

Figure 1.—Index map showing location of Ramsays Draft Wilderness Study Area and Ramsays Draft Addition, and the location of some 7 1/2-minute quadrangles and some published geologic maps.

STUDIES RELATED TO WILDERNESS

Roadless Areas

The Wilderness Act (Public Law 88-577, September 3, 1964) and related acts require the U.S. Geological Survey and the U.S. Bureau of Mines to survey certain areas on Federal lands to determine their mineral resource potential. Results must be made available to the public and be submitted to the President and the Congress. This report presents the results of a geochemical survey of the Ramsays Draft Addition, which is adjacent to Ramsays Draft Wilderness Study Area in the George Washington National Forest, Augusta and Highland Counties, Va. The area was classified as a further planning area during the Second Roadless Area Review and Evaluation (RARE II) by the U.S. Forest Service, January 1979.

INTRODUCTION

The U.S. Geological Survey (USGS) made a reconnaissance geochemical survey of the Ramsays Draft Addition (fig. 1) to test for indistinct or unspaced mineral deposits that might be recognized by their geochemical halos. Thirty-three stream-sediment, two soil, and 22 rock samples were collected from the addition during the earlier study of Ramsays Draft Wilderness Study Area (Lesure and others, 1977). The author, assisted by James D. Bliss, April 1979, and Andrew E. Grose, October 1979, collected 57 stream-sediment, 143 soil, and 22 rock samples in and near the addition to complete the sampling pattern. The earlier studies of Ramsays Draft outlined a low-grade stratabound copper deposit in greenish-gray sandstone of the Hampshire Formation of Late Devonian age (Lesure and Motooka, 1980), and the sampling in the addition was designed to check for more such deposits.

PROCEDURES

Most of the small drainage basins in the study area and a few adjacent to it were sampled by collecting a few handfuls of the finest sediment available (fig. 2). After drying in the laboratory, the samples were sieved and the minus 80-mesh (0.177 mm) fraction was used for analyses.

The rock samples (fig. 3) consist of a few small chips taken from beds of mostly one lithology and of known thickness. The samples are representative of the major rock types exposed in the addition and are described in detail by Motooka and others (1981). Most are samples of reddish- and greenish-gray sandstone from the Hampshire Formation. The rest are siltstone, shale, and sandstone from the Jennings Shale of Middle Devonian age and sandstone from the Poccono Formation of Early Mississippian age. The greenish-gray beds in the Hampshire tend to contain a little more copper than the red beds (Lesure and others, 1977, table 6) and were sampled wherever possible, especially where they contain obvious concentrations of organic remains.

Soil samples (fig. 3) were collected mostly in areas of few outcrops. The soil samples are from the A₂ or upper B soil zones, just below the dark, organic-rich surface soil (A₁ zone). The soil samples include 79 from areas underlain by the Jennings Formation, 50 from areas underlain by the Hampshire Formation, and 14 from areas underlain by the Poccono Formation.

All samples were scanned spectrographically for 31 elements and analyzed chemically for zinc in USGS laboratories, Denver, Colo. The complete analytical data and rock sample descriptions are given in Motooka and others (1981). Table 1 contains a summary of the analytical data for soil and stream-sediment samples. Concentrations of selected elements in some miscellaneous samples having high values for one or more elements are given in tables 2 and 3.

DISCUSSION

The analytical data (table 2) outline one area on McManaway Run in the Hampshire Formation containing higher-than-background amounts of copper, lead, and zinc in rock samples (figs. 3, 6, 7) and another that contains anomalous lead in soil on the Jennings Formation on a ridge on the west side of Shenandoah Mountain (table 3 and fig. 4). Both sites probably contain only subeconomic amounts of these metals. The mineralization is probably similar to but less extensive than the low-grade stratabound copper deposit in Ramsays Draft Wilderness Study Area (Lesure and Motooka, 1980). We estimated that the deposit might contain as much as 10 tons of copper, hardly an economic amount. That deposit is presumably the source of copper in the one stream-sediment sample from the Ramsays Draft area that had as much as 50 ppm copper. The two areas of anomalous metal content in the addition are not associated with anomalous stream-sediment samples they presumably contain less available metal than the first area discovered inside the wilderness study area.

A third area, near Stark Pond (fig. 5), was sampled in more detail because one soil sample (YRD 510) contained 0.5 ppm silver. Samples collected near the original site do not contain anomalous amounts of the elements looked for (table 3).

