UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Analytical results and sample locality map of stream-sediment, heavy-mineral-concentrate, and rock samples from the Coal Canyon (UT-060-100C), Spruce Canyon (UT-060-100D), and Flume Canyon (UT-060-100B) Wilderness Study Areas, Grand County, Utah.

By

Jerry D. Gaccetta[1], David E. Detra[1], David L. Fey[1],

and Robert B. Vaughn[2]

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[1]U.S. Geological Survey, DFC, Box 25046, MS 973, Denver, CO 80225
[2]U.S. Geological Survey, DFC, Box 25046, MS 424, Denver, CO 80225

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CONTENTS

ILLUSTRATIONS

TABLES

STUDIES RELATED TO WILDERNESS

Bureau of Land Management Wilderness Study Areas

The Federal Land Policy and Management Act (Public Law 94-579, October 21, 1976) requires the U.S. Geological Survey and the U.S. Bureau of Mines to conduct mineral surveys on certain areas to determine their mineral values, if any. 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 Coal Canyon (UT-060-100C), Spruce Canyon (UT-060-100D), and Flume Canyon (UT-060-100B) Wilderness Study Areas, Grand County, Utah.

INTRODUCTION

In May 1985, the U.S. Geological Survey conducted a reconnaissance geochemical survey of the Coal Canyon (UT-060-100C), Spruce Canyon (UT-060-100D), and Flume Canyon (UT-060-100B) Wilderness Study Areas, Grand County, Utah.

The Coal Canyon Wilderness Study Area (WSA) comprises about 33 mi^2 (85 km^2) (20,774 acres); The Spruce Canyon WSA comprises about 22.5 mi^2 (58 km^2) (14,376 acres); and the Flume Canyon WSA comprises about 26 mi^2 (67 km^2) (16,495 acres). The study areas are located in east-central Utah, midway between the town of Green River, Utah and the Utah-Colorado border (fig. 1.). Access to the study areas is by gravel and dirt roads that extend north from Interstate 70 across the Grand Valley to the face of the Book Cliffs, from there travel is restricted to dirt roads following the larger drainages into the study areas.

The topographic relief in the study areas as a whole is great, about 3250 ft (990 m), with a maximum elevation of 8989 ft (2740 m) near the headwaters of Cottonwood Wash in the Coal Canyon WSA. Vegetation in the study areas is predominately grasses, sagebrush, and cactus of the prickly pear type. At the higher elevations vegetation consists of cedar, pinon pine, and sagebrush. Cottonwood and willow trees are found along streams were conditions are favorable.

The Coal Canyon, Spruce Canyon, and Flume Canyon WSA's lie within the southern boundary of the Uintah Basin and north of the Book Cliffs escarpment. The Wilderness Study Areas have been mapped by Gualtieri (1988) and Cashion (1973) and consist of Cretaceous and Tertiary sedimentary strata dipping gently northward into the Uintah Basin. The oldest stratigraphic unit within the areas is the Mancos Shale, which forms the base of the Book Cliffs. Overlying the Mancos Shale is the Mesa Verde Group, which Fisher (1960) divides into seven units in this area. Unconformably overlying the Mesa Verde Group is the Wasatch Formation, which inturn is capped by the Green River Formation (Cashion, 1967).

METHODS OF STUDY

Sample Media

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.

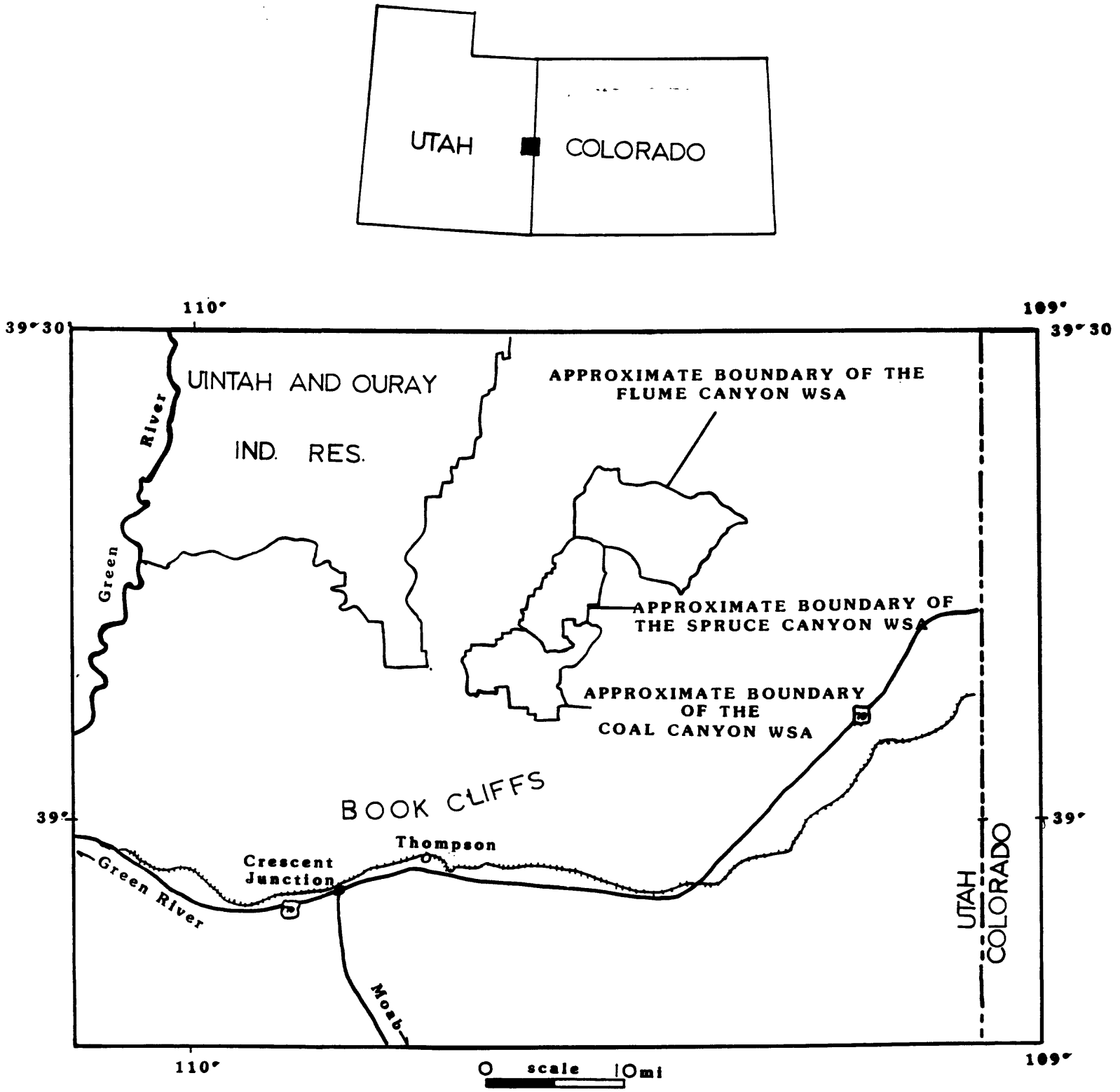

Figure 1. Location map of the Coal Canyon, Spruce Canyon, and the Flume Canyon Wilderness Study Areas, Grand County, Utah.

Heavy-mineral-concentrate samples provide information about the chemistry of certain minerals in rock material eroded from the drainage basin upstream from each sample site. The selective concentration of minerals, many of which may be ore related, permits determination of some elements that are not easily detected in stream-sediment samples.

Analyses of unaltered or unmineralized rock samples provide background geochemical data for individual rock units. On the other hand, analyses of altered or mineralized rocks, where present, may provide useful geochemical information about the major- and trace-element assemblages associated with a mineralizing system.

Sample Collection

In the Coal Canyon WSA, 55 heavy-mineral-concentrate, 55 stream-sediment, and 24 rock samples were collected (plate 1). In the Spruce Canyon WSA, 19 heavy-mineral-concentrate, 19 stream-sediment, and 6 rock samples were collected. Finally, in the Flume Canyon WSA, 39 heavy-mineral-concentrate, 39 stream-sediment, and 24 rock samples were collected. Sampling density for the combined areas is 1.4 sites per 1 mi^2 for heavy-mineral-concentrate and stream-sediment samples.

Stream-sediment samples

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 1:100,000 topographic map (plate 1). Each sample was composited from several localities within an area that may extend as much as 20 ft from the site plotted on the map.

Heavy-mineral-concentrate samples

Heavy-mineral-concentrate samples were collected from the same active alluvium as the stream-sediment samples. Each bulk sample was screened with a 2.0-mm (10-mesh) screen to remove the coarse material. The less than 2.0-mm fraction was panned until most of the quartz, feldspar, organic material, and clay-sized material were removed.

Rock samples

Rock samples were collected from various types of occurrences in the vicinity of the plotted site location. Descriptions of rock samples are in tables 12 through 14.

Sample Preparation

The stream-sediment samples were air dried, then sieved using 80-mesh (0.17-mm) stainless-steel sieves. The portion of the sediment passing through the sieve was saved for analysis.

Samples that had been panned in the field were air dried and sieving to -35 mesh, bromoform (specific gravity 2.85) was used to remove the remaining quartz and feldspar from the heavy-mineral-concentrate samples that had been panned in the field. The resultant heavy-mineral sample was separated into three fractions using a large electromagnet (in this case a modified Frantz Isodynamic Separator) by placing the sample in contact with the face of the

magnet. The most magnetic material (removed at a setting of 0.25 ampere), primarily magnetite, was not analyzed. The second fraction (removed at a setting of 1.75 ampere) largely ferromagnesian silicates and iron oxides, was saved for archival storage. The third fraction (the nonmagnetic material which may include the nonmagnetic ore minerals, zircon, sphene, etc.) was split using a Jones splitter for analysis. One split was hand ground for spectrographic analysis; the other split was saved for mineralogical analysis. (These magnetic separates are the same separates that would be produced by using a Frantz Isodynamic Separator set at a slope of 15° and a tilt of 10° with a current of 0.2 ampere to remove the magnetite and ilmenite, and a current of 0.6 ampere to split the remainder of the sample into paramagnetic and nonmagnetic fractions.)

Rock samples were crushed and then pulverized to minus 0.15 mm with ceramic plates.

Sample Analysis

Spectrographic method

The stream-sediment and rock samples were analyzed for 35 elements and the heavy-mineral-concentrate samples were analyzed for 37 using semiquantitative, direct-current arc emission spectrographic method (modification of Grimes and Marrannzino, 1968 and Myers and others, 1961). The elements analyzed and their lower limits of determination are listed in table 1. 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 interval at the 83 percent confidence level and plus or minus two reporting intervals 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). Analytical data for samples from the Coal Canyon, Spruce Canyon, and the Flume Canyon WSAs are listed in tables 3 through 11.

Chemical methods

Samples from these study areas were also analyzed by atomic absorption (AA), inductively coupled plasma-atomic emission spectroscopy (ICP), and delayed neutron activation (DN). Rock and stream-sediment samples were analyzed for gold (Au) using atomic absorption spectroscopy, arsenic (As), antimony (Sb), bismuth (Bi), cadmium (Cd), and zinc (Zn) using inductively coupled plasmas-atomic emission spectroscopy and uranium (U) and thorium (Th) using delayed neutron activation. See table 2 for a more detailed summary of these chemical methods.

DATA STORAGE SYSTEM

Upon completion of all analytical work, the analytical results were entered into the Branch of Geochemistry computer data base called PLUTO. This data base contains both descriptive geological information and analytical

data. Any or all of this information may be retrieved and converted to a binary form (STATPAC) for computerized statistical analysis or publication (VanTrump and Miesch, 1977).

DESCRIPTION OF DATA TABLES

Tables 3-11 list the results of analyses for the samples of stream sediment, heavy-mineral concentrate, and rock. For the nine tables, the data are arranged so that column 1 contains the USGS-assigned sample numbers, such as CC001S. The prefix CC indicates samples collected in the Coal Canyon WSA; SC indicate samples collected in the Spruce Canyon WSA; and FC indicates samples collected in the Flume Canyon WSA. The suffixes C, S, or R indicates whether the sample was taken as a concentrate, stream sediment, or rock. Numbers correspond to the numbers shown on the site location map (plate. 1.). Columns in which the element headings show the letter "s" beside the element symbol are emission spectrographic analyses; "aa" indicates atomic absorption analyses; "icp" indicates inductively coupled plasma-atomic emission spectroscopy; and "dn" indicates delayed neutron activation analyses. A letter "N" in the tables indicates that a given element was looked for but not detected at the lower limit of determination shown for that element in table 1. For emission spectrographic analyses, a "less than" symbol (<) entered in the tables in front of the lower limit of determination indicates that an element was observed but was below the lowest reporting value. For AA and ICP analyses, a "less than" symbol (<) entered in the tables in front of the lower limit of determination indicates that an element was below the lowest reporting value. If an element was observed but was above the highest reporting value, a "greater than" symbol (>) was entered in the tables in front of the upper limit of determination. Because of the formatting used in the computer program that produced tables 3-11, some of the elements listed in these tables (Fe, Mg, Ca, Ti, Ag, and Be) carry one or more nonsignificant digits to the right of the significant digits. The analysts did not determine these elements to the accuracy suggested by the extra zeros.

ACKNOWLEDGMENTS

A number of our colleagues also participated in collection and analyses of these samples: collection, Phil Hageman; analyses, David McKown and Mollie Malcolm.

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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 based on a 5-mg sample, and are therefore two reporting intervals higher than the limits given for rocks.]

Elements	Lower determination limit	Upper determination limit
	Percent	
Calcium (Ca)	.05	20
Iron (Fe)	0.05	20
Magnesium (Mg)	.02	10
Sodium (Na)	0.2	5
Phosphorus (P)	0.2	10
Titanium (Ti)	.002	1
	Parts per million	
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)	10	2,000
Chromium (Cr)	10	5,000
Copper (Cu)	5	20,000
Gallium (Ga)	5	500
Germanium (Ge)	10	100
Lanthanum (La)	50	1,000
Manganese (Mn)	10	5,000
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
Thorium (Th)	100	2,000
Vanadium (V)	10	10,000
Tungsten (W)	20	10,000
Yttrium (Y)	10	2,000
Zinc (Zn)	200	10,000
Zirconium (Zr)	10	1,000
Palladium (Pd)*	5	1,000
Platinum (Pt)*	20	1,000

*Determined in heavy-mineral-concentrate samples only. Limits are for heavy-mineral-concentrate samples.

TABLE 2.--Chemical methods used

[AA = atomic absorption; ICP = inductively coupled plasma spectroscopy; DN = delayed neutron; and S = spectrophotometry]

Element or constituent determined	Sample type	Method	Determination limit (micrograms/ gram or ppm)	Reference
Gold (Au)	rock	AA	.1	Modification of Thompson and others, 1968.
Arsenic (As)	rock	ICP	5	Crock and others, 1987.
Antimony (Sb)	rock	ICP	2	
Zinc (Zn)	rock	ICP	2	
Bismuth (Bi)	rock	ICP	2	
Cadmium (Cd)	rock	ICP	0.1	
Thorium (Th)	rock	DN		Millard, 1976.
Uranium (U)	rock	DN		Millard, 1976.

TABLE 3--ANALYTICAL RESULTS OF STREAM-SEDIMENT SAMPLES COLLECTED FROM THE COAL CANYON WILDERNESS STUDY AREA, UTAH.
[N, not detected; <, detected but below the limit of determination shown; >, determined to be greater than the value shown.]

