UNITED STATES DEPARTMENT OF THE INTERIOR
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**Analytical results and sample locality map
of stream-sediment and panned-concentrate samples
from the Slate Range Wilderness Study Area (CDCA),
Inyo County, California**

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PLATE 1.--Map showing geochemical sample sites from Slate Range Wilderness Study Area Inyo County, California	in pocket
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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 resource potential. Results must be made available to the public and be submitted to the President and the Congress. This report presents the results of a mineral survey of the Slate Range Wilderness Study Area, California Desert Conservation Area (CDCA 142), Inyo County, California.

INTRODUCTION

In May, 1983, we conducted a reconnaissance geochemical survey of the Slate Range Wilderness Study Area, Inyo County, California.

The Slate Range Wilderness Study Area comprises about 70 mi² (182 km²) in the southwest corner of Inyo County, California, and lies east of the southern reaches of Panamint Valley. The area is bordered by Death Valley National Monument to the east and north and by U.S. Naval Reservation to the south. Access to the vicinity of the study area is provided by dirt road from Panamint Valley through Goler Canyon. Access to the Slate Range Wilderness Study Area is restricted to jeep trails, foot, or helicopter.

Most of the study area is covered by Tertiary flows, agglomerates and tuffs. These have eroded to form rounded hills throughout much of the Slate Range Wilderness Study Area, though some of the more recent flows have produced rather steep scarps. The southeastern portion of the study area is overlain by large alluvial fans.

The topographic relief in the study area ranges from 1230 ft (375 m), in Panamint Valley to 5809 ft (1770 m) on Needle Peak. Most of the terrain contains only minor sagebrush and creosote, and is deeply dissected by intermittent stream drainages. The climate is arid to semiarid.

METHODS OF STUDY

Sample Collection

We collected samples at 148 sites (plate 1). At nearly all of those sites, we collected both a stream-sediment sample and a heavy-mineral concentrate. We analyzed 148 stream-sediment samples and 126 panned-concentrate samples for a sampling density of about 1 sample per .5 mi² for the stream sediment and heavy-mineral concentrate.

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.

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 = 1:62,500). Each sample was composited from several localities within an area that may extend as much as 500 ft from the site plotted on the map.

Heavy-mineral-concentrate samples

We panned heavy-mineral-concentrate samples from the same active alluvium as the stream-sediment samples. Each bulk sample was passed through a 2.0-mm (10-mesh) screen to remove the coarse material. The sediment passing through the screen was panned until most of the quartz, feldspar, organic, and clay-sized material was removed. The sample was air dried.

Sample Preparation

We sieved the stream-sediment samples at the collection site through a 2-mm screen and the minus-2-m material was retained. The samples were air dried and sieved to 80-mesh using stainless-steel sieves. The portion of the sediment passing through the sieve was saved for analysis.

After panning the sediment, we used bromoform 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 2). 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

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

- 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.
- 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.
- 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.

Table 2. Spectrographic results from the analysis of minus-80-mesh stream sediment samples from Slate Range Wilderness

Study Area, California

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

Sample	Latitude	Longitude	Fe-pct. s	Mg-pct. s	Ca-pct. s	Ti-pct. s	Mn-ppm s	Ag-ppm s	B-ppm s	Ba-ppm s	Co-ppm s	Cr-ppm s
PN007	35 50 40	116 55 37	10	3.0	5	1.0	1,500	<.5	15	2,000	50	150
PN008	35 51 8	116 55 26	10	3.0	7	1.0	2,000	<.5	50	2,000	50	200
PN009	35 51 4	116 55 31	10	3.0	10	1.0	1,500	N	10	1,500	50	150
PN010	35 51 26	116 56 8	7	3.0	7	>1.0	1,500	N	50	2,000	30	150
PN011	35 51 22	116 56 9	5	5.0	10	.7	1,000	<.5	50	2,000	20	100
PN012	35 51 16	116 56 2	15	3.0	7	>1.0	2,000	N	30	1,500	70	200
PN013	35 51 24	116 58 48	5	2.0	5	1.0	700	N	50	1,000	30	100
PN014	35 50 58	116 58 50	7	3.0	7	1.0	1,000	N	70	2,000	30	200
PN015	35 50 41	116 58 30	5	2.0	5	1.0	1,000	N	50	1,500	20	100
PN016	35 50 46	116 58 25	15	3.0	10	1.0	1,500	N	50	2,000	30	200
PN020	35 50 44	116 56 19	10	5.0	10	>1.0	1,500	N	30	2,000	50	150
PN021	35 50 21	116 55 57	5	1.5	3	.7	500	N	20	1,000	20	70
PN022	35 50 11	116 56 7	7	5.0	7	1.0	1,500	N	50	1,500	30	30
PN023	35 50 3	116 55 48	7	5.0	10	>1.0	1,500	N	70	2,000	30	150
PN024	35 50 4	116 55 40	10	3.0	7	1.0	1,000	N	50	2,000	30	100
PN025	35 51 43	116 59 36	10	2.0	10	1.0	1,500	N	50	3,000	50	100
PN026	35 51 7	116 59 51	10	1.5	5	1.0	1,000	N	30	2,000	50	150
PN027	35 50 49	116 59 49	7	2.0	5	.7	700	N	20	2,000	30	100
PN028	35 52 52	116 55 30	20	7.0	15	>1.0	2,000	N	50	2,000	100	700
PN029	35 52 18	116 56 3	7	2.0	5	.7	700	N	70	1,000	50	100
PN030	35 48 29	116 58 18	10	2.0	5	>1.0	1,000	N	50	1,000	30	150
PN031	35 47 59	116 57 24	7	5.0	7	1.0	1,000	N	70	1,500	30	100
PN032	35 49 18	116 57 53	5	3.0	5	1.0	1,000	N	70	700	20	50
PN033	35 49 38	116 58 1	10	3.0	7	1.0	1,500	N	50	1,000	20	150
PN034	35 49 25	116 58 7	10	2.0	5	1.0	1,500	N	30	1,000	30	150
PN035	35 47 55	116 55 55	7	3.0	7	1.0	1,000	N	50	1,500	20	100
PN036	35 49 7	116 56 13	10	3.0	10	1.0	1,500	N	50	1,000	30	200
PN037	35 49 47	116 56 7	5	1.5	5	.7	500	N	20	700	20	70
PN038	35 50 8	116 59 6	7	2.0	10	1.0	1,500	N	50	1,500	30	150
PN039	35 48 3	116 59 21	15	3.0	3	>1.0	1,500	N	20	700	50	200
PN040	35 52 15	116 56 10	10	2.0	5	>1.0	1,000	N	50	1,000	20	100
PN041	35 51 46	116 55 51	7	3.0	7	>1.0	1,000	N	70	1,000	30	200
PN042	35 50 40	116 55 25	10	3.0	5	1.0	1,000	N	50	1,000	30	150
PN043	35 49 31	116 55 30	10	3.0	7	1.0	1,500	N	50	1,500	30	150
PN044	35 48 51	116 57 11	10	3.0	5	1.0	1,500	N	20	1,000	50	200
PN045	35 48 18	116 56 22	7	2.0	5	1.0	1,000	N	50	1,000	20	100
PN046	35 50 9	116 58 15	7	3.0	7	1.0	1,000	N	70	1,000	20	100
PN047S	35 51 6	117 0 9	15	3.0	7	>1.0	1,500	N	70	2,000	50	200
PN048S	35 51 25	117 1 20	10	3.0	7	1.0	1,000	N	20	1,500	30	200
PN049S	35 51 4	117 1 17	7	2.0	5	1.0	1,000	N	20	1,000	20	200
PN050S	35 52 48	116 56 35	15	5.0	7	1.0	1,000	N	50	1,500	50	200
PN051S	35 52 18	116 56 41	15	5.0	10	>1.0	1,500	N	50	2,000	50	200
PN052S	35 51 53	116 57 23	15	5.0	15	>1.0	1,500	N	50	2,000	50	300
PN053S	35 51 46	116 57 37	10	3.0	10	>1.0	1,500	N	70	2,000	30	150
PN054S	35 51 18	116 57 40	10	3.0	7	>1.0	1,000	N	70	1,500	30	150

