UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

# Analytical results and sample locality map of stream-sediment and heavy-mineral-concentrate samples from the Moses and Dennison Peak Roadless Areas, Tulare County, California

By

J. A. Domenico, R. J. Goldfarb, D. L. Leach,

and S. M. Smaglik

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## STUDIES RELATED TO WILDERNESS

The Wilderness Act (Public Law 88-577, September 3, 1964) and related acts require the U.S. Geological Survey and the U.S. Bureau of Mines to survey certain areas on Federal lands to determine their mineral resource potential. Results must be made available to the public and be submitted to the President and the Congress. This report presents the results of a geochemical survey of the Moses and Dennison Peak Roadless Areas in the Sequoia National Forest, Tulare County, California. Moses and Dennison Peak Roadless Areas were classified as further planning areas during the Second Roadless Area Review and Evaluation (RARE II) by the U.S. Forest Service, January 1979.

## INTRODUCTION

From 1979 to 1982, we conducted a reconnaissance geochemical survey of the Moses and Dennison Peak Roadless Areas, Tulare County, California.

The Moses and Dennison Peak Roadless Areas comprise about 45 $mi^2$ in the Sequoia National Forest, of Tulare County, California, and lie immediately southwest of Sequoia National Park (see plate 1). Springville lies 4 miles to the southwest and Visalia is 30 miles to the northwest. Access to the study area is provided by California Highway 190, Gulch Park Road and Bear Creek Road.

The exposed rocks within Moses and Dennison Peak Roadless Areas are primarily Jurassic or Cretaceous plutons of the Sierra Nevada Batholith. Some of these plutons are separated by septa of metamorphic roof pendants. These septa consist of quartzite, schist, marble, and calc-silicate rocks of the Tule River pendants within the Jurassic-Triassic Kings Sequence (Saleeby and others, 1978). The geology of the study areas is discussed in detail by Sawlan and Ort (in press).

Both roadless areas are characterized by extreme relief and dense vegetation. Dennison Peak Roadless Area ranges in elevation from 8400 ft near Dennison Mountain to 3600 ft on Backbone Creek. The North Fork of the Tule River and Dillonwood Grove State Forest, separate Dennison Peak Roadless Area from the northern part of Moses Roadless Area to the southeast. In the northern part of Moses Roadless Area, elevations range from 9300 ft on top of Moses Mountain to 3700 ft along the North Fork of the Tule River. Mountain Home State Forest divides this northern part from the southern part of the Moses Roadless Area, which is centered about the North Fork of the Middle Fork of the Tule River.

## METHODS OF STUDY

### Sample Collection

We collected stream-sediment samples at 85 sites (plate 1). At many of those sites, we also collected a heavy-mineral concentrate. We analyzed 85 stream-sediment samples, and 58 panned-concentrate samples, for a sampling density of about 1 sample per 0.5 $mi^2$ for the stream sediment.