Sample	Latitude	Longtude	Ca %-s	Fe %-s	Mg %-s	Na %-s	P %-s	Ti %-s	Ag ppm-s	As ppm-s	Au ppm-s
CC001S	39 2 0	109 42 7	2.0	3.0	1.0	1.5	<.2	.3	N	N	N
CC002S	39 4 45	109 41 50	3.0	3.0	1.0	1.0	<.2	.5	N	N	N
CC003S	39 5 39	109 41 50	3.0	2.0	1.0	1.5	N	.5	N	N	N
CC004S	39 5 10	109 40 49	3.0	3.0	1.5	2.0	N	.3	N	N	N
CC005S	39 3 11	109 38 48	2.0	2.0	1.0	1.0	N	.3	N	N	N
CC006S	39 3 15	109 38 42	3.0	3.0	1.0	1.5	N	.5	N	N	N
CC007S	39 3 9	109 38 32	1.5	3.0	.7	2.0	N	.5	N	N	N
CC008S	39 2 49	109 37 59	1.5	5.0	1.0	1.0	<.2	.3	N	N	N
CC009S	39 1 55	109 37 55	1.5	3.0	1.0	1.0	<.2	.3	N	N	N
CC010S	39 2 6	109 39 1	1.5	5.0	1.0	.7	<.2	.5	N	N	N
CC011S	39 1 53	109 39 9	1.5	5.0	1.0	1.5	<.2	.5	N	N	N
CC012S	39 2 42	109 40 15	1.0	3.0	.7	2.0	<.2	.5	N	N	N
CC013S	39 2 39	109 40 26	1.0	3.0	1.0	1.0	<.2	.5	N	N	N
CC014S	39 1 1	109 40 8	1.5	5.0	1.0	.3	.2	.5	N	N	N
CC015S	39 5 34	109 38 50	2.0	2.0	1.0	1.0	<.2	.5	N	N	N
CC016S	39 6 31	109 38 40	3.0	5.0	1.0	1.5	<.2	.5	2.0	N	N
CC017S	39 6 27	109 38 52	2.0	1.5	1.0	1.5	<.2	.3	N	N	N
CC018S	39 7 20	109 40 37	3.0	2.0	1.0	1.5	<.2	.3	N	N	N
CC019S	39 7 25	109 40 25	2.0	2.0	1.0	1.5	<.2	.5	N	N	N
CC020S	39 6 40	109 39 9	3.0	2.0	1.0	2.0	<.2	.5	N	N	N
CC021S	39 8 32	109 38 53	2.0	2.0	1.0	1.5	<.2	.3	N	N	N
CC022S	39 9 0	109 38 44	1.5	1.5	.7	1.5	<.2	.3	N	N	N
CC023S	39 9 0	109 39 0	5.0	3.0	1.0	1.5	<.2	.5	N	N	N
CC024S	39 6 34	109 36 58	1.5	1.5	.7	1.0	<.2	.3	N	N	N
CC025S	39 6 28	109 37 2	1.5	1.5	1.0	1.5	<.2	.3	N	N	N
CC026S	39 6 33	109 35 32	1.5	3.0	1.0	1.0	<.2	.5	N	N	N
CC027S	39 6 23	109 36 2	1.0	2.0	1.0	1.0	<.2	.3	N	N	N
CC028S	39 6 10	109 34 43	5.0	2.0	1.0	1.5	.2	.3	N	N	N
CC029S	39 6 8	109 34 45	1.5	3.0	1.0	.7	.2	.3	N	N	N
CC030S	39 5 58	109 33 59	1.5	2.0	1.0	1.0	<.2	.3	N	N	N
CC031S	39 1 20	109 36 30	1.5	2.0	1.0	.7	<.2	.3	N	N	N
CC032S	39 4 49	109 29 10	1.0	5.0	1.0	1.0	<.2	.3	N	N	N
CC033S	39 7 4	109 29 47	2.0	3.0	1.0	1.0	.2	.3	N	N	N
CC034S	39 5 40	109 29 30	1.5	5.0	1.0	1.0	.2	.5	N	N	N
CC035S	39 5 39	109 29 47	1.5	3.0	1.0	1.0	.2	.5	N	N	N
CC036S	39 7 39	109 29 6	1.5	2.0	1.0	1.0	<.2	.3	N	N	N
CC037S	39 7 37	109 29 19	1.5	3.0	1.0	1.0	<.2	.5	N	N	N
CC038S	39 7 56	109 28 32	2.0	3.0	1.0	1.5	<.2	.3	N	N	N
CC039S	39 8 2	109 28 8	1.5	3.0	1.0	.7	<.2	.3	N	N	N
CC040S	39 8 28	109 26 49	1.5	5.0	.7	1.0	<.2	.3	N	N	N
CC041S	39 9 52	109 26 45	1.5	1.5	1.0	1.0	N	.3	N	N	N
CC042S	39 9 5	109 27 38	1.5	2.0	1.0	1.0	N	.2	N	N	N
CC043S	39 9 55	109 30 37	2.0	1.5	1.0	1.5	N	.2	N	N	N
CC044S	39 8 35	109 31 24	2.0	2.0	1.0	1.5	N	.3	N	N	N
CC045S	39 8 48	109 31 16	2.0	1.5	1.0	1.5	N	.3	N	N	N

TABLE 3--ANALYTICAL RESULTS OF STREAM-SEDIMENT SAMPLES COLLECTED FROM THE COAL CANYON WILDERNESS STUDY AREA, UTAH.--Continued

Sample	B ppm-s	Ba ppm-s	Be ppm-s	Bi ppm-s	Cd ppm-s	Co ppm-s	Cr ppm-s	Cu ppm-s	Ga ppm-s	Ge ppm-s	La ppm-s
CC001S	50	1,500	1.0	N	N	10	30	20	15	N	<50
CC002S	50	1,000	1.5	N	N	10	30	15	10	N	N
CC003S	50	1,000	1.0	N	N	10	30	10	15	N	N
CC004S	50	1,000	1.0	N	N	10	50	20	20	N	N
CC005S	30	1,000	1.0	N	N	10	30	15	15	N	N
CC006S	70	1,000	1.0	N	N	10	30	20	15	N	N
CC007S	50	1,000	1.0	N	N	10	30	20	15	N	N
CC008S	50	1,000	1.0	N	N	10	30	20	10	N	N
CC009S	30	1,000	<1.0	N	N	10	20	10	5	N	N
CC010S	50	700	<1.0	N	N	10	30	15	7	N	N
CC011S	30	1,500	1.0	N	N	10	20	20	15	N	50
CC012S	50	1,000	1.0	N	N	<10	20	7	10	N	N
CC013S	30	1,000	<1.0	N	N	10	20	15	10	N	N
CC014S	50	700	<1.0	N	N	10	50	20	10	N	N
CC015S	30	1,500	1.0	N	N	<10	30	10	10	N	N
CC016S	30	1,000	1.0	N	N	10	30	15	15	N	70
CC017S	20	1,000	1.0	N	N	10	30	15	15	N	<50
CC018S	50	1,000	1.0	N	N	10	30	10	15	N	N
CC019S	50	1,000	1.0	N	N	10	30	10	10	N	50
CC020S	30	1,000	<1.0	N	N	10	50	15	10	N	N
CC021S	70	1,000	1.0	N	N	10	100	15	15	N	N
CC022S	30	1,000	1.0	N	N	10	30	10	15	N	N
CC023S	50	1,500	1.5	N	N	10	50	15	15	N	50
CC024S	30	700	<1.0	N	N	10	50	10	10	N	N
CC025S	30	1,000	1.0	N	N	10	50	10	15	N	N
CC026S	50	1,000	<1.0	N	N	10	50	15	15	N	N
CC027S	50	700	1.0	N	N	10	50	15	10	N	100
CC028S	30	1,000	1.0	N	N	10	30	10	15	N	N
CC029S	50	700	1.0	N	N	10	50	15	15	N	N
CC030S	50	1,000	1.0	N	N	10	30	15	15	N	N
CC031S	50	1,000	<1.0	N	N	10	50	15	10	N	N
CC032S	50	1,000	1.0	N	N	15	50	20	15	N	N
CC033S	30	1,500	1.0	N	N	10	30	10	10	N	N
CC034S	50	1,500	1.0	N	N	10	50	15	10	N	70
CC035S	50	2,000	1.0	N	N	10	30	10	15	N	N
CC036S	30	1,000	<1.0	N	N	10	30	10	15	N	N
CC037S	50	1,500	1.0	N	N	15	30	15	20	N	N
CC038S	30	1,000	1.0	N	N	10	30	10	15	N	N
CC039S	50	1,500	1.0	N	N	10	50	10	10	N	N
CC040S	30	1,500	<1.0	N	N	10	50	15	10	N	100
CC041S	50	2,000	1.0	N	N	10	30	15	10	N	N
CC042S	30	2,000	<1.0	N	N	<10	20	15	10	N	N
CC043S	50	1,500	<1.0	N	N	<10	20	10	10	N	N
CC044S	50	1,500	1.0	N	N	10	30	15	15	N	<50
CC045S	50	2,000	1.0	N	N	<10	20	30	10	N	N

TABLE 3--ANALYTICAL RESULTS OF STREAM-SEDIMENT SAMPLES COLLECTED FROM THE COAL CANYON WILDERNESS STUDY AREA, UTAH.--Continued

Sample	Mn ppm-s	Mo ppm-s	Nb ppm-s	Ni ppm-s	Pb ppm-s	Sb ppm-s	Sc ppm-s	Sn ppm-s	Sr ppm-s	Th ppm-s	V ppm-s	W ppm-s
CC001S	500	N	N	10	20	N	7	N	150	N	70	N
CC002S	700	N	N	15	15	N	10	N	200	N	100	N
CC003S	500	N	N	10	15	N	7	N	150	N	100	N
CC004S	700	N	N	15	20	N	7	N	150	N	100	N
CC005S	500	N	N	10	10	N	7	N	150	N	100	N
CC006S	700	N	N	15	30	N	7	N	200	N	100	N
CC007S	500	N	<20	7	10	N	7	N	100	N	70	N
CC008S	500	N	N	10	15	N	7	N	100	N	100	N
CC009S	300	N	N	7	10	N	7	N	100	N	70	N
CC010S	500	N	N	10	20	N	7	N	100	N	70	N
CC011S	700	N	N	7	20	N	7	N	150	N	100	N
CC012S	500	N	N	7	10	N	5	N	150	N	50	N
CC013S	500	N	N	7	10	N	5	N	150	N	70	N
CC014S	200	N	<20	10	10	N	10	N	100	N	100	N
CC015S	500	N	N	7	10	N	7	N	150	N	100	N
CC016S	700	N	N	7	20	N	10	N	150	N	100	N
CC017S	500	N	N	10	15	N	7	N	150	N	70	N
CC018S	500	N	N	7	15	N	10	N	150	N	100	N
CC019S	500	N	N	10	15	N	7	N	150	N	100	N
CC020S	500	N	<20	10	15	N	7	N	150	N	100	N
CC021S	500	N	<20	10	20	N	7	N	150	N	150	N
CC022S	500	N	N	7	10	N	7	N	150	N	100	N
CC023S	700	N	<20	10	20	N	10	N	200	N	150	N
CC024S	300	N	N	7	10	N	7	N	100	N	70	N
CC025S	300	N	N	7	10	N	7	N	100	N	70	N
CC026S	300	N	N	10	15	N	7	N	100	N	100	N
CC027S	300	N	N	10	10	N	7	N	100	N	100	N
CC028S	700	N	<20	10	15	N	10	N	200	N	100	N
CC029S	300	N	N	15	15	N	7	N	150	N	100	N
CC030S	500	N	N	7	15	N	5	N	100	N	100	N
CC031S	300	N	N	10	30	N	7	N	100	N	100	N
CC032S	500	N	N	20	30	N	10	N	150	N	150	N
CC033S	500	N	<20	10	15	N	7	N	150	N	100	N
CC034S	700	N	N	7	15	N	10	N	100	N	100	N
CC035S	500	N	N	7	15	N	7	N	150	N	100	N
CC036S	500	N	N	7	20	N	7	N	100	N	70	N
CC037S	700	N	N	10	20	N	7	N	100	N	100	N
CC038S	500	N	N	15	15	N	7	N	100	N	100	N
CC039S	500	N	N	10	10	N	7	N	100	N	100	N
CC040S	500	N	N	10	15	N	7	N	100	N	100	N
CC041S	500	N	N	15	20	N	7	N	150	N	100	N
CC042S	700	N	N	7	20	N	7	N	150	N	100	N
CC043S	500	N	N	10	10	N	5	N	150	N	100	N
CC044S	500	N	N	15	10	N	7	N	150	N	100	N
CC045S	700	N	N	10	15	N	7	N	150	N	100	N

TABLE 3--ANALYTICAL RESULTS OF STREAM-SEDIMENT SAMPLES COLLECTED FROM THE COAL CANYON WILDERNESS STUDY AREA, UTAH.--Continued

Sample	Y ppm-s	Zn ppm-s	Zr ppm-s	As/p ppm	Bi/p ppm	Cd/p ppm	Sb/p ppm	Zn/p ppm	Au ppm	Th ppm	U ppm
CC001S	20	N	>1,000	7	<2	.2	<2	42	<.05	10.70	2.68
CC002S	15	N	300	6	<2	.3	<2	35	<.05	12.60	3.18
CC003S	15	N	200	<5	<2	.3	<2	31	<.05	8.72	2.38
CC004S	20	N	500	<5	<2	.3	<2	33	<.05	10.30	2.70
CC005S	20	N	200	<5	<2	.3	<2	34	<.05	10.30	2.72
CC006S	20	N	300	<5	<2	.3	<2	40	<.05	8.71	3.25
CC007S	100	N	>1,000	<5	<2	.2	<2	36	<.05	11.20	2.62
CC008S	20	N	700	5	<2	.3	<2	40	<.05	8.75	2.66
CC009S	10	N	500	<5	<2	.3	<2	31	<.05	9.04	2.27
CC010S	15	N	500	6	<2	.3	<2	47	<.05	9.41	2.32
CC011S	50	N	700	<5	<2	.3	<2	42	<.05	12.40	3.20
CC012S	15	N	500	<5	<2	.1	<2	24	<.05	11.40	2.52
CC013S	20	N	700	<5	<2	.3	<2	37	<.05	8.78	2.61
CC014S	30	N	1,000	7	<2	.2	<2	47	<.05	5.80	3.11
CC015S	15	N	200	<5	<2	.3	<2	27	<.05	7.74	3.02
CC016S	20	N	1,000	<5	<2	.3	<2	35	<.05	11.60	3.04
CC017S	20	N	300	<5	<2	.2	<2	29	<.05	10.80	2.83
CC018S	20	N	>1,000	<5	<2	.3	<2	30	<.05	10.60	2.82
CC019S	20	N	300	<5	<2	.3	<2	31	<.05	10.10	2.89
CC020S	15	N	>1,000	<5	<2	.3	<2	31	<.05	10.40	2.78
CC021S	20	N	1,000	<5	<2	.3	<2	40	<.05	11.90	3.15
CC022S	20	N	300	<5	<2	.2	<2	25	<.05	12.70	3.01
CC023S	30	N	>1,000	<5	<2	.3	<2	34	<.05	27.20	4.57
CC024S	15	N	700	<5	<2	.2	<2	32	<.05	7.77	2.13
CC025S	20	N	300	<5	<2	.2	<2	36	<.05	8.88	2.48
CC026S	30	N	700	6	<2	.2	<2	43	<.05	7.85	2.55
CC027S	50	N	700	8	<2	.2	<2	48	<.05	8.97	2.53
CC028S	30	N	1,000	<5	<2	.3	<2	34	<.05	28.40	4.96
CC029S	20	N	300	7	<2	.3	<2	49	<.05	10.70	2.78
CC030S	20	N	1,000	7	<2	.3	<2	45	<.05	9.30	2.46
CC031S	20	N	300	11	<2	.3	<2	55	<.05	7.75	2.64
CC032S	20	N	500	12	<2	.3	<2	64	<.05	9.54	3.06
CC033S	20	N	300	<5	<2	.2	<2	32	<.05	8.22	2.73
CC034S	30	N	>1,000	<5	<2	.3	<2	40	<.05	14.60	3.66
CC035S	20	N	1,000	<5	<2	.2	<2	37	<.05	14.30	4.05
CC036S	20	N	300	<5	<2	.3	<2	35	<.05	10.70	2.76
CC037S	20	N	500	<5	<2	.2	<2	43	<.05	13.70	3.20
CC038S	15	N	200	<5	<2	.3	<2	38	<.05	7.00	2.79
CC039S	20	N	300	<5	<2	.3	<2	39	<.05	9.30	3.21
CC040S	50	N	>1,000	<5	<2	.3	<2	44	<.05	17.30	4.07
CC041S	20	N	200	8	<2	.2	<2	39	<.05	10.10	3.07
CC042S	20	N	500	<5	<2	.3	<2	34	<.05	11.90	3.11
CC043S	20	N	200	<5	<2	.3	<2	26	<.05	12.60	3.05
CC044S	20	N	500	<5	<2	.4	<2	30	<.05	8.89	2.34
CC045S	20	N	700	<5	<2	.3	<2	29	<.05	14.20	3.03

