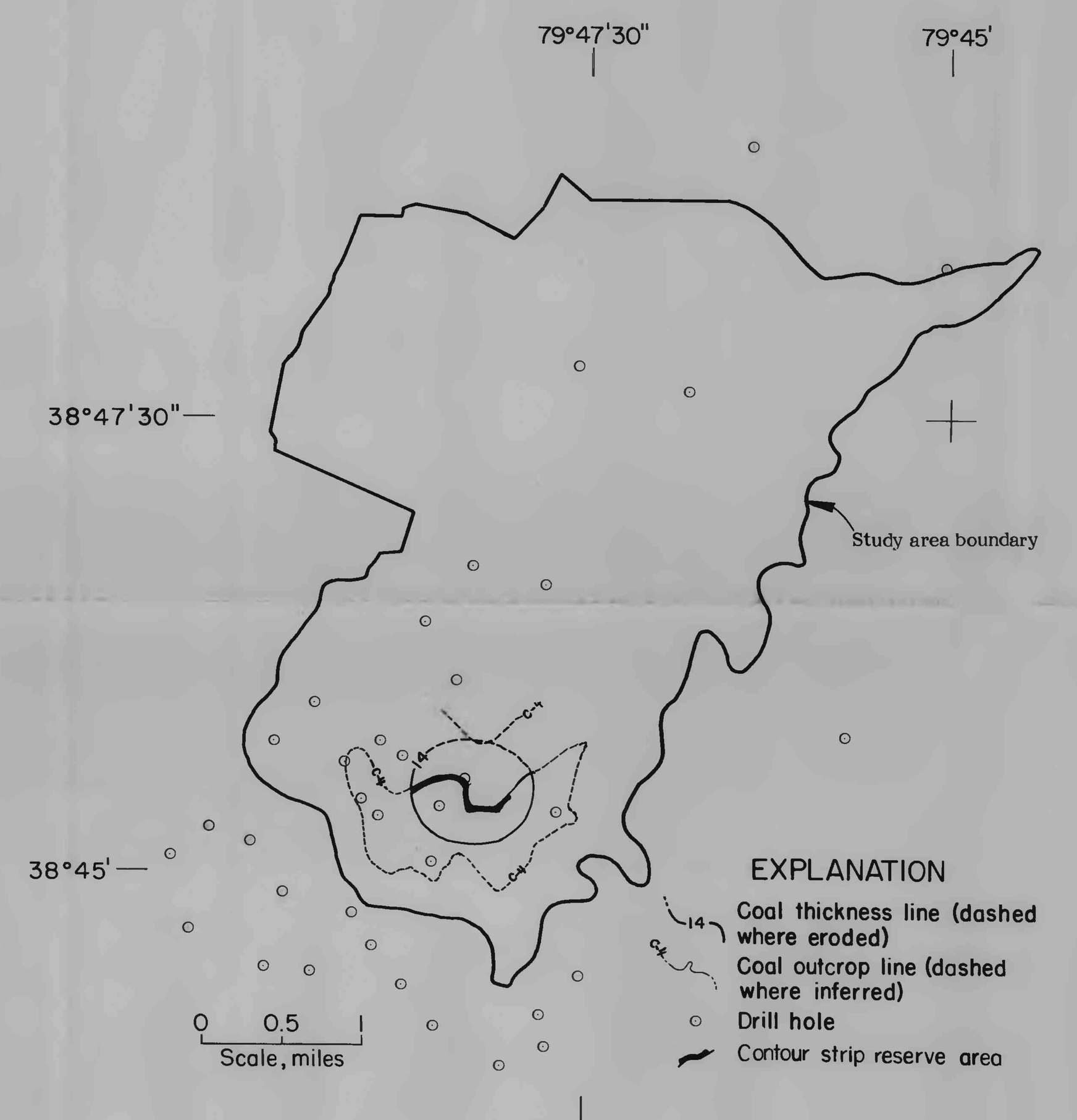

Figure 22.—C-4 coal bed restricted reserve base.