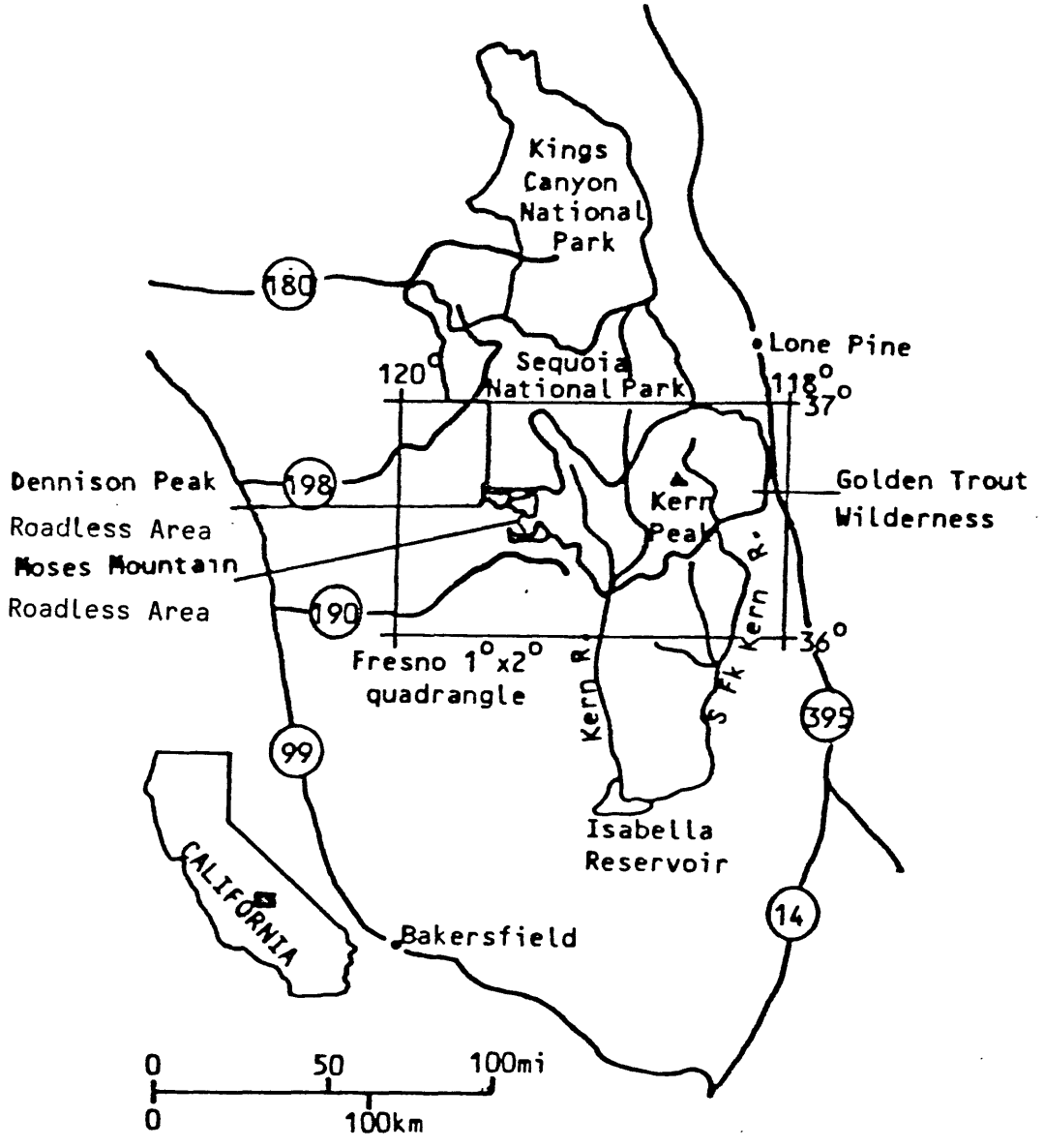


Figure 1. Location map of the Moses and Dennison Peak Roadless Areas, Tulare County, California.

### 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 200 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 material, 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 mm material was retained. The samples were air dried and sieved to minus-80-mesh using stainless steel sieves. The portion of the sediment passing through the sieve was split and a representative fraction 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 and ore related minerals) was hand ground for spectrographic 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) (tables A1 and A2). 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).

## 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.

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Saleeby, J. B., Goodwin, S. E., Sharp, W. D., and Busby, C. J., 1978, Early Mesozoic paleotectonic reconstruction of the southern Sierra Nevada region, in Mesozoic Paleogeography of the Western United States: Society of Economic Paleontologists and Mineralogists Pacific Section, p. 311-336.

Sawlan, M. G., and Ort, K. M., in press, Geologic map of the Moses and Dennison Peak Roadless Areas, Tulare County, California,: U.S. Geological Survey MF Map 1651-C.