TABLE 3--ANALYTICAL RESULTS OF STREAM-SEDIMENT SAMPLES COLLECTED FROM THE COAL CANYON WILDERNESS STUDY AREA, UTAH.--Continued

Sample	Latitude	Longtude	Ca %-s	Fe %-s	Mg %-s	Na %-s	P %-s	Ti %-s	Ag ppm-s	As ppm-s	Au ppm-s
CC046S	39 8 4	109 31 43	2.0	2.0	1.0	1.5	N	.3	N	N	N
CC047S	39 8 18	109 31 46	1.5	2.0	1.0	1.5	N	.3	N	N	N
CC048S	39 10 48	109 31 40	2.0	2.0	1.0	1.5	N	.3	N	N	N
CC049S	39 11 7	109 32 10	1.5	1.5	1.0	1.5	N	.3	N	N	N
CC050S	39 9 13	109 33 49	1.5	2.0	1.0	1.5	N	.3	N	N	N
CC051S	39 8 48	109 34 52	2.0	1.5	1.0	2.0	N	.3	N	N	N
CC052S	39 8 41	109 34 45	1.5	1.0	.7	1.5	N	.3	N	N	N
CC053S	39 9 40	109 35 38	1.0	1.5	.5	1.5	N	.5	N	N	N
CC054S	39 7 37	109 25 32	1.5	1.0	.7	1.5	N	.3	N	N	N
CC055S	39 7 28	109 25 32	1.5	2.0	1.0	1.5	N	.3	<.5	N	N

Sample	B ppm-s	Ba ppm-s	Be ppm-s	Bi ppm-s	Cd ppm-s	Co ppm-s	Cr ppm-s	Cu ppm-s	Ga ppm-s	Ge ppm-s	La ppm-s
CC046S	70	1,500	1.0	N	N	10	30	15	15	N	<50
CC047S	30	1,500	1.0	N	N	<10	20	7	10	N	N
CC048S	70	1,500	1.0	N	N	10	20	15	15	N	<50
CC049S	50	1,500	1.0	N	N	10	20	20	10	N	N
CC050S	50	2,000	<1.0	N	N	10	20	20	7	N	N
CC051S	30	1,500	<1.0	N	N	<10	30	10	10	N	N
CC052S	30	1,000	1.0	N	N	<10	20	7	7	N	N
CC053S	30	1,000	<1.0	N	N	<10	20	7	10	N	50
CC054S	20	1,500	<1.0	N	N	<10	20	7	7	N	N
CC055S	50	1,500	<1.0	N	N	<10	20	300	10	N	N

Sample	Mn ppm-s	Mo ppm-s	Nb ppm-s	Ni ppm-s	Pb ppm-s	Sb ppm-s	Sc ppm-s	Sn ppm-s	Sr ppm-s	Th ppm-s	V ppm-s	W ppm-s
CC046S	700	N	N	15	15	N	7	N	150	N	100	N
CC047S	500	N	N	10	N	N	5	N	150	N	70	N
CC048S	500	N	N	15	15	N	7	N	150	N	100	N
CC049S	500	N	N	10	10	N	5	N	150	N	70	N
CC050S	700	N	N	10	10	N	5	N	100	N	100	N
CC051S	500	N	N	7	<10	N	5	N	150	N	70	N
CC052S	300	N	N	5	<10	N	5	N	150	N	70	N
CC053S	500	N	N	7	10	N	7	N	150	N	70	N
CC054S	300	N	N	7	10	N	5	N	150	N	70	N
CC055S	700	N	N	15	10	N	7	N	100	N	100	N

Sample	Y ppm-s	Zn ppm-s	Zr ppm-s	As/p ppm	Bi/p ppm	Cd/p ppm	Sb/p ppm	Zn/p ppm	Au ppm	Th ppm	U ppm
CC046S	20	N	300	<5	<2	.4	<2	33	<.05	10.60	2.68
CC047S	15	N	300	<5	<2	.3	<2	28	<.05	9.79	2.46
CC048S	20	N	300	<5	<2	.3	<2	31	<.05	9.88	2.43
CC049S	15	N	200	<5	<2	.3	<2	27	<.05	8.27	2.19
CC050S	20	N	>1,000	5	<2	.3	<2	37	<.05	8.30	2.35
CC051S	20	N	300	<5	<2	.2	<2	25	<.05	7.93	2.27
CC052S	15	N	700	<5	<2	.2	<2	29	<.05	9.34	2.29
CC053S	70	N	>1,000	<5	<2	.2	<2	25	<.05	43.20	6.43
CC054S	15	N	>1,000	<5	<2	.2	<2	23	<.05	16.20	3.29
CC055S	20	N	1,000	<5	<2	.4	<2	43	<.05	9.13	2.59

TABLE 4--ANALYTICAL RESULTS OF HEAVY-MINERAL-CONCENTRATE SAMPLES COLLECTED FROM THE COAL CANYON WILDERNESS STUDY AREA, UTAH.

[N, not detected; <, detected but below the limit of determination shown; >, determined to be greater than the value shown.]

Sample	Latitude	Longtude	Ca %-s	Fe %-s	Mg %-s	Na %-s	P %-s	Ti %-s	Ag ppm-s	As ppm-s
CC001C	39 2 0	109 42 7	2.0	.5	.50	N	1.0	2.0	N	N
CC002C	39 4 45	109 41 50	5.0	.5	5.00	N	1.0	>2.0	N	N
CC003C	39 5 39	109 41 50	5.0	.7	2.00	N	1.5	>2.0	N	N
CC004C	39 5 10	109 40 49	3.0	.3	1.00	N	1.5	>2.0	N	N
CC005C	39 3 11	109 38 48	3.0	.3	.70	N	1.0	>2.0	N	N
CC006C	39 3 15	109 38 42	2.0	.3	.50	N	1.0	>2.0	N	N
CC007C	39 3 9	109 38 32	5.0	.3	1.00	N	2.0	>2.0	N	N
CC008C	39 2 49	109 37 59	3.0	5.0	1.00	N	1.5	>2.0	N	N
CC009C	39 1 55	109 37 55	1.5	.3	.50	N	.5	1.5	N	N
CC010C	39 2 6	109 39 1	1.5	15.0	.70	N	.5	>2.0	N	N
CC011C	39 1 53	109 39 9	3.0	.3	1.00	N	1.5	>2.0	N	N
CC012C	39 2 42	109 40 15	5.0	.2	.20	N	2.0	>2.0	N	N
CC013C	39 2 39	109 40 26	5.0	.3	1.00	N	1.5	>2.0	N	N
CC014C	39 1 1	109 40 8	1.0	20.0	.20	N	<.5	1.5	N	N
CC015C	39 5 34	109 38 50	5.0	.3	1.50	N	2.0	>2.0	N	N
CC016C	39 6 31	109 38 40	7.0	.5	.70	N	2.0	>2.0	N	N
CC017C	39 6 27	109 38 52	7.0	.5	1.50	N	1.5	>2.0	N	N
CC018C	39 7 20	109 40 37	5.0	.5	1.50	N	1.5	>2.0	N	N
CC019C	39 7 25	109 40 25	3.0	.2	1.00	N	1.0	>2.0	10	N
CC020C	39 6 40	109 39 9	7.0	.7	2.00	N	2.0	>2.0	N	N
CC021C	39 8 32	109 38 53	3.0	.5	1.00	N	1.5	>2.0	N	N
CC022C	39 9 0	109 38 44	5.0	.5	.70	N	2.0	>2.0	N	N
CC023C	39 9 0	109 39 0	2.0	.7	.20	N	1.0	>2.0	N	N
CC024C	39 6 34	109 36 58	5.0	1.0	1.00	N	1.5	>2.0	N	N
CC025C	39 6 28	109 37 2	2.0	.5	.70	N	1.0	>2.0	N	N
CC026C	39 6 33	109 35 32	3.0	10.0	1.50	N	1.0	>2.0	N	N
CC027C	39 6 23	109 36 2	3.0	15.0	1.50	N	1.0	>2.0	N	N
CC028C	39 6 10	109 34 43	2.0	15.0	1.00	N	1.0	>2.0	N	N
CC029C	39 6 8	109 34 45	1.0	20.0	.50	N	N	1.0	N	N
CC030C	39 5 58	109 33 59	3.0	10.0	1.00	N	1.0	2.0	N	N
CC031C	39 1 20	109 36 30	1.0	10.0	.30	N	<.5	.7	N	N
CC032C	39 4 49	109 29 10	.7	15.0	.20	N	<.5	.7	N	N
CC033C	39 7 4	109 29 27	3.0	.3	1.00	N	1.5	>2.0	N	N
CC034C	39 5 40	109 29 30	2.0	.5	.70	N	1.0	2.0	N	N
CC035C	39 5 39	109 29 47	1.5	.3	.30	N	1.0	2.0	N	N
CC036C	39 7 39	109 29 6	1.5	.5	.30	N	1.0	>2.0	N	N
CC037C	39 7 37	109 29 19	3.0	.3	.50	N	1.0	2.0	N	N
CC038C	39 7 56	109 28 32	5.0	.5	1.50	N	1.5	2.0	20	N
CC039C	39 8 2	109 28 8	3.0	.5	1.00	N	1.0	>2.0	N	N
CC040C	39 8 28	109 26 49	.7	.3	.30	N	.5	2.0	N	N
CC041C	39 9 52	109 26 45	.7	.7	.15	N	<.5	.7	N	N
CC042C	39 9 5	109 27 38	2.0	.3	.20	N	1.0	2.0	N	N
CC043C	39 9 24	109 30 39	2.0	.3	1.00	N	1.0	>2.0	N	N
CC044C	39 8 35	109 31 24	3.0	.5	1.50	N	1.5	>2.0	N	N
CC045C	39 8 48	109 31 16	1.5	.5	.70	N	.7	>2.0	N	N

TABLE 4--ANALYTICAL RESULTS OF HEAVY-MINERAL-CONCENTRATE SAMPLES COLLECTED FROM THE COAL CANYON WILDERNESS STUDY AREA, UTAH.--Continued

Sample	Au ppm-s	B ppm-s	Ba ppm-s	Be ppm-s	Bi ppm-s	Cd ppm-s	Co ppm-s	Cr ppm-s	Cu ppm-s
CC001C	N	50	>10,000	<2	N	N	N	70	N
CC002C	N	30	>10,000	<2	N	N	N	30	N
CC003C	N	50	>10,000	<2	N	N	N	30	N
CC004C	N	50	>10,000	<2	N	N	<20	20	N
CC005C	N	30	>10,000	<2	N	N	N	20	N
CC006C	N	30	>10,000	<2	N	N	N	20	N
CC007C	N	50	>10,000	<2	N	N	N	30	N
CC008C	N	70	>10,000	<2	N	N	N	50	20
CC009C	N	30	>10,000	N	N	N	N	<20	N
CC010C	N	30	>10,000	<2	N	N	<20	<20	70
CC011C	N	30	>10,000	<2	N	N	N	30	N
CC012C	N	50	>10,000	<2	N	N	N	20	N
CC013C	N	50	>10,000	<2	N	N	N	50	N
CC014C	N	20	>10,000	N	N	N	<20	<20	100
CC015C	N	50	>10,000	<2	N	N	<20	30	N
CC016C	N	50	>10,000	<2	N	N	<20	100	N
CC017C	N	50	>10,000	<2	N	N	N	70	N
CC018C	N	70	>10,000	<2	N	N	<20	30	N
CC019C	500	30	>10,000	N	N	N	N	20	N
CC020C	N	70	>10,000	<2	N	N	N	70	<10
CC021C	N	70	>10,000	<2	N	N	N	20	N
CC022C	N	70	>10,000	<2	N	N	N	50	N
CC023C	N	30	>10,000	<2	N	N	N	50	N
CC024C	N	100	>10,000	<2	N	N	N	50	N
CC025C	N	70	>10,000	<2	N	N	N	70	N
CC026C	N	70	>10,000	<2	N	N	<20	30	50
CC027C	N	100	>10,000	<2	N	N	<20	50	50
CC028C	N	50	>10,000	<2	N	N	<20	50	70
CC029C	N	50	>10,000	<2	N	N	20	30	100
CC030C	N	50	>10,000	<2	N	N	<20	30	50
CC031C	N	20	>10,000	<2	N	N	N	<20	50
CC032C	N	20	>10,000	N	N	N	<20	N	50
CC033C	N	50	>10,000	<2	N	N	N	20	N
CC034C	N	50	>10,000	<2	N	N	N	<20	N
CC035C	N	30	>10,000	<2	N	N	N	50	N
CC036C	N	30	>10,000	<2	N	N	N	20	N
CC037C	N	30	>10,000	<2	N	N	N	<20	N
CC038C	50	50	>10,000	<2	N	N	N	<20	N
CC039C	N	20	>10,000	<2	N	N	N	20	N
CC040C	N	20	>10,000	<2	N	N	N	<20	N
CC041C	N	50	>10,000	N	N	N	N	<20	N
CC042C	N	30	>10,000	<2	N	N	N	<20	N
CC043C	N	30	>10,000	<2	N	N	N	<20	N
CC044C	N	30	>10,000	<2	N	N	N	50	N
CC045C	N	50	>10,000	<2	N	N	N	20	N

TABLE 4--ANALYTICAL RESULTS OF HEAVY-MINERAL-CONCENTRATE SAMPLES COLLECTED FROM THE COAL CANYON WILDERNESS STUDY AREA, UTAH.--Continued

Sample	Ga ppm-s	Ge ppm-s	La ppm-s	Mn ppm-s	Mo ppm-s	Nb ppm-s	Ni ppm-s	Pb ppm-s	Sb ppm-s	Sc ppm-s
CC001C	N	N	1,500	100	N	50	N	50	N	20
CC002C	N	N	200	300	N	50	N	50	N	50
CC003C	N	N	200	300	N	70	N	200	N	50
CC004C	N	N	300	200	N	70	<10	50	N	50
CC005C	N	N	500	100	N	50	N	50	N	20
CC006C	N	N	700	100	N	50	N	50	N	30
CC007C	N	N	1,000	500	N	50	N	100	N	50
CC008C	N	N	1,000	700	N	<50	N	50	N	70
CC009C	N	N	500	70	N	<50	N	N	N	15
CC010C	N	N	150	500	N	<50	15	70	N	20
CC011C	N	N	500	150	N	<50	N	50	N	30
CC012C	N	N	700	200	N	70	N	70	N	100
CC013C	N	N	700	100	<10	<50	N	50	N	20
CC014C	N	N	100	1,000	N	N	30	100	N	10
CC015C	N	N	300	150	N	<50	N	50	N	30
CC016C	N	N	2,000	200	N	50	N	70	N	70
CC017C	N	N	1,500	150	N	50	N	300	N	50
CC018C	N	N	1,000	200	N	100	N	50	N	50
CC019C	N	N	500	70	N	50	N	70	N	50
CC020C	N	N	700	500	N	100	N	100	N	50
CC021C	N	N	200	150	N	50	<10	50	N	50
CC022C	N	N	500	300	N	50	<10	100	N	70
CC023C	N	N	>2,000	300	N	50	<10	100	N	70
CC024C	N	N	300	200	N	50	N	50	N	50
CC025C	N	N	1,000	300	N	50	<10	50	N	70
CC026C	N	N	500	500	N	50	20	70	N	20
CC027C	N	N	200	500	N	<50	30	50	N	20
CC028C	N	N	300	700	N	<50	30	10	N	30
CC029C	N	N	100	1,000	10	N	50	10	N	<10
CC030C	N	N	500	500	N	50	30	10	N	20
CC031C	N	N	<100	500	N	N	20	10	N	<10
CC032C	N	N	<100	500	N	N	15	70	N	<10
CC033C	N	N	300	150	N	50	N	50	N	30
CC034C	N	N	500	150	N	<50	N	30	N	30
CC035C	N	N	500	100	N	<50	N	30	N	30
CC036C	N	N	700	100	N	50	N	50	N	15
CC037C	N	N	500	150	N	50	N	100	N	20
CC038C	N	N	300	200	N	<50	N	50	N	15
CC039C	N	N	500	300	N	<50	N	N	N	30
CC040C	N	N	500	100	N	<50	N	30	N	15
CC041C	N	N	700	150	N	<50	N	20	N	<10
CC042C	N	N	500	70	N	50	N	20	N	20
CC043C	N	N	500	150	N	50	N	20	N	30
CC044C	N	N	200	200	N	100	N	20	N	30
CC045C	N	N	1,000	150	N	50	N	30	N	20

