

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

**Analytical results and sample locality map
of stream-sediment and panned-concentrate samples
from the Buffalo Peaks Wilderness Study Area,
Lake, Park, and Chaffee Counties, Colorado**

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This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards and stratigraphic nomenclature. Any use of trade names is for descriptive purposes only and does not imply endorsement by the USGS.

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STUDIES RELATED TO WILDERNESS

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 partial results of a geochemical survey of the Buffalo Peaks Wilderness Area in the Pike and San Isabel National Forests, Lake, Park and Chaffee Counties, Colorado. The area was established as a wilderness study area by Public Law 96-560 (96th Congress, 1980).

INTRODUCTION

In June and July 1982, we conducted a reconnaissance geochemical survey of the Buffalo Peaks Wilderness Study Area, Lake, Park, and Chaffee Counties, Colorado.

The Buffalo Peaks Wilderness Study Area comprises about 56,200 acres about 10 mi (16 km) north of Buena Vista (see figure 1). Access to the vicinity of the study area is provided on the east and south by U.S. Highway 285, and on the west by U.S. Highway 24.

The study area is a major portion of the Mosquito Range (fig. 1) which is structurally part of the east flank of the north-northwest-trending Sawatch anticline. Precambrian igneous and metamorphic rocks of the core of the anticline are exposed in the west two-thirds of the study area while bedrock in the east one-third is made up mostly of east-dipping Paleozoic sediments. In the vicinity of North and South Buffalo Peaks, the sequence of Paleozoic sediments is covered by Tertiary extrusive rocks. Nowlan and Gerstel (in press) discuss the geochemistry more fully and Hedlund and others (1983) outline the geology and mineral resources.

The topographic relief in the study area is about 4,000 ft (1,200 m), with a maximum elevation of 13,000 ft (4,050 m). Perennial streams drain the slopes of the major ridge which dominates the northern portion of the area, and the slopes of North and South Buffalo Peaks in the southern portion. The climate ranges from semiarid in the Arkansas Valley to alpine at higher elevations.

METHODS OF STUDY

Sample Collection

We collected samples at 84 sites (plate 1). At nearly all of those sites, we collected a stream-sediment sample and two panned-concentrate samples. We analyzed 84 stream-sediment samples and 156 panned-concentrate samples for a sampling density of about three samples (one sediment plus two concentrates) per square mile.

Stream-sediment samples

Analyses of the stream-sediment samples represent the chemistry of the rock material eroded from the drainage basin upstream from each sample site. Such information is useful in identifying those basins which contain concentrations of elements that may be related to mineral deposits.

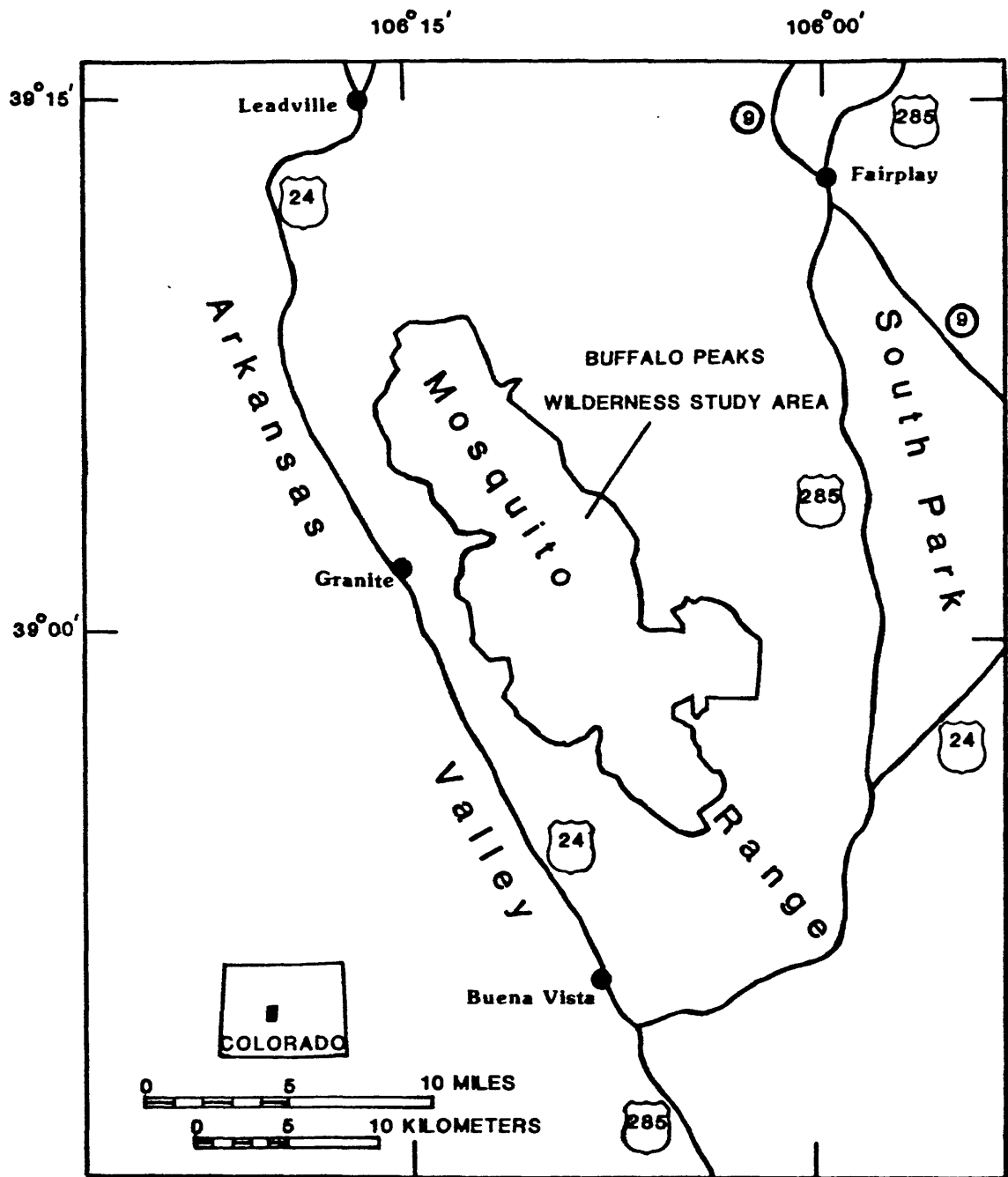


Figure 1.--Index map, Buffalo Peaks Wilderness Study Area, Colorado

The stream-sediment samples consisted of active alluvium collected primarily from first-order (unbranched) and second-order (below the junction of two first-order) streams as shown on USGS topographic maps (scale = 1:24,000).

Panned-concentrate samples

We panned two samples from the same active alluvium as the stream-sediment samples. Each bulk sample was panned until much of the quartz, feldspar, organic, and clay-sized material was removed. One concentrate sample was further panned until dark minerals dominated the sample and is referred to as the raw panned-concentrate sample.

Sample Preparation

The stream-sediment samples were air dried and sieved to 0.25 mm (60 mesh) using stainless steel sieves. That portion of the sediment passing through the sieve was pulverized to minus 0.15 mm (100 mesh) prior to analysis. The entire raw panned-concentrate sample was also pulverized to minus 0.15 mm.

The second panned sample, the heavy-mineral concentrate, was sieved to minus .56 mm (30 mesh). Bromoform was used to separate and remove the remaining quartz and feldspar from the heavy-mineral concentrate. The heavy minerals (specific gravity 2.8) were separated into three fractions using a large electromagnet (in this case a modified Frantz Isodynamic Separator). The most magnetic material (largely magnetite) was discarded. The second fraction (largely ferromagnesian silicates and iron oxides) was saved for analysis/archival storage. The third fraction (the least magnetic material including nonmagnetic ore minerals, zircon, sphene, etc.) was divided into two splits using a Jones splitter. One split was hand ground for spectrographic analysis; the other split was saved for mineralogical analysis.