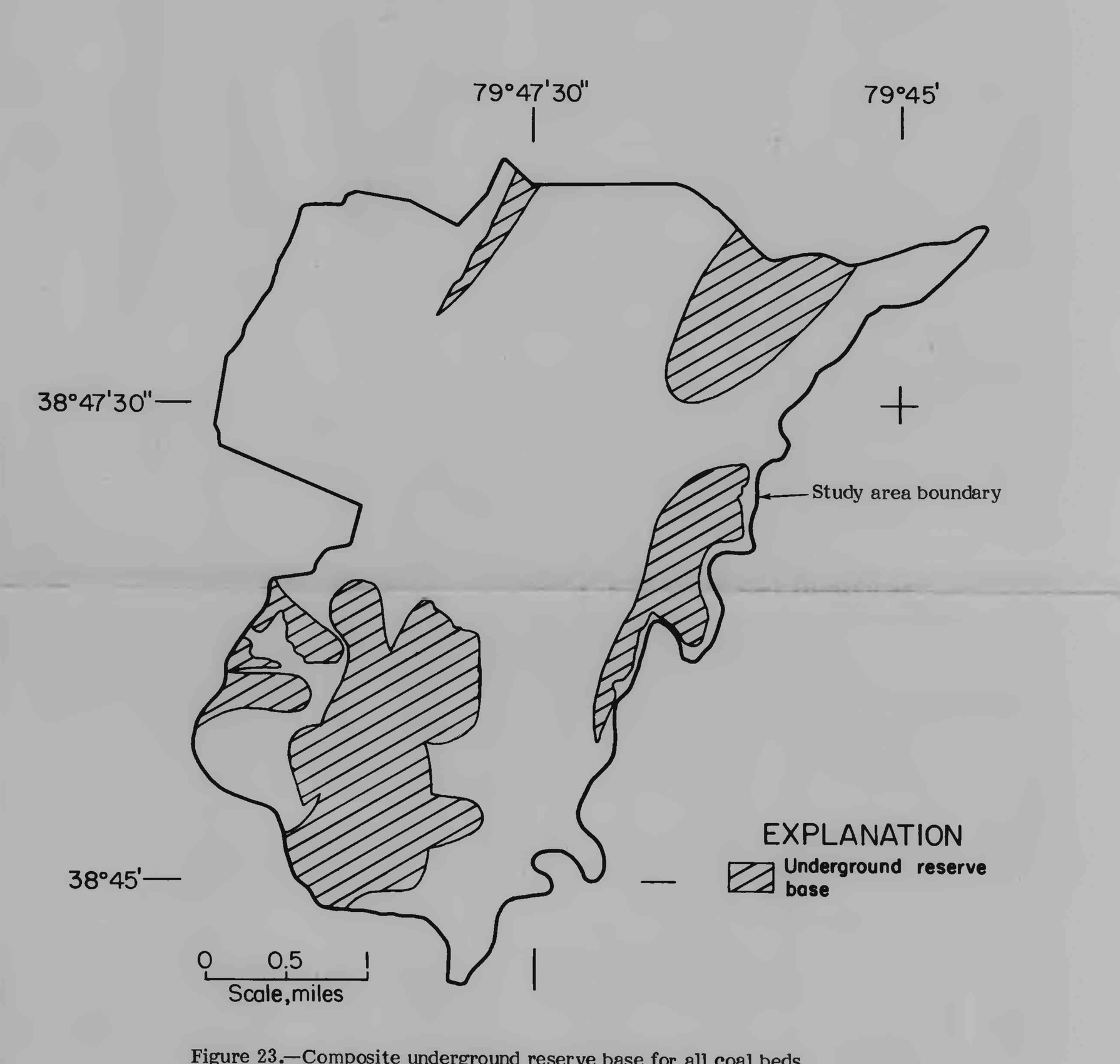

Figure 23.—Composite underground reserve base for all coal beds.

COAL RESERVE BASE

The Sewell(?), Sewell B(?), Hughes Ferry(?), C, and C-1 coal beds are of sufficient thickness for underground and surface mining; only surface-minable reserves occur in the Fire Creek(?), C-2, and C-4 coal beds (table 1). No coal reserves occur in the Little Raleigh(?) and Sewell A(?) coalbeds.

Coal analyses from this investigation (table 3, fig. 14) are on weathered coal from outcrops, prospect trenches, and adit entrances. All samples were oxidized and contained considerable surface moisture. Weathering lowers the free-swelling index and heating value and increases the oxygen content in the ultimate analyses (Yohe, 1958; Rees, 1966). These listed analyses are only an indication of coal quality. Coal analyses reported by previous investigators (Reger, 1931; written commun., U.S. Forest Service, 1980; sheet 1) are on less-weathered samples from prospect trenches, adits, and drill cores. Based on the reported analyses, study-area coal can be tentatively ranked as medium- to high-volatile A bituminous.

Coal in the region is generally suitable for the manufacture of metallurgical coke (Wolfson and Ortuglio, 1969; Ortuglio and others, 1975; Sanner and Benson, 1979). Analyses from this study and those reported by others indicate that some of the raw coal within the study area has an ash and sulfur content within at least marginal-grade coking-coal quality, containing not more than 12 percent ash and 1.0 percent or less sulfur. Most raw coal containing less than 1.0 percent sulfur would be suitable for compliance steam coal.

Spectrographic analyses of coal-ash samples by the U.S. Bureau of Mines (USBM) indicated that germanium is the only anomalous element in coal beds in the study area. High values (66 to 662 ppm) were found in several mappable coal beds in the southern portion of the area (WVCM-34, 35, 36, and 38; fig. 14). However, germanium is not presently recovered from coal.