Table 2. Spectrographic results from the analysis of minus-80-mesh stream sediment samples from Slate Range Wilderness Study Area, California

Sample	Cu-ppm s	La-ppm s	Mo-ppm s	Nb-ppm s	Ni-ppm s	Pb-ppm s	Sr-ppm s	V-ppm s	Y-ppm s	Zn-ppm s
PN007	50	100	N	N	100	50	1,500	200	30	N
PN008	30	100	N	N	100	50	2,000	200	30	<200
PN009	30	100	N	N	70	50	1,500	200	20	N
PN010	30	150	N	N	50	30	1,500	200	50	N
PN011	30	100	N	N	50	50	1,500	150	50	N
PN012	50	100	N	N	70	30	1,000	300	30	<200
PN013	30	100	N	N	30	70	700	150	30	N
PN014	20	150	N	N	50	70	1,000	200	50	N
PN015	20	100	N	N	30	70	1,000	150	30	N
PN016	30	150	N	N	50	70	1,500	200	50	N
PN020	50	100	N	N	70	50	2,000	200	50	N
PN021	20	70	N	N	30	30	1,000	70	20	N
PN022	50	100	N	N	30	30	1,000	100	30	N
PN023	30	150	N	N	50	50	2,000	200	30	N
PN024	30	100	N	N	50	50	1,000	150	30	N
PN025	50	150	7	N	50	70	1,500	150	50	N
PN026	30	150	N	N	50	50	1,000	200	30	N
PN027	30	100	N	N	50	50	700	100	20	N
PN028	50	100	N	N	200	50	1,500	300	50	200
PN029	50	150	N	N	70	70	1,000	100	30	N
PN030	30	100	N	N	50	20	700	200	30	N
PN031	20	100	N	N	50	50	700	150	50	N
PN032	20	100	N	N	20	50	700	100	50	N
PN033	20	150	N	N	50	30	1,500	200	50	<200
PN034	30	200	N	N	50	50	1,000	300	30	N
PN035	30	150	N	N	50	50	1,000	150	30	N
PN036	30	100	N	N	70	30	1,000	200	30	N
PN037	15	50	N	N	20	20	500	100	20	N
PN038	30	200	N	N	70	30	1,500	150	30	<200
PN039	30	70	N	N	100	20	700	300	30	N
PN040	30	70	N	N	50	50	1,000	200	20	N
PN041	30	100	5	N	70	30	1,500	150	20	N
PN042	30	100	N	N	70	50	1,000	200	30	N
PN043	30	100	N	N	50	30	2,000	150	50	N
PN044	30	70	N	N	70	30	1,000	200	30	N
PN045	20	70	N	N	50	50	1,000	150	30	N
PN046	20	70	5	N	50	50	1,500	100	30	N
PN047s	50	200	N	N	100	70	1,500	300	50	N
PN048s	30	100	N	N	150	20	1,000	200	30	N
PN049s	20	100	N	N	70	10	1,500	200	50	N
PN050s	70	150	N	N	150	70	700	200	50	N
PN051s	70	150	N	N	150	50	1,500	200	50	N
PN052s	50	150	N	N	150	70	2,000	200	50	N
PN053s	50	150	N	N	70	70	1,500	200	70	N
PN054s	50	100	N	N	100	70	1,000	150	50	N

Table 2. Spectrographic results from the analysis of minus-80-mesh stream sediment samples from Slate Range Wilderness Study Area, California--continued

Sample	Latitude	Longitude	Fe-pct. s	Mg-pct. s	Ca-pct. s	Ti-pct. s	Mn-pptm s	Ag-pptm s	B-pptm s	Ba-pptm s	Co-pptm s	Cr-pptm s
PN055S	35 50 54	116 57 33	10	5.0	10	>1.0	1,500	N	70	2,000	50	150
PN056S	35 50 6	116 57 36	7	3.0	10	1.0	1,000	N	50	1,500	30	200
PN056S	35 50 6	116 57 36	10	3.0	15	>1.0	2,000	N	50	2,000	50	150
PN058S	35 48 55	116 57 17	7	3.0	7	.7	1,000	N	30	1,500	30	150
PN059S	35 49 58	117 1 59	10	3.0	7	1.0	1,000	5.0	70	1,000	30	100
PN060S	35 50 51	117 0 58	10	3.0	7	>1.0	1,500	N	50	1,500	50	150
PN061S	35 50 37	117 0 45	10	2.0	5	>1.0	1,000	N	50	1,000	50	150
PN062S	35 50 15	117 0 40	7	2.0	5	.7	1,000	N	20	1,500	30	200
PN063S	35 50 29	117 5 16	20	5.0	7	>1.0	1,500	N	30	1,500	50	200
PN064S	35 50 27	117 5 23	15	3.0	5	>1.0	1,000	N	10	1,500	30	100
PN065S	35 50 10	117 5 1	10	3.0	5	>1.0	1,000	N	50	1,000	30	100
PN066S	35 50 11	117 5 19	10	3.0	7	>1.0	1,500	N	30	1,500	30	150
PN067S	35 49 54	117 5 21	10	3.0	10	>1.0	1,500	N	30	2,000	30	150
PN068S	35 49 25	117 5 9	10	3.0	7	1.0	1,500	N	70	1,500	30	150
PN069S	35 49 22	117 5 33	10	5.0	10	>1.0	1,500	N	70	1,500	50	200
PN070S	35 50 28	117 3 43	10	3.0	10	1.0	1,000	<.5	70	1,500	30	100
PN071S	35 50 16	117 3 12	10	3.0	15	1.0	1,500	7.0	50	1,000	50	300
PN072S	35 50 7	117 2 50	10	3.0	15	1.0	1,500	.5	20	1,000	30	500
PN073S	35 49 56	117 2 49	7	2.0	7	.7	700	<.5	30	700	20	150
PN074S	35 49 32	117 2 32	10	5.0	15	>1.0	1,500	<.5	70	1,000	50	300
PN075S	35 49 7	117 2 12	10	3.0	10	>1.0	1,500	N	30	1,500	50	300
PN076S	35 48 47	117 1 47	10	3.0	10	>1.0	1,000	N	20	1,000	50	500
PN077S	35 48 21	117 1 49	5	2.0	10	1.0	1,000	N	20	700	20	200
PN078S	35 48 9	117 1 46	10	3.0	15	>1.0	1,000	N	50	1,000	30	200
PN079S	35 49 37	117 1 32	10	3.0	10	>1.0	1,500	N	50	1,000	30	150
PN080S	35 48 48	117 5 31	7	5.0	15	>1.0	1,000	N	70	1,000	20	150
PN081S	35 48 21	117 5 7	5	2.0	5	1.0	700	N	30	700	20	100
PN082S	35 47 55	117 5 31	10	3.0	15	1.0	1,500	N	50	1,000	20	150
PN083S	35 47 56	117 5 54	7	3.0	15	>1.0	1,500	N	70	1,000	20	150
PN084S	35 47 50	117 4 23	5	5.0	10	1.0	1,000	N	30	700	20	150
PN085S	35 47 49	117 4 29	5	2.0	5	>1.0	1,000	N	50	1,000	20	100
PN086S	35 48 58	117 4 59	7	3.0	7	>1.0	1,000	N	50	1,000	30	100
PN087S	35 48 37	117 4 38	7	2.0	10	1.0	1,000	N	50	1,000	20	70
PN088S	35 52 3	117 0 9	7	2.0	7	1.0	1,000	N	70	1,500	20	150
PN089S	35 52 41	117 0 31	15	5.0	15	>1.0	1,500	N	50	1,500	50	500
PN090S	35 52 24	117 0 3	7	1.5	10	1.0	1,000	N	50	1,000	30	100
PN091S	35 52 32	117 0 5	10	3.0	10	1.0	1,500	N	30	1,000	30	200
PN092S	35 52 9	116 58 53	10	3.0	10	>1.0	1,500	N	70	1,500	30	200
PN093S	35 52 11	116 57 50	7	3.0	10	>1.0	1,000	N	50	1,000	30	150
PN094S	35 52 16	116 57 49	10	3.0	15	>1.0	1,000	N	100	1,500	20	150
PN095S	35 52 42	116 57 58	10	2.0	10	>1.0	1,500	N	70	1,000	70	150
PN096S	35 52 48	116 59 13	7	2.0	15	>1.0	2,000	N	50	1,500	30	200
PN097S	35 52 48	116 59 44	15	3.0	15	>1.0	1,500	N	50	2,000	50	300
PN098S	35 52 40	116 58 36	7	2.0	5	1.0	1,000	N	50	700	30	100
PN099S	35 52 5	117 0 55	10	2.0	7	>1.0	1,500	N	70	2,000	30	150