REFERENCES CITED

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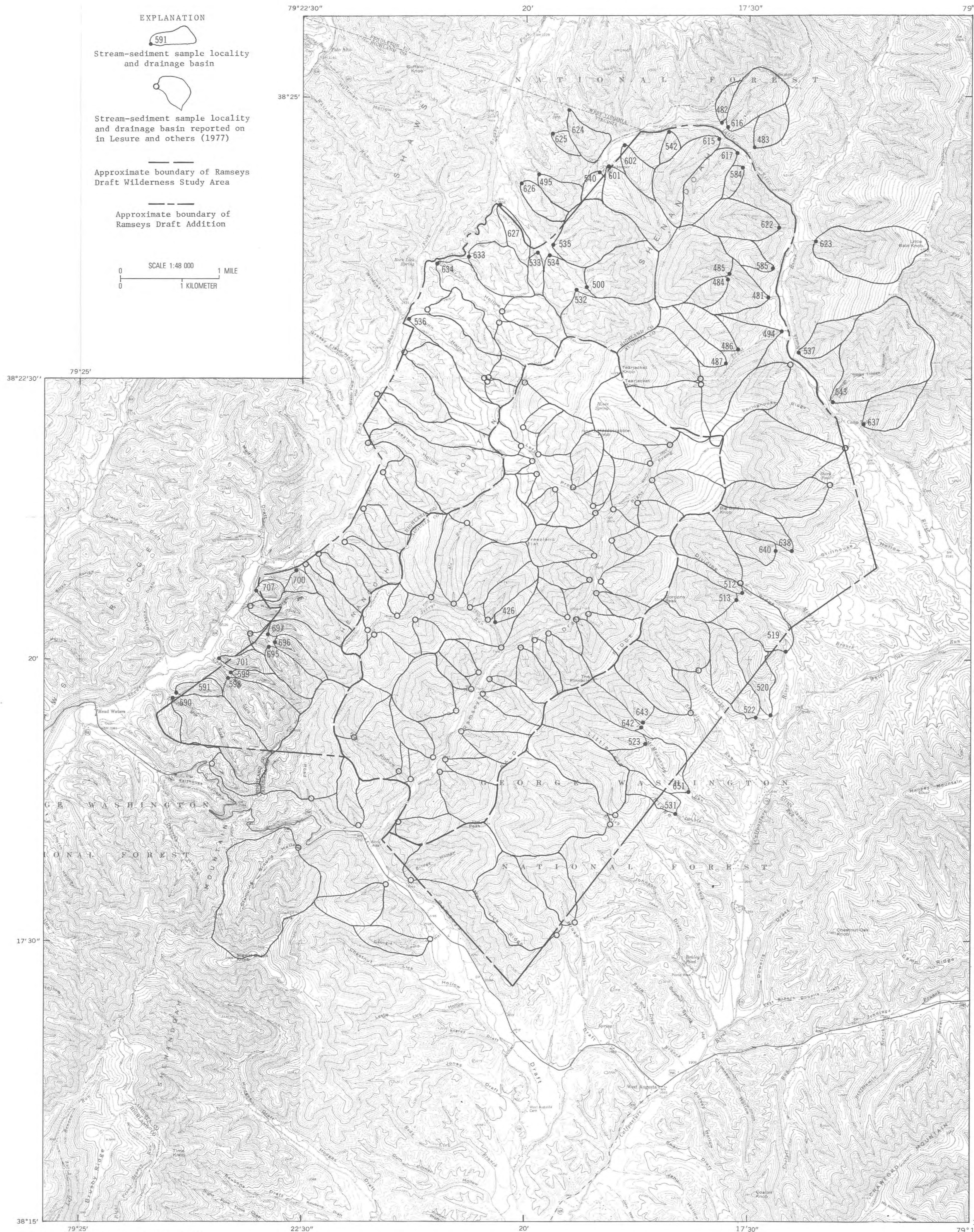


Figure 2.—Small drainage basins and stream-sediment sample localities.