Coal Evaluation Procedure

To evaluate the coal reserves of Cheat Mountain Roadless Area, an attempt was made to locate and reopen all known mines and prospects in and near the area. Interviews were conducted with mineral-rights owners, prospectors, and local residents having knowledge of such mines and prospects. Many of the original prospects reported by Reger (1931) are caved and their locations are uncertain. Nine prospects and one coal exposure were located and examined within the study area. In addition, seven mines, 15 prospects, and eight exposures were investigated outside the study area.

The degree of geologic control dictates the category in which coal resources are placed. Along with data points established during this investigation, published information (Reger, 1931; West Virginia Department of Mines Annual Reports) was utilized where detailed coal-bed descriptions and locations were reported. Published information was verified where possible by geologic inferences and reports from prospectors.

The reserve base in this report constitutes that portion of the resources in the measured and indicated (demonstrated) categories 28 in. or more in thickness; this is considered minable coal by present underground methods (U.S. Bureau of Mines and U.S. Geological Survey, 1976). Only clean coal was considered in this thickness. In cases where two coal beds are separated by a parting, the thickness is taken to be the cumulative thickness of the benches, provided the parting is not thicker than either bench. Reserve-base maps were adapted from individual bed maps.

Surface-minable coal greater than 28 in. thick was not calculated separately, but is included in the underground reserve base. A restricted-reserve base was calculated for coal greater than 14 in. in thickness, which is the least thickness recoverable by contour-strip and conventional auger mining. The contour-strip-minable area was delineated using the outcrop trace of these coal beds between the 21- and 28-inch isopach lines and a 15 to 1 overburden-to-coal ratio. A 25- to 105-foot highwall would be developed, which is comparable to other mines near the study area. The auger-minable area was based on a 150-foot average auger-penetration depth from the strip-mine highwall (Secor and others, 1977). Using the smallest diameter auger currently available and a 30 percent undersize to allow for sagging and misalignment of the auger, 21 in. is the minimum coal-bed thickness recoverable. Restricted coal reserves were estimated using an 85-percent recovery factor for contour-strip and a 35-percent recovery factor for auger methods (Secor and others, 1977). Because of the thin interval between the C, C-1, C-2, and C-4 coal beds, it may be economically feasible to extract these beds by multiple coal-bed strip mining. The restricted reserve-base area for multiple coal-bed stripping of this coal interval was delineated by using: 1) the outcrop trace, where the coal beds are greater than 14 in. in thickness are not recoverable by underground methods, 2) cumulative thickness of coal beds greater than 14 in. in the minable zone, 3) a 15-to-1 overburden and interburden to coal ratio, and 4) an upper limit of the highwall to the base of the overlying Kanawha Formation sandstones as described by Englund and others (1981).

The recovery factor will vary due to local geologic conditions, mining plans, and mining machinery utilized. Geologic data and past mining history are insufficient to accurately determine the recovery factor at this time. Because of variability of coal-bed thickness in this region, flexible mining techniques, such as conventional and continuous mining methods, have been utilized.

Fire Creek(?) Coal Bed

Located a few feet above the Late Mississippian-age Mauch Chunk Formation, the Fire Creek(?) coal bed is stratigraphically the lowest New River Formation coal bed in the Cheat Mountain Roadless Area (fig. 2). A reserve block along Shavers Fork may be minable by contour strip and auger methods (fig. 15).

Analyses of samples collected from Fire Creek(?) zone coal beds (table 2; Reger, 1931) indicated these beds have very low sulfur and moderate ash content.

Sewell(?) Coal Bed

Continuous throughout the study area, the Sewell(?) coal bed occurs within a thick interval of predominantly dark-gray shale between lower unnamed sandstone members of the New River Formation, a zone in which three to four coal beds are found. Core descriptions for drill holes SF-11 and SF-17 (Behum and Hammack, 1982a) indicate that the bed is canneloid in the southern reserve block (fig. 16). A lower ply of fossiliferous, carbonaceous shale and bone is found in the northeastern portion of the study area. This ply is often removed in nearby mines to gain additional mining height.

Reserves from the northwestern deposit may be minable from small drift mines driven from the west slope of Cheat Mountain. The Shavers Fork deposit would have to be accessed from adits inside the area along this river (see topographic map on sheet 1). Access to the Fishinghawk Creek deposit may be possible by either reopening the old Davis Coal Land Company No. 3 mine or by driving new heading immediately east of the mine (Behum and Hammack, 1982a). The southern deposit appears to be accessible by driving entries into outcrops southwest of the area.