Table 2. Spectrographic results from the analysis of minus-80-mesh stream sediment samples from Slate Range Wilderness Study Area, California--continued

Sample	Cu-ppm s	La-ppm s	Mo-ppm s	Nb-ppm s	Ni-ppm s	Pb-ppm s	Sr-ppm s	V-ppm s	Y-ppm s	Zn-ppm s
PN055S	50	150	N	<20	100	100	1,000	200	50	N
PN056S	30	100	N	N	100	50	1,000	200	30	N
PN056S	70	200	N	N	70	50	1,500	200	30	N
PN058S	30	100	N	N	50	50	1,000	150	30	N
PN059S	30	100	N	N	70	70	1,000	200	50	N
PN060S	30	200	N	N	100	70	1,000	200	50	N
PN061S	20	100	N	N	70	70	1,000	300	50	N
PN062S	30	100	N	N	70	50	1,000	150	30	N
PN063S	50	200	N	<20	70	70	1,500	300	50	N
PN064S	30	100	N	N	30	30	1,000	200	30	N
PN065S	20	150	N	N	50	50	700	200	50	N
PN066S	20	100	N	20	30	30	1,500	200	50	N
PN067S	30	150	N	N	70	70	1,500	200	50	N
PN068S	30	150	N	N	50	50	1,000	300	50	N
PN069S	30	200	N	20	100	50	1,000	200	50	200
PN070S	30	100	N	N	50	70	700	200	50	N
PN071S	50	100	N	N	150	100	2,000	200	50	N
PN072S	50	70	N	N	200	50	1,500	200	30	<200
PN073S	30	70	N	N	50	30	1,000	150	20	N
PN074S	50	100	N	N	100	70	1,500	200	30	N
PN075S	30	100	N	N	100	30	2,000	200	50	<200
PN076S	30	70	N	N	70	20	1,000	200	50	N
PN077S	20	50	N	N	30	30	700	150	20	N
PN078S	30	100	N	<20	100	70	1,500	200	50	N
PN079S	30	50	7	N	70	70	1,000	200	30	N
PN080S	30	100	N	N	50	100	1,000	200	50	N
PN081S	20	70	N	N	50	50	700	100	30	N
PN082S	30	100	N	N	50	50	1,000	200	50	N
PN083S	20	100	N	N	70	70	1,000	200	50	N
PN084S	20	100	N	N	70	30	1,500	150	50	N
PN085S	20	100	N	N	50	50	700	150	50	N
PN086S	30	100	N	N	50	70	1,000	150	50	N
PN087S	20	100	N	N	30	50	700	100	30	N
PN088S	30	150	<5	<20	50	70	1,000	100	30	N
PN089S	30	150	N	N	200	50	2,000	200	30	<200
PN090S	20	100	5	N	100	30	1,000	100	30	N
PN091S	20	100	N	N	100	50	1,000	150	20	N
PN092S	50	100	N	N	100	50	1,500	150	30	N
PN093S	30	100	N	<20	70	70	1,000	150	20	N
PN094S	50	150	N	<20	150	70	1,500	150	50	N
PN095S	30	150	N	N	100	50	1,000	200	50	N
PN096S	50	150	N	N	100	70	1,500	150	50	N
PN097S	30	150	N	<20	150	50	1,500	300	50	N
PN098S	20	70	N	N	100	30	700	150	20	N
PN099S	30	150	N	<20	100	50	1,500	200	50	N

Table 2. Spectrographic results from the analysis of minus-80-mesh stream sediment samples from Slate Range Wilderness Study Area, California--continued

Sample	Latitude	Longitude	Fe-ppt. s	Mg-ppt. s	Ca-ppt. s	Ti-ppt. s	Mn-ppt. s	Ag-ppt. s	B-ppt. s	Ba-ppt. s	Co-ppt. s	Cr-ppt. s
PN100S	35 51 29	117 1 31	10	3.0	10	>1.0	1,500	N	100	1,500	20	150
PN101S	35 50 52	117 1 40	7	2.0	10	1.0	1,000	N	30	1,500	20	100
PN102S	35 52 13	117 1 36	5	3.0	7	1.0	1,000	N	20	1,500	30	200
PN103S	35 52 39	117 1 36	20	5.0	10	>1.0	1,500	N	30	1,000	50	300
PN104S	35 52 8	117 1 59	10	3.0	10	1.0	1,000	N	20	1,500	30	150
PN105S	35 52 47	117 2 19	10	3.0	10	>1.0	1,000	N	30	2,000	30	150
PN106S	35 52 26	117 2 21	10	5.0	10	1.0	1,500	N	50	2,000	30	150
PN107S	35 51 53	117 2 12	7	2.0	7	1.0	1,000	N	30	1,500	30	150
PN108S	35 51 11	117 2 3	5	3.0	10	>1.0	1,000	N	30	1,000	30	200
PN109S	35 51 24	117 0 51	10	2.0	10	>1.0	1,000	N	70	2,000	50	150
PN110S	35 50 56	117 0 50	10	2.0	5	1.0	1,000	N	50	1,500	30	150
PN111S	35 50 59	117 0 44	10	3.0	10	1.0	700	N	50	1,500	20	150
PN112S	35 47 51	117 3 19	15	5.0	10	1.0	1,000	N	70	1,000	30	200
PN113S	35 50 25	116 59 21	7	2.0	10	1.0	1,000	N	50	2,000	20	100
PN114S	35 49 33	116 59 8	10	3.0	10	1.0	1,500	N	50	1,500	30	150
PN115S	35 49 38	116 59 5	10	3.0	10	>1.0	1,000	N	70	2,000	30	200
PN116S	35 49 53	117 0 13	7	2.0	5	1.0	1,000	N	30	1,000	20	150
PN117S	35 49 3	116 59 42	10	3.0	10	1.0	1,000	.5	20	1,000	20	200
PN118S	35 50 22	117 1 44	20	5.0	10	>1.0	1,500	N	70	2,000	50	200
PN119S	35 51 1	117 2 26	7	2.0	10	1.0	1,000	N	20	1,000	20	150
PN120S	35 49 15	117 1 17	10	3.0	10	1.0	1,000	N	50	1,000	30	150
PN121S	35 48 55	117 1 20	7	3.0	5	1.0	1,000	N	50	1,000	20	200
PN122S	35 48 35	117 0 53	10	5.0	7	>1.0	1,000	N	50	1,000	50	200
PN123S	35 48 3	117 0 6	20	5.0	10	>1.0	2,000	N	20	1,000	70	700
PN124S	35 47 52	117 0 47	15	5.0	7	>1.0	1,500	N	50	1,000	50	500
PN125S	35 47 47	117 1 17	15	3.0	7	>1.0	1,500	N	50	1,000	50	500
PN126S	35 50 53	117 3 47	7	5.0	7	>1.0	2,000	N	30	1,500	50	300
PN127S	35 51 12	117 4 38	10	3.0	10	>1.0	1,500	N	50	2,000	30	200
PN128S	35 51 9	117 4 46	7	2.0	5	1.0	1,500	N	30	1,000	20	150
PN129S	35 51 37	117 4 35	7	3.0	7	>1.0	1,000	N	50	1,500	30	150
PN130S	35 49 46	117 3 21	15	3.0	7	1.0	1,500	.5	50	1,500	30	150
PN131S	35 49 24	117 3 32	15	5.0	5	>1.0	1,500	N	50	1,000	50	150
PN132S	35 49 2	117 3 15	20	5.0	7	>1.0	2,000	N	20	1,000	50	200
PN133S	35 48 30	117 3 6	>20	7.0	10	>1.0	2,000	N	30	1,000	70	500
PN134S	35 47 55	117 2 34	20	5.0	10	>1.0	2,000	<.5	50	1,500	50	200
PN135S	35 53 11	117 2 43	2	10.0	5	1.0	1,000	N	20	2,000	30	50
PN136S	35 52 56	117 3 35	20	3.0	5	>1.0	1,500	N	50	1,000	70	200
PN137S	35 52 59	117 3 39	10	2.0	5	1.0	1,500	N	70	1,500	30	100
PN138S	35 52 43	117 3 53	10	3.0	5	1.0	1,000	N	30	1,000	30	200
PN139S	35 52 49	117 3 55	7	2.0	5	1.0	1,000	N	30	1,000	30	150
PN140S	35 49 46	117 4 7	7	3.0	7	1.0	1,000	N	50	1,500	30	100
PN142S	35 49 11	117 3 59	10	3.0	7	1.0	1,000	N	70	1,500	30	100
PN143S	35 48 59	117 4 2	7	5.0	10	1.0	1,500	N	50	1,500	30	100
PN144S	35 48 20	117 3 56	7	5.0	10	1.0	1,500	N	50	1,500	30	150
PN145S	35 48 15	117 4 11	10	5.0	10	>1.0	1,500	N	50	1,500	50	150