TABLE 4--ANALYTICAL RESULTS OF HEAVY-MINERAL-CONCENTRATE SAMPLES COLLECTED FROM THE COAL CANYON WILDERNESS STUDY AREA, UTAH.--Continued

Sample	Sn ppm-s	Sr ppm-s	Th ppm-s	V ppm-s	W ppm-s	Y ppm-s	Zn ppm-s	Zr ppm-s	Pd ppm-s	Pt ppm-s
CC001C	N	5,000	200	70	N	500	N	>2,000	N	N
CC002C	100	5,000	<200	100	N	500	N	>2,000	N	N
CC003C	N	2,000	<200	150	N	700	N	>2,000	N	N
CC004C	N	3,000	<200	150	N	700	N	>2,000	N	N
CC005C	N	3,000	<200	100	N	300	N	>2,000	N	N
CC006C	N	5,000	<200	100	N	500	N	>2,000	N	N
CC007C	50	5,000	<200	150	N	700	N	>2,000	N	N
CC008C	N	7,000	<200	100	N	700	N	>2,000	N	N
CC009C	N	5,000	N	50	N	200	N	>2,000	N	N
CC010C	N	5,000	N	50	N	300	N	>2,000	N	N
CC011C	N	7,000	N	150	N	700	N	>2,000	N	N
CC012C	N	1,000	N	200	N	1,000	N	>2,000	N	N
CC013C	N	2,000	N	100	N	500	N	>2,000	N	N
CC014C	N	7,000	N	20	N	100	N	>2,000	N	N
CC015C	N	3,000	<200	200	N	700	N	>2,000	N	N
CC016C	N	5,000	200	150	N	700	N	>2,000	N	N
CC017C	N	2,000	<200	100	N	700	N	>2,000	N	N
CC018C	N	3,000	<200	200	N	700	N	>2,000	N	N
CC019C	N	2,000	N	100	N	700	N	>2,000	N	N
CC020C	N	2,000	<200	150	N	700	N	>2,000	N	N
CC021C	N	1,000	<200	150	N	500	N	>2,000	N	N
CC022C	N	500	<200	150	N	700	N	>2,000	N	N
CC023C	N	1,500	500	100	N	700	N	>2,000	N	N
CC024C	N	1,500	<200	150	N	500	N	>2,000	N	N
CC025C	20	1,500	N	100	N	700	N	>2,000	N	N
CC026C	N	1,500	N	100	N	500	N	>2,000	N	N
CC027C	20	1,500	N	70	N	500	N	>2,000	N	N
CC028C	N	3,000	N	100	N	500	N	>2,000	N	N
CC029C	N	3,000	N	30	N	100	500	>2,000	N	N
CC030C	N	1,500	N	70	N	500	N	>2,000	N	N
CC031C	N	10,000	N	30	N	100	1,000	>2,000	N	N
CC032C	N	5,000	N	20	N	150	N	>2,000	N	N
CC033C	N	2,000	<200	150	N	500	N	>2,000	N	N
CC034C	N	5,000	N	70	N	500	N	>2,000	N	N
CC035C	N	3,000	<200	70	N	500	N	>2,000	N	N
CC036C	N	2,000	N	70	N	300	N	>2,000	N	N
CC037C	N	3,000	N	70	N	500	N	>2,000	N	N
CC038C	N	2,000	N	100	N	300	N	>2,000	N	N
CC039C	N	5,000	N	70	N	500	N	>2,000	N	N
CC040C	N	3,000	<200	50	N	300	N	>2,000	N	N
CC041C	N	10,000	<200	50	N	100	N	>2,000	N	N
CC042C	N	5,000	<200	100	N	300	N	>2,000	N	N
CC043C	150	3,000	<200	100	N	500	N	>2,000	N	N
CC044C	N	2,000	<200	150	N	500	N	>2,000	N	N
CC045C	N	5,000	200	100	N	300	N	>2,000	N	N

TABLE 4--ANALYTICAL RESULTS OF HEAVY-MINERAL-CONCENTRATE SAMPLES COLLECTED FROM THE COAL CANYON WILDERNESS STUDY AREA, UTAH.--Continued

Sample	Latitude	Longtude	Ca %-s	Fe %-s	Mg %-s	Na %-s	P %-s	Ti %-s	Ag ppm-s	As ppm-s
CC046C	39 8 6	109 31 40	3.0	.5	1.00	N	.7	>2.0	N	N
CC047C	39 8 18	109 31 46	3.0	.5	1.50	N	1.5	>2.0	N	N
CC048C	39 10 52	109 31 40	7.0	.7	2.00	N	2.0	>2.0	N	N
CC049C	39 11 7	109 32 10	5.0	.7	1.50	N	2.0	>2.0	N	N
CC050C	39 9 13	109 33 49	5.0	.7	2.00	N	1.0	>2.0	N	N
CC051C	39 8 19	109 34 50	3.0	1.0	1.00	N	2.0	>2.0	N	N
CC052C	39 8 13	109 34 45	3.0	1.0	1.50	N	2.0	>2.0	N	N
CC053C	39 9 38	109 35 52	2.0	.5	.10	N	1.5	>2.0	N	N
CC054C	39 7 37	109 25 32	2.0	.5	.70	N	1.5	>2.0	N	N
CC055C	39 7 28	109 25 32	1.0	.3	.50	N	.5	1.0	N	N

Sample	Au ppm-s	B ppm-s	Ba ppm-s	Be ppm-s	Bi ppm-s	Cd ppm-s	Co ppm-s	Cr ppm-s	Cu ppm-s
CC046C	N	20	>10,000	<2	N	N	N	20	N
CC047C	N	50	>10,000	<2	N	N	N	30	N
CC048C	N	30	>10,000	<2	N	N	N	50	<10
CC049C	N	30	>10,000	<2	N	N	N	50	N
CC050C	N	20	>10,000	<2	N	N	N	30	N
CC051C	N	50	>10,000	<2	N	N	N	50	N
CC052C	N	100	>10,000	<2	N	N	N	70	N
CC053C	N	20	>10,000	<2	N	N	N	<20	N
CC054C	N	50	>10,000	<2	N	N	N	100	20
CC055C	N	20	>10,000	N	N	N	N	<20	<10

Sample	Ga ppm-s	Ge ppm-s	La ppm-s	Mn ppm-s	Mo ppm-s	Nb ppm-s	Ni ppm-s	Pb ppm-s	Sb ppm-s	Sc ppm-s
CC046C	N	N	500	150	N	50	N	N	N	30
CC047C	N	N	500	150	N	70	N	30	N	50
CC048C	N	N	300	700	N	50	<10	20	N	30
CC049C	N	N	300	300	N	100	N	30	N	30
CC050C	N	N	300	200	N	<50	N	N	N	20
CC051C	N	N	500	200	N	70	<10	N	N	100
CC052C	N	N	>2,000	300	N	100	<10	50	N	150
CC053C	N	N	700	150	N	50	<10	N	N	100
CC054C	N	N	>2,000	200	N	50	<10	50	N	150
CC055C	N	N	300	100	N	<50	N	20	N	<10

Sample	Sn ppm-s	Sr ppm-s	Th ppm-s	V ppm-s	W ppm-s	Y ppm-s	Zn ppm-s	Zr ppm-s	Pd ppm-s	Pt ppm-s
CC046C	N	5,000	<200	100	N	500	N	>2,000	N	N
CC047C	N	3,000	<200	150	N	500	N	>2,000	N	N
CC048C	N	3,000	<200	150	N	500	N	>2,000	N	N
CC049C	N	1,000	<200	200	N	500	N	>2,000	N	N
CC050C	N	2,000	<200	70	N	500	N	>2,000	N	N
CC051C	N	700	200	200	N	700	N	>2,000	N	N
CC052C	N	500	300	200	N	700	N	>2,000	N	N
CC053C	N	500	<200	70	N	700	N	>2,000	N	N
CC054C	N	700	200	150	N	700	N	>2,000	N	N
CC055C	N	1,500	N	30	N	150	N	>2,000	N	N

TABLE 5--ANALYTICAL RESULTS OF ROCK SAMPLES COLLECTED FROM THE COAL CANYON WILDERNESS STUDY AREA, UTAH.

[N, not detected; <, detected but below the limit of determination shown; >, determined to be greater than the value shown.]

Sample	Latitude	Longtude	Ca %-s	Fe %-s	Mg %-s	Na %-s	P %-s	Ti %-s	Ag ppm-s	As ppm-s	Au ppm-s
CC001R	39 2 44	109 37 56	.15	.30	.30	<.2	N	.50	N	N	N
CC008R	39 2 49	109 37 59	2.00	>20.00	2.00	.3	N	.07	N	N	N
CC010R	39 2 6	109 39 9	2.00	>20.00	2.00	.2	N	.07	N	N	N
CC011R	39 1 53	109 39 9	10.00	10.00	5.00	2.0	N	.30	N	N	N
CC013R	39 2 41	109 40 27	1.00	.15	.50	.2	N	.05	N	N	N
CC014RA	39 1 6	109 40 7	1.50	20.00	3.00	.3	N	.20	N	N	N
CC014RB	39 1 6	109 40 7	1.50	5.00	3.00	.5	N	.50	N	N	N
CC019R	39 7 25	109 40 25	5.00	15.00	3.00	>5.0	N	.70	N	N	N
CC022R	39 9 0	109 38 44	10.00	5.00	5.00	5.0	N	.30	N	N	N
CC023R	39 9 0	109 39 0	10.00	7.00	5.00	5.0	N	.50	N	N	N
CC025R	39 6 28	109 37 2	.30	.20	.10	N	N	.07	N	N	N
CC026RA	39 6 37	109 35 34	1.50	1.00	1.50	.3	N	.30	N	N	N
CC026RB	39 6 37	109 35 34	.20	.07	.07	.2	N	.20	N	N	N
CC027RA	39 6 23	109 36 2	2.00	>20.00	1.50	.3	N	.10	N	N	N
CC027RB	39 6 18	109 36 0	15.00	7.00	7.00	<.2	N	.10	N	N	N
CC029R	39 6 10	109 34 50	2.00	15.00	2.00	1.0	N	.30	N	N	N
CC032R	39 4 47	109 29 8	10.00	5.00	5.00	1.0	N	.50	N	N	N
CC033R	39 7 4	109 29 47	>20.00	1.50	2.00	1.5	N	.20	N	N	N
CC034R	39 5 37	109 29 29	5.00	10.00	5.00	3.0	N	1.00	N	N	N
CC035R	39 5 39	109 29 43	1.00	7.00	1.50	5.0	N	.70	N	N	N
CC039R	39 8 2	109 28 8	.20	1.50	.10	N	N	.05	N	N	N
CC042R	39 9 5	109 27 38	15.00	1.50	1.00	5.0	N	.20	N	N	N
CC046R	39 8 6	109 31 40	1.50	2.00	1.00	2.0	N	.50	N	N	N
CC051R	39 8 19	109 34 50	7.00	7.00	5.00	>5.0	N	1.00	N	N	N

TABLE 5--ANALYTICAL RESULTS OF ROCK SAMPLES COLLECTED FROM THE COAL CANYON WILDERNESS STUDY AREA, UTAH.--Continued

Sample	B ppm-s	Ba ppm-s	Be ppm-s	Bi ppm-s	Cd ppm-s	Co ppm-s	Cr ppm-s	Cu ppm-s	Ga ppm-s	Ge ppm-s	La ppm-s
CC001R	100	150	10.0	N	N	N	20	10	15	<10	N
CC008R	N	200	1.5	N	N	N	30	7	15	N	N
CC010R	<10	300	1.0	N	N	N	20	7	10	N	N
CC011R	10	700	<1.0	N	N	<10	30	15	15	N	50
CC013R	10	30	3.0	N	N	N	10	7	10	N	N
CC014RA	10	300	1.5	N	N	<10	50	15	15	N	50
CC014RB	50	500	<1.0	N	N	10	70	20	20	N	<50
CC019R	20	3,000	<1.0	N	N	15	70	30	30	N	70
CC022R	10	700	N	N	N	10	70	10	20	N	<50
CC023R	15	1,000	<1.0	N	N	15	50	15	30	N	<50
CC025R	10	700	N	N	N	N	10	7	N	N	50
CC026RA	30	150	N	N	N	<10	20	7	<5	N	N
CC026RB	50	70	7.0	N	N	N	30	N	N	>100	N
CC027RA	N	500	2.0	N	N	N	20	10	20	N	N
CC027RB	10	200	N	N	N	N	20	7	N	N	N
CC029R	50	300	1.0	N	N	<10	30	20	20	N	70
CC032R	30	1,000	<1.0	N	N	<10	50	10	15	N	N
CC033R	<10	300	N	N	N	N	50	5	10	N	70
CC034R	50	1,000	1.0	N	N	15	70	50	50	N	50
CC035R	15	1,000	<1.0	N	N	10	30	10	30	N	<50
CC039R	15	700	N	N	N	N	10	10	N	N	N
CC042R	15	2,000	<1.0	N	N	<10	20	7	20	N	N
CC046R	15	700	<1.0	N	N	10	20	5	10	N	<50
CC051R	30	1,000	<1.0	N	N	15	100	30	100	N	50

TABLE 5--ANALYTICAL RESULTS OF ROCK SAMPLES COLLECTED FROM THE COAL CANYON WILDERNESS STUDY AREA, UTAH.--Continued

Sample	Mn ppm-s	Mo ppm-s	Nb ppm-s	Ni ppm-s	Pb ppm-s	Sb ppm-s	Sc ppm-s	Sn ppm-s	Sr ppm-s	Th ppm-s	V ppm-s	W ppm-s
CC001R	20	N	N	7	N	N	20	N	N	N	150	N
CC008R	5,000	N	N	7	30	N	7	N	N	N	30	N
CC010R	>5,000	N	N	7	30	N	7	N	N	N	30	N
CC011R	5,000	N	N	10	30	N	7	N	100	N	70	N
CC013R	20	N	N	N	10	N	N	N	N	N	10	N
CC014RA	1,000	N	N	15	30	N	10	N	1,500	N	100	N
CC014RB	300	N	N	20	30	N	10	N	100	N	200	N
CC019R	1,000	N	N	30	50	N	20	N	200	N	200	N
CC022R	700	N	N	15	70	N	10	N	100	N	100	N
CC023R	1,000	N	N	20	50	N	7	N	200	N	150	N
CC025R	70	N	N	<5	15	N	N	N	100	N	500	N
CC026RA	100	N	N	10	15	N	<5	N	100	N	50	N
CC026RB	50	N	N	5	N	N	7	N	N	N	50	N
CC027RA	5,000	N	N	10	30	N	7	N	N	N	50	N
CC027RB	1,000	N	N	5	10	N	<5	N	200	N	20	N
CC029R	700	5	N	20	70	N	10	N	700	N	200	N
CC032R	700	N	N	15	10	N	10	N	200	N	70	N
CC033R	>5,000	N	N	N	50	N	15	N	500	N	50	N
CC034R	700	N	<20	30	70	N	15	N	150	N	200	N
CC035R	500	N	N	15	30	N	7	N	150	N	150	N
CC039R	1,000	N	N	N	<10	N	N	N	N	N	70	N
CC042R	>5,000	N	N	7	50	N	5	N	200	N	100	N
CC046R	700	N	N	10	50	N	5	N	150	N	100	N
CC051R	1,000	N	N	20	50	N	15	N	150	N	200	N