The magnetic separates discussed are the same separates that would be produced by removing the magnetite with a hand magnet and then using a Frantz Isodynamic Separator set at a slope of 15° and a tilt of 10° with a current of 0.1 ampere to remove the ilmenite, and a current of 1.0 ampere to split the remainder of the sample into magnetic and nonmagnetic fractions.

Sample Analysis

Spectrographic method

We analyzed the stream-sediment and heavy-mineral-concentrate samples for 31 elements using a semiquantitative, direct-current arc emission spectrographic method (Grimes and Marranzino, 1968) (Table 3). Spectrographic results were obtained by visual comparison of spectra derived from the sample against spectra obtained from standards made from pure oxides and carbonates. Standard concentrations are geometrically spaced over any given order of magnitude of concentration as follows: 100, 50, 20, 10, and so forth. Samples whose concentrations are estimated to fall between those values are assigned values of 70, 30, 15, and so forth. The precision of the analytical method is approximately plus or minus one reporting unit at the 83 percent confidence level and plus or minus two reporting units at the 96 percent confidence level (Motooka and Grimes, 1976). Values determined for the major elements (iron, magnesium, calcium, and titanium) are given in weight percent; all others are given in parts per million (micrograms/gram) (table 1).

TABLE 1.--Limits of determination for the spectrographic analysis of rocks and stream sediments, based on a 10-mg sample

[The spectrographic limits of determination for heavy-mineral-concentrate samples are two reporting units higher than the limits given for rocks and stream sediments]

Elements	Lower determination limit	Upper determination limit
Percent		
Iron (Fe)	0.05	20
Magnesium (Mg)	.02	10
Calcium (Ca)	.05	20
Titanium (Ti)	.002	1
Parts per million		
Manganese (Mn)	10	5,000
Silver (Ag)	0.5	5,000
Arsenic (As)	200	10,000
Gold (Au)	10	500
Boron (B)	10	2,000
Barium (Ba)	20	5,000
Beryllium (Be)	1	1,000
Bismuth (Bi)	10	1,000
Cadmium (Cd)	20	500
Cobalt (Co)	5	2,000
Chromium (Cr)	10	5,000
Copper (Cu)	5	20,000
Lanthanum (La)	20	1,000
Molybdenum (Mo)	5	2,000
Niobium (Nb)	20	2,000
Nickel (Ni)	5	5,000
Lead (Pb)	10	20,000
Antimony (Sb)	100	10,000
Scandium (Sc)	5	100
Tin (Sn)	10	1,000
Strontium (Sr)	100	5,000
Vanadium (V)	10	10,000
Tungsten (W)	50	10,000
Yttrium (Y)	10	2,000
Zinc (Zn)	200	10,000
Zirconium (Zr)	10	1,000
Thorium (Th)	100	2,000

Chemical methods

The stream sediments were also analyzed for As, Bi, Cd, Sb, and Zn by a modification of the atomic absorption spectrographic method described by Viets (1978), and for U by fluorimetry (Hopkins, 1978). The raw panned concentrate samples were analyzed for gold by atomic absorption spectroscopy (Thompson and others, 1968). The methods of analysis and corresponding limits of determination are summarized in table 2.

Table 2.--Chemical methods used

Sample type	Constituent determined	Analytical method	Determination limit ¹ micrograms/ gram or ppm	Reference
Sediments	As	AA	5 or 10	Modifications of Viets, 1978
	Bi	AA	1	----do-----
	Cd	AA	0.1	----do-----
	Sb	AA	2	----do-----
	Zn	AA	5	----do-----
	U	Fluorimetry	0.1	Hopkins, 1978
Raw panned concentrate	Au	AA	0.05	Thompson and others, 1968

¹The determination limit is dependent upon sample weight. Given limits imply use of sample weight required by method. Higher limits of determination result from using less than required sample weight.

Description of Tables

The analytical results of stream sediments, nonmagnetic heavy-mineral concentrates, and raw panned concentrates are listed in tables 3-5 respectively.

The order of listing of elements in tables 3-5 is somewhat arbitrary and is based partially upon Goldschmidt's classification (Levinson, 1974, p. 61-66), and partially on widely recognized geochemical associations discussed by many geochemists (for example, Beus and Grigorian, 1977; Levinson, 1974, 1980; Rose, Hawkes, and Webb, 1979). For this study the elements are grouped according to the following:

Carbonate mineral group-----Ca, Mg, Sr
Mafic mineral group-----B, Co, Cr, Fe, Mn, Ni, Sc, V
Sulfide mineral group-----Ag, As, Ba, Bi, Cd, Cu, Pb, Zn
Granitic/pegmatitic group-----Be, La, Mo, Nb, Sn, Ti, Th, U, W, Y, Zr

Emission-spectrographic data for the elements arsenic, gold, bismuth, cadmium, antimony, and tungsten are not listed in table 3 because they were not detected in any sediment sample. Antimony was not detected by the chemical method either. Similarly silver, arsenic, gold, cadmium, antimony, and zinc are not listed in table 4 because they were not detected in any nonmagnetic heavy-mineral-concentrate sample.

ROCK ANALYSIS STORAGE SYSTEM

Upon completion of all analytical work, the analytical results were entered into a computer-based file called RASS (Rock Analysis Storage System). This RASS file contains both descriptive geological information and analytical data. Any or all of this information may be retrieved and converted to a standard form (STATPAC) for computerized statistical analysis or publication (VanTrump and Miesch, 1976).

REFERENCES CITED

- Beus, A. A., and Grigorian, S. V., 1977, Geochemical exploration models for mineral deposits: Wilmette, Illinois, Applied Publishing, 287 p.
- Grimes, D. J., and Marranzino, A. P., 1968, Direct-current arc and alternating-current spark emission spectrographic field methods for the semiquantitative analysis of geologic materials: U.S. Geological Survey Circular 591, 6 p.
- Hedlund, D. C., Nowlan, G. A., and Wood, R. H., II, 1983, Mineral resource potential of the Buffalo Peaks Wilderness Study Area, Lake, Park and Chaffee Counties, Colorado: U.S. Geological Survey Miscellaneous Field Studies MF-1628-A, scale 1:50,000.
- Hopkins, D. M., 1977, Determination of uranium and thorium after complete sample decomposition and anion-exchange separation, in Abstracts of Papers, American Chemical Society National Meeting, 176th [abs.]: Miami Beach, Florida, Sept. 10-15, 1978, abstract no. 41, History of Chemistry section.

- Levinson, A. A., 1974, Introduction to exploration geochemistry: Wilmette, Illinois, Applied Publishing, 614 p.
- Levinson, A. A., 1980, Introduction to exploration geochemistry (2nd ed.): Wilmette, Illinois, Applied Publishing, 924 p.
- Motooka, J. M., and Grimes, D. J., 1976, Analytical precision of one-sixth order semiquantitative spectrographic analyses: U.S. Geological Survey Circular 738, 25 p.
- Nowlan, G. A., and Gerstel, W. J., Stream-sediment and panned-concentrate geochemistry of the Buffalo Peaks Wilderness Study Area, Lake, Park, and Chaffee Counties, Colorado: U.S. Geological Survey Miscellaneous Field Studies Map MF-1628-B, scale 1:50,000 (in press).
- Rose, A. W., Hawkes, H. E., and Webb, J. S., 1979, Geochemistry in mineral exploration (2nd ed.): London, Academic Press, 657 p.
- Thompson, C. E., Nakagawa, H. M., and Van Sickle, G. H., 1968, Rapid analysis for gold in geologic materials, in Geological Survey research 1968: U.S. Geological Survey Professional Paper 600-B, p. B130-B132.
- VanTrump, George, Jr., and Miesch, A. T., 1976, The U.S. Geological Survey RASS-STATPAC system for management and statistical reduction of geochemical data: Computers and Geosciences, v. 3, p. 475-488.
- Viets, J. G., 1978, Determination of silver, bismuth, cadmium, copper, lead, and zinc in geological materials by atomic-absorption spectrometry with tricaprylylmethylammonium chloride: Analytical Chemistry, v. 52, p. 1097-1101.