Table 2. Spectrographic results from the analysis of minus-80-mesh stream sediment samples from Slate Range Wilderness Study Area, California--continued

Sample	Cu-ppm s	La-ppm s	Mo-ppm s	Nb-ppm s	Ni-ppm s	Pb-ppm s	Sr-ppm s	V-ppm s	Y-ppm s	Zn-ppm s
PN100S	30	150	N	N	100	70	1,000	200	50	N
PN101S	30	100	N	N	70	30	1,500	150	30	N
PN102S	30	100	N	N	70	70	700	200	30	N
PN103S	30	150	N	N	150	50	1,000	300	50	<200
PN104S	30	100	N	N	100	30	1,000	200	20	N
PN105S	20	150	N	N	100	50	1,500	150	30	N
PN106S	30	150	N	N	70	70	1,500	150	30	N
PN107S	20	150	N	N	50	50	1,000	100	30	N
PN108S	20	100	N	N	50	50	1,000	150	30	N
PN109S	20	200	N	<20	50	70	1,000	200	50	N
PN110S	20	100	N	N	30	70	700	200	50	N
PN111S	20	100	N	N	50	70	1,000	200	30	N
PN112S	30	100	N	N	50	70	700	200	50	N
PN113S	30	150	N	N	30	50	1,000	150	50	N
PN114S	20	150	N	<20	30	70	1,000	200	50	N
PN115S	30	150	N	N	50	70	1,500	200	50	<200
PN116S	20	150	N	N	30	50	1,000	150	30	N
PN117S	20	100	N	N	50	30	1,000	200	30	N
PN118S	50	150	N	N	70	50	1,000	300	50	<200
PN119S	20	70	N	N	30	30	1,000	150	20	N
PN120S	30	100	N	N	50	50	1,000	200	50	N
PN121S	30	70	N	N	50	30	1,000	200	30	N
PN122S	20	100	N	N	70	50	1,000	200	30	N
PN123S	50	100	N	N	150	50	1,000	500	50	200
PN124S	30	70	N	N	70	50	1,000	300	50	N
PN125S	30	100	N	N	150	50	700	300	50	200
PN126S	50	100	N	N	150	30	1,000	150	50	N
PN127S	30	100	N	N	100	70	1,500	200	50	N
PN128S	30	100	N	N	70	50	1,000	150	30	N
PN129S	30	150	N	N	50	50	1,500	150	50	N
PN130S	20	100	N	<20	50	50	1,500	200	50	N
PN131S	30	70	N	<20	50	50	1,000	200	50	N
PN132S	20	200	N	N	70	30	1,000	300	50	200
PN133S	30	150	N	N	100	30	1,500	500	50	200
PN134S	30	100	N	N	70	30	1,000	300	50	200
PN135S	20	70	N	N	50	50	1,000	200	30	N
PN136S	30	150	N	N	150	50	1,000	500	30	200
PN137S	20	150	N	<20	30	70	1,000	200	50	N
PN138S	15	70	N	N	50	50	1,000	200	30	N
PN139S	20	100	N	N	30	50	1,000	150	30	N
PN140S	20	100	N	N	30	70	1,000	200	50	N
PN142S	30	100	N	N	50	70	1,500	200	50	N
PN143S	20	100	N	N	50	50	1,500	150	50	N
PN144S	20	100	N	N	50	50	1,500	150	30	N
PN145S	30	100	N	<20	70	50	1,500	200	50	N

Table 2. Spectrographic results from the analysis of minus-80-mesh stream sediment samples from Slate Range Wilderness Study Area, California--continued

Sample	Latitude	Longitude	Fe-pct. s	Mg-pct. s	Ca-pct. s	Ti-pct. s	Mn-ppm s	Ag-ppm s	B-ppm s	Ba-ppm s	Co-ppm s	Cr-ppm s
PN146S	35 48 15	117 4 16	7	5.0	5	1.0	1,000	N	50	1,000	30	100
PN147S	35 46 48	117 7 8	10	5.0	10	>1.0	1,500	N	100	2,000	30	150
PN148S	35 48 46	117 7 6	15	10.0	15	>1.0	2,000	N	70	2,000	50	200
PN149S	35 48 41	117 8 11	10	7.0	5	>1.0	1,500	N	50	1,500	50	300
PN150S	35 47 52	117 7 54	7	2.0	5	1.0	1,000	N	50	1,000	20	100
PN151S	35 48 7	117 7 29	15	5.0	7	>1.0	2,000	N	50	1,000	30	300
PN152S	35 48 3	117 6 22	7	3.0	5	1.0	1,000	N	50	1,000	20	100
PN160S	35 52 20	117 3 6	20	3.0	5	>1.0	1,500	N	20	1,000	50	200
PN161S	35 51 45	117 3 36	7	2.0	5	>1.0	1,500	N	50	2,000	30	100
PN162S	35 52 13	117 4 34	10	5.0	10	>1.0	2,000	N	30	2,000	50	150
PN163S	35 53 19	117 5 5	>20	3.0	7	>1.0	2,000	N	20	1,000	30	150
PN164S	35 53 5	117 5 6	10	3.0	5	1.0	1,500	N	20	1,500	50	200
PN170S	35 51 57	117 4 24	10	3.0	7	>1.0	2,000	N	30	2,000	30	150

Table 2. Spectrographic results from the analysis of minus-80-mesh stream sediment samples from Slate Range Wilderness Study Area, California--continued

Sample	Cu-ppm s	La-ppm s	Mo-ppm s	Nb-ppm s	Ni-ppm s	Pb-ppm s	Sr-ppm s	V-ppm s	Y-ppm s	Zn-ppm s
PN146S	20	100	N	N	30	70	1,000	100	30	N
PN147S	30	150	N	N	70	70	2,000	200	50	N
PN148S	50	150	N	N	100	70	2,000	150	50	N
PN149S	30	200	N	<20	100	50	1,500	200	70	N
PN150S	20	70	N	N	30	70	700	100	30	N
PN151S	30	100	N	<20	50	50	1,000	300	50	<200
PN152S	15	70	N	N	30	30	1,000	100	30	N
PN160S	50	100	N	N	100	50	1,000	300	30	N
PN161S	30	150	N	N	50	30	2,000	200	50	N
PN162S	50	100	N	N	50	50	1,500	200	50	N
PN163S	30	200	N	N	70	50	1,000	500	100	N
PN164S	30	70	N	N	100	50	1,000	200	30	N
PN170S	30	150	N	<20	50	70	1,500	200	50	N

Table 3. Spectrographic results from the analysis of nonmagnetic heavy-mineral concentrate samples from Slate Range Wilderness Study Area, California