Surface-minable reserves occur along Shavers Fork and the west slope of Cheat Mountain. Most of the coal at the latter locality is inferred. The inferred restricted-reserve base and reserves (U.S. Bureau of Mines and U.S. Geological Survey, 1980) are as follows:

Restricted reserves (demonstrated)—152,000 short tons
Restricted reserves (demonstrated)—79,000 short tons
Restricted reserve base (inferred)-164,000 short tons
Restricted reserves (inferred)——89,000 short tons

The quality of the Sewell(?) coal bed is generally excellent, with an average of 0.58 percent sulfur and 6.8 percent ash (as-received) in the study area vicinity. However, in the southern deposit, where the bed grades to cannel coal with bony partings, a corresponding increase in ash and sulfur content occurs. Analyses from this deposit (table 3 and Behum and Hammack, 1982b) show an average 1.05 percent sulfur and 35.7 percent ash (as-received). Impure canneloid coal collected from the Linan mine dump contained 43 percent ash (as-received). Additional sampling is necessary to fully assess the ash content and cleaning characteristics of coal in the southern deposit.

Washability analyses of this coal bed from mine samples indicated that Sewell(?) coal with moderate ash content (10 to 15 percent) can be upgraded to meet premium coking-coal ash and sulfur-content criteria, while the high-ash coal (greater than 15 percent) can be cleaned to meet at least marginal-grade coking-coal criteria (Deurbrouck, 1966; Sanner and Benson, 1979).

Sewell B(?) Coal Bed

A small reserve-base block in the Sewell B(?) coal bed is found along the western boundary of the study area (fig. 17). Erosion preceeding deposition of the overlying sandstone has removed much of the coal bed and associated shales in the southern and northern portions of the study area.

Reserves of the Sewell B(?) coal bed are presumably accessible from outside of the area by driving drift entries into outcrops on the west slope of Cheat Mountain.

Analyses indicate that the bed has moderate ash but a fairly high sulfur content for coal beds in the New River Formation. The ash content averages 11.5 percent (as-received) while sulfur averages 2.8 percent. A lower bench, consisting of interlaminated impure and high-ash coal, contained 45 percent ash (as-received) in outcrops along Stalnaker Run (table 3). Cleaning would be necessary to lower the ash and sulfur content. Additional coal samples from drill core or surface prospects are required to assess the cleaning characteristics.

Hughes Ferry(?) Coal Bed

The Hughes Ferry(?) coal horizon is persistent throughout the study area. Coal reserve-base blocks are located along the northern and southwestern boundary (fig. 18). Reserves of the Hughes Ferry (?) coal bed in the southwestern deposit may be accessed by small drift mines driven into outcrops located either outside the study area on the west slope of Cheat Mountain or inside the study area along Red Run. A small block in the Fishinghawk Creek deposit could be reached by entries outside of the area along the creek.

Analyses of four outcrop samples of the Hughes Ferry (?) coal bed, taken in and near the study area (table 3), and drill-core sample (Behum and Hammack, 1982b), indicated this coal generally has a low sulfur and a low to moderate (11.5 percent average) ash content.

C Coal Bed

Coals of the Middle Pennsylvanian Kanawha Formation occur about 300 ft above the base of the Sewell(?) coal bed in a 120-foot interval composed of shale, sandy shale, sandstone, and siltstone. The zone contains up to nine coal beds; only two, the C and C-1 coal beds, are of sufficient thickness and lateral extent to estimate an underground reserve base. The C coal bed attains maximum thickness in the south-central portion of the study area (fig. 19). Additional reserves exist immediately to the north.

Access to the underground-minable C coal bed deposit would have to be from adits driven inside the study area in the Rose Run and Stalnaker Run drainages. Additional coal may be recoverable by both single and multiple coal-bed stripping and subsequent auger mining. A small tract south of Rose Run is minable by either underground or contour-strip methods. Strip mining would allow recovery of coal from the overlying C-1 and C-4 beds, which at this locality would be too thin to economically extract individually. If strip mining were conducted, 186,000 short tons would be shifted from the underground reserve base (table 4) to the restricted (surface minable) reserve base.

C-1 Coal Bed

The C-1 coal bed occurs 20 to 40 ft above the C coal bed and is separated from it by a variable sequence of shale, thin sandstone, and one to two thin coal beds. Areas of thick coal in the C-1 bed overlie thicker pods in the C bed between Stalnaker and Rose Runs (fig. 20). The minability of this coal bed is limited by the close proximity to the C coal bed. The invervening strata is relatively weak and would probably provide a poor roof span over possible C coal-bed workings. Therefore, no underground-reserve base was estimated for the part of the C-1 bed which overlies minable C coal bed areas.