Table 3.--Analytical data for stream-seediment samples from 84 sites draining the Buffalo Peaks Wilderness Study Area, Colorado

Analytical methods: s, emission spectroscopy; a, atomic absorption; f, fluorimetric. Lower limit of determination in parentheses. N, not detected. Analyses: G. W. Day, D. L. Kelley, R. J. Fairfield

Site	Latitude	Longitude	Cu pct (.05)	Hg pct (.02)	Sr ppm (100)	As ppm (10)	Co ppm (5)	Cr ppm (10)	Fe pct (.05)	Mn ppm (10)	Ni ppm (5)	Scd ppm (5)
1	39 4 16	106 13 46	.7	.7	100	20	10	70	3	1,500	30	5
2	39 4 17	106 13 47	.7	.7	100	10	10	50	3	500	15	5
3	39 4 16	106 13 54	.7	1.0	200	20	15	70	3	2,000	30	5
4	38 56 16	106 3 35	.7	.5	300	10	5	20	2	700	5	5
5	38 56 18	106 8 32	1.0	.7	500	10	15	30	5	1,500	15	5
7	38 57 15	106 8 15	1.0	.7	300	10	10	30	3	1,500	5	5
9	38 56 48	106 8 39	.7	.7	100	10	10	30	3	700	15	5
10	38 57 18	106 10 22	.7	.7	200	10	10	50	7	700	20	5
11	38 55 22	106 6 24	.7	.5	100	10	10	20	5	2,000	5	5
12	38 55 1	106 6 34	1.0	.7	200	10	7	30	3	700	20	5
13	38 54 7	106 5 8	1.0	.5	200	10	7	30	5	1,000	5	10
14	38 55 26	106 5 25	.7	.5	100	10	5	50	3	1,000	10	20
16	38 55 15	106 4 12	.7	.5	100	10	5	20	3	1,000	5	5
17	38 55 15	106 4 19	1.0	.7	100	10	10	30	5	1,500	15	5
18	38 56 54	106 3 45	.7	.5	100	10	5	10	2	1,000	5	5
20	38 55 1	106 4 19	2.0	1.0	500	10	15	30	5	1,000	15	5
21	38 56 7	106 4 20	2.0	1.0	500	20	15	50	5	1,000	15	5
22	38 58 19	106 4 37	2.0	1.0	500	20	20	70	7	1,500	20	20
23	38 58 22	106 4 26	1.5	1.0	500	20	15	30	3	1,000	15	15
26	38 59 42	106 2 18	1.5	1.0	500	20	15	30	3	1,000	15	15
27	39 1 14	106 2 3	1.0	.7	300	10	5	30	2	500	5	5
28	39 1 22	106 3 30	.7	.7	100	20	15	30	3	1,000	15	10
29	39 1 29	106 5 11	1.0	1.0	300	30	15	50	3	1,500	15	20
31	39 1 20	106 6 35	1.0	2.0	100	200	10	50	5	1,500	30	5
31	39 1 52	106 13 30	.7	.7	100	10	5	30	3	1,500	15	5
32	38 55 26	106 11 26	2.0	1.0	500	10	10	10	7	1,500	5	5
33	38 57 47	106 11 29	1.0	.7	200	<10	7	20	5	1,000	10	5
34	38 59 27	106 12 29	1.0	.7	200	10	5	20	3	1,000	5	5
35	38 59 3	106 12 12	1.0	.5	100	<10	5	N	3	500	5	5
36	38 58 52	106 12 9	1.0	.7	100	<10	7	30	5	700	5	5
37	39 5 34	106 9 2	1.0	.7	100	70	7	50	5	1,000	15	5
40	39 3 23	106 10 28	1.0	.7	100	50	10	30	7	2,000	10	5
41	39 3 19	106 10 21	1.0	.7	100	50	7	30	5	1,500	10	5
42	39 3 33	106 10 19	1.0	.7	100	50	10	50	5	1,500	15	5
43	39 4 7	106 9 44	1.0	.7	100	50	10	50	5	1,500	20	5
44	39 4 7	106 9 44	1.0	.7	200	30	7	50	5	1,500	10	5
47	39 4 5	106 8 20	1.0	.7	200	20	5	30	3	1,000	10	5
48	39 0 31	106 9 35	1.5	1.0	500	20	7	50	5	1,000	15	5
49	39 0 31	106 9 32	1.5	.7	500	20	15	50	7	1,500	20	5
50	39 1 23	106 9 20	1.5	.7	500	10	7	20	3	500	5	5
51	39 1 21	106 9 21	.7	.7	100	20	7	20	3	500	5	5
52	39 1 40	106 8 45	1.5	.7	300	50	7	70	10	1,000	10	20
53	39 2 15	106 5 31	5.0	.7	1,000	70	5	30	2	700	7	5
54	39 3 11	106 5 17	2.0	2.0	300	100	15	70	5	700	20	15
55	39 1 0	106 5 40	1.0	1.0	200	100	15	70	7	1,500	15	15

Table 3.--Analytical data for stream-sediment samples from 64 sites draining the Buffalo Peaks Watershed Study Area, Colorado--continued