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

Sample	Latitude	Longitude	Fe-pct. s	Mg-pct. s	Ca-pct. s	Ti-pct. s	Mn-ppm s	Ag-ppm s	As-ppm s	Au-ppm s	B-ppm s	Ba-ppm s
7	35 50 40	116 55 37	10.0	10.00	20.0	2.00	5,000	N	N	N	N	>10,000
8	35 51 8	116 55 26	7.0	10.00	15.0	2.00	3,000	N	N	N	N	7,000
9	35 51 4	116 55 31	10.0	10.00	20.0	2.00	3,000	N	N	N	20	1,500
10	35 51 26	116 56 8	3.0	7.00	30.0	1.50	3,000	N	N	N	N	2,000
11	35 51 22	116 56 9	5.0	7.00	15.0	2.00	2,000	N	N	N	<20	1,500
12	35 51 16	116 56 2	3.0	5.00	10.0	2.00	2,000	N	N	N	20	10,000
13	35 51 24	116 58 48	5.0	5.00	7.0	2.00	1,500	N	N	N	20	3,000
14	35 50 58	116 58 50	3.0	5.00	10.0	>2.00	1,500	N	N	N	20	1,000
15	35 50 41	116 58 30	10.0	10.00	10.0	>2.00	1,500	N	N	N	30	700
16	35 50 46	116 58 25	5.0	7.00	10.0	2.00	1,500	N	N	N	20	1,000
20	35 50 44	116 56 19	5.0	7.00	15.0	1.50	1,000	N	N	N	20	>10,000
21	35 50 21	116 55 57	7.0	7.00	10.0	2.00	1,500	N	N	N	30	5,000
22	35 50 11	116 56 7	10.0	10.00	30.0	>2.00	3,000	N	N	N	50	10,000
23	35 50 3	116 55 48	3.0	7.00	15.0	2.00	1,500	N	N	N	N	>10,000
24	35 50 4	116 55 40	2.0	5.00	15.0	2.00	1,000	N	N	N	50	1,500
25	35 51 43	116 59 36	.5	.20	2.0	.30	300	N	N	N	N	>10,000
26	35 51 7	116 59 51	.3	.30	.7	.20	200	N	N	N	N	>10,000
27	35 50 49	116 59 49	2.0	3.00	3.0	1.50	500	N	N	N	N	>10,000
28	35 52 52	116 55 30	2.0	10.00	20.0	.70	1,000	N	N	N	N	10,000
29	35 52 18	116 56 3	1.5	2.00	10.0	2.00	700	N	N	N	20	7,000
30	35 48 29	116 58 18	2.0	3.00	10.0	>2.00	1,000	N	N	N	30	2,000
31	35 47 59	116 57 24	1.5	1.50	7.0	>2.00	500	N	N	N	20	2,000
32	35 49 18	116 57 53	2.0	1.00	5.0	>2.00	500	N	N	N	30	1,500
33	35 49 38	116 58 1	1.5	1.50	7.0	>2.00	500	N	N	N	<20	1,500
34	35 49 25	116 58 7	1.0	.70	5.0	2.00	500	N	N	N	<20	10,000
35	35 47 55	116 55 55	2.0	3.00	10.0	>2.00	700	N	N	N	20	5,000
36	35 49 7	116 56 13	1.5	3.00	7.0	2.00	500	N	N	N	N	>10,000
37	35 49 47	116 56 7	2.0	3.00	10.0	>2.00	1,500	N	N	N	<20	7,000
38	35 50 8	116 59 6	1.0	1.50	10.0	1.50	700	N	N	N	<20	>10,000
39	35 48 3	116 59 21	2.0	2.00	7.0	>2.00	700	N	N	N	20	10,000
40	35 52 15	116 56 10	3.0	5.00	7.0	1.50	700	N	N	N	N	7,000
41	35 51 46	116 55 51	1.5	2.00	15.0	2.00	700	N	N	N	N	>10,000
42	35 50 40	116 55 25	2.0	3.00	10.0	2.00	700	N	N	N	20	3,000
43	35 49 31	116 55 30	2.0	3.00	10.0	2.00	700	N	N	N	20	10,000
44	35 48 51	116 57 11	1.5	3.00	7.0	1.50	700	N	N	N	N	>10,000
45	35 48 18	116 56 22	1.0	1.50	7.0	2.00	500	N	N	N	N	2,000
46	35 50 9	116 58 15	2.0	2.00	10.0	>2.00	700	N	N	N	20	3,000
47	35 51 6	117 0 9	2.0	3.00	10.0	2.00	700	N	N	N	N	5,000
48	35 51 25	117 1 20	.2	.50	1.5	.20	150	N	N	N	N	>10,000
49	35 51 4	117 1 17	1.0	1.00	7.0	2.00	300	N	N	N	N	>10,000
50	35 52 48	116 56 35	5.0	5.00	10.0	1.50	700	N	N	N	20	1,500
51	35 52 18	116 56 41	5.0	7.00	15.0	1.00	700	N	N	N	<20	2,000
52	35 51 53	116 57 23	2.0	5.00	15.0	1.50	700	N	N	N	N	1,500
53	35 51 46	116 57 37	2.0	3.00	7.0	2.00	700	N	N	N	<20	>10,000
54	35 51 18	116 57 40	1.0	1.00	5.0	1.50	300	N	N	N	<20	1,000

Table 3. Spectrographic results from the analysis of nonmagnetic heavy-mineral concentrate samples from Slate Range Wilderness Study Area, California

Sample	Be-ppm s	Bi-ppm s	Cd-ppm s	Co-ppm s	Cr-ppm s	Cu-ppm s	La-ppm s	Mo-ppm s	Nb-ppm s	Ni-ppm s	Pb-ppm s
7	N	N	N	10	1,000	30	300	N	N	150	70
8	N	N	N	10	700	10	100	N	N	100	50
9	N	N	N	15	1,000	20	300	N	<50	200	50
10	N	N	N	10	300	20	500	N	N	30	50
11	N	N	N	20	700	20	300	N	50	200	50
12	N	N	N	20	500	20	700	N	50	100	50
13	N	N	N	20	300	50	700	N	50	200	50
14	N	N	N	15	200	30	700	N	50	150	70
15	N	N	N	50	500	50	700	N	50	300	70
16	<2	N	N	20	200	20	100	N	<50	100	50
20	N	N	N	20	700	30	300	N	50	300	30
21	N	N	N	30	700	30	200	N	70	300	30
22	<2	N	N	30	500	30	500	N	70	300	70
23	N	N	N	20	700	300	200	N	70	300	70
24	N	N	N	15	300	30	500	N	<50	150	20
25	N	N	N	<10	30	<10	100	N	N	<10	20
26	N	N	N	<10	50	<10	50	N	N	15	<20
27	N	N	N	15	70	30	200	N	N	50	20
28	N	N	N	15	500	20	700	N	N	150	<20
29	N	N	N	10	150	15	700	N	<50	50	150
30	N	N	N	15	200	70	500	10	70	70	70
31	N	N	N	15	150	20	500	10	50	50	50
32	N	N	N	15	200	30	700	15	<50	50	50
33	<2	N	N	10	200	15	200	N	<50	70	30
34	<2	N	N	15	150	20	200	N	<50	50	1,500
35	<2	N	N	20	200	20	500	<10	<50	150	70
36	N	N	N	15	300	15	200	N	<50	150	70
37	N	N	N	20	500	20	500	15	50	150	500
38	N	N	N	15	300	20	300	N	<50	70	50
39	<2	N	N	15	200	20	500	<10	<50	70	50
40	<2	N	N	20	300	10	200	<10	<50	100	30
41	N	N	N	15	200	15	500	<10	<50	70	30
42	<2	N	N	15	300	15	300	N	<50	100	70
43	N	N	N	15	300	20	500	N	<50	100	1,500
44	N	N	N	15	500	10	200	N	<50	150	50
45	<2	N	N	10	200	10	200	N	<50	70	50
46	N	N	N	15	150	50	300	10	<50	100	50
47	<2	N	N	15	700	10	200	N	N	150	30
48	N	N	N	<10	100	<10	50	N	N	<10	<20
49	<2	N	N	10	200	20	300	N	N	50	30
50	N	N	N	20	700	20	500	N	<50	150	20
51	<2	N	N	20	700	20	200	N	<50	200	20
52	N	N	N	15	500	10	300	N	<50	150	30
53	N	N	N	15	500	20	200	N	<50	150	1,500
54	<2	N	N	10	150	20	200	N	50	50	70

Table 3. Spectrographic results from the analysis of nonmagnetic heavy-mineral concentrate samples from Slate Range Wilderness Study Area, California