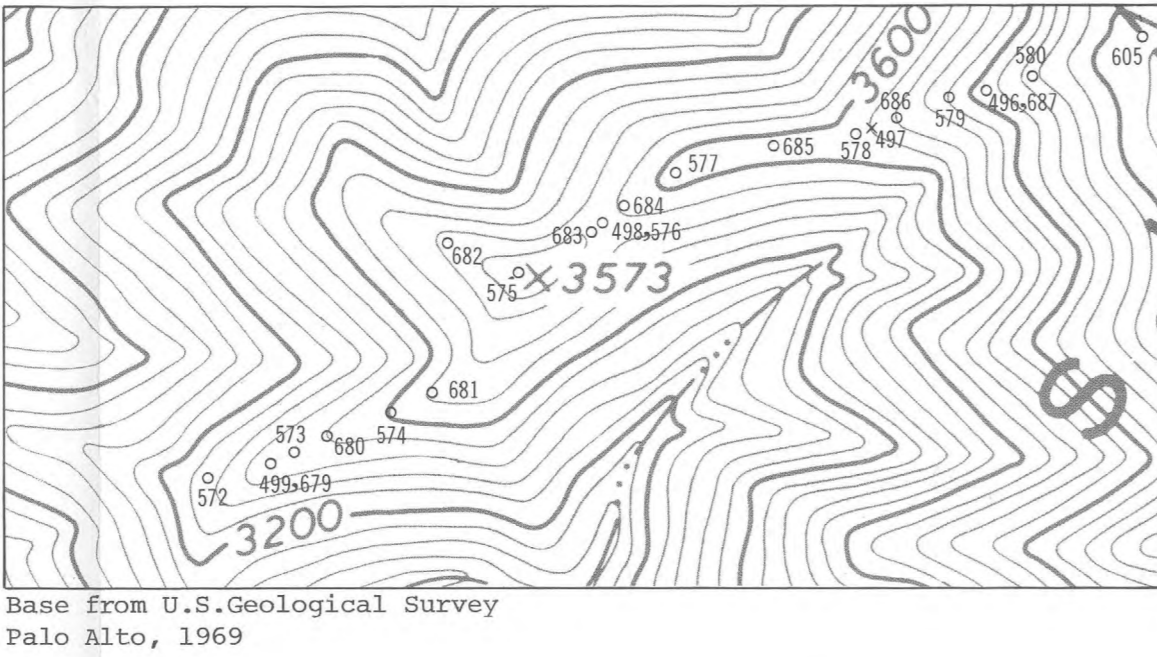


Figure 4.—Detail of rock and soil sample localities on the west side of Shenandoah Mountain. Sample locality symbols are same as in figure 3.