Site	V ppm (10)	Ag ppm (.5)	As ppm (.5)	Ba ppm (20)	Bi ppm (2)	Cd ppm (.1)	Cu ppm (5)	Pb ppm (10)	Zn ppm (5)	Zn ppm (200)	Be ppm (1)	La ppm (20)	Mo ppm (5)
1	100	N	5	300	<2	.5	20	70	110	N	2	300	N
2	70	N	<5	300	<2	.2	20	70	90	N	2	200	N
3	100	N	5	300	<2	1.5	50	100	150	<200	2	50	N
4	70	N	<5	500	2	.2	15	50	85	N	2	100	N
5	100	N	<5	300	<2	.3	20	50	90	N	2	50	N
6	70	N	N	300	<2	.3	30	70	100	N	3	100	N
7	100	N	N	300	<2	.4	30	50	150	N	3	50	N
8	100	N	<5	300	2	.7	30	100	140	N	2	70	N
9	70	N	<5	300	<2	.5	30	70	150	<200	3	300	N
10	70	N	<5	300	<2	.3	50	70	120	N	3	300	N
11	100	N	<5	300	N	.4	30	70	120	N	2	300	N
12	70	N	<5	300	N	.4	30	70	120	N	2	300	N
13	100	N	<5	300	N	.4	30	70	120	N	2	300	N
14	70	N	<5	300	<2	.4	50	150	70	N	2	1,000	7
15	70	N	<5	300	<2	.4	30	100	85	N	2	700	N
16	70	N	<5	300	<2	.3	50	100	130	N	2	300	5
17	70	N	<5	300	<2	.3	20	70	120	N	3	300	N
18	200	N	5	500	<2	.4	30	50	120	N	1	50	N
19	100	N	N	300	<2	.3	30	30	85	N	1	50	N
20	200	N	N	300	<2	.3	30	30	85	N	1	200	N
21	100	N	N	300	<2	.3	30	20	80	N	1	50	N
22	200	N	N	300	2	.3	30	20	70	N	1	50	N
23	100	N	<5	300	<2	.3	30	20	70	N	1	50	N
24	100	N	<5	500	2	.3	30	20	70	N	1	50	N
25	100	N	<5	500	<2	.3	30	20	70	N	1	50	N
26	50	N	<5	500	<2	.2	10	15	40	N	1	30	N
27	100	N	5	300	2	.5	20	15	50	N	1	20	N
28	100	N	5	300	<2	.4	30	30	60	N	1	30	N
29	200	N	<5	300	2	.4	30	30	85	N	2	50	N
30	70	N	<5	300	2	.4	20	50	90	N	2	300	N
31	200	N	N	300	2	.5	50	70	90	N	2	70	N
32	100	N	N	300	2	.5	30	70	90	N	2	200	N
33	50	N	N	500	<2	.3	15	70	70	N	2	300	N
34	30	N	<5	300	<2	.3	15	70	75	N	2	100	N
35	70	N	<5	300	<2	.3	20	70	70	N	2	100	N
36	100	N	<5	300	<2	.3	20	70	70	N	2	100	N
37	100	N	<5	300	<2	1.1	30	200	150	N	3	200	N
38	70	N	N	500	<2	.6	20	70	65	N	2	1,000	5
39	70	N	N	300	<2	.3	15	100	45	N	1	1,000	N
40	100	N	N	300	<2	.6	30	70	95	N	2	100	N
41	100	N	N	300	<2	.5	30	70	95	N	2	200	N
42	100	N	N	500	<2	.3	15	70	60	N	2	300	N
43	70	N	N	500	<2	.4	20	70	75	N	3	300	N
44	100	N	N	700	<2	.2	20	50	95	N	2	200	N
45	100	N	<5	500	2	.6	30	70	110	N	2	100	N
46	100	N	N	700	<2	.2	20	50	75	N	2	150	N
47	100	N	N	700	<2	.2	20	50	75	N	2	150	N
48	100	N	<5	700	<2	.2	20	50	75	N	2	150	N
49	100	N	<5	700	<2	.2	20	50	75	N	2	150	N
50	100	N	<5	700	<2	.2	20	50	75	N	2	150	N
51	70	N	<5	300	N	.4	20	50	70	N	3	100	N
52	200	N	N	500	N	.4	20	70	70	N	2	1,000	N
53	70	N	N	300	N	.5	15	20	50	N	2	20	N
54	100	N	<5	300	<2	.4	30	20	55	N	2	30	N
55	200	N	5	300	<2	.7	30	100	110	<200	2	50	N

Table 3.--Analytical data for stream-sediment samples from 34 sites draining the Buffalo Peaks Wilderness Study Area, Colorado--continued

Site	As ppm (2)	Sb ppm (10)	Bi ppm (.002)	Th ppm (100)	U ppm (.05)	Y ppm (10)	Zr ppm (10)
1	N	N	.50	<100	28.00	70	500
2	20	N	.50	<100	4.20	70	1,000
3	4	N	.30	N	20.00	50	300
4	<20	N	.30	N	3.60	50	300
5	N	N	.50	N	5.00	50	300
7	<20	N	.50	N	3.70	50	300
9	<20	N	.50	N	11.00	50	300
10	<20	N	.50	N	1.50	50	500
11	<20	N	.50	100	12.00	70	300
12	<20	N	.50	<100	.90	70	1,000
13	20	N	.70	<100	1.90	70	700
14	<20	N	.70	500	6.00	1,000	500
16	20	10	.70	150	2.60	100	300
17	<20	N	.70	100	47.00	100	700
18	N	N	.30	<100	.85	70	300
20	N	N	.50	N	.50	20	200
21	N	N	.50	N	.60	20	200
22	N	N	.50	N	.45	20	300
23	N	N	.50	N	.75	20	200
26	N	N	.50	N	1.20	20	200
27	N	N	.30	N	.50	70	300
28	N	N	.30	N	.80	20	300
29	N	N	.30	N	1.40	20	200
30	<20	N	.50	N	1.60	30	300
31	<20	N	.50	100	6.00	70	500
32	<20	N	.50	N	18.00	50	300
33	<20	N	.30	<100	>.70	70	500
34	<20	N	.30	100	11.00	70	700
35	<20	N	.30	<100	24.00	20	300
36	<20	N	.30	<100	3.20	50	300
37	<20	N	.50	100	1.90	70	1,000
40	<20	N	.50	100	12.00	100	500
41	<20	N	.50	150	6.80	200	700
42	<20	N	.70	<100	6.00	100	300
43	<20	N	.50	<100	20.00	70	500
44	<20	N	.50	<100	5.50	150	500
47	<20	N	.50	100	6.10	100	300
48	<20	N	.70	N	4.40	70	1,000
49	<20	N	.70	N	5.50	70	700
50	20	N	.70	N	4.30	70	700
51	<20	N	.30	N	14.00	70	300
52	<20	N	1.0	100	6.90	300	>1,000
53	<20	N	.30	N	4.90	30	300
54	<20	N	.50	N	1.10	20	200
55	<20	N	.50	N	10.00	30	300

Table 3.--Analytical data for stream-sediment samples from 84 sites draining the Buffalo Peaks Wilderness Study Area, Colorado--continued

Site	Latitude	Longitude	Ca pct s	Mg pct s	Sr ppm s	B ppm s	Co ppm s	Cr ppm s	Fe pct s	Mn ppm s	Ni ppm s	Sc ppm s
			(.05)	(.02)	(100)	(10)	(5)	(10)	(.05)	(10)	(5)	(5)
56	39 1 0	106 5 37	2.0	1.5	500	15	15	30	5	1,000	15	15
57	39 2 43	106 6 39	2.0	2.0	500	20	15	70	7	1,000	20	10
58	39 3 11	106 2 24	1.0	2.0	300	70	10	50	7	1,000	20	5
59	39 3 25	106 2 16	2.0	2.0	100	100	10	50	3	500	30	5
60	39 3 10	106 12 7	1.0	.7	100	50	5	30	5	700	10	5
61	39 5 5	106 11 58	1.0	.7	200	20	5	50	5	700	10	5
62	39 5 3	106 12 0	1.0	.7	100	20	5	30	5	700	10	5
63	39 4 43	106 13 9	.7	.7	100	20	7	30	5	700	10	5
64	39 5 22	106 11 3	1.0	.7	100	30	7	70	5	700	15	5
65	39 5 18	106 11 2	1.0	.7	100	30	7	50	5	700	10	5
66	39 5 14	106 2 26	1.0	1.0	150	70	10	50	3	700	15	5
67	39 9 20	106 14 58	2.0	1.0	1,000	30	10	50	5	700	15	5
68	39 3 33	106 14 2	1.0	.7	200	20	7	30	5	700	10	5
69	39 3 31	106 14 4	1.0	.7	100	20	7	30	3	700	10	5
70	39 7 13	106 13 56	1.0	.7	200	20	7	50	5	700	15	5
71	39 7 16	106 13 56	1.0	.7	100	30	10	70	5	1,500	30	5
72	39 7 17	106 15 8	1.0	.7	100	30	10	70	5	500	30	15
73	39 7 15	106 15 9	1.0	.7	300	<10	5	30	2	500	10	10
74	39 7 24	106 14 18	2.0	1.0	500	30	15	100	7	5,000	30	15
75	39 1 6	106 13 28	1.0	.5	200	10	10	30	7	2,000	5	10
76	39 2 15	106 7 15	1.0	.5	200	20	7	50	5	700	5	10
77	39 2 8	106 7 0	.7	.5	100	50	7	30	5	1,000	10	5
78	39 3 50	106 5 19	1.0	.5	200	10	5	70	3	700	5	10
79	39 3 52	106 5 20	.7	.7	150	50	10	20	5	1,000	15	5
80	39 3 55	106 4 4	.7	.5	100	50	5	70	3	700	5	15
81	39 3 56	106 7 29	1.0	1.0	100	50	5	20	3	1,500	10	5
82	39 3 58	106 7 29	1.0	.7	300	30	7	30	3	1,500	5	5
83	39 6 15	106 9 34	1.0	.7	150	50	10	70	5	1,500	15	5
84	39 6 45	106 10 5	.7	.7	150	50	7	30	3	500	15	5
85	39 7 45	106 11 33	.2	.5	100	70	7	30	3	700	15	5
86	39 9 24	106 12 22	.5	.7	100	150	10	100	5	700	30	5
87	39 7 9	106 16 19	1.0	1.0	200	50	15	70	5	2,000	30	5
88	39 9 37	106 16 12	1.0	.7	300	20	10	50	3	2,000	15	5
89	39 9 3	106 16 26	1.0	.7	200	20	10	30	7	3,000	10	5
90	39 8 20	106 16 18	1.0	.7	200	50	10	30	5	2,000	15	5
91	38 56 30	106 8 18	2.0	.7	300	10	10	30	5	1,000	15	5
92	39 5 1	106 14 59	1.0	1.0	300	100	30	70	7	5,000	20	5
93	39 2 16	106 6 46	20.0	2.0	1,000	70	5	30	2	200	20	5
94	39 1 56	106 6 32	2.0	5.0	500	10	20	70	10	2,000	20	20