Sample	Sb-ppm s	Sc-ppm s	Sn-ppm s	Sr-ppm s	V-ppm s	W-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Th-ppm s
7										
8	N	30	30	10,000	500	N	1,000	N	>2,000	N
9	N	20	20	1,000	200	N	300	N	>2,000	N
10	N	30	30	700	300	N	300	N	>2,000	N
11	N	15	30	1,000	70	N	200	N	2,000	N
12	N	50	30	1,000	200	N	200	N	>2,000	N
13	N	30	30	1,000	200	N	300	N	>2,000	200
14	N	20	30	700	200	N	300	N	>2,000	N
15	N	30	30	1,000	200	N	300	N	>2,000	200
16	N	50	30	300	200	N	300	N	>2,000	<200
20	N	15	<20	2,000	150	N	150	N	>2,000	N
21	N	30	20	1,000	150	N	150	N	>2,000	N
22	N	50	20	500	200	N	200	N	>2,000	N
23	N	50	<20	1,000	500	N	300	N	>2,000	N
24	N	50	700	1,000	200	N	300	N	>2,000	N
25	N	30	50	700	150	N	200	N	>2,000	200
26	N	15	N	7,000	20	N	100	N	>2,000	N
27	N	15	N	10,000	<20	N	100	N	>2,000	N
28	N	15	N	2,000	70	N	200	N	>2,000	N
29	N	20	N	1,500	100	N	200	N	>2,000	N
30	N	20	30	700	100	N	300	N	>2,000	200
31	N	20	50	500	150	N	300	N	>2,000	200
32	N	15	20	1,000	100	N	300	N	>2,000	200
33	N	50	30	500	150	N	300	N	>2,000	N
34	N	15	30	700	100	N	300	N	>2,000	<200
35	N	20	20	500	200	N	500	N	>2,000	<200
36	N	15	N	700	150	N	300	N	>2,000	200
37	N	10	30	1,500	100	N	150	N	>2,000	<200
38	N	20	<20	700	200	N	300	N	>2,000	200
39	N	20	<20	1,500	100	N	200	N	>2,000	200
40	N	15	30	300	150	N	500	N	>2,000	200
41	N	20	20	500	150	N	500	N	>2,000	200
42	N	15	30	1,000	1,000	N	300	N	>2,000	N
43	N	20	30	700	150	N	300	N	>2,000	<200
44	N	20	20	700	150	N	300	N	>2,000	<200
45	N	20	20	700	100	N	200	N	>2,000	N
46	N	20	<20	700	100	N	300	N	>2,000	N
47	N	20	30	1,500	150	N	300	N	>2,000	<200
48	N	<10	N	5,000	20	N	30	N	2,000	200
49	N	30	<20	700	70	N	500	N	>2,000	N
50	N	30	<20	700	150	N	200	N	>2,000	N
51	N	30	<20	500	150	N	300	N	>2,000	N
52	N	20	<20	1,000	100	N	200	N	>2,000	N
53	N	20	<20	1,000	150	N	300	N	>2,000	<200
54	N	15	N	1,000	70	N	150	N	>2,000	<200

Table 3. Spectrographic results from the analysis of nonmagnetic heavy-mineral concentrate samples from Slate Range Wilderness Study Area, California--continued

Sample	Latitude	Longitude	Fe-ppt. s	Mg-ppt. s	Ca-ppt. s	Ti-ppt. s	Mn-ppt. s	Ag-ppt. s	As-ppt. s	Au-ppt. s	B-ppt. s	Ba-ppt. s
56	35 50 6	116 57 36	1.0	.70	10.0	2.00	300	N	N	N	N	10,000
57	35 49 21	116 57 30	.7	.15	10.0	1.50	300	N	N	N	50	>10,000
58	35 48 55	116 57 17	.7	.30	7.0	2.00	200	N	N	N	<20	10,000
59	35 49 58	117 1 59	1.0	.70	7.0	2.00	200	N	N	N	<20	1,500
60	35 50 51	117 0 58	.2	.15	3.0	.50	150	N	N	N	N	>10,000
61	35 50 37	117 0 45	.3	.15	3.0	2.00	150	N	N	N	N	3,000
62	35 50 15	117 0 40	.7	.70	7.0	.70	300	N	N	N	20	>10,000
63	35 50 29	117 5 16	.7	.30	7.0	>2.00	300	N	N	N	20	2,000
64	35 50 27	117 5 23	1.5	.50	7.0	>2.00	300	N	N	N	N	700
65	35 50 10	117 5 1	1.0	.50	10.0	>2.00	300	N	N	N	30	200
66	35 50 11	117 5 19	1.5	.30	7.0	>2.00	300	N	N	N	N	300
67	35 49 54	117 5 21	1.5	.70	10.0	>2.00	300	N	N	N	N	700
68	35 49 25	117 5 9	1.0	.50	10.0	>2.00	500	N	N	N	<20	200
69	35 49 22	117 5 33	2.0	1.00	10.0	>2.00	500	N	N	N	N	300
70	35 50 28	117 3 43	.7	.20	5.0	>2.00	300	N	N	N	<20	500
72	35 50 7	117 2 50	1.0	.30	5.0	2.00	300	N	N	N	N	700
73	35 49 56	117 2 49	2.0	1.50	7.0	2.00	500	N	N	N	30	1,000
74	35 49 32	117 2 32	5.0	1.00	7.0	>2.00	700	N	N	N	N	700
75	35 49 7	117 2 12	1.5	1.00	10.0	>2.00	700	N	N	N	N	2,000
76	35 48 47	117 1 47	1.5	1.00	7.0	>2.00	300	N	N	N	20	300
77	35 48 21	117 1 49	1.5	.30	1.0	2.00	300	N	N	N	N	700
80	35 48 48	117 5 31	1.0	.30	7.0	>2.00	300	N	N	N	<20	500
81	35 48 21	117 5 7	1.0	.50	10.0	>2.00	500	N	N	N	50	500
82	35 47 55	117 5 31	1.5	1.00	7.0	>2.00	500	N	N	N	N	300
83	35 47 56	117 5 54	1.5	1.50	10.0	>2.00	500	N	N	N	20	1,000
84	35 47 50	117 4 23	1.5	1.50	15.0	>2.00	700	N	N	N	50	500
85	35 47 49	117 4 29	.7	.30	5.0	>2.00	300	N	N	N	N	500
86	35 48 58	117 4 59	.7	.50	10.0	>2.00	500	N	N	N	20	500
87	35 48 37	117 4 38	1.0	1.00	10.0	>2.00	500	N	N	N	<20	300
89	35 52 41	117 0 31	1.5	1.00	15.0	1.00	300	N	N	N	N	1,000
90	35 52 24	117 0 3	1.0	.30	15.0	1.00	700	N	N	N	20	>10,000
91	35 52 32	117 0 5	1.5	1.00	15.0	1.50	500	N	N	N	20	10,000
92	35 52 9	116 58 53	1.5	1.50	10.0	1.50	500	N	N	N	N	>10,000
93	35 52 11	116 57 50	1.5	.70	7.0	2.00	300	N	N	N	N	>10,000
94	35 52 16	116 57 49	1.5	.70	7.0	2.00	500	N	N	N	20	10,000
95	35 52 42	116 57 58	1.0	.70	10.0	1.50	500	N	N	N	20	2,000
97	35 52 48	116 59 44	.7	.20	5.0	.70	200	N	N	N	N	>10,000
98	35 52 40	116 58 36	1.0	.50	10.0	1.50	500	N	N	N	N	>10,000
99	35 52 5	117 0 55	1.5	1.00	15.0	1.50	500	N	N	N	<20	10,000
100	35 51 29	117 1 31	1.5	1.00	5.0	.70	500	N	N	N	20	>10,000
101	35 50 52	117 1 40	2.0	3.00	10.0	2.00	1,000	N	N	N	50	>10,000
102	35 52 13	117 1 36	.7	.70	3.0	.50	200	N	N	N	N	>10,000
105	35 52 47	117 2 19	7.0	10.00	20.0	2.00	1,500	N	N	N	N	>10,000
106	35 52 26	117 2 21	5.0	10.00	15.0	1.50	1,500	N	N	N	N	>10,000
108	35 51 11	117 2 3	3.0	5.00	7.0	1.00	700	N	N	N	N	>10,000