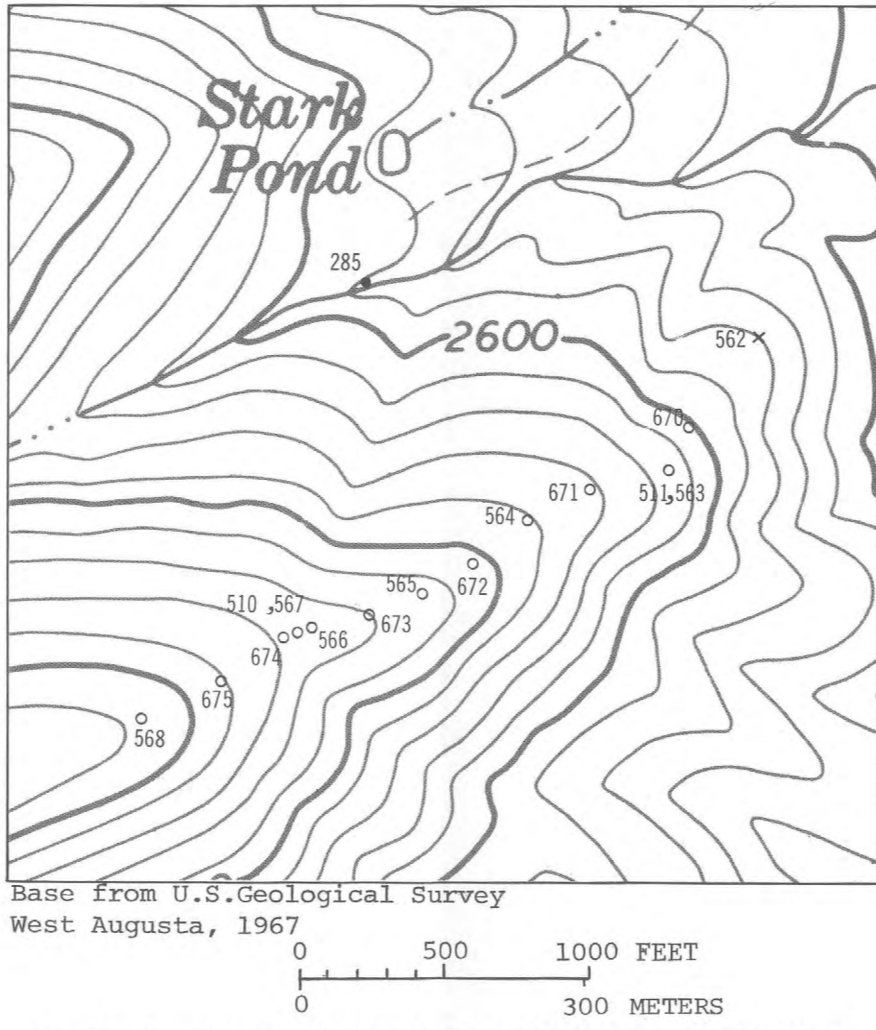


Figure 5.—Detail of sample localities near Stark Pond. Sample locality symbols are same as in figures 2 and 3. Stream-sediment sample 285 is from Lesure and others (1977).

Table 1.—Range and median concentrations of 23 elements in soil and stream-sediment samples from Ramsays Draft Wilderness Study Area and Addition

Elements	Soil on Jennings Formation 79 samples			Soil on Hampshire Formation 159 samples			Soil on Poccono Formation 51 samples			Stream Sediments 146 samples		
	Low	High	Median	Low	High	Median	Low	High	Median	Low	High	Median
	Percent											
Ca	N	0.2	<0.05	N	0.5	<0.05	<0.05	0.3	<0.05	<0.05	0.7	0.07
Fe	0.20	3	1.5	0.1	5	1.5	0.15	3	1	0.5	7	1.5
Mg	0.05	0.5	0.2	0.02	0.5	0.15	0.02	0.3	0.1	0.05	0.7	0.2
Ti	0.2	>1	0.5	0.2	1	0.5	0.3	1	0.5	0.1	0.7	0.2
Parts per million												
Ag	N	0.5	N	N	3	N	1	N	N	N	<0.5	N
B	70	200	150	15	200	70	30	150	50	<10	200	30
Ba	150	1500	500	50	2000	300	50	1000	200	100	700	300
Be	<1	3	1	N	5	<1	N	2	<1	N	5	1.5
Co	N	50	7	N	100	5	N	30	5	N	50	15
Cr	20	100	70	<10	100	30	<10	70	20	10	150	30
Cu	N	50	10	N	300	15	N	15	7	<5	50	15
La	20	70	50	N	100	20	N	70	20	N	70	30
Mn	30	>5000	700	10	>5000	100	10	>5000	300	150	>5000	1500
Nb	N	30	<20	N	150	20	N	30	20	N	20	<20
Ni	<5	50	15	<5	70	7	N	30	5	5	100	30
Pb	N	500	20	N	15	<10	N	30	15	N	100	15
Se	5	20	10	5	15	10	<5	15	7	<5	30	10
Sr	N	100	<100	N	150	N	N	<100	N	N	150	N
Th	30	150	100	20	200	70	15	150	70	20	200	70
W	N	50	N	N	50	N	N	70	N	N	N	N
Y	15	70	30	<10	100	30	15	100	30	15	100	30
Zn	<5	230	50	<5	1	95	1	95	1	20	550	75
Zr	100	700	300	70	>1000	500	150	1000	300	30	700	200