TABLE 5--ANALYTICAL RESULTS OF ROCK SAMPLES COLLECTED FROM THE COAL CANYON WILDERNESS STUDY AREA, UTAH.--Continued

Sample	Y ppm-s	Zn ppm-s	Zr ppm-s	As/p ppm	Bi/p ppm	Cd/p ppm	Sb/p ppm	Zn/p ppm	Au ppm	Th ppm	U ppm
CC001R	70	N	200	<5	<2	<.1	<2	3	<.05	6.43	1.170
CC008R	15	N	30	<5	<2	.8	<2	30	<.05	--	--
CC010R	15	N	50	<5	2	1.1	<2	30	<.05	4.30	1.740
CC011R	30	N	150	<5	<2	.8	<2	45	<.05	7.20	2.310
CC013R	10	N	50	<5	<2	<.1	<2	8	<.05	7.70	3.460
CC014RA	30	N	70	<5	<2	1.0	<2	45	<.05	9.85	3.620
CC014RB	20	N	150	<5	<2	.3	<2	77	<.05	12.80	4.660
CC019R	50	N	150	<5	<2	.8	<2	120	<.05	<6.60	19.500
CC022R	15	N	70	<5	<2	.5	<2	63	<.05	7.63	1.990
CC023R	15	N	200	5	<2	.5	<2	62	<.05	6.02	1.940
CC025R	<10	N	15	<5	<2	<.1	<2	6	<.05	1.80	.832
CC026RA	10	N	500	<5	<2	.1	<2	39	<.05	4.50	2.340
CC026RB	30	N	200	<5	<2	<.1	<2	4	<.05	<1.70	.779
CC027RA	30	N	70	<5	<2	.4	<2	26	<.05	5.36	1.800
CC027RB	10	N	300	<5	<2	.5	<2	8	<.05	<1.70	1.070
CC029R	20	N	70	16	<2	.5	<2	64	<.05	13.20	5.420
CC032R	20	N	200	<5	<2	.3	<2	29	<.05	6.53	2.290
CC033R	70	N	50	7	<2	1.0	<2	17	<.05	<2.00	1.510
CC034R	50	N	200	<5	<2	.9	<2	120	<.05	11.50	4.690
CC035R	15	N	200	9	<2	.1	<2	31	<.05	7.54	2.190
CC039R	<10	N	20	<5	<2	<.1	<2	2	<.05	<1.30	.464
CC042R	20	N	50	<5	<2	.6	<2	39	<.05	3.90	1.630
CC046R	20	N	200	<5	<2	.2	<2	38	<.05	7.73	2.830
CC051R	30	N	200	<5	<2	.3	<2	56	<.05	12.80	3.180

TABLE 6--ANALYTICAL RESULTS OF STREAM-SEDIMENT SAMPLES COLLECTED FROM THE SPRUCE CANYON WILDERNESS STUDY AREA, UTAH.
[N, not detected; <, detected but below the limit of determination shown; >, determined to be greater than the value shown.]

Sample	Latitude	Longtude	Ca %-s	Fe %-s	Mg %-s	Na %-s	P %-s	Ti %-s	Ag ppm-s	As ppm-s	Au ppm-s
SC001S	39 11 5	109 27 35	5.0	5.0	1.5	2.0	N	.5	<.5	N	N
SC002S	39 12 22	109 27 59	5.0	5.0	1.5	1.5	N	.5	N	N	N
SC003S	39 12 18	109 28 10	3.0	3.0	1.0	1.5	N	.3	N	N	N
SC004S	39 11 28	109 29 9	2.0	2.0	1.0	1.5	N	.5	N	N	N
SC005S	39 12 13	109 29 50	3.0	3.0	1.0	2.0	<.2	.5	N	N	N
SC006S	39 12 2	109 30 31	2.0	2.0	1.0	1.5	<.2	.5	N	N	N
SC007S	39 12 2	109 32 52	1.5	2.0	1.0	1.5	<.2	.5	N	N	N
SC008S	39 11 34	109 31 21	3.0	2.0	1.5	1.0	N	.5	N	N	N
SC009S	39 12 8	109 32 50	2.0	3.0	1.0	3.0	N	.5	N	N	N
SC010S	39 11 58	109 32 19	2.0	3.0	1.0	1.5	N	.5	N	N	N
SC011S	39 11 13	109 32 59	2.0	2.0	1.0	2.0	N	.5	N	N	N
SC012S	39 11 39	109 34 20	1.5	1.5	.7	1.5	<.2	.5	N	N	N
SC013S	39 11 45	109 34 19	20.0	1.0	1.0	1.5	N	.2	N	N	N
SC014S	39 10 57	109 35 24	5.0	2.0	.7	2.0	N	.5	N	N	N
SC015S	39 10 50	109 35 30	5.0	2.0	1.5	2.0	N	.3	N	N	N
SC016S	39 13 15	109 27 37	1.0	2.0	1.0	1.0	N	.3	N	N	N
SC017S	39 13 31	109 27 46	3.0	2.0	1.0	2.0	N	.3	N	N	N
SC018S	39 14 25	109 29 18	5.0	2.0	1.0	2.0	<.2	.5	N	N	N
SC019S	39 15 43	109 31 12	3.0	1.5	.5	2.0	<.2	.3	N	N	N

Sample	B ppm-s	Ba ppm-s	Be ppm-s	Bi ppm-s	Cd ppm-s	Co ppm-s	Cr ppm-s	Cu ppm-s	Ga ppm-s	Ge ppm-s	La ppm-s
SC001S	50	1,500	1.0	N	N	10	50	30	15	N	<50
SC002S	30	1,500	1.0	N	N	10	30	15	10	N	<50
SC003S	50	1,500	1.0	N	N	10	30	15	10	N	N
SC004S	30	1,000	1.5	N	N	10	30	10	10	N	N
SC005S	50	1,000	1.0	N	N	15	30	15	15	N	N
SC006S	50	1,000	1.5	N	N	15	30	15	10	N	<50
SC007S	50	1,500	1.5	N	N	10	70	10	10	N	N
SC008S	50	1,000	1.0	N	N	10	30	15	10	N	50
SC009S	50	1,500	1.0	N	N	10	50	20	15	N	N
SC010S	50	1,000	1.0	N	N	10	30	15	10	N	50
SC011S	50	1,000	1.0	N	N	10	30	20	20	N	N
SC012S	30	1,000	1.0	N	N	10	30	10	10	N	N
SC013S	20	1,000	<1.0	N	N	10	20	7	7	N	N
SC014S	70	1,000	<1.0	N	N	10	30	10	10	N	70
SC015S	50	1,500	<1.0	N	N	10	70	15	7	N	N
SC016S	50	1,000	<1.0	N	N	10	30	7	7	N	N
SC017S	50	1,500	<1.0	N	N	10	30	15	15	N	N
SC018S	30	1,500	1.0	N	N	10	30	20	10	N	150
SC019S	50	1,000	1.0	N	N	<10	30	7	10	N	N

TABLE 6--ANALYTICAL RESULTS OF STREAM-SEDIMENT SAMPLES COLLECTED FROM THE SPRUCE CANYON WILDERNESS STUDY AREA, UTAH.--Continued

Sample	Mn ppm-s	Mo ppm-s	Nb ppm-s	Ni ppm-s	Pb ppm-s	Sb ppm-s	Sc ppm-s	Sn ppm-s	Sr ppm-s	Th ppm-s	V ppm-s	W ppm-s
SC001S	700	N	<20	15	10	N	7	N	150	N	100	N
SC002S	700	N	N	15	<10	N	7	N	150	N	150	N
SC003S	500	N	N	10	<10	N	5	N	150	N	70	N
SC004S	700	N	N	7	10	N	7	N	150	N	70	N
SC005S	1,000	N	N	15	15	N	7	N	150	N	100	N
SC006S	700	N	N	10	10	N	7	N	200	N	100	N
SC007S	700	N	<20	10	N	N	7	N	150	N	70	N
SC008S	700	N	N	20	10	N	10	N	150	N	100	N
SC009S	700	N	N	15	20	N	10	N	150	N	70	N
SC010S	500	N	N	10	10	N	7	N	150	N	70	N
SC011S	700	N	N	15	30	N	7	N	150	N	100	N
SC012S	500	N	N	10	15	N	7	N	200	N	70	N
SC013S	500	N	N	7	20	N	5	N	700	N	50	N
SC014S	1,000	N	<20	7	30	N	10	N	300	N	100	N
SC015S	700	N	N	10	15	N	7	N	150	N	100	N
SC016S	500	N	N	7	15	N	5	N	100	N	70	N
SC017S	500	N	N	7	20	N	7	N	150	N	100	N
SC018S	700	N	N	7	20	N	7	N	200	N	100	N
SC019S	700	N	N	5	20	N	5	N	200	N	50	N

Sample	Y ppm-s	Zn ppm-s	Zr ppm-s	As/p ppm	Bi/p ppm	Cd/p ppm	Sb/p ppm	Zn/p ppm	Au ppm	Th ppm	U ppm
SC001S	20	N	300	<5	<2	.3	<2	33	<.05	8.59	3.11
SC002S	20	N	300	<5	<2	.3	<2	30	<.05	11.20	2.99
SC003S	15	N	500	<5	<2	.3	<2	26	<.05	9.97	2.86
SC004S	15	N	500	<5	<2	.3	<2	26	<.05	7.70	2.73
SC005S	20	N	200	<5	<2	.3	<2	28	<.05	7.62	2.74
SC006S	20	N	1,000	<5	<2	.3	<2	35	<.05	10.20	3.08
SC007S	20	N	>1,000	<5	<2	.3	<2	30	<.05	11.30	3.33
SC008S	30	N	200	<5	<2	.4	<2	34	<.05	14.50	3.11
SC009S	20	N	500	<5	<2	.3	<2	37	<.05	14.60	3.04
SC010S	20	N	500	<5	<2	.3	<2	34	<.05	11.90	3.25
SC011S	15	N	200	<5	<2	.3	<2	38	<.05	12.50	3.11
SC012S	20	N	300	<5	<2	.2	<2	31	<.05	9.67	2.68
SC013S	15	N	150	<5	<2	.3	<2	32	<.05	5.80	1.92
SC014S	20	N	>1,000	<5	<2	.3	<2	30	<.05	16.80	3.42
SC015S	20	N	500	<5	<2	.3	<2	28	<.05	7.65	3.06
SC016S	20	N	500	5	<2	.3	<2	43	<.05	4.20	2.34
SC017S	15	N	300	<5	<2	.3	<2	25	<.05	11.80	3.22
SC018S	50	N	1,000	<5	<2	.2	<2	29	<.05	34.00	5.85
SC019S	20	N	>1,000	<5	<2	<.1	<2	17	<.05	22.70	4.88

TABLE 7--ANALYTICAL RESULTS OF HEAVY-MINERAL-CONCENTRATE SAMPLES COLLECTED FROM THE SPRUCE CANYON WILDERNESS STUDY AREA, UTAH.

[N, not detected; <, detected but below the limit of determination shown; >, determined to be greater than the value shown.]

Sample	Latitude	Longtude	Ca %-s	Fe %-s	Mg %-s	Na %-s	P %-s	Ti %-s	Ag ppm-s	As ppm-s
SC001C	39 11 5	109 27 35	3	.5	.2	N	1.5	>2.0	N	N
SC002C	39 12 22	109 27 59	2	.5	.7	N	.5	1.0	N	N
SC003C	39 12 18	109 28 10	2	.7	.5	N	.5	1.0	N	N
SC004C	39 11 28	109 29 9	3	.7	.7	N	3.0	>2.0	N	N
SC005C	39 12 13	109 29 50	2	.7	.7	N	1.5	>2.0	N	N
SC006C	39 12 2	109 30 31	3	.7	.2	N	1.0	>2.0	N	N
SC007C	39 12 2	109 32 52	3	.5	.7	N	3.0	>2.0	N	N
SC008C	39 11 34	109 31 21	3	.7	1.0	N	1.5	>2.0	N	N
SC009C	39 12 8	109 32 50	3	.5	.5	N	2.0	>2.0	N	N
SC010C	39 11 58	109 32 19	3	.5	.5	N	3.0	>2.0	N	N
SC011C	39 11 13	109 32 59	2	.5	.2	N	2.0	>2.0	N	N
SC012C	39 11 39	109 34 20	3	.5	.3	N	3.0	>2.0	N	N
SC013C	39 11 45	109 34 19	7	1.0	1.0	N	3.0	>2.0	N	N
SC014C	39 10 57	109 35 24	2	.5	.2	N	1.5	>2.0	N	N
SC015C	39 10 50	109 35 30	2	1.0	1.0	N	.5	1.5	N	N
SC016C	39 13 15	109 27 37	3	.7	1.0	N	1.5	>2.0	N	N
SC017C	39 13 31	109 27 46	2	.7	.5	N	1.5	>2.0	N	N
SC018C	39 14 25	109 29 18	2	.5	.2	N	1.0	>2.0	N	N
SC019C	39 15 43	109 31 12	2	.3	.1	N	2.0	>2.0	N	N

Sample	Au ppm-s	B ppm-s	Ba ppm-s	Be ppm-s	Bi ppm-s	Cd ppm-s	Co ppm-s	Cr ppm-s	Cu ppm-s
SC001C	N	50	>10,000	<2	N	N	N	20	N
SC002C	N	20	>10,000	<2	N	N	N	N	N
SC003C	N	200	>10,000	<2	N	N	N	N	N
SC004C	N	70	>10,000	<2	N	N	N	50	N
SC005C	N	70	>10,000	<2	N	N	N	70	N
SC006C	N	70	>10,000	<2	N	N	N	20	N
SC007C	N	30	>10,000	<2	N	N	N	20	N
SC008C	N	70	>10,000	<2	N	N	N	70	N
SC009C	N	70	>10,000	<2	N	N	N	20	<10
SC010C	N	50	>10,000	<2	N	N	N	30	N
SC011C	N	30	>10,000	<2	N	N	N	30	<10
SC012C	N	50	>10,000	<2	N	N	N	20	10
SC013C	N	70	>10,000	<2	N	N	N	20	20
SC014C	N	30	>10,000	<2	N	N	N	<20	N
SC015C	N	30	>10,000	<2	N	N	N	100	N
SC016C	N	30	>10,000	<2	N	N	<20	20	<10
SC017C	N	50	>10,000	<2	N	N	N	50	N
SC018C	N	20	>10,000	<2	N	N	N	20	<10
SC019C	N	70	>10,000	<2	N	N	N	20	N

TABLE 7--ANALYTICAL RESULTS OF HEAVY-MINERAL-CONCENTRATE SAMPLES COLLECTED FROM THE SPRUCE CANYON WILDERNESS STUDY AREA, UTAH.--Continued