Table 3. Spectrographic results from the analysis of nonmagnetic heavy-mineral concentrate samples from Slate Range Wilderness Study Area, California--continued

Sample	Be-ppm s	Bi-ppm s	Cd-ppm s	Co-ppm s	Cr-ppm s	Cu-ppm s	La-ppm s	Mo-ppm s	Nb-ppm s	Ni-ppm s	Pb-ppm s
56	<2	N	N	<10	150	15	500	10	<50	50	70
57	<2	N	N	N	30	20	500	10	<50	20	100
58	<2	N	N	<10	50	20	500	10	<50	20	70
59	N	N	N	10	100	15	200	10	<50	20	70
60	<2	N	N	N	30	<10	150	N	N	<10	30
61	<2	N	N	N	20	15	200	10	N	<10	70
62	<2	N	N	<10	200	15	200	N	<50	30	50
63	N	N	N	<10	50	15	200	15	50	10	50
64	N	N	N	10	150	15	300	10	50	15	50
65	N	N	N	10	100	30	700	15	70	10	100
66	N	N	N	10	70	30	200	15	50	<10	50
67	N	N	N	<10	100	30	300	10	50	15	50
68	N	N	N	10	100	20	700	15	70	15	70
69	N	N	N	10	150	20	700	10	50	30	50
70	N	N	N	10	50	15	500	15	70	<10	50
72	N	N	N	<10	70	15	150	N	<50	20	50
73	N	N	N	10	150	20	200	<10	50	30	70
74	N	N	N	20	300	70	500	20	100	70	50
75	N	N	N	20	200	<10	500	N	100	70	50
76	N	N	N	10	200	15	500	10	50	50	50
77	N	N	N	<10	100	30	200	30	<50	50	150
80	N	N	N	10	50	20	500	10	50	N	30
81	N	N	N	10	70	20	700	10	<10	<10	30
82	N	N	N	15	300	15	500	15	100	50	50
83	N	N	N	10	200	30	700	15	70	50	100
84	N	N	N	10	150	30	1,000	15	70	20	70
85	N	N	N	10	50	15	200	N	50	N	5,000
86	N	N	N	<10	70	15	500	N	70	<10	100
87	3	N	N	10	70	20	700	10	70	<10	50
89	<2	N	N	10	150	30	300	N	50	30	50
90	2	70	N	10	50	30	500	10	50	20	50
91	N	N	N	10	200	10	500	<10	<50	50	50
92	N	N	N	20	150	20	200	N	<50	30	50
93	<2	N	N	10	100	20	300	<10	<50	20	50
94	N	N	N	10	150	20	500	N	50	15	50
95	N	N	N	10	150	15	700	15	<50	30	50
97	<2	N	N	<10	30	20	100	N	<50	15	30
98	N	N	N	<10	70	30	500	<10	50	30	50
99	2	N	N	10	150	30	300	<10	<50	50	50
100	N	N	N	N	300	50	70	N	<50	50	20
101	N	N	N	15	500	70	500	N	50	100	30
102	N	N	N	<10	150	15	50	N	N	30	20
105	N	N	N	30	1,000	30	150	N	<50	300	50
106	N	N	N	50	1,500	30	100	N	<50	500	<20
108	<2	N	N	20	300	50	100	N	<50	200	30

Table 3. Spectrographic results from the analysis of nonmagnetic heavy-mineral concentrate samples from Slate Range Wilderness Study Area, California--continued

Sample	Sb-ppm s	Sc-ppm s	Sn-ppm s	Sr-ppm s	V-ppm s	W-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Th-ppm s
56	N	15	<20	2,000	100	N	300	N	>2,000	<200
57	N	15	<20	3,000	70	N	300	N	>2,000	<200
58	N	15	20	1,500	100	N	300	N	>2,000	<200
59	N	10	20	2,000	100	N	200	N	>2,000	<200
60	N	<10	N	5,000	50	N	150	N	>2,000	N
61	N	30	20	700	100	N	500	N	>2,000	200
62	N	10	N	2,000	70	N	150	N	>2,000	<200
63	N	20	20	1,500	100	N	300	N	>2,000	300
64	N	30	30	1,000	150	N	500	N	>2,000	200
65	N	30	70	N	200	N	700	N	>2,000	200
66	N	20	50	500	150	N	500	N	>2,000	300
67	N	20	30	1,500	200	N	300	N	>2,000	300
68	N	20	50	N	200	N	500	N	>2,000	300
69	N	20	50	700	200	N	500	N	>2,000	200
70	N	15	30	500	150	N	300	N	>2,000	300
72	N	15	N	2,000	100	N	100	N	>2,000	N
73	N	10	20	3,000	150	N	200	N	>2,000	200
74	N	20	50	1,000	300	N	500	N	>2,000	500
75	N	30	<20	1,000	150	N	500	N	>2,000	500
76	N	30	50	700	150	N	300	N	>2,000	<200
77	N	30	N	2,000	150	N	300	N	>2,000	N
80	N	10	20	1,000	150	N	300	N	>2,000	<200
81	N	15	30	1,000	150	N	500	N	>2,000	N
82	N	15	30	700	150	N	500	N	>2,000	700
83	N	<10	70	1,000	200	N	300	N	>2,000	200
84	N	15	50	500	200	N	500	N	>2,000	<200
85	N	15	30	700	100	N	200	N	>2,000	N
86	N	15	30	700	100	N	300	N	>2,000	200
87	N	20	50	500	150	N	500	N	>2,000	300
89	N	15	N	2,000	100	N	150	N	>2,000	<200
90	N	15	N	1,000	100	N	200	N	>2,000	N
91	N	15	N	2,000	70	N	200	N	>2,000	N
92	N	15	<20	1,500	100	N	200	N	>2,000	N
93	N	15	N	2,000	70	N	150	N	>2,000	<200
94	N	15	20	1,000	100	N	200	N	>2,000	N
95	N	15	<20	1,000	100	N	300	N	>2,000	<200
97	N	10	<20	7,000	70	N	100	N	>2,000	N
98	N	15	N	2,000	100	N	200	N	>2,000	N
99	N	15	N	2,000	100	N	150	N	>2,000	N
100	N	15	N	2,000	70	N	150	N	>2,000	N
101	N	20	<20	1,000	150	N	300	N	>2,000	<200
102	N	15	N	5,000	70	N	50	N	>2,000	N
105	N	30	N	1,000	300	N	150	N	>2,000	N
106	N	50	N	700	300	N	100	N	>2,000	N
108	N	20	N	1,500	100	N	150	N	>2,000	N

Table 3. Spectrographic results from the analysis of nonmagnetic heavy-mineral concentrate samples from Slate Range Wilderness Study Area, California--continued