Table 3.--Analytical data for stream-sediment samples from 84 sites draining the Buffalo Peaks Wilderness Study Area, Colorado--continued

site	Ag μm s (10)	As μm d (5)	Ba μm s (20)	Bi μm d (2)	Cd μm a (.1)	Cu μm s (5)	Pb μm s (10)	Zn μm a (5)	Zn μm s (200)	Be μm s (1)	La μm s (20)	Mo μm s (5)
56	200	<5	300	<2	.5	30	50	65	N	2	30	N
57	200	<5	500	<2	.2	30	70	75	N	2	100	N
58	200	N	500	2	.5	30	70	70	N	2	30	N
59	100	<5	500	2	.4	70	30	75	N	2	50	N
62	100	<5	700	2	.9	30	200	120	N	2	150	N
63	100	<5	500	<2	.4	30	100	95	N	3	150	N
64	100	<5	500	2	.5	30	100	90	N	3	200	N
66	70	<5	500	<2	.4	20	70	90	N	2	70	N
67	100	5	300	2	.7	30	100	90	N	2	300	N
68	100	<5	500	2	.6	30	100	110	N	2	150	N
71	100	<5	500	2	.5	30	20	65	N	2	30	N
73	100	<5	500	<2	.4	30	100	95	N	3	200	N
74	100	<5	300	2	.7	30	100	75	N	2	300	N
75	70	5	300	2	.6	30	100	110	N	3	200	N
76	70	N	700	2	.6	30	100	130	N	3	100	N
77	70	<5	500	2	.8	30	100	130	<200	3	70	N
78	100	N	500	2	.4	50	70	120	N	2	70	N
79	50	N	500	2	.5	10	50	70	N	3	70	N
80	100	<5	700	2	.8	30	100	120	N	2	70	S
81	70	N	500	<2	.5	15	70	80	N	3	200	N
84	70	<5	500	<2	.7	15	50	80	N	3	300	N
85	70	N	500	2	.8	30	50	130	<200	3	50	N
89	50	N	300	<2	.5	10	70	50	N	3	70	N
37	100	N	300	<2	.5	20	70	90	N	2	500	N
86	50	N	300	<2	.7	15	70	65	N	2	1,000	N
37	70	<5	300	<2	.8	15	70	190	<200	2	70	N
96	70	N	500	<2	.7	15	70	90	N	2	300	N
99	100	5	500	2	1.4	30	100	130	N	2	300	N
100	70	N	500	<2	.8	20	70	90	N	2	100	N
101	70	10	300	2	9.0	30	300	110	<200	2	70	N
102	70	10	300	2	2.4	50	300	110	<200	3	100	N
105	100	<5	500	<2	1.1	50	70	65	N	2	100	N
106	70	<5	500	<2	.6	30	50	120	N	2	200	N
107	100	5	500	<2	.9	30	100	80	N	2	1,000	N
109	70	<5	500	<2	.8	30	50	130	<200	2	70	N
111	70	N	500	<2	.5	30	50	120	N	3	100	N
112	70	5	70	<2	1.5	50	100	160	<200	2	200	N
114	50	N	150	<2	1.0	15	20	85	N	1	20	N
115	50	<5	500	<2	.6	50	50	130	200	1	100	N

Table 3.--Analytical data for stream-sediment samples from 84 sites draining the Buffalo Peaks Wilderness Study Area, Colorado--continued

site	As ppm s (20)	Sb ppm s (10)	Ti pct s (.002)	Th ppm s (100)	U ppm f (.05)	Y ppm s (10)	Zr ppm s (10)
50	h	N	.30	N	.70	20	200
57	h	N	.70	N	3.90	70	500
58	<20	N	.50	N	1.10	30	500
59	<20	N	.30	N	3.00	30	200
62	<20	N	1.0	N	34.00	100	1,000
63	<20	N	.70	N	1.30	200	700
64	<20	N	.70	N	3.60	100	700
66	<20	N	.50	N	4.00	70	500
67	<20	N	1.0	N	27.00	100	1,000
68	<20	N	.50	N	5.10	70	500
71	<20	N	.30	N	1.60	20	200
73	<20	N	.70	N	9.50	500	700
74	<20	N	1.0	N	9.10	70	500
75	<20	N	.50	N	10.00	100	300
76	<20	N	.30	N	21.00	200	500
77	<20	N	.30	N	9.80	70	200
78	<20	N	.50	N	13.00	70	500
79	<20	N	.50	N	2.40	30	150
80	<20	N	1.0	N	42.00	70	300
31	<20	N	.30	N	28.00	50	300
84	<20	N	.50	N	5.80	70	500
35	<20	N	.50	N	33.00	50	300
36	<20	N	.30	N	6.60	30	500
37	<20	N	.50	150	9.00	100	1,000
86	<20	N	.30	200	9.00	100	300
97	h	30	.30	N	3.40	30	300
98	<20	N	.50	100	1.20	500	500
99	<20	N	.50	<100	21.00	70	500
100	<20	N	.50	N	4.30	70	700
101	<20	N	.30	N	7.40	50	300
102	<20	N	.30	N	9.10	70	300
105	<20	N	.50	N	4.30	70	500
106	<20	N	.50	<100	1.90	70	300
107	<20	N	.70	200	8.30	150	300
109	N	N	.30	N	9.50	70	200
111	h	N	.30	N	19.00	70	700
112	N	N	.30	N	9.10	100	200
114	N	N	.15	N	53.00	15	30
115	<20	N	1.0	N	7.80	15	200

Table 4.--Analytical data for nonmagnetic heavy-mineral-concentrate samples from 78 sites draining the Buffalo Peaks Wilderness Study Area, Colorado

Analyses by emission spectroscopy. Lower limit of determination in parentheses. N, not detected. Analysts: J. A. Domanico, R. W. Baker]