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**TABLE 1.--Limits of determination for the spectrographic analysis of 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 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 |

Table A1--Data for stream sediment samples from Moses Mountain Wilderness and Dennison Peak Wilderness, California.

| Sample | LATITUDE | LONGITUDE | S-FE% | S-MG% | S-CA% | S-TI% | S-MN | S-AG | S-AS | S-AU | S-B | S-BA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 36 18 12 | 118 38 46 | 3.0 | 1.5 | 3.0 | .70 | 1,500 | N | N | N | 15 | 500 |
| 02 | 36 18 19 | 118 39 44 | 3.0 | .7 | .7 | .50 | 1,000 | N | N | N | 70 | 300 |
| 03 | 36 18 8 | 118 39 41 | 3.0 | .5 | 1.0 | .50 | 1,500 | N | N | N | 10 | 300 |
| 04 | 36 18 3 | 118 39 59 | 3.0 | 1.0 | .7 | .70 | 1,000 | N | N | N | 70 | 300 |
| 05 | 36 17 19 | 118 39 49 | 2.0 | .7 | .7 | .30 | 1,000 | N | N | N | 20 | 200 |
| 06 | 36 17 5 | 118 39 52 | 7.0 | 1.5 | 1.0 | .70 | 1,000 | N | N | N | 70 | 300 |
| 07 | 36 16 32 | 118 39 52 | 5.0 | 1.0 | .3 | .50 | 700 | N | N | N | 70 | 300 |
| 08 | 36 16 13 | 118 39 59 | 7.0 | 1.5 | 1.0 | .70 | 1,500 | N | N | N | 70 | 700 |
| 09 | 36 14 30 | 118 37 4 | 7.0 | 3.0 | 2.0 | 1.00 | 1,000 | N | N | N | 70 | 300 |
| 10 | 36 14 27 | 118 37 1 | 10.0 | 3.0 | 2.0 | .70 | 1,000 | N | N | N | 50 | 200 |
| 11 | 36 14 1 | 118 37 50 | 7.0 | 2.0 | 1.5 | .50 | 700 | N | N | N | 100 | 300 |
| 12 | 36 13 57 | 118 37 49 | 15.0 | 3.0 | 3.0 | 1.00 | 1,500 | N | N | N | 100 | 300 |
| 13 | 36 13 28 | 118 38 25 | 7.0 | 3.0 | 2.0 | .70 | 1,000 | N | N | N | 70 | 200 |
| 14 | 36 13 5 | 118 39 6 | 3.0 | 1.5 | .2 | .50 | 1,000 | N | N | N | 150 | 500 |
| 15 | 36 12 11 | 118 38 44 | 2.0 | .5 | >20.0 | .10 | 3,000 | N | N | N | 10 | 100 |
| 16 | 36 11 27 | 118 40 8 | 7.0 | 2.0 | 5.0 | .30 | 1,500 | N | N | N | 10 | 300 |
| 17 | 36 10 11 | 118 42 23 | 5.0 | 1.5 | 2.0 | .30 | 1,000 | N | N | N | 10 | 200 |
| 18 | 36 9 34 | 118 43 49 | 3.0 | .3 | .5 | .20 | 500 | N | N | N | 15 | 500 |
| 19 | 36 11 25 | 118 44 51 | 5.0 | 1.5 | 5.0 | .30 | 1,000 | N | N | N | 15 | 300 |