Sample	Ga ppm-s	Ge ppm-s	La ppm-s	Mn ppm-s	Mo ppm-s	Nb ppm-s	Ni ppm-s	Pb ppm-s	Sb ppm-s	Sc ppm-s
SC001C	N	N	700	150	N	50	N	70	N	20
SC002C	N	N	500	100	N	<50	N	50	N	<10
SC003C	N	N	200	100	N	<50	N	30	N	<10
SC004C	N	N	500	300	N	70	N	30	N	30
SC005C	N	N	500	200	N	50	N	50	N	20
SC006C	N	N	1,000	150	N	50	<10	70	N	30
SC007C	N	N	300	200	N	50	N	70	N	50
SC008C	N	N	1,000	200	N	70	<10	30	N	30
SC009C	N	N	700	150	N	50	N	100	N	20
SC010C	N	N	1,500	200	N	50	N	100	N	50
SC011C	N	N	700	200	N	50	N	70	N	30
SC012C	N	N	500	300	N	50	N	50	N	50
SC013C	N	N	300	500	N	70	N	70	N	30
SC014C	N	N	>2,000	150	N	50	N	100	N	50
SC015C	N	N	700	200	N	<50	N	50	N	10
SC016C	N	N	300	200	N	50	N	50	N	20
SC017C	N	N	500	150	N	50	N	100	N	70
SC018C	10	N	1,500	100	N	<50	N	70	N	20
SC019C	N	N	>2,000	300	N	50	<10	70	N	50

Sample	Sn ppm-s	Sr ppm-s	Th ppm-s	V ppm-s	W ppm-s	Y ppm-s	Zn ppm-s	Zr ppm-s	Pd ppm-s	Pt ppm-s
SC001C	N	2,000	<200	100	N	500	N	>2,000	N	N
SC002C	N	7,000	N	50	N	150	N	>2,000	N	N
SC003C	N	7,000	N	50	N	100	N	>2,000	N	N
SC004C	N	1,500	N	150	N	700	N	>2,000	N	N
SC005C	N	5,000	<200	100	N	300	N	>2,000	N	N
SC006C	N	3,000	200	70	N	500	N	>2,000	N	N
SC007C	N	2,000	<200	150	N	700	N	>2,000	N	N
SC008C	N	3,000	<200	100	N	500	N	>2,000	N	N
SC009C	N	2,000	<200	100	N	500	N	>2,000	N	N
SC010C	N	1,500	<200	150	N	700	N	>2,000	N	N
SC011C	N	2,000	<200	70	N	500	N	>2,000	N	N
SC012C	N	1,000	<200	100	N	700	N	>2,000	N	N
SC013C	70	1,000	N	150	N	500	N	>2,000	N	N
SC014C	N	1,000	200	70	N	700	N	>2,000	N	N
SC015C	N	5,000	<200	50	N	150	N	>2,000	N	N
SC016C	N	5,000	<200	70	N	200	N	>2,000	N	N
SC017C	N	3,000	200	150	N	500	N	>2,000	N	N
SC018C	N	2,000	200	50	N	500	N	>2,000	N	N
SC019C	N	1,000	200	100	N	700	N	>2,000	N	N

TABLE 8--ANALYTICAL RESULTS OF ROCK SAMPLES COLLECTED FROM THE SPRUCE CANYON WILDERNESS STUDY AREA, UTAH.

[N, not detected; <, detected but below the limit of determination shown; >, determined to be greater than the value shown.]

Sample	Latitude	Longtude	Ca %-s	Fe %-s	Mg %-s	Na %-s	P %-s	Ti %-s	Ag ppm-s	As ppm-s	Au ppm-s
SC003R	39 12 18	109 28 10	2.00	2.0	2.0	5	N	.5	N	N	N
SC009R	39 12 8	109 32 50	5.00	5.0	3.0	>5	N	.5	N	N	N
SC010R	39 11 58	109 32 19	15.00	5.0	7.0	>5	N	.3	N	N	N
SC015RA	39 10 50	109 35 30	7.00	1.5	1.0	2	N	.3	N	N	N
SC015RB	39 10 50	109 35 30	3.00	7.0	2.0	>5	N	.5	N	N	N
SC018R	39 14 25	109 29 18	.15	5.0	.3	>5	N	1.0	N	N	N

Sample	B ppm-s	Ba ppm-s	Be ppm-s	Bi ppm-s	Cd ppm-s	Co ppm-s	Cr ppm-s	Cu ppm-s	Ga ppm-s	Ge ppm-s	La ppm-s
SC003R	15	1,000	<1	N	N	<10	30	7	20	N	<50
SC009R	20	1,000	<1	N	N	20	100	15	30	N	70
SC010R	30	700	<1	N	N	15	70	10	30	N	100
SC015RA	10	700	<1	N	N	10	30	<5	10	N	50
SC015RB	20	700	<1	N	N	20	100	30	50	N	50
SC018R	20	300	<1	N	N	N	70	30	30	N	70

Sample	Mn ppm-s	Mo ppm-s	Nb ppm-s	Ni ppm-s	Pb ppm-s	Sb ppm-s	Sc ppm-s	Sn ppm-s	Sr ppm-s	Th ppm-s	V ppm-s	W ppm-s
SC003R	1,000	N	N	<5	20	N	7	N	200	N	70	N
SC009R	700	N	N	20	50	N	20	N	200	N	100	N
SC010R	3,000	N	N	15	50	N	15	N	200	N	100	N
SC015RA	700	N	N	10	20	N	10	N	200	N	100	N
SC015RB	300	N	N	50	50	N	10	N	100	N	200	N
SC018R	50	N	N	10	30	N	7	N	100	N	150	N

Sample	Y ppm-s	Zn ppm-s	Zr ppm-s	As/p ppm	Bi/p ppm	Cd/p ppm	Sb/p ppm	Zn/p ppm	Au ppm	Th ppm	U ppm
SC003R	20	N	200	<5	<2	.2	<2	13	<.05	5.10	1.96
SC009R	30	N	100	<5	<2	.8	<2	70	<.05	10.50	2.10
SC010R	50	N	70	<5	<2	1.2	<2	54	<.05	10.30	1.56
SC015RA	15	N	200	<5	<2	.4	<2	49	<.05	5.43	1.59
SC015RB	20	N	100	<5	<2	.7	<2	110	<.05	10.60	2.82
SC018R	15	N	200	<5	<2	.1	<2	4	<.05	13.10	2.16

TABLE 9-- ANALYTICAL RESULTS OF STREAM-SEDIMENT SAMPLES COLLECTED FROM THE FLUME CANYON WILDERNESS STUDY AREA, UTAH.
[N, not detected; <, detected but below the limit of determination shown; >, determined to be greater than the value shown.]

Sample	Latitude	Longtude	Ca %-s	Fe %-s	Mg %-s	Na %-s	P %-s	Ti %-s	Ag ppm-s	As ppm-s	Au ppm-s
FC001S	39 12 7	109 9 43	3.0	2.0	1.0	5.0	N	.3	N	N	N
FC002S	39 12 8	119 9 34	2.0	2.0	1.0	2.0	N	.5	N	N	N
FC003S	39 13 49	109 24 37	3.0	2.0	2.0	3.0	N	.5	N	N	N
FC004S	39 13 46	109 24 45	3.0	2.0	1.5	2.0	N	.5	N	N	N
FC005S	39 12 47	109 26 35	7.0	3.0	2.0	5.0	N	.5	N	N	N
FC006S	39 13 59	109 27 15	3.0	2.0	1.5	5.0	N	.5	N	N	N
FC007S	39 15 13	109 27 39	3.0	2.0	2.0	2.0	N	.3	N	N	N
FC008S	39 15 40	109 28 39	2.0	2.0	2.0	5.0	N	.5	N	N	N
FC009S	39 15 39	109 29 0	2.0	1.5	1.0	5.0	N	.5	N	N	N
FC010S	39 16 24	109 30 27	1.5	2.0	1.0	5.0	N	.5	N	N	N
FC011S	39 16 56	109 31 21	2.0	2.0	1.0	5.0	N	.5	N	N	N
FC012S	39 17 2	109 31 19	2.0	3.0	1.5	5.0	N	.7	N	N	N
FC013S	39 9 20	109 23 50	.5	2.0	1.0	1.5	N	.3	N	N	N
FC014S	39 10 23	109 7 51	.5	2.0	1.0	1.5	N	.3	N	N	N
FC015S	39 11 22	109 8 7	.5	2.0	1.0	2.0	N	.5	N	N	N
FC016S	39 10 30	109 24 5	5.0	2.0	2.0	3.0	N	.5	N	N	N
FC017S	39 10 53	109 23 18	1.5	2.0	1.0	2.0	N	.5	N	N	N
FC018S	39 11 44	109 19 7	1.0	1.5	.7	1.5	N	.3	N	N	N
FC019S	39 13 8	109 21 43	2.0	2.0	1.5	3.0	N	.5	N	N	N
FC020S	39 13 36	109 19 57	1.5	2.0	1.0	2.0	N	.5	N	N	N
FC021S	39 13 51	109 19 49	2.0	1.5	1.5	2.0	N	.3	N	N	N
FC022S	39 13 21	109 14 14	3.0	3.0	2.0	3.0	N	.5	N	N	N
FC023S	39 12 48	109 18 49	2.0	2.0	2.0	3.0	N	.5	N	N	N
FC024S	39 12 50	109 18 50	2.0	1.5	1.0	1.5	N	.3	N	N	N
FC025S	39 14 5	109 17 31	1.5	2.0	1.0	1.5	N	.3	N	N	N
FC026S	39 15 10	109 17 8	1.5	3.0	1.5	1.5	N	.5	N	N	N
FC027S	39 15 29	109 18 58	1.5	1.5	1.0	1.5	N	.5	N	N	N
FC028S	39 17 11	109 19 12	3.0	1.5	2.0	3.0	N	.5	N	N	N
FC029S	39 17 51	109 21 28	5.0	2.0	2.0	3.0	N	.3	N	N	N
FC030S	39 17 34	109 20 55	5.0	3.0	3.0	3.0	N	.5	N	N	N
FC031S	39 18 21	109 23 22	2.0	1.5	2.0	3.0	N	.3	N	N	N
FC032S	39 18 19	109 24 26	5.0	3.0	3.0	5.0	N	.5	N	N	N
FC033S	39 18 23	109 25 9	1.5	2.0	1.0	2.0	N	.5	N	N	N
FC034S	39 17 44	109 25 37	2.0	2.0	1.0	3.0	N	.3	N	N	N
FC035S	39 17 47	109 25 40	2.0	2.0	1.0	3.0	N	.5	N	N	N
FC036S	39 18 48	109 26 12	2.0	2.0	1.0	3.0	N	.5	N	N	N
FC037S	39 18 53	109 27 59	2.0	2.0	1.0	5.0	N	.5	N	N	N
FC038S	39 19 12	109 29 18	2.0	2.0	1.0	5.0	N	.5	N	N	N
FC039S	39 19 8	109 29 17	1.5	1.5	1.0	5.0	N	.3	N	N	N

TABLE 9-- ANALYTICAL RESULTS OF STREAM-SEDIMENT SAMPLES COLLECTED FROM THE FLUME CANYON WILDERNESS STUDY AREA, UTAH.--Continued

Sample	B ppm-s	Ba ppm-s	Be ppm-s	Bi ppm-s	Cd ppm-s	Co ppm-s	Cr ppm-s	Cu ppm-s	Ga ppm-s	Ge ppm-s	La ppm-s
FC001S	20	1,500	<1	N	N	10	30	15	20	N	70
FC002S	20	1,500	<1	N	N	10	30	10	15	N	50
FC003S	20	2,000	<1	N	N	10	30	10	15	N	50
FC004S	20	1,500	<1	N	N	10	20	10	10	N	N
FC005S	20	2,000	<1	N	N	10	70	20	20	N	50
FC006S	20	1,000	<1	N	N	10	50	15	15	N	N
FC007S	15	2,000	<1	N	N	10	20	10	10	N	70
FC008S	20	1,500	<1	N	N	10	50	15	30	N	50
FC009S	20	1,500	<1	N	N	10	20	10	30	N	50
FC010S	15	1,000	<1	N	N	10	30	20	30	N	50
FC011S	30	1,500	<1	N	N	10	20	10	30	N	N
FC012S	20	1,500	<1	N	N	15	30	15	30	N	50
FC013S	20	1,500	<1	N	N	10	20	15	15	N	<50
FC014S	15	1,500	<1	N	N	10	15	10	10	N	50
FC015S	15	1,500	<1	N	N	10	30	10	10	N	<50
FC016S	20	1,500	<1	N	N	10	30	15	20	N	N
FC017S	15	2,000	<1	N	N	10	20	15	15	N	N
FC018S	15	1,000	<1	N	N	<10	20	7	5	N	N
FC019S	20	1,500	<1	N	N	15	20	10	10	N	50
FC020S	15	2,000	<1	N	N	10	30	10	10	N	50
FC021S	20	2,000	<1	N	N	10	20	10	15	N	100
FC022S	30	1,500	<1	N	N	10	50	20	20	N	50
FC023S	20	1,000	<1	N	N	10	30	15	15	N	<50
FC024S	15	1,500	<1	N	N	<10	20	10	10	N	50
FC025S	15	1,000	<1	N	N	10	30	10	15	N	50
FC026S	20	1,000	<1	N	N	10	30	10	15	N	50
FC027S	20	2,000	<1	N	N	<10	20	15	10	N	70
FC028S	20	2,000	<1	N	N	<10	20	7	15	N	50
FC029S	15	1,500	<1	N	N	10	20	10	15	N	N
FC030S	20	2,000	<1	N	N	10	30	10	20	N	50
FC031S	15	1,500	<1	N	N	10	70	10	15	N	70
FC032S	20	1,500	<1	N	N	10	30	20	20	N	100
FC033S	20	1,500	<1	N	N	10	30	10	15	N	70
FC034S	15	1,500	<1	N	N	10	30	15	20	N	N
FC035S	20	1,500	<1	N	N	<10	30	15	15	N	<50
FC036S	20	1,500	<1	N	N	<10	30	0	20	N	70
FC037S	20	1,500	<1	N	N	<10	30	15	20	N	N
FC038S	20	1,500	<1	N	N	10	50	10	15	N	<50
FC039S	20	1,500	<1	N	N	<10	30	7	20	N	50

TABLE 9-- ANALYTICAL RESULTS OF STREAM-SEDIMENT SAMPLES COLLECTED FROM THE FLUME CANYON WILDERNESS STUDY AREA, UTAH.--Continued

Sample	Mn ppm-s	Mo ppm-s	Nb ppm-s	Ni ppm-s	Pb ppm-s	Sb ppm-s	Sc ppm-s	Sn ppm-s	Sr ppm-s	Th ppm-s	V ppm-s	W ppm-s
FC001S	700	N	N	7	30	N	7	N	300	N	70	N
FC002S	700	N	N	5	30	N	7	N	200	N	100	N
FC003S	1,000	N	N	5	30	N	7	N	200	N	100	N
FC004S	700	N	N	<5	20	N	7	N	200	N	100	N
FC005S	1,000	N	N	7	30	N	7	N	200	N	100	N
FC006S	700	N	N	10	30	N	7	N	200	N	100	N
FC007S	1,000	N	N	<5	20	N	7	N	150	N	70	N
FC008S	1,000	N	N	5	50	N	7	N	300	N	100	N
FC009S	700	N	N	<5	30	N	7	N	300	N	70	N
FC010S	1,000	N	N	7	30	N	7	N	200	N	70	N
FC011S	700	N	N	5	30	N	7	N	300	N	50	N
FC012S	1,000	N	N	10	30	N	10	N	300	N	100	N
FC013S	700	N	N	10	30	N	7	N	150	N	70	N
FC014S	700	N	N	5	30	N	5	N	100	N	70	N
FC015S	1,000	N	N	7	30	N	7	N	150	N	100	N
FC016S	1,000	N	N	7	30	N	7	N	200	N	100	N
FC017S	1,000	N	N	7	30	N	7	N	150	N	70	N
FC018S	500	N	N	5	20	N	5	N	100	N	50	N
FC019S	700	N	N	10	20	N	7	N	150	N	100	N
FC020S	700	N	N	10	20	N	7	N	150	N	100	N
FC021S	700	N	N	7	30	N	7	N	200	N	70	N
FC022S	1,000	N	N	15	30	N	10	N	200	N	100	N
FC023S	700	N	N	10	30	N	7	N	200	N	70	N
FC024S	500	N	N	5	20	N	5	N	150	N	50	N
FC025S	500	N	N	10	20	N	5	N	150	N	50	N
FC026S	700	N	N	10	30	N	7	N	100	N	70	N
FC027S	700	N	N	5	20	N	7	N	100	N	70	N
FC028S	700	N	N	5	30	N	7	N	300	N	70	N
FC029S	700	N	N	7	30	N	7	N	150	N	70	N
FC030S	700	N	N	5	30	N	7	N	100	N	70	N
FC031S	700	N	N	5	30	N	7	N	200	N	70	N
FC032S	700	N	N	10	50	N	7	N	200	N	100	N
FC033S	500	N	N	5	30	N	7	N	150	N	70	N
FC034S	700	N	N	7	30	N	7	N	300	N	70	N
FC035S	700	N	N	7	30	N	7	N	150	N	70	N
FC036S	700	N	N	7	20	N	7	N	200	N	70	N
FC037S	700	N	N	5	30	N	7	N	200	N	50	N
FC038S	700	N	N	7	30	N	7	N	200	N	50	N
FC039S	700	N	N	5	50	N	7	N	300	N	70	N