1 Only 50 soils on Hampshire and 14 on Poccono were tested for zinc by means of atomic-absorption methods.

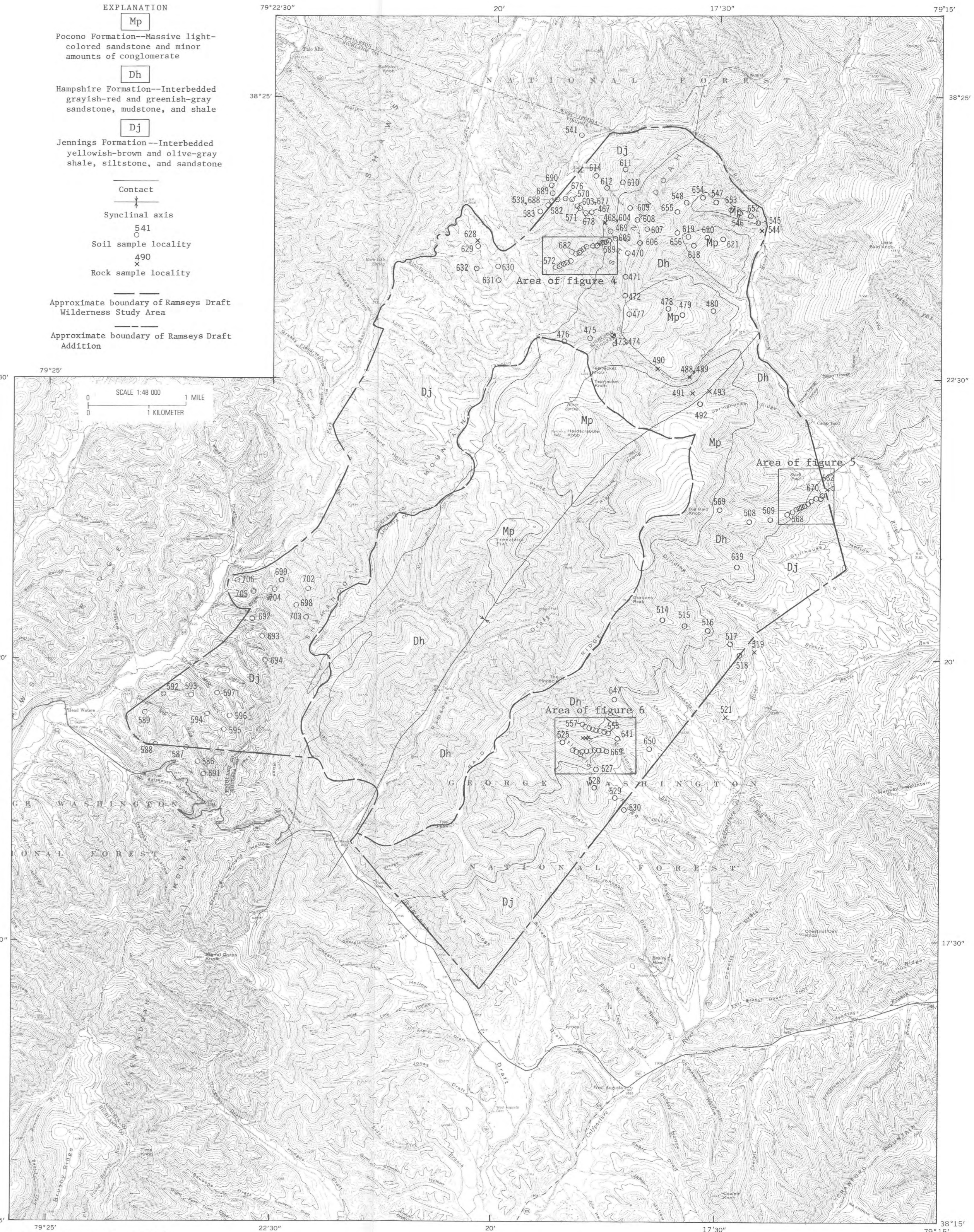


Figure 3.—Soil and rock sample localities, and areas of figures 4-6.

Geology simplified from Lesure (1982)