Access to this coal bed would have to be from entries into the outcrop north of Stalnaker Run. Headings into the eastern coal block would have to be developed through a small area of thin coal (about 24 to 28 in. thick). Surface-minable reserves were estimated as a more practical alternative for recovery of the C-1 coal bed, assuming underground extraction of the C coal bed. A small amount of the surface reserve base would only be recoverable if mined by multiple coal beds methods with a C coal bed tract south of Rose Run. No analyses are available for this coal bed, but electric logs have indicated a low to moderate ash content (Elkins and Kelly Lands, written commun., 1981).

C-2 Coal Bed

The C-2 coal bed occurs 40 to 50 ft above the C-1 coal bed in the unnamed coal zone of the Kanawha Formation (fig. 2). Although the bed is thin (less than 16 in. thick), it is persistent and underlies most of the highlands in the southern part of the study area (fig. 21). A small amount of the coal resources may be recovered by contour strip mining in conjunction with extraction of the underlying C-1 coal bed.

No coal analyses for this study are available, but electric logs indicate the coal bed has a moderate ash content.

C-4 Coal Bed

The C-4 coal bed is thin (less than 18 in. thick); only a small area of coal (fig. 22) may be recoverable by multiple coal-bed stripping of the C-4, C-1, and a tract of the C coal bed south of Rose Run. No analyses are available for the C-4 coal bed, but electric logs indicate the coal bed has moderate to high ash content.

Other Coal Beds

Three New River Formation coal beds, termed the Little Raleigh(?), Welch (?), and Sewell A(?) coal beds by Reger (1931, fig. 3), contain coal greater than 28 in. thick. These coal beds are not considered economically recoverable using current underground and surface-mining techniques because of limited deposit size or poor coal quality. No coal-reserve base or reserves were calculated for the Little Raleigh(?), Welch(?), and Sewell A (?) coal beds.

Numerous thin or discontinuous coal beds occur in the study area (fig. 2) for which no coal-reserve base could be estimated. The C rider and C-3 coal beds are persistent in the southern part of the study area, but are too thin to be minable separately. Portions of the C rider and C-3 coal beds could probably be recovered in conjunction with multiple-seam stripping of the C, C-1, C-2, and C-4 coal beds.

Reserve Summary

The demonstrated reserved base for coal within the study area is 11.5 million short tons (table 4). A composite reserve-base area for all coal beds is shown in figure 23. Exact reserves have not been determined for this area because the specific recovery factor for these coal beds by undeground-mining methods has not been sufficiently demonstrated within the Georges Creek coal basin. However, if a 50-percent recovery factor is utilized, 5.74 million short tons are potentially recoverable; if a 60-percent factor is used, 6.88 million short tons can be recovered.

An additional reserve base was estimated for surface-minable coal in the Fire Creek(?), Sewell(?), C, C-1, C-2, and C-4 coal beds. This reserve base is classified as restricted because of the prohibition of surface mining in eastern National Forests. The resricted-reserve base is 1.62 million short tons, of which 750,000 short tons are minable by stripping and 260,000 short tons are minable by auger mining. A composite restricted-reserve-base area for all of the above-mentioned coal beds is shown in figure 24.