TABLE 9-- ANALYTICAL RESULTS OF STREAM-SEDIMENT SAMPLES COLLECTED FROM THE FLUME CANYON WILDERNESS STUDY AREA, UTAH.--Continued

Sample	Y ppm-s	Zn ppm-s	Zr ppm-s	As/p ppm	Bi/p ppm	Cd/p ppm	Sb/p ppm	Zn/p ppm	Au ppm	Th ppm	U ppm
FC001S	100	N	500	5	<2	.3	<2	25	<.05	13.70	3.13
FC002S	20	N	500	<5	<2	.3	<2	29	<.05	9.38	2.56
FC003S	20	N	1,000	<5	<2	.3	<2	23	<.05	11.60	3.22
FC004S	20	N	1,000	<5	<2	.3	<2	19	<.05	12.20	3.35
FC005S	20	N	300	<5	<2	.3	<2	27	<.05	12.20	3.01
FC006S	15	N	200	<5	<2	.3	<2	25	<.05	8.80	2.34
FC007S	30	N	>1,000	<5	<2	.4	<2	27	<.05	13.90	3.73
FC008S	30	N	>1,000	5	<2	.3	<2	26	<.05	22.10	4.45
FC009S	20	N	1,000	<5	<2	.2	<2	23	<.05	10.30	2.93
FC010S	20	N	700	<5	<2	.3	<2	32	<.05	8.40	2.77
FC011S	15	N	700	<5	<2	.2	<2	30	<.05	11.10	2.84
FC012S	50	N	1,000	<5	<2	.3	<2	37	<.05	11.70	3.43
FC013S	15	N	200	7	<2	.4	<2	39	<.05	5.75	1.96
FC014S	30	N	1,000	<5	<2	.3	<2	33	<.05	7.74	2.31
FC015S	20	N	200	<5	<2	.3	<2	38	<.05	8.47	2.26
FC016S	15	N	300	<5	<2	.3	<2	28	<.05	7.51	2.73
FC017S	15	N	700	<5	<2	.3	<2	37	<.05	6.02	2.37
FC018S	20	N	150	<5	<2	.3	<2	31	<.05	6.91	2.02
FC019S	15	N	500	<5	<2	.3	<2	32	<.05	8.38	2.30
FC020S	15	N	700	<5	<2	.3	<2	36	<.05	12.10	3.34
FC021S	20	N	700	<5	<2	.3	<2	24	<.05	15.40	3.71
FC022S	20	N	300	<5	<2	.4	<2	42	<.05	8.71	2.72
FC023S	20	N	150	<5	<2	.4	<2	39	<.05	8.22	2.12
FC024S	15	N	700	<5	<2	.3	<2	24	<.05	8.32	2.47
FC025S	15	N	200	6	<2	.2	<2	37	<.05	7.29	2.02
FC026S	20	N	300	8	<2	.3	<2	47	<.05	8.39	2.33
FC027S	20	N	>1,000	<5	<2	.2	<2	26	<.05	16.60	3.44
FC028S	30	N	>1,000	<5	<2	.2	<2	19	<.05	10.70	2.96
FC029S	10	N	300	<5	<2	.3	<2	23	<.05	9.11	2.59
FC030S	20	N	700	<5	<2	.3	<2	25	<.05	10.10	2.94
FC031S	15	N	>1,000	<5	<2	.2	<2	23	<.05	15.70	3.45
FC032S	20	N	300	<5	<2	.3	<2	25	<.05	11.20	2.46
FC033S	50	N	>1,000	<5	<2	.3	<2	23	<.05	19.10	3.76
FC034S	15	N	200	<5	<2	.3	<2	24	<.05	7.88	2.41
FC035S	20	N	1,000	<5	<2	.3	<2	26	<.05	13.90	3.34
FC036S	20	N	1,000	<5	<2	.3	<2	26	<.05	9.51	2.81
FC037S	15	N	150	<5	<2	.2	<2	21	<.05	10.90	2.35
FC038S	20	N	>1,000	<5	<2	.2	<2	22	<.05	15.80	3.19
FC039S	30	N	700	<5	<2	.2	<2	21	<.05	12.20	2.75

TABLE 10--ANALYTICAL RESULTS OF HEAVY-MINERAL-CONCENTRATE SAMPLES COLLECTED FROM THE FLUME CANYON WILDERNESS STUDY AREA, UTAH.

[N, not detected; <, detected but below the limit of determination shown; >, determined to be greater than the value shown.]

Sample	Latitude	Longtude	Ca %-s	Fe %-s	Mg %-s	Na %-s	P %-s	Ti %-s	Ag ppm-s	As ppm-s
FC001C	39 12 7	109 9 43	2.0	.3	.10	N	1.0	>2.0	N	N
FC002C	39 12 8	109 9 34	2.0	.3	.20	N	2.0	2.0	N	N
FC003C	39 13 49	109 24 37	1.0	.2	.20	N	.7	1.0	N	N
FC004C	39 13 46	109 24 45	3.0	.2	.30	N	1.5	>2.0	N	N
FC005C	39 12 47	109 26 35	2.0	.5	.30	N	1.0	>2.0	N	N
FC006C	39 13 59	109 27 15	3.0	.3	.20	N	1.5	>2.0	N	N
FC007C	39 15 13	109 27 39	1.5	.3	.30	N	.5	1.5	N	N
FC008C	39 15 40	109 28 39	2.0	.3	.05	N	2.0	>2.0	N	N
FC009C	39 15 39	109 29 0	5.0	.3	.15	N	3.0	>2.0	N	N
FC010C	39 16 24	109 30 27	5.0	.7	.15	N	3.0	>2.0	N	N
FC011C	39 16 56	109 31 21	10.0	.5	.10	N	3.0	>2.0	N	N
FC012C	39 17 2	109 31 19	5.0	.3	.10	N	3.0	>2.0	N	N
FC013C	39 9 20	109 23 50	1.0	.7	.20	N	.7	1.5	N	N
FC014C	39 10 23	109 7 51	2.0	.3	.10	N	1.0	2.0	N	N
FC015C	39 11 22	109 8 7	3.0	.7	.30	N	2.0	>2.0	N	N
FC016C	39 10 30	109 24 5	2.0	.5	.30	N	.7	>2.0	N	N
FC017C	39 10 53	109 23 18	1.5	.7	.20	N	.7	1.5	N	N
FC018C	39 11 44	109 19 7	5.0	.5	.50	N	3.0	>2.0	N	N
FC019C	39 13 8	109 21 43	3.0	.3	.50	N	2.0	>2.0	N	N
FC020C	39 13 36	109 19 57	1.5	.3	.10	N	1.5	2.0	N	N
FC021C	39 13 51	109 19 49	.7	.5	.20	N	<.5	1.5	N	N
FC022C	39 13 21	109 14 14	2.0	.7	.50	N	1.5	>2.0	N	N
FC023C	39 12 48	109 18 49	2.0	.3	.20	N	1.5	2.0	N	N
FC024C	39 12 50	109 18 50	2.0	.5	.20	N	1.5	>2.0	N	N
FC025C	39 14 5	109 17 31	1.0	.7	.07	N	.5	2.0	N	N
FC026C	39 15 10	109 17 8	1.5	1.5	.10	N	.5	1.5	N	N
FC027C	39 15 29	109 18 58	2.0	.7	.20	N	1.5	>2.0	N	N
FC028C	39 17 11	109 19 12	3.0	.5	.30	N	2.0	>2.0	N	N
FC029C	39 17 51	109 21 28	2.0	.3	.30	N	.5	2.0	N	N
FC030C	39 17 34	109 20 55	3.0	1.0	1.00	N	.7	2.0	N	N
FC031C	39 18 21	109 23 22	2.0	.7	.70	N	1.0	>2.0	N	N
FC032C	39 18 19	109 24 26	3.0	.5	1.00	N	1.0	>2.0	N	N
FC033C	39 18 23	109 25 9	2.0	.5	.30	N	1.5	>2.0	N	N
FC034C	39 17 44	109 25 37	3.0	.7	.50	N	2.0	>2.0	N	N
FC035C	39 17 47	109 25 40	1.5	.5	.30	N	1.0	>2.0	N	N
FC036C	39 18 48	109 26 12	3.0	.7	1.00	N	2.0	>2.0	N	N
FC037C	39 18 53	109 27 59	3.0	.5	.20	N	2.0	>2.0	N	N
FC038C	39 19 12	109 29 18	2.0	1.0	.20	N	1.0	>2.0	N	N
FC039C	39 19 8	109 29 17	7.0	1.0	.70	N	3.0	>2.0	N	N

TABLE 10--ANALYTICAL RESULTS OF HEAVY-MINERAL-CONCENTRATE SAMPLES COLLECTED FROM THE FLUME CANYON WILDERNESS STUDY AREA, UTAH.--Continued

Sample	Au ppm-s	B ppm-s	Ba ppm-s	Be ppm-s	Bi ppm-s	Cd ppm-s	Co ppm-s	Cr ppm-s	Cu ppm-s
FC001C	N	N	>10,000	<2	N	N	N	<20	N
FC002C	N	30	>10,000	<2	N	N	N	<20	N
FC003C	N	10	>10,000	<2	N	N	N	<20	N
FC004C	N	50	>10,000	<2	N	N	N	<20	N
FC005C	N	20	>10,000	<2	N	N	N	<20	<10
FC006C	N	20	>10,000	<2	N	N	N	<20	N
FC007C	N	N	>10,000	<2	N	N	N	<20	<10
FC008C	N	N	>10,000	<2	N	N	N	<20	N
FC009C	N	20	>10,000	<2	N	N	N	<20	N
FC010C	N	70	>10,000	<2	N	N	N	50	N
FC011C	N	70	>10,000	<2	N	N	N	30	N
FC012C	N	30	>10,000	<2	N	N	N	20	N
FC013C	N	<20	>10,000	<2	N	N	N	<20	<10
FC014C	N	20	>10,000	<2	N	N	N	<20	<10
FC015C	N	70	>10,000	<2	N	N	N	<20	N
FC016C	N	20	>10,000	<2	N	N	N	<20	N
FC017C	N	20	>10,000	<2	N	N	N	<20	15
FC018C	N	50	>10,000	<2	N	N	N	30	N
FC019C	N	30	>10,000	<2	N	N	N	30	N
FC020C	N	70	>10,000	<2	N	N	N	20	N
FC021C	N	20	>10,000	<2	N	N	N	<20	<10
FC022C	N	20	>10,000	<2	N	N	N	<20	<10
FC023C	N	50	>10,000	<2	N	N	N	<20	N
FC024C	N	70	>10,000	<2	N	N	N	<20	N
FC025C	N	20	>10,000	<2	N	N	N	N	N
FC026C	N	0	>10,000	<2	N	N	N	<20	N
FC027C	N	70	>10,000	<2	N	N	N	30	N
FC028C	N	50	>10,000	<2	N	N	N	20	N
FC029C	N	30	>10,000	<2	N	N	N	<20	N
FC030C	N	50	>10,000	<2	N	N	N	20	N
FC031C	N	30	>10,000	<2	N	N	N	30	70
FC032C	N	30	>10,000	<2	N	N	N	20	30
FC033C	N	20	>10,000	<2	N	N	N	70	N
FC034C	N	30	>10,000	<2	N	N	N	50	<10
FC035C	N	50	>10,000	<2	N	N	N	<20	N
FC036C	N	30	>10,000	<2	N	N	N	30	N
FC037C	N	50	>10,000	<2	N	N	<20	<20	N
FC038C	N	30	>10,000	<2	N	N	N	<20	N
FC039C	N	20	>10,000	<2	N	N	N	30	N

TABLE 10--ANALYTICAL RESULTS OF HEAVY-MINERAL-CONCENTRATE SAMPLES COLLECTED FROM THE FLUME CANYON WILDERNESS STUDY AREA, UTAH.--Continued

Sample	Ga ppm-s	Ge ppm-s	La ppm-s	Mn ppm-s	Mo ppm-s	Nb ppm-s	Ni ppm-s	Pb ppm-s	Sb ppm-s	Sc ppm-s
FC001C	N	N	200	100	N	100	10	150	N	30
FC002C	N	N	300	200	N	70	10	100	N	20
FC003C	N	N	500	70	N	<50	<10	30	N	10
FC004C	N	N	300	150	N	100	10	50	N	20
FC005C	N	N	500	150	N	100	<10	70	N	20
FC006C	N	N	300	150	N	100	<10	50	N	15
FC007C	N	N	500	100	N	70	N	150	N	10
FC008C	N	N	<100	100	N	70	<10	N	N	50
FC009C	N	N	500	150	N	70	<10	70	N	70
FC010C	N	N	500	1,000	N	N	<10	200	N	100
FC011C	N	N	200	700	N	50	<10	100	N	100
FC012C	N	N	300	500	N	50	<10	50	N	70
FC013C	N	N	100	100	N	<50	<10	N	N	<10
FC014C	N	N	700	100	N	<50	<10	30	N	10
FC015C	N	N	200	500	N	50	<10	50	N	15
FC016C	N	N	150	70	N	50	<10	50	N	10
FC017C	N	N	300	150	N	N	<10	N	N	N
FC018C	N	N	500	500	N	70	<10	70	N	70
FC019C	N	N	500	150	N	<50	<10	50	N	30
FC020C	N	N	700	150	N	<50	N	50	N	20
FC021C	N	N	700	100	N	<50	10	30	N	10
FC022C	N	N	300	200	N	50	10	50	N	30
FC023C	N	N	200	100	N	<50	<10	20	N	15
FC024C	N	N	1,000	100	N	50	N	70	N	30
FC025C	N	N	<100	50	N	<50	N	20	N	<10
FC026C	N	N	150	70	N	N	N	30	N	<10
FC027C	N	N	>2,000	200	N	50	N	150	N	20
FC028C	N	N	700	200	N	70	<10	50	N	20
FC029C	N	N	300	70	N	<50	<10	50	N	10
FC030C	N	N	2,000	200	N	<50	N	70	N	15
FC031C	N	N	300	150	N	50	10	50	N	20
FC032C	N	N	500	150	N	50	N	100	N	30
FC033C	N	N	1,500	200	N	<50	N	70	N	50
FC034C	N	N	1,000	150	N	70	<10	70	N	70
FC035C	N	N	1,500	150	N	50	N	50	N	50
FC036C	N	N	500	150	N	<50	N	50	N	30
FC037C	N	N	700	200	N	50	N	50	N	100
FC038C	N	N	1,000	200	N	<50	<10	50	N	70
FC039C	N	N	300	500	N	100	<10	50	N	70