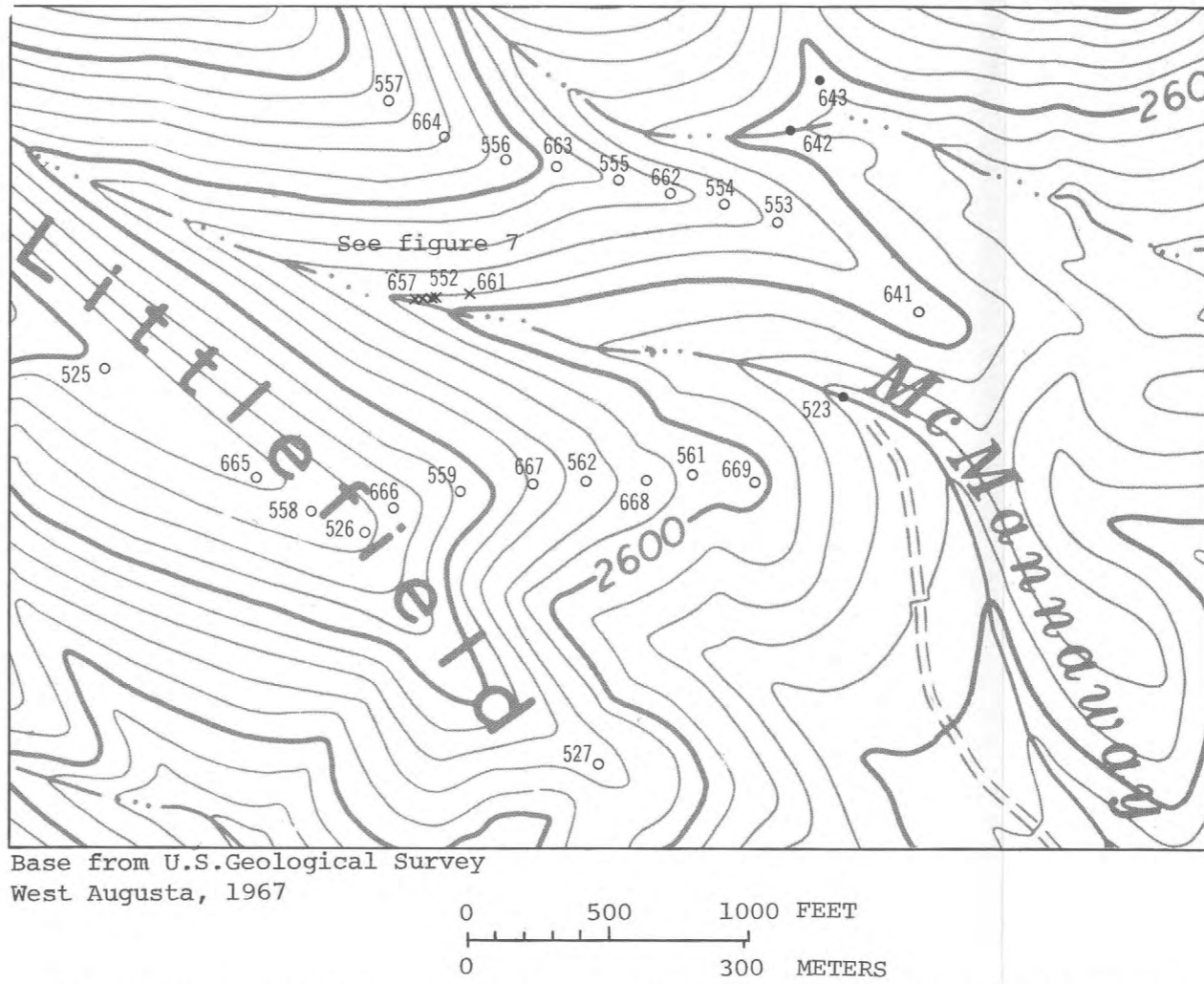


Figure 6.—Detail of sample localities along McManaway Run. Sample locality symbols are same as in figures 2 and 3.