Sample	Latitude	Longitude	Fe-ppt. s	Mg-ppt. s	Ca-pct. s	Ti-pct. s	Mn-ppm s	Ag-ppm s	As-ppm s	Au-ppm s	B-ppm s	Ba-ppm s
109	35 51 24	117 0 51	5.0	1.50	2.0	1.00	1,000	N	N	N	100	>10,000
112	35 47 51	117 3 19	15.0	7.00	7.0	2.00	1,000	N	N	N	<20	1,500
113	35 50 25	116 59 21	3.0	1.50	2.0	.70	700	N	N	N	N	>10,000
114	35 49 33	116 59 8	2.0	3.00	10.0	2.00	700	N	N	N	N	10,000
115	35 49 38	116 59 5	3.0	2.00	5.0	1.50	700	N	N	N	N	>10,000
116	35 49 53	117 0 13	5.0	7.00	15.0	1.50	3,000	N	N	N	<20	7,000
118	35 50 22	117 1 44	3.0	5.00	7.0	1.50	700	N	N	N	<20	2,000
121	35 48 55	117 1 20	3.0	3.00	7.0	>2.00	700	N	N	N	30	500
122	35 48 35	117 0 53	3.0	5.00	15.0	>2.00	1,000	N	N	N	N	2,000
123	35 48 3	117 0 6	3.0	2.00	10.0	>2.00	700	N	N	N	N	300
124	35 47 52	117 0 47	7.0	5.00	10.0	>2.00	1,500	N	N	N	N	700
125	35 47 47	117 1 17	.7	.30	5.0	.50	200	N	N	N	<20	700
127	35 51 12	117 4 38	5.0	7.00	15.0	1.50	1,000	N	N	N	20	>10,000
128	35 51 9	117 4 46	2.0	2.00	7.0	1.50	1,000	N	N	N	50	1,500
130	35 49 46	117 3 21	1.5	1.50	10.0	>2.00	500	N	N	N	20	500
131	35 49 24	117 3 32	2.0	3.00	10.0	>2.00	700	N	N	N	N	700
132	35 49 2	117 3 15	1.5	2.00	10.0	2.00	700	N	N	N	30	2,000
133	35 48 30	117 3 6	.5	.20	7.0	.70	150	N	N	N	N	2,000
134	35 47 55	117 2 34	.2	.15	3.0	.70	70	N	N	N	N	500
136	35 52 56	117 3 35	.5	.15	7.0	.30	100	N	N	N	N	10,000
137	35 52 59	117 3 39	.3	1.00	7.0	1.00	700	N	N	N	N	>10,000
138	35 52 43	117 3 53	1.0	1.00	7.0	1.50	300	N	N	N	N	>10,000
139	35 52 49	117 3 55	1.0	3.00	10.0	.15	1,000	N	N	N	N	700
140	35 49 46	117 4 7	1.0	1.00	7.0	>2.00	300	N	N	N	<20	700
142	35 49 11	117 3 59	.7	.50	7.0	2.00	300	N	N	N	<20	5,000
143	35 48 59	117 4 2	2.0	2.00	10.0	>2.00	500	N	N	N	N	300
144	35 48 20	117 3 56	.7	1.00	10.0	>2.00	300	N	N	N	20	700
145	35 48 15	117 4 11	1.5	2.00	10.0	>2.00	700	N	N	N	<20	1,000
147	35 46 48	117 7 8	.5	.30	5.0	>2.00	200	N	N	N	20	7,000
148	35 48 46	117 7 6	1.0	1.00	10.0	>2.00	500	N	N	N	30	700
149	35 48 41	117 8 11	1.0	1.50	10.0	>2.00	700	N	N	N	20	300
150	35 47 52	117 7 54	1.5	1.00	7.0	>2.00	700	N	N	N	50	500
151	35 48 7	117 7 29	.7	.70	7.0	>2.00	300	N	N	N	N	1,000
160	35 52 20	117 3 6	5.0	.30	5.0	1.50	500	N	N	N	N	>10,000
161	35 51 45	117 3 36	5.0	3.00	7.0	>2.00	1,000	N	N	N	30	>10,000
163	35 53 19	117 5 5	.5	.15	5.0	>2.00	300	N	N	N	N	3,000

Table 3. Spectrographic results from the analysis of nonmagnetic heavy-mineral concentrate samples from Slate Range Wilderness Study Area, California--continued

Sample	Be-ppm s	Bi-ppm s	Cd-ppm s	Co-ppm s	Cr-ppm s	Cu-ppm s	La-ppm s	Mo-ppm s	Nb-ppm s	Ni-ppm s	Pb-ppm s
109	N	N	N	30	500	70	200	N	<50	150	50
112	N	N	N	70	500	5,000	500	N	<50	300	50
113	<2	N	N	15	150	50	300	N	N	70	20
114	<2	N	N	15	700	30	300	<10	<50	100	30
115	<2	N	N	15	300	20	300	N	<50	100	30
116	N	N	N	50	1,000	30	500	N	<50	300	50
118	<2	N	N	20	700	20	500	N	<50	200	20
121	N	N	N	20	500	30	300	10	50	150	50
122	N	N	N	30	500	20	500	N	100	200	50
123	N	N	N	15	200	15	200	N	<50	70	50
124	N	N	N	30	500	30	200	N	<50	150	<20
125	2	N	N	<10	50	<10	50	N	N	20	50
127	<2	N	N	15	700	15	100	N	<50	200	30
128	<2	N	N	15	200	15	70	N	<50	100	100
130	N	N	N	15	200	20	700	15	50	50	50
131	N	N	N	15	200	20	300	N	50	70	30
132	N	N	N	10	200	15	500	N	<50	50	50
133	<2	N	N	<10	30	<10	70	N	N	<10	50
134	N	N	N	N	20	<10	50	N	N	<10	30
136	2	N	N	<10	<20	<10	50	N	N	<10	70
137	<2	N	N	N	70	<10	200	N	<50	10	70
138	<2	N	N	<10	150	10	150	N	<50	30	70
139	<2	N	N	<10	200	10	50	N	N	30	30
140	N	N	N	10	100	15	300	<10	50	30	70
142	N	N	N	10	50	15	200	N	<50	15	30
143	N	N	N	15	700	20	200	<10	50	100	20
144	N	N	N	<10	150	15	500	<10	50	10	30
145	N	N	N	10	200	20	500	30	50	30	30
147	N	N	N	<10	50	<10	300	N	70	20	<20
148	N	N	N	10	100	15	500	N	50	30	100
149	N	N	N	10	200	30	700	15	50	50	70
150	N	N	N	20	200	20	1,000	<10	150	70	<20
151	N	N	N	10	150	10	300	<10	70	30	30
160	N	N	N	20	150	<10	300	N	<50	50	<20
161	<2	N	N	200	200	50	300	N	50	300	50
163	N	150	N	10	30	10	500	15	70	20	150

Table 3. Spectrographic results from the analysis of nonmagnetic heavy-mineral concentrate samples from Slate Range Wilderness Study Area, California--continued

Sample	Sb-ppm s	Sc-ppm s	Sn-ppm s	Sr-ppm s	V-ppm s	W-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Th-ppm s
109	N	50	N	1,000	200	N	200	N	>2,000	500
112	N	30	<20	500	500	N	150	<500	>2,000	N
113	N	15	N	3,000	100	N	150	N	>2,000	N
114	N	30	20	500	150	N	300	N	>2,000	<200
115	N	30	<20	1,500	150	N	300	N	>2,000	N
116	N	50	N	300	200	N	200	N	>2,000	N
118	N	50	N	300	150	N	300	N	>2,000	<200
121	N	30	200	500	150	N	300	N	>2,000	300
122	N	50	<20	700	200	N	300	N	>2,000	2,000
123	N	20	20	700	150	N	300	N	>2,000	300
124	N	50	N	700	300	N	300	N	>2,000	N
125	N	10	N	1,500	70	N	50	N	2,000	N
127	N	20	N	1,000	150	N	100	N	2,000	N
128	N	15	N	1,000	100	N	150	N	>2,000	N
130	N	20	30	700	200	N	500	N	>2,000	<200
131	N	15	20	1,000	200	N	200	N	>2,000	<200
132	N	15	20	1,500	150	N	300	N	>2,000	200
133	N	<10	N	1,500	50	N	70	N	>2,000	N
134	N	<10	N	1,000	50	N	70	N	>2,000	N
136	N	<10	N	1,500	30	N	70	N	>2,000	<200
137	N	<10	<20	1,000	50	N	200	N	2,000	700
138	N	10	N	1,000	70	N	200	N	>2,000	500
139	N	<10	N	1,500	20	N	50	N	500	N
140	N	<10	20	1,000	150	N	200	N	>2,000	<200
142	N	<10	<20	1,000	70	N	200	N	>2,000	<200
143	N	20	20	1,000	150	N	200	N	>2,000	N
144	N	10	30	700	100	N	300	N	>2,000	N
145	N	20	30	700	150	N	300	N	>2,000	N
147	N	<10	20	700	100	N	200	N	>2,000	N
148	N	<10	30	1,000	100	N	200	N	>2,000	<200
149	N	20	50	700	200	N	500	N	>2,000	300
150	N	<10	50	N	300	N	700	N	>2,000	700
151	N	<10	<20	2,000	100	N	150	N	>2,000	N
160	N	<10	N	1,500	300	<100	300	N	>2,000	N
161	N	15	20	1,000	200	N	200	N	>2,000	<200
163	N	<10	100	<200	200	700	700	N	>2,000	5,000