TABLE 10--ANALYTICAL RESULTS OF HEAVY-MINERAL-CONCENTRATE SAMPLES COLLECTED FROM THE FLUME CANYON WILDERNESS STUDY AREA, UTAH.--Continued

Sample	Sn ppm-s	Sr ppm-s	Th ppm-s	V ppm-s	W ppm-s	Y ppm-s	Zn ppm-s	Zr ppm-s	Pd ppm-s	Pt ppm-s
FC001C	N	3,000	N	100	N	500	N	>2,000	N	N
FC002C	N	5,000	N	150	N	500	N	>2,000	N	N
FC003C	N	7,000	N	70	N	300	N	>2,000	N	N
FC004C	N	3,000	N	100	N	500	N	>2,000	N	N
FC005C	N	3,000	<200	100	N	500	N	>2,000	N	N
FC006C	N	7,000	N	100	N	200	N	>2,000	N	N
FC007C	N	5,000	N	50	N	200	N	>2,000	N	N
FC008C	N	1,500	N	100	N	500	N	>2,000	N	N
FC009C	N	700	<200	150	N	700	N	>2,000	N	N
FC010C	N	1,500	N	100	N	700	N	>2,000	N	N
FC011C	100	1,500	<200	200	N	700	N	>2,000	N	N
FC012C	N	1,500	<200	150	N	700	N	>2,000	N	N
FC013C	N	7,000	<200	30	N	100	N	>2,000	N	N
FC014C	N	7,000	N	50	N	500	N	>2,000	N	N
FC015C	<20	3,000	N	70	N	500	N	>2,000	N	N
FC016C	N	3,000	N	50	N	200	N	>2,000	N	N
FC017C	N	7,000	N	30	N	100	N	>2,000	N	N
FC018C	N	500	<200	150	N	700	N	>2,000	N	N
FC019C	N	2,000	<200	70	N	500	N	>2,000	N	N
FC020C	500	2,000	<200	70	N	300	N	>2,000	N	N
FC021C	N	10,000	N	50	N	150	N	>2,000	N	N
FC022C	N	7,000	N	100	N	300	N	>2,000	N	N
FC023C	N	3,000	N	70	N	200	N	>2,000	N	N
FC024C	N	7,000	<200	150	N	700	N	>2,000	N	N
FC025C	N	5,000	N	30	N	100	1,000	>2,000	N	N
FC026C	N	10,000	N	30	N	100	N	>2,000	N	N
FC027C	N	5,000	200	100	N	700	N	>2,000	N	N
FC028C	N	3,000	N	100	N	500	N	>2,000	N	N
FC029C	N	10,000	N	70	N	200	N	>2,000	N	N
FC030C	N	10,000	N	100	N	500	N	>2,000	N	N
FC031C	N	7,000	N	100	N	500	N	>2,000	N	N
FC032C	N	2,000	N	150	N	700	N	>2,000	N	N
FC033C	N	2,000	<200	100	N	700	N	>2,000	N	N
FC034C	N	1,500	N	150	N	700	N	>2,000	N	N
FC035C	N	1,500	<200	100	N	500	N	>2,000	N	N
FC036C	N	3,000	N	100	N	500	N	>2,000	N	N
FC037C	N	1,500	<200	150	N	700	N	>2,000	N	N
FC038C	20	2,000	<200	50	N	500	N	>2,000	N	N
FC039C	N	2,000	N	150	N	500	N	>2,000	N	N

TABLE 11--ANALYTICAL RESULTS OF ROCK SAMPLES FROM THE FLUME CANYON WILDERNESS STUDY AREA, UTAH.

[N, not detected; <, detected but below the limit of determination shown; >, determined to be greater than the value shown.]

Sample	Latitude	Longtude	Ca %-s	Fe %-s	Mg %-s	Na %-s	P %-s	Ti %-s	Ag ppm-s	As ppm-s	Au ppm-s
FC002R	39 12 8	109 9 34	.30	10.00	1.00	3.0	<.2	.500	1.0	N	N
FC003R	39 13 49	109 24 37	.15	3.00	.70	>5.0	N	.500	N	N	N
FC004R	39 13 46	109 24 45	1.00	7.00	.70	.3	N	.200	N	N	N
FC008R	39 15 40	109 28 39	7.00	5.00	3.00	>5.0	N	.500	N	N	N
FC009R	39 15 39	109 29 0	15.00	7.00	2.00	5.0	N	.500	N	N	N
FC011R	39 16 56	109 31 21	5.00	7.00	1.50	5.0	N	.700	N	N	N
FC012R	39 17 2	109 31 19	15.00	5.00	3.00	5.0	N	.500	N	N	N
FC013R	39 9 20	109 23 50	.30	2.00	.50	1.0	<.2	.500	N	N	N
FC015RA	39 11 24	109 8 5	.05	.50	2.00	.2	N	.500	N	N	N
FC015RB	39 11 22	109 8 5	.07	N	.05	<.2	N	.070	N	N	N
FC020RA	39 13 34	109 20 0	>20.00	3.00	3.00	1.0	N	.300	N	N	N
FC020RB	39 13 38	109 20 0	.07	.70	.70	1.0	N	.700	N	N	N
FC021RA	39 13 40	109 19 51	15.00	20.00	1.00	.7	N	.100	N	N	N
FC021RB	39 13 51	109 19 49	.20	>20.00	.15	<.2	N	.030	1.5	<200	N
FC023R	39 13 21	109 14 14	.10	.50	.15	1.0	N	.300	N	N	N
FC024R	39 12 50	109 18 50	.15	2.00	.30	1.0	N	.300	N	N	N
FC025R	39 14 5	109 17 31	.30	.15	.10	N	N	.200	N	N	N
FC029R	39 17 51	109 21 28	>20.00	1.00	.70	.3	N	.007	N	N	N
FC033R	39 18 23	109 25 9	20.00	2.00	10.00	2.0	N	.070	N	N	N
FC035R	39 17 47	109 25 40	10.00	5.00	3.00	5.0	N	.300	N	N	N
FC036R	39 18 48	109 26 12	20.00	.70	1.50	2.0	N	.070	N	N	N
FC037R	39 18 53	109 27 59	20.00	.70	>10.00	.2	N	.015	N	N	N
FC038R	39 19 12	109 29 18	15.00	1.00	10.00	.2	N	.020	N	N	N
FC039R	39 19 8	109 29 17	15.00	.70	>10.00	1.0	N	.030	N	N	N

TABLE 11--ANALYTICAL RESULTS OF ROCK SAMPLES FROM THE FLUME CANYON WILDERNESS STUDY AREA, UTAH.--Continued

Sample	B ppm-s	Ba ppm-s	Be ppm-s	Bi ppm-s	Cd ppm-s	Co ppm-s	Cr ppm-s	Cu ppm-s	Ga ppm-s	Ge ppm-s	La ppm-s
FC002R	30	700	<1.0	N	N	10	50	20	50	N	70
FC003R	30	500	1.0	N	N	10	100	15	50	N	50
FC004R	50	500	1.0	N	N	<10	150	30	10	N	150
FC008R	15	500	<1.0	N	N	10	70	20	30	N	50
FC009R	30	1,000	<1.0	N	N	10	70	20	70	N	70
FC011R	20	1,000	<1.0	N	N	15	50	20	50	N	70
FC012R	30	1,500	<1.0	N	N	<10	50	20	30	N	50
FC013R	30	300	N	N	N	N	50	7	10	N	<50
FC015RA	20	300	N	N	N	<10	20	5	5	N	N
FC015RB	30	20	2.0	N	N	N	<10	<5	N	N	N
FC020RA	15	500	N	N	N	<10	30	7	20	N	N
FC020RB	30	300	<1.0	N	N	<10	70	30	50	N	50
FC021RA	<10	700	1.5	N	N	<10	20	7	20	N	N
FC021RB	<10	700	N	<10	N	50	10	100	10	N	N
FC023R	15	500	<1.0	N	N	<10	20	7	7	N	50
FC024R	10	500	<1.0	N	N	<10	30	5	10	N	<50
FC025R	10	300	N	N	N	N	15	N	N	N	N
FC029R	N	200	N	N	N	N	10	7	N	N	N
FC033R	N	3,000	N	N	N	50	15	7	N	N	50
FC035R	10	1,000	N	N	N	15	100	20	30	N	50
FC036R	N	700	N	N	N	N	20	7	N	N	N
FC037R	N	300	N	N	N	N	10	<5	N	N	N
FC038R	N	150	N	N	N	N	<10	<5	N	N	N
FC039R	10	300	N	N	N	N	15	<5	N	N	N

TABLE 11--ANALYTICAL RESULTS OF ROCK SAMPLES FROM THE FLUME CANYON WILDERNESS STUDY AREA, UTAH.--Continued

Sample	Mn ppm-s	Mo ppm-s	Nb ppm-s	Ni ppm-s	Pb ppm-s	Sb ppm-s	Sc ppm-s	Sn ppm-s	Sr ppm-s	Th ppm-s	V ppm-s	W ppm-s
FC002R	300	N	<20	20	50	N	10	N	100	N	150	N
FC003R	100	N	N	10	70	N	10	N	100	N	200	N
FC004R	500	N	N	7	30	N	5	N	100	N	150	N
FC008R	1,000	N	N	10	50	N	10	N	200	N	100	N
FC009R	1,000	N	N	20	50	N	15	N	700	N	100	N
FC011R	1,000	N	N	20	50	N	10	N	300	N	150	N
FC012R	1,500	N	N	10	30	N	15	N	1,000	N	100	N
FC013R	30	N	N	N	50	N	<5	N	100	N	70	N
FC015RA	20	N	N	N	20	N	<5	N	N	N	50	N
FC015RB	N	N	N	N	N	N	N	N	N	N	<10	N
FC020RA	700	N	N	7	20	N	7	N	100	N	70	N
FC020RB	30	N	N	7	50	N	10	N	N	N	200	N
FC021RA	5,000	N	N	5	15	N	<5	N	100	N	50	N
FC021RB	500	15	N	50	100	N	N	N	N	N	50	N
FC023R	50	N	N	<5	15	N	<5	N	N	N	30	N
FC024R	300	N	N	7	10	N	7	N	100	N	70	N
FC025R	<10	N	N	<5	N	N	N	N	N	N	10	N
FC029R	2,000	N	N	5	30	N	N	N	1,000	N	15	N
FC033R	2,000	N	N	30	100	N	5	N	200	N	30	N
FC035R	700	N	N	15	20	N	15	N	300	N	70	N
FC036R	1,000	N	N	<5	10	N	5	N	700	N	20	N
FC037R	200	N	N	N	N	N	7	N	3,000	N	50	N
FC038R	700	N	N	N	N	N	<5	N	1,000	N	15	N
FC039R	200	N	N	<5	N	N	5	N	1,500	N	30	N

TABLE 11--ANALYTICAL RESULTS OF ROCK SAMPLES FROM THE FLUME CANYON WILDERNESS STUDY AREA, UTAH.--Continued

Sample	Y ppm-s	Zn ppm-s	Zr ppm-s	As/p ppm	Bi/p ppm	Cd/p ppm	Sb/p ppm	Zn/p ppm	Au ppm	Th ppm	U ppm
FC002R	30	N	200	<5	<2	<.1	<2	67	<.05	11.90	3.080
FC003R	20	N	200	5	<2	.3	<2	110	<.05	10.90	4.340
FC004R	15	N	200	9	<2	<.1	<2	18	<.05	<2.60	1.920
FC008R	20	N	200	<5	<2	.4	<2	58	<.05	12.30	2.870
FC009R	30	N	150	<5	<2	.3	<2	58	<.05	9.23	1.990
FC011R	30	N	300	<5	<2	.1	<2	58	<.05	12.50	2.090
FC012R	30	N	300	5	<2	.3	<2	45	<.05	8.59	2.620
FC013R	15	N	500	13	<2	<.1	<2	6	<.05	9.52	2.930
FC015RA	15	N	1,000	<5	<2	.3	<2	40	<.05	6.24	2.690
FC015RB	10	N	70	<5	<2	<.1	<2	3	<.05	6.00	1.730
FC020RA	15	N	150	<5	<2	.4	<2	23	<.05	4.90	1.390
FC020RB	15	N	150	<5	<2	<.1	<2	55	<.05	16.60	6.020
FC021RA	15	N	50	<5	<2	.9	<2	20	<.05	2.50	.894
FC021RB	10	1,000	20	940	<2	6.2	53	1,300	<.25	17.00	15.600
FC023R	30	N	1,000	11	<2	.3	<2	19	<.05	9.64	3.190
FC024R	15	N	200	<5	<2	<.1	<2	29	<.05	5.30	1.690
FC025R	10	N	300	<5	<2	<.1	<2	<2	<.05	2.30	.834
FC029R	N	N	<10	35	<2	.5	<2	44	<.05	<5.50	15.000
FC033R	70	N	20	<5	<2	1.2	<2	200	<.05	3.00	1.090
FC035R	20	N	100	<5	<2	.4	<2	64	<.05	13.20	3.290
FC036R	10	N	20	<5	<2	.4	<2	58	<.05	<4.20	7.750
FC037R	<10	N	15	<5	<2	<.1	<2	<2	<.05	3.10	1.170
FC038R	10	N	<10	<5	<2	.3	<2	<2	<.05	<7.80	27.400
FC039R	10	N	30	<5	<2	.2	<2	<2	<.05	2.90	.792

Table 12. Description of rock samples from the Coal Canyon Wilderness Study Area

CC001R	Coal
CC008R	Siltstone, red to brown (lower Parachute Creek)
CC010R	Silty sandstone, dark brown to red
CC011R	Medium grained sandstone, gray to brown
CC013R	Coal
CC014RA	Siltstone, red to brown, iron oxide staining
CC014RB	Shale, Medium gray
CC019R	Shaley sandstone, medium to dark gray
CC022R	Medium grained sandstone, orange brown
CC023R	Sandstone, light tan, fine to medium grained
CC025R	Rounded cobbles of black shale
CC026RA	Shale, medium to dark gray
CC026RB	Coal
CC027R	Siltstone, medium brown to reddish gray
CC027RB	Sandstone, medium gray, fine grained
CC029R	Shale, medium gray
CC032RA	Shale, light to medium gray
CC033R	Siltstone, yellow to tan
CC034R	Siltstone to shale, greenish gray
CC035R	Sandstone, medium tan
CC039R	Cobbles of black shale
CC042R	Conglomeritic sandstone, dark brown
CC046R	Sandstone, medium grained, tan
CC051R	Sandstone, medium grained, tan

Table 13. Description of rock samples from the Spruce Canyon Wilderness Study Area

SC003R	Sandstone, light tan, medium grained
SC009R	Sandstone, light tan, fine grained
SC010R	Calcareous mudstone
SC015RA	Sandstone, medium grained
SC015RB	Shaley sandstone, greenish gray
SC0018R	Mudstone, purple

Table 14. Description of rock samples from the Flume Canyon Wilderness Study Area

FC002R	Shale, green
FC003R	Marlstone, brownish black
FC004R	Pebble conglomerate
FC008R	Grab sample
FC009R	Sandy shale, greenish blue
FC011R	Sandstone, fine grained, green and tan
FC012R	Sandstone
FC013R	Mudstone, calcareous, tan
FC015RA	Shale, brown to tan
FC015RB	Coal
FC020RA	Limestone, medium gray
FC020RB	Marlstone, brown to black
FC021RA	Limestone, red brown with calcareous nodules
FC021RB	Iron oxide nodule
FC023R	Shale
FC024R	Sandstone, medium grained, yellow
FC025R	Sandstone, white, calcareous
FC029R	Limestone, black
FC033R	Limestone, red to brown
FC035R	Shale, tan
FC036R	Limestone, light brown
FC037R	Limestone, white to tan
FC038R	Limestone, light tan
FC039R	Limestone, white to tan