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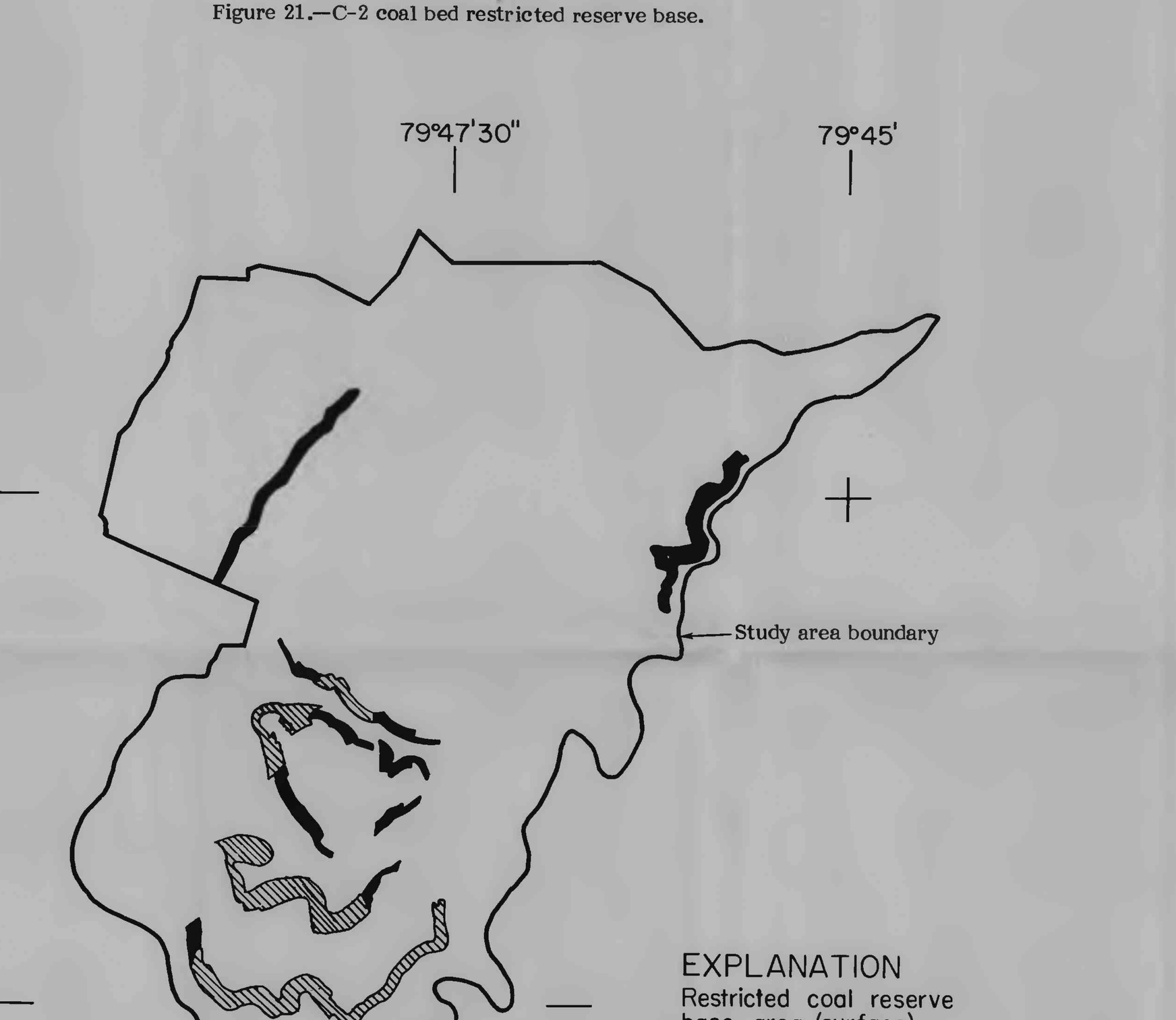

Figure 24.—Composite restricted (surface minable) reserve base for all coal beds.

TABLE 3.--Analyses of coal, Cheat Mounain Roadless Area.[1]