| 20 | 36 17 8 | 118 46 5 | 1.0 | .2 | .3 | .20 | 1,000 | N | N | N | 30 | 300 |
| 21 | 36 17 52 | 118 46 30 | 2.0 | .2 | .3 | .30 | 700 | N | N | N | 30 | 500 |
| 22 | 36 18 19 | 118 46 48 | 1.0 | .2 | .2 | .20 | 700 | .5 | N | N | 20 | 500 |
| 23 | 36 18 8 | 118 47 25 | 3.0 | 1.0 | .7 | .50 | 500 | N | N | N | 20 | 200 |
| 24 | 36 18 8 | 118 47 17 | 3.0 | .3 | .2 | .20 | 1,000 | N | N | N | 20 | 700 |
| 25 | 36 18 28 | 118 48 28 | 7.0 | 3.0 | 2.0 | 1.00 | 1,500 | N | N | N | 30 | 700 |
| 26 | 36 17 26 | 118 42 11 | 3.0 | .5 | .3 | .30 | 1,500 | N | N | N | 20 | 1,000 |
| 27 | 36 17 11 | 118 42 36 | 3.0 | .2 | .2 | .20 | 700 | N | N | N | 15 | 500 |
| 28 | 36 13 24 | 118 36 59 | 7.0 | 3.0 | 3.0 | 1.00 | 1,500 | N | N | N | 20 | 500 |
| 29 | 36 12 38 | 118 36 51 | 3.0 | 2.0 | 3.0 | .50 | 700 | .5 | N | N | 150 | 300 |
| 30 | 36 11 59 | 118 38 8 | 7.0 | 2.0 | 1.5 | 1.00 | 1,000 | N | N | N | 100 | 300 |
| 31 | 36 11 39 | 118 41 33 | 5.0 | .5 | 1.0 | .20 | 500 | N | N | N | N | 200 |
| 32 | 36 11 30 | 118 36 49 | 7.0 | 3.0 | 2.0 | .70 | 1,500 | .5 | N | N | 70 | 500 |
| 33 | 36 10 59 | 118 41 34 | 5.0 | .7 | 1.0 | .20 | 700 | N | N | N | 10 | 200 |
| 34 | 36 9 16 | 118 45 6 | 3.0 | .5 | 2.0 | .20 | 700 | N | N | N | 10 | 700 |
| 35 | 36 11 23 | 118 46 7 | 3.0 | 1.5 | 3.0 | .30 | 1,000 | N | N | N | 20 | 700 |
| 36 | 36 18 45 | 118 41 37 | 2.0 | .2 | .5 | .15 | 500 | N | N | N | 15 | 300 |
| 37 | 36 18 27 | 118 41 8 | 1.5 | .7 | .7 | .20 | 300 | N | N | N | 20 | 200 |
| 38 | 36 18 30 | 118 42 59 | 1.5 | .5 | .7 | .20 | 300 | N | N | N | N | 300 |
| 39 | 36 18 30 | 118 43 5 | 1.5 | .3 | .5 | .20 | 300 | N | N | N | N | 200 |
| 40 | 36 17 8 | 118 44 1 | 2.0 | .3 | .3 | .20 | 700 | N | N | N | 20 | 500 |
| 41 | 36 16 35 | 118 44 51 | 3.0 | .7 | .7 | .30 | 1,000 | N | N | N | 70 | 700 |
| 42 | 36 15 40 | 118 44 10 | 7.0 | .7 | 1.0 | .30 | 700 | N | N | N | 10 | 300 |
| 43 | 36 19 7 | 118 47 40 | 3.0 | 1.5 | 1.0 | .50 | 1,000 | N | N | N | 50 | 200 |
| 44 | 36 18 18 | 118 47 2 | 3.0 | .7 | .5 | .20 | 500 | N | N | N | 50 | 700 |
| 45 | 36 18 7 | 118 47 18 | 3.0 | .7 | .7 | .20 | 700 | N | N | N | 30 | 700 |