Site	Latitude	Longitude	Ca pct (.1)	Mg pct (.05)	Sr ppm (200)	g ppm (20)	Co ppm (10)	Cr ppm (20)	Fe pct (.1)	Mn ppm (20)	Ni ppm (10)	Sc ppm (10)
1	39 4 10	106 13 46	7	.05	N	N	N	50	.15	700	N	20
2	39 4 17	106 13 47	15	<.05	N	N	N	30	<.10	1,000	N	20
4	38 58 10	106 8 35	15	<.05	N	N	N	50	.10	1,000	N	20
5	38 56 18	106 8 32	15	.10	N	N	N	70	.10	700	N	20
7	38 57 15	106 8 15	10	.05	N	N	N	30	.10	1,000	N	20
9	38 56 43	106 6 39	7	.15	N	N	N	100	.15	1,000	20	20
10	38 57 18	106 10 22	7	.10	N	20	N	70	.20	1,000	N	20
13	38 54 9	106 5 8	7	.05	N	N	N	20	.15	500	N	20
14	38 55 26	106 5 25	10	.05	N	N	N	20	.10	700	20	20
16	38 55 15	106 4 12	10	.05	N	N	N	20	.15	1,000	10	20
17	38 55 13	106 4 19	10	<.05	N	N	N	<20	.10	500	10	20
18	38 56 54	106 3 45	10	.05	N	N	N	<20	.15	1,500	N	20
20	38 58 1	106 4 19	7	1.00	1,000	20	N	50	.15	500	N	30
21	38 56 7	106 4 20	3	.50	1,000	N	N	20	.30	200	N	20
22	38 58 17	106 4 37	5	.50	700	N	N	50	.20	300	N	20
23	38 58 22	106 4 26	5	.70	1,000	70	N	50	.30	500	N	20
26	38 59 42	106 2 18	3	.15	1,000	N	N	20	.20	300	N	20
27	39 0 14	106 2 3	5	.10	1,500	20	N	30	.10	300	N	20
28	39 1 22	106 3 30	3	.20	200	20	N	50	.10	300	N	20
29	39 1 29	106 5 11	7	.50	700	N	N	20	.70	300	N	30
31	39 1 52	106 13 30	10	.05	N	N	N	50	.20	1,000	N	50
32	38 58 29	106 11 26	10	2.00	N	N	N	N	.30	500	N	20
33	38 57 47	106 11 29	10	.10	N	N	N	50	.15	1,000	N	30
34	38 59 27	106 12 29	10	<.05	N	N	N	30	.15	1,000	N	30
35	38 57 5	106 12 12	15	<.05	N	N	N	20	.10	1,000	N	30
36	38 56 52	106 12 9	15	<.05	N	N	N	20	.10	1,000	N	30
37	39 5 34	106 9 2	10	<.05	N	30	N	70	<.10	500	N	30
40	39 5 23	106 10 28	7	<.05	N	20	N	<20	.15	700	N	30
41	39 3 19	106 10 21	10	.05	N	20	N	70	.15	700	N	30
42	39 3 33	106 10 19	10	<.05	N	<20	N	70	.20	1,000	N	30
43	39 4 9	106 9 44	10	<.05	N	<20	N	30	.20	700	N	30
44	39 4 7	106 9 44	10	<.05	N	<20	10	70	.30	700	N	30
47	39 4 5	106 8 20	15	.07	N	<20	N	50	.50	1,000	N	30
48	39 0 31	106 9 35	15	<.05	N	N	N	70	.10	500	N	30
49	39 0 31	106 9 32	7	.05	N	N	N	20	.20	500	N	30
50	39 1 23	106 9 20	7	<.05	N	N	N	<20	.15	500	N	30
51	39 1 21	106 9 21	7	<.05	N	N	N	20	.20	300	N	30
52	39 1 40	106 8 45	3	.05	200	N	N	<20	.20	200	N	30
53	39 2 15	106 5 31	30	.50	700	30	N	50	.50	2,000	N	30
54	39 3 11	106 5 17	15	.70	200	20	10	70	.70	1,000	N	20
55	39 1 0	106 6 40	15	1.00	200	N	10	150	1.00	500	N	20
56	39 1 0	106 6 37	15	.07	N	N	N	70	.15	300	N	15
58	38 57 11	106 2 24	10	.20	500	N	N	30	.20	300	N	20
59	38 58 25	106 2 16	15	.70	300	30	10	20	.70	500	N	20
62	39 3 10	106 12 7	20	.10	200	N	N	20	.15	700	20	20

Table 4.--Analytical data for nonmagnetic heavy-mineral-concentrate samples from 78 sites draining the Buffalo Peaks Watershed Study Area, Colorado--continued

site	Al ppm (20)	Si ppm (20)	Cu ppm (10)	Pb ppm (20)	Be ppm (2)	La ppm (50)	Mo ppm (10)	Nb ppm (50)	Sn ppm (20)	Ti pct (.005)	Th ppm (200)	W ppm (100)
1	N	150	N	N	3	1,000	N	<50	N	1.5	N	N
2	N	50	N	70	<2	1,500	N	<50	N	>2.0	200	N
4	20	70	N	30	2	700	N	50	N	>2.0	N	N
5	20	500	N	30	2	700	N	<50	N	2.0	N	N
7	30	70	N	50	2	1,000	N	50	N	>2.0	500	N
9	200	50	N	100	N	700	10	70	70	>2.0	N	N
10	50	70	N	70	2	1,000	10	70	70	>2.0	200	N
13	N	100	N	70	3	700	N	50	20	2.0	<200	N
14	N	70	N	100	N	2,000	N	N	N	.5	1,500	N
16	20	100	N	100	2	1,500	N	<50	N	1.5	300	N
17	N	70	N	50	<2	500	N	<50	N	1.0	300	N
18	20	50	N	150	2	500	N	N	N	.5	300	N
20	N	10,000	N	1,500	N	300	20	N	N	.5	N	N
21	<20	1,000	N	30	2	100	N	N	N	.1	N	N
22	N	5,000	N	30	2	200	N	N	N	.2	N	N
23	N	700	N	20	N	500	N	N	N	.2	N	N
24	N	300	N	30	N	150	N	N	N	.1	N	N
27	N	100	N	50	N	300	N	N	N	>2.0	N	N
28	30	3,000	N	1,000	N	100	N	<50	50	>2.0	N	N
29	30	700	N	200	2	200	N	N	20	.5	N	N
31	N	70	N	100	3	1,500	N	<50	N	1.0	300	N
32	30	150	N	50	2	1,000	N	<50	30	.7	<200	N
33	N	50	N	100	N	>2,000	N	<50	20	>2.0	700	N
34	N	<50	N	70	N	2,000	N	<50	N	1.0	200	N
35	N	<50	N	100	N	>2,000	N	<50	N	2.0	700	N
36	<20	300	N	70	N	1,500	N	<50	N	2.0	200	N
37	N	50	N	50	N	300	N	<50	N	2.0	N	N
40	20	200	N	70	3	1,000	N	N	N	.5	N	N
41	20	100	N	70	2	500	N	<50	N	>2.0	N	N
42	20	300	N	30	N	300	N	<50	N	2.0	N	N
43	20	200	N	50	2	1,500	N	N	N	.7	N	200
44	20	150	N	30	3	1,000	N	<50	N	1.5	N	N
47	N	200	N	70	N	1,000	N	N	N	1.5	N	N
48	<20	100	N	50	2	300	N	<50	N	1.5	N	N
49	150	100	N	50	N	500	10	<50	50	>2.0	N	N
50	50	300	N	50	2	1,000	150	<50	N	1.5	<200	100
51	20	500	N	50	2	500	30	<50	N	1.0	200	N
52	<20	700	N	70	2	200	N	<50	N	.5	200	N
53	30	>10,000	N	70	3	1,000	N	<50	50	1.0	N	N
54	100	3,000	N	1,500	<2	2,000	N	N	<20	.2	700	N
55	50	3,000	N	100	<2	500	N	<50	N	.2	<200	N
56	50	700	N	100	<2	300	N	50	N	>2.0	200	100
58	<20	10,000	N	30	<2	500	N	N	N	.1	N	N
59	N	2,000	N	30	2	500	N	N	N	.3	N	N
62	20	>500	N	30	N	500	N	<50	N	1.5	N	100