Sample number	Coal bed	Sample interval (inches)	Condition of sample[2]	Proximate (percent) Moisture	Volatile Matter	Fixed Carbon	Ash	Ultimate (percent) Hydrogen	Carbon	Nitrogen	Oxygen	Sulfur	Calorific value (B.T.U.)	Fusibility of ash[3] (°F)	Sulfur forms[4] (percent) Sulfate	Pyritic	Organic
WVCM-7	C	42.5	A.R.	13.0	27.2	56.4	3.4	5.1	65.6	1.1	24.2	0.6	10,975	2,420 IDT	0.01	0.02	0.54
			M.F.	--	31.2	64.9	3.9	4.2	75.4	1.3	14.6	.7	12,614	2,520 ST	.02	.02	.62
			M.A.F.	--	32.5	67.5	--	4.4	78.4	1.3	15.2	.7	13,126	2,600 FT	.02	.02	.64
WVCM-39	Uncorrelated	19.0	A.R.	9.5	23.3	54.9	12.3	5.2	66.6	1.2	13.8	1.0	11,684	2,310 IDT	.02	.95	.38
			M.F.	--	25.8	60.6	13.6	4.6	73.6	1.3	5.9	1.1	12,910	2,400 ST	.02	.61	.42
			M.A.F.	--	29.8	70.2	--	5.3	85.2	1.5	6.8	1.2	14,934	2,490 FT	.03	.71	.48
WVCM-35	Hughes Ferry (?)	22.0	A.R.	21.9	22.6	43.8	11.7	--	--	--	--	--	8,795	2,290 IDT	.01	.01	.01
			M.F.	--	28.9	56.1	15.0	--	--	--	--	--	11,265	2,410 ST	.20	.26	.30
			M.A.F.	--	34.0	66.0	--	--	--	--	--	--	13,250	2,500 FT	--	--	--
WVCM-34	do.	42.0	A.R.	21.3	22.6	41.0	15.1	5.6	47.4	0.9	30.4	0.7	7,682	2,800+IDT	.01	.01	.02
			M.F.	--	28.8	52.0	19.2	4.1	60.2	1.1	14.6	.9	9,759	2,800+ST	.14	.17	.21
			M.A.F.	--	35.6	64.4	--	5.0	74.4	1.4	18.0	1.1	12,072	2,800+FT	.55	.70	.87
WVCM-40	do.	18.5	A.R.	21.7	21.8	53.2	3.3	6.1	63.6	1.3	25.1	0.6	11,054	2,080 IDT	.02	.04	.50
			M.F.	--	27.9	67.9	4.2	4.8	81.2	1.6	7.5	.7	14,117	2,200 ST	.02	.05	.64
			M.A.F.	--	29.1	70.9	--	5.0	84.7	1.7	7.8	.7	14,737	2,290 FT	.03	.05	.66
WVCM-8	do.	20.25	A.R.	8.5	23.7	53.8	14.0	5.0	64.7	1.0	14.7	.6	11,031	2,650 IDT	.02	.06	.50
			M.F.	--	25.9	58.8	15.3	4.4	70.6	1.1	7.9	.6	12,051	2,760 ST	.02	.06	.55
			M.A.F.	--	30.5	69.5	--	5.7	83.4	1.3	9.3	.7	14,235	2,800 FT	.03	.07	.65
WVCM-36	Sewell B (?)[5]	19.0	A.R.	7.5	24.3	55.6	12.6	5.2	68.7	1.2	10.7	1.7	12,262	2,080 IDT	.01	1.48	.24
			M.F.	--	26.3	60.1	13.6	4.7	74.3	1.3	4.3	1.9	13,260	2,200 ST	.01	1.60	.26
			M.A.F.	--	30.5	69.5	--	5.5	86.0	1.5	5.0	2.2	15,351	2,320 FT	.02	1.85	.30
WVCM-37	do[6]	10.0	A.R.	8.2	17.9	28.5	45.4	--	--	--	--	--	6,428	2,800 IDT	.01	0.26	--
			M.F.	--	19.5	31.1	49.4	--	--	--	--	--	7,001	2,800 ST	.01	.28	--
			M.A.F.	--	38.5	61.5	--	--	--	--	--	--	13,838	2,800 FT	.02	.56	--
WVCM-20	Sewell (?)	29.0	A.R.	6.8	21.4	66.7	5.1	5.1	77.0	1.2	11.0	0.5	13,398	2,800+IDT	.01	.03	.44
			M.F.	--	22.9	71.6	5.5	4.7	82.7	1.3	5.4	.5	14,376	2,800+ST	.01	.03	.47
			M.A.F.	--	24.3	75.7	--	5.0	87.4	1.4	5.7	.5	15,205	2,800+FT	.01	.03	.50
WVCM-38	do.	32.75	A.R.	6.5	20.1	40.4	33.0	4.4	48.3	0.9	12.0	1.4	8,511	2,510 IDT	.01	.93	.50
			M.F.	--	21.5	43.2	35.3	3.9	51.6	.9	6.7	1.5	9,100	2,600 ST	.01	.99	.53
			M.A.F	--	33.2	66.8	--	6.1	79.8	1.4	10.3	2.4	14,068	2,680 FT	.02	1.53	.82
WVCM-48	do.	Grab sample	A.R.	1.3	15.6	39.8	43.3	--	--	--	--	--	7,821	2,800+IDT	.01	.03	--
			M.F.	--	15.8	40.3	43.9	--	--	--	--	--	7,922	2,800+ST	.01	.03	--
			M.A.F.	--	28.1	71.9	--	--	--	--	--	--	14,114	2,800+FT	.01	.05	--
WVCM-49	do.	27.0	A.R.	16.4	20.0	54.6	9.0	5.5	62.7	1.0	21.3	0.4	10,635	2,280 IDT	.03	.04	.36
			M.F.	--	23.9	65.4	10.7	4.5	75.0	1.2	8.1	.5	12,721	2,370 ST	.03	.05	.43
			M.A.F.	--	26.8	73.2	--	5.0	84.0	1.3	9.0	.6	14,252	2,450 FT	.04	.06	.48
WVCM-1	Little Raleigh (?)	24.0	A.R.	3.0	21.9	53.2	21.9	--	--	--	--	--	11,372	2,800+IDT	.01	.07	--
			M.F.	--	22.6	54.9	22.5	--	--	--	--	--	11,672	2,800+ST	.01	.07	--
			M.A.F.	--	29.2	70.8	--	--	--	--	--	--	15,065	2,800+FT	.01	.09	--
WVCM-31	Fire Creek (?)[7]	16.0	A.R.	11.8	21.5	47.1	19.6	4.6	54.5	0.7	20.1	.5	9,142	--	.02	.09	.37
			M.F.	--	24.5	53.4	22.2	3.7	61.8	.8	10.9	.5	10,360	--	.02	.10	.42
			M.A.F.	--	31.3	68.7	--	4.8	79.5	1.1	14.0	.7	13,321	--	.03	.13	.54
WVCM-32	do.[8]	16.0	A.R.	6.7	23.3	57.9	12.1	5.0	68.8	1.0	12.4	.8	11,876	2,550 IDT	.01	.34	.43
			M.F.	--	25.0	62.0	13.0	4.6	73.8	1.0	6.9	.8	12,724	2,630 ST	.01	.37	.46
			M.A.F.	--	28.7	71.3	--	5.2	84.7	1.2	7.9	1.0	14,618	2,710 FT	.01	.42	.52
WVCM-2	do.	19.0	A.R.	3.3	21.1	57.0	18.6	4.5	67.6	1.0	7.8	0.5	11,768	2,800+IDT	.01	.06	.46
			M.F.	--	21.8	59.0	19.2	4.3	69.9	1.1	5.0	.5	12,167	2,800+ST	.01	.06	.48
			M.A.F.	--	27.0	73.0	--	5.3	86.5	1.3	6.2	.7	15,061	2,800+FT	.01	.08	.59
WVCM-10	do.	15.0	A.R.	20.2	11.8	53.6	14.4	--	--	--	--	--	7,799	2,800 IDT	.01	.10	--
			M.F.	--	14.8	67.2	18.0	--	--	--	--	--	9,774	2,800 ST	.01	.12	--
			M.A.F.	--	18.0	82.0	--	--	--	--	--	--	11,920	2,800 FT	.01	.15	--