Table A1--Data for stream sediment samples from Moses Mountain Wilderness and Dennison Peak Wilderness, California.

| Sample | S-BE | S-BI | S-CD | S-CO | S-CR | S-CU | S-LA | S-MO | S-NB | S-NI | S-PB |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 3.0 | N | N | 7 | 20 | 10 | 100 | <5 | N | 10 | 70 |
| 02 | 2.0 | N | N | 10 | 70 | 15 | 50 | N | N | 30 | 20 |
| 03 | 2.0 | N | N | 7 | 20 | 10 | 50 | N | N | <5 | 30 |
| 04 | 2.0 | N | N | 15 | 70 | 15 | 70 | N | 20 | 30 | 20 |
| 05 | 10.0 | N | N | 5 | 50 | 7 | N | N | N | 20 | 70 |
| 06 | 3.0 | N | N | 20 | 100 | 20 | 50 | N | 20 | 30 | 50 |
| 07 | 5.0 | N | N | 15 | 70 | 20 | 70 | 7 | 20 | 50 | 70 |
| 08 | 3.0 | N | N | 20 | 100 | 20 | 50 | N | 20 | 30 | 50 |
| 09 | 1.0 | N | N | 30 | 100 | 20 | 50 | N | N | 20 | 30 |
| 10 | 1.0 | N | N | 30 | 150 | 20 | 30 | N | <20 | 20 | 15 |
| 11 | 1.0 | N | N | 30 | 150 | 20 | 50 | N | N | 30 | 20 |
| 12 | 1.0 | N | N | 50 | 300 | 30 | 100 | N | <20 | 70 | 20 |
| 13 | 1.0 | N | N | 30 | 150 | 20 | 30 | N | N | 50 | 10 |
| 14 | 2.0 | N | N | 20 | 70 | 20 | 30 | N | N | 70 | 70 |
| 15 | 1.5 | N | N | 5 | 20 | 7 | N | 20 | N | 20 | 20 |
| 16 | 2.0 | N | N | 15 | 100 | 10 | N | N | N | 10 | 50 |
| 17 | 1.5 | N | N | 15 | 30 | 5 | N | N | N | 5 | 20 |
| 18 | 2.0 | N | N | <5 | N | 20 | 50 | N | N | <5 | 30 |
| 19 | 2.0 | N | N | 10 | 15 | 15 | 20 | N | N | 5 | 30 |
| 20 | 5.0 | N | N | 5 | 10 | 15 | 50 | N | N | 15 | 50 |
| 21 | 5.0 | N | N | 7 | 15 | 30 | 100 | 5 | N | 15 | 100 |
| 22 | 3.0 | N | N | N | N | 10 | 70 | N | N | <5 | 50 |
| 23 | 1.0 | N | N | 20 | 70 | 20 | N | N | N | 15 | 20 |
| 24 | 2.0 | N | N | 7 | 20 | 20 | 70 | <5 | N | 10 | 70 |
| 25 | 1.0 | N | N | 30 | 100 | 50 | 300 | N | N | 20 | 30 |
| 26 | 5.0 | N | N | 7 | 20 | 20 | 200 | 7 | <20 | 15 | 150 |
| 27 | 3.0 | N | N | <5 | <10 | 5 | 70 | <5 | N | 5 | 30 |
| 28 | 1.0 | N | N | 50 | 150 | 30 | 50 | N | N | 30 | 30 |
| 29 | 1.0 | N | N | 50 | 150 | 100 | 30 | N | N | 50 | 30 |
| 30 | 1.0 | N | N | 30 | 100 | 30 | 30 | N | N | 50 | 30 |
| 31 | 2.0 | N | N | 10 | 20 | 5 | 20 | N | N | 5 | 30 |
| 32 | 1.0 | N | N | 30 | 100 | 50 | 50 | N | N | 50 | 50 |
| 33 | 2.0 | N | N | 7 | 30 | <5 | 20 | N | N | 5 | 20 |
| 34 | 1.5 | N | N | 5 | <10 | 20 | 30 | N | N | 5 | 50 |
| 35 | 1.5 | N | N | 10 | 30 | 15 | 100 | N | N | 20 | 50 |
| 36 | 2.0 | N | N | 5 | N | <5 | 50 | N | N | <5 | 30 |
| 37 | 2.0 | N | N | 5 | 15 | 7 | N | N | N | 10 | 30 |
| 38 | 1.5 | N | N | 5 | N | <5 | 30 | N | N | <5 | 30 |
| 39 | 2.0 | N | N | 5 | N | <5 | 20 | N | N | <5 | 30 |
| 40 | 3.0 | N | N | 5 | 10 | 10 | 70 | N | N | 5 | 50 |
| 41 | 2.0 | N | N | 7 | 15 | 15 | N | 5 | N | 5 | 30 |
| 42 | 2.0 | N | N | 15 | 20 | 10 | 70 | N | N | 5 | 30 |
| 43 | 1.5 | N | N | 15 | 20 | 15 | N | N | N | 15 | 20 |
| 44 | 2.0 | N | N | 10 | 30 | 20 | 70 | N | 20 | 15 | 70 |
| 45 | 2.0 | N | N | 10 | 30 | 20 | 70 | N | 20 | 20 | 70 |

Table A1--Data for stream sediment samples from Moses Mountain Wilderness and Dennison Peak Wilderness, California.