Table 4.--Analytical data for nonmagnetic heavy-mineral-concentrate samples from 78 sites draining the Buffalo Peaks wilderness Study Area, Colorado--continued

Site	Cr ppm (20)	Zr ppm (20)
1	700	>2,000
2	1,500	>2,000
4	700	>2,000
5	700	>2,000
7	1,000	>2,000
9	700	>2,000
10	700	>2,000
13	700	>2,000
14	1,000	>2,000
16	1,000	>2,000
17	1,000	>2,000
18	1,500	>2,000
20	500	>2,000
21	200	>2,000
22	500	>2,000
23	500	>2,000
26	300	>2,000
27	700	>2,000
28	500	>2,000
29	200	>2,000
31	700	>2,000
32	500	>2,000
33	1,500	>2,000
34	1,500	>2,000
35	2,000	>2,000
36	700	>2,000
37	700	>2,000
40	700	>2,000
41	1,000	>2,000
42	1,000	>2,000
43	1,000	>2,000
44	700	>2,000
47	1,000	>2,000
48	700	>2,000
49	500	>2,000
50	1,000	>2,000
51	700	>2,000
52	300	>2,000
53	1,000	>2,000
54	500	>2,000
55	300	>2,000
56	500	>2,000
58	300	>2,000
59	700	>2,000
62	1,000	>2,000

Table 4.--Analytical data for nonmagnetic heavy-mineral-concentrate samples from 78 sites draining the Buffalo Peaks Wilderness Study Area, Colorado--continued

Site	Latitude	Longitude	Cu pct (.1)	Mg pct (.05)	Sr ppm (200)	Z ppm (20)	Co ppm (10)	Cr ppm (20)	Fe pct (.1)	Mn ppm (20)	Ni ppm (10)	Sc ppm (10)
63	39 3 5	106 11 58	30	<.05	N	N	N	<20	.10	1,000	N	20
64	39 3 3	106 12 0	30	.10	N	N	N	20	.15	1,000	N	20
66	39 4 43	106 13 9	20	.20	N	N	N	50	.20	500	N	20
67	39 5 22	106 11 3	15	.10	N	N	10	70	.20	500	N	20
68	39 5 18	106 11 2	30	.20	N	N	N	70	.20	700	N	20
71	38 58 14	106 2 26	7	5.00	N	50	70	200	3.00	1,000	N	20
73	39 3 20	106 14 58	30	.30	N	N	N	100	.15	2,000	N	20
74	39 8 33	106 14 2	10	.10	N	20	N	70	.30	1,000	N	20
75	39 8 31	106 14 4	15	.10	N	N	N	30	.15	1,500	N	20
76	39 7 13	106 13 58	10	.15	N	70	N	70	.30	1,000	N	20
77	39 7 16	106 13 56	7	.20	N	<20	N	70	.30	700	N	20
78	39 7 17	106 15 8	15	.05	N	20	10	50	.20	700	N	20
79	39 7 15	106 15 9	10	.10	N	20	10	70	.30	700	N	20
80	39 7 24	106 14 18	15	.10	N	N	N	70	.30	1,000	N	20
81	39 1 6	106 13 28	15	.10	N	N	<10	50	.50	700	N	20
84	39 2 15	106 7 15	7	.10	N	N	15	70	.50	300	30	20
85	39 2 8	106 7 0	7	.10	N	<20	20	70	1.50	700	20	20
86	38 56 50	106 5 19	10	<.05	N	N	N	<20	.15	500	N	20
87	38 56 52	106 5 20	7	.05	N	N	10	20	.30	200	N	20
88	38 56 35	106 4 4	10	.05	N	N	15	30	.30	300	10	15
97	39 3 56	106 7 29	5	.20	N	N	N	20	.20	200	N	20
98	39 3 38	106 7 29	7	<.05	N	N	N	20	.15	500	N	20
99	39 6 15	106 9 34	5	.05	N	N	50	20	.30	500	N	20
100	39 6 45	106 10 5	15	.05	N	N	10	50	.20	500	N	20
101	39 7 45	106 11 33	7	.05	N	70	N	100	.70	500	N	20
102	39 9 24	106 12 22	10	.07	N	30	N	100	.50	700	N	20
105	39 7 9	106 16 19	15	.05	N	<20	N	70	.50	700	N	20
106	39 6 37	106 16 12	15	.05	N	N	N	70	.30	1,000	N	20
107	39 9 6	106 16 26	20	<.05	N	N	N	50	.15	1,000	N	20
109	39 6 20	106 16 18	30	<.05	N	N	N	30	.20	700	N	20
111	38 56 30	106 8 18	10	<.05	N	N	N	30	.20	200	N	20
114	39 2 16	106 6 46	7	1.00	300	150	10	100	.70	500	N	20
115	39 1 56	106 6 32	10	.70	500	N	15	70	.50	300	N	20

Table 4.--Analytical data for nonmagnetic heavy-mineral-concentrate samples from 78 sites draining the Buffalo Peaks Watershed Study Area, Colorado--continued

Site	V ppm (20)	Ba ppm (50)	Bi ppm (20)	Cu ppm (10)	Pb ppm (20)	Be ppm (2)	La ppm (50)	Mo ppm (10)	Nb ppm (50)	Sn ppm (20)	Ti pct (.005)	Th ppm (200)	W ppm (100)
65	<20	150	N	N	50	N	1,000	N	N	N	.5	N	<100
66	<20	300	N	N	30	N	500	N	<50	N	.5	N	N
67	20	300	N	<10	70	<2	1,000	N	<50	N	1.5	300	N
68	<20	300	N	<10	200	15	>2,000	N	N	<20	1.0	1,500	N
69	<20	500	N	10	100	N	2,000	N	50	<20	2.0	500	N
70	100	200	N	10	70	N	500	10	<50	<20	2.0	200	N
71	30	200	N	<10	100	N	2,000	N	N	<20	2.0	500	N
72	30	150	N	<10	100	N	>2,000	N	<50	<20	>2.0	500	N
73	30	100	N	<10	70	<2	1,500	N	<50	<20	1.5	200	N
74	30	500	N	<10	70	2	700	N	<50	N	1.0	<200	N
75	20	1,000	N	<10	50	3	500	N	N	N	1.0	<200	N
76	20	150	50	N	100	2	>2,000	N	50	N	1.0	500	N
77	20	200	N	N	100	2	2,000	N	50	N	1.5	500	N
78	20	100	N	N	70	<2	1,500	N	70	N	2.0	300	N
79	20	100	N	N	100	N	2,000	N	70	N	>2.0	500	N
80	20	100	N	N	100	N	2,000	N	70	30	>2.0	500	N
81	20	100	N	N	100	N	2,000	N	70	50	>2.0	2,000	N
82	20	70	N	<10	500	<2	>2,000	N	100	30	>2.0	1,000	<100
83	20	100	N	10	150	N	1,500	10	N	N	.5	1,500	N
84	20	200	N	<10	100	2	2,000	N	N	N	.5	1,500	N
85	20	100	N	<10	150	2	>2,000	N	N	20	1.5	2,000	N
86	20	70	N	20	300	N	1,500	N	N	N	1.0	200	N
87	20	150	N	20	700	2	1,500	N	N	N	1.5	200	N
88	20	100	N	<10	50	2	1,500	N	N	N	.7	200	N
89	20	100	N	<10	50	2	1,500	N	N	<20	2.0	200	N
90	20	70	N	10	100	<2	2,000	N	70	20	>2.0	300	N
91	20	70	N	10	100	N	1,500	N	70	N	>2.0	300	N
92	20	70	N	10	70	N	1,500	N	50	N	2.0	200	N
93	20	70	N	<10	70	N	2,000	N	<50	30	>2.0	300	N
94	20	50	N	N	70	N	>2,000	N	50	20	2.0	300	N
95	20	50	N	N	50	N	1,500	N	50	N	1.5	300	N
96	20	50	N	N	150	2	700	N	N	50	1.5	500	N
97	20	300	N	10	300	N	500	<10	50	20	1.5	200	N
98	20	300	N	30	50	N	150	N	N	N	1.0	<200	N
99	20	300	N	30	50	N	150	N	N	N	1.0	<200	N
100	20	300	N	30	50	N	150	N	N	N	1.0	<200	N
101	20	300	N	30	50	N	150	N	N	N	1.0	<200	N
102	20	300	N	30	50	N	150	N	N	N	1.0	<200	N
103	20	300	N	30	50	N	150	N	N	N	1.0	<200	N
104	20	300	N	30	50	N	150	N	N	N	1.0	<200	N
105	20	300	N	30	50	N	150	N	N	N	1.0	<200	N
106	20	300	N	30	50	N	150	N	N	N	1.0	<200	N
107	20	300	N	30	50	N	150	N	N	N	1.0	<200	N
108	20	300	N	30	50	N	150	N	N	N	1.0	<200	N
109	20	300	N	30	50	N	150	N	N	N	1.0	<200	N
110	20	300	N	30	50	N	150	N	N	N	1.0	<200	N
111	20	300	N	30	50	N	150	N	N	N	1.0	<200	N
112	20	300	N	30	50	N	150	N	N	N	1.0	<200	N
113	20	300	N	30	50	N	150	N	N	N	1.0	<200	N
114	20	300	N	30	50	N	150	N	N	N	1.0	<200	N
115	20	300	N	30	50	N	150	N	N	N	1.0	<200	N