1 Analyses by Department of Energy, Division of Solid Fuel Mining and Preparation, Pittsburgh, Pennsylvania. All samples are of weathered coal and were collected from either adits, prospects, or exposures. An attempt was made to penetrate the coal bed at least 1 ft to lessen the effects of weathering.
2 A.R. = as received; M.F. = moisture free; M.A.F. = moisture and ash free.
3 IDT = initial deformation temperature; ST = softening temperature; FT = fluid temperature.
4 Atomic absorption analyses
5 Upper bench at locality 36-37.
6 Lower bench at locality 36-37.
7 Upper bench at locality 31-32.
8 Lower bench at locality 31-32.

Table 4.--*Summary of estimated demonstrated coal reserve base and reserves.*
[Compiled by P.T. Behum and R.W. Hammack, April 14, 1982 .]

Coalbed / Mining technique	Acres of coal	Reserve base (short tons) Measured	Indicated	Demonstrated 1	Reserves (short tons)
C-4					
Strip[2]	17	34,000	8,000	42,000	35,000[3]
C-2					
Strip[2]	34	54,000	23,000	78,000	66,000[3]
C-1					
Underground	46	45,000	171,000	216,000	108,000-129,000[4]
Strip[2]	104	237,000	91,000	328,000	279,000[3]
Auger[2]	52	161,000	41,000	203,000	71,000[5]
Surface total[2]	155	398,000	132,000	530,000	349,000
C					
Underground	485	1,710,000	613,000	2,320,000	1,160,000-1,390,000[4]
Strip[2]	127	327,000	142,000	469,000	401,000[3]
Auger[2]	76	184,000	95,000	280,000	98,000[5]
Surface total[2]	203	511,000	237,000	749,000	499,000
Hughes Ferry(?)					
Underground	133	324,000	317,000	641,000	321,000-385,000[4]
Sewell B(?)					
Underground	77	315,000	19,000	334,000	167,000-200,000[4]
Sewell(?)					
Underground	1,519	4,530,000	3,430,000	7,960,000	3,980,000-4,780,000[4]
Strip[2]	9	32,000	19,000	51,000	43,000[3]
Auger[2]	15	56,000	45,000	101,000	35,000[5]
Surface total[2]	23	89,000	64,000	152,000	79,000
Fire Creek(?)					
Strip 2	13	45,000	3,000	48,000	41,000[3]
Auger 2	25	84,000	6,000	90,000	32,000[5]
Surface total[2]	38	130,000	8,000	138,000	73,000
Total					
Underground		6,930,000	4,560,000	11,500,000	5,740,000-6,880,000[4]
Strip[2]		730,000	286,000	1,020,000	863,000[3]
Auger[2]		486,000	188,000	673,000	236,000[5]
Surface total[2]		1,220,000	473,000	1,690,000	1,100,000

1 Demonstrated is the total of the measured and indicated reserve base; tonnage may not total due to independent rounding.
2 Classified as restricted.
3 At an 85 percent recovery factor.
4 At a 50 to 60 percent recovery factor, respectively.
5 At a 35 percent recovery factor.
6 Total surface acres may not total due to independent rounding.

COAL RESERVE BASE MAPS
By
Paul T. Behum and Richard W. Hammack

MINERAL RESOURCE POTENTIAL MAPS OF THE CHEAT MOUNTAIN ROADLESS AREA, RANDOLPH COUNTY, WEST VIRGINIA

By
Kenneth J. Englund, Wayne R. Sigleo, Peggy L. Foose, and Nancy K. Teaford, U.S. Geological Survey
and
Paul T. Behum and Richard W. Hammack, U.S. Bureau of Mines

1983

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