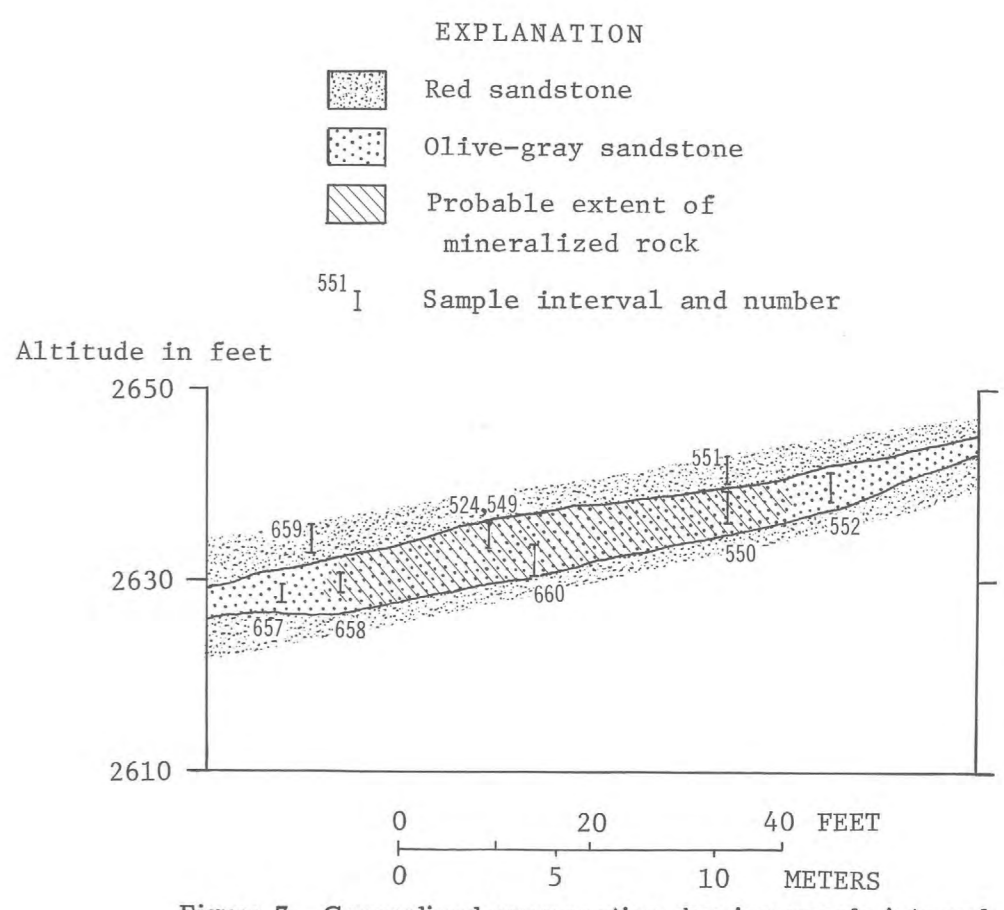


Figure 7.—Generalized cross section showing sample intervals in area of mineralized rock along McManaway Run. See figure 6 for line of section.

Table 2.—Concentrations of selected elements in rock samples from area of base-metal anomaly on McManaway Run

Sample No.	Ag S	Co S	Cu S	Pb S	Zn S	Zn AA	Sample description
524	1.0	50	70	1500	300	380	1-m chip sample, grayish-brown, medium-grained sandstone.
549	1.0	15	70	1500	200	280	0.6-m chip sample, light-olive-gray, very fine-grained, arkosic sandstone, upper part; grayish-brown to moderate-yellowish-brown, medium-grained, micaceous, arkosic sandstone containing coalified plant remains and limonite plant impressions, lower part. Resample of area of sample 524.
550	N	30	150	20	<200	190	1-m chip sample, olive-gray, very fine-grained, micaceous, arkosic sandstone.
551	N	20	N	30	N	45	1-m chip sample, crossbedded, brownish-gray, fine-grained, arkosic sandstone.
552	N	20	50	10	N	75	1-m chip sample, olive-drab, fine-grained, micaceous, arkosic sandstone.
657	N	15	30	<10	N	35	0.6-m chip sample, light-brown to tan, medium-fine-grained, micaceous, arkosic sandstone.
658	N	20	150	<10	N	40	0.6-m chip sample, light-brown to tan, fine-grained, micaceous, arkosic sandstone.
659	N	15	<5	<10	N	40	1-m chip sample, dark-reddish-brown, fine-grained, arkosic sandstone.
660	N	30	30	200	300	450	1-m chip sample, olive-gray to grayish-orange, fine-grained, micaceous, arkosic sandstone. Lower part contains coaly material and limonite-coated plant impressions.
661	N	20	100	N	N	140	0.25-m chip sample, greenish-gray, fine-grained, arkosic sandstone, minor plant remains.
Background value	7	5	N	N	N	36	

Table 3.—Concentrations of selected elements in soil samples from area of base-metal anomaly shown in figure 4 and detailed sample area of figure 5

[Complete analyses given in Motooka and others (1981). All data in parts per million. Symbols explained in table 2.]

Sample No.	Ag S	Co S	Cu S	Pb S	Zn S	Zn AA
498	<0.5	N	20	500	N	90
575	N	10	10	30	N	65
576	N	5	7	300	N	140
683	N	7	10	70	N	120
684	N	7	7	10	N	55
510	0.5	5	50	15	N	20
566	N	N	<5	15	N	25
567	N	N	15	20	N	25
674	N	10	7	20	N	55

GEOCHEMICAL SURVEY OF THE RAMSEYS DRAFT ADDITION, AUGUSTA AND HIGHLAND COUNTIES, VIRGINIA

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