Table 4.---Analytical data for nonmagnetic heavy-mineral-concentrate samples from 78 sites draining the Buffalo Peaks Wilderness Study Area, Colorado--continued

Site	Y (20)	Y (20)
63	1,600	>2,000
64	1,500	>2,000
66	1,600	>2,000
67	1,500	>2,000
68	1,500	>2,000
71	500	>2,000
73	1,500	>2,000
74	2,000	>2,000
75	1,000	>2,000
76	1,000	>2,000
77	700	>2,000
78	700	>2,000
79	700	>2,000
80	1,000	>2,000
81	700	>2,000
84	1,500	>2,000
85	1,000	>2,000
86	1,000	>2,000
87	700	>2,000
88	1,500	>2,000
97	500	>2,000
98	500	>2,000
99	700	>2,000
100	1,000	>2,000
101	700	>2,000
102	1,000	>2,000
103	700	>2,000
106	1,000	>2,000
107	1,500	>2,000
109	700	>2,000
111	1,000	>2,000
114	1,500	>2,000
115	1,000	>2,000

Table 2. Results in raw panned-concentrate samples from 76 sites draining the Buffalo Peaks Wilderness Study Area, Colorado
 [Analyses by atomic absorption. "N" not detected. Lower limit of determination in parentheses. Analyst: A. L. Gruzensky]

Site	Latitude	Longitude	Au ppm	weight g	Site	Latitude	Longitude	Au ppm	Weight g
1	37 4 16	106 13 46	N (.05)	10.00	53	39 2 15	106 5 31	N (.05)	10.00
2	37 4 17	106 13 47	<.05	10.00	54	39 3 11	106 5 17	N (.05)	10.00
3	37 4 16	106 13 54	N (.05)	10.00	55	39 1 0	106 6 40	N (.11)	4.35
4	36 56 10	106 8 35	.05	10.00	56	39 1 0	106 6 37	N (.05)	10.00
5	36 53 18	106 8 32	N (.05)	10.00	57	39 2 48	106 6 39	N (.05)	10.00
7	36 57 15	106 8 15	N (.05)	9.50	58	38 59 11	106 2 24	N (.05)	10.00
9	36 50 43	106 8 39	N (.05)	10.00	62	39 5 10	106 12 7	N (.05)	10.00
10	36 57 18	106 10 22	N (.05)	10.00	63	39 5 5	106 11 58	N (.05)	10.00
13	36 54 9	106 5 8	N (.05)	10.00	64	39 5 3	106 12 0	N (.05)	10.00
14	36 55 25	106 5 25	N (.05)	10.00	66	39 4 43	106 13 9	N (.05)	9.60
16	36 55 15	106 4 12	N (.05)	10.00	67	39 5 22	106 11 3	N (.12)	4.12
17	36 55 13	106 4 19	N (.05)	10.00	68	39 5 18	106 11 2	N (.10)	4.85
18	36 56 54	106 3 45	N (.05)	10.00	71	38 58 14	106 2 26	N (.05)	10.00
20	36 56 1	106 4 19	N (.05)	10.00	73	39 9 20	106 14 58	N (.05)	10.00
21	36 58 7	106 4 20	N (.05)	10.00	74	39 8 33	106 14 2	N (.05)	10.00
22	36 58 19	106 4 37	N (.05)	10.00	75	39 8 31	106 14 4	N (.08)	6.25
23	36 58 22	106 4 26	N (.05)	10.00	76	39 7 13	106 13 58	N (.05)	9.85
26	36 59 42	106 2 18	N (.05)	10.00	77	39 7 16	106 13 56	N (.06)	7.80
27	39 0 14	106 2 3	N (.05)	10.00	78	39 7 17	106 15 8	N (.06)	8.00
28	39 1 22	106 3 30	N (.05)	10.00	79	39 7 15	106 15 9	.95 (.06)	7.90
29	39 1 29	106 5 11	.05	10.00	80	39 7 24	106 14 18	N (.05)	9.50
31	39 1 52	106 13 30	N (.05)	10.00	81	39 1 6	106 13 28	.30 (.05)	10.00
32	36 58 20	106 11 26	N (.05)	10.00	84	39 2 15	106 7 15	N (.12)	4.05
33	36 57 47	106 11 29	N (.05)	10.00	85	39 2 8	106 7 0	N (.05)	10.00
34	36 59 27	106 12 20	1.0	10.00	86	38 56 50	106 5 19	N (.05)	10.00
35	36 59 3	106 12 12	N (.05)	10.00	87	38 56 52	106 5 20	.25 (.05)	10.00
36	36 50 52	106 12 9	N (.05)	10.00	88	38 56 35	106 4 4	N (.05)	10.00
37	39 3 34	106 9 2	N (.05)	10.00	97	39 3 56	106 7 29	N (.05)	10.00
40	39 3 23	106 10 28	N (.05)	10.00	98	39 3 58	106 7 29	N (.05)	10.00
41	39 3 19	106 10 21	N (.05)	10.00	99	39 6 15	106 9 34	N (.05)	10.00
42	39 3 33	106 10 19	N (.05)	10.00	100	39 6 45	106 10 5	N (.05)	10.00
43	39 4 9	106 9 44	N (.05)	10.00	101	39 7 45	106 11 33	N (.05)	10.00
44	39 4 7	106 9 44	N (.13)	3.80	102	39 9 24	106 12 22	N (.05)	10.00
47	39 4 5	106 8 20	N (.05)	10.00	105	39 7 9	106 16 19	N (.05)	10.00
48	39 0 31	106 9 35	N (.05)	10.00	106	39 6 37	106 16 12	.05 (.05)	10.00
49	39 0 31	106 9 32	N (.05)	10.00	107	39 9 8	106 16 26	N (.05)	10.00
50	39 1 23	106 9 20	4.7	10.00	109	39 8 20	106 16 18	N (.05)	10.00
51	39 1 21	106 9 21	.80	10.00	111	38 56 30	106 8 18	.05 (.05)	10.00
52	39 1 40	106 8 45	N (.05)	10.00	115	39 1 56	106 6 32	N (.05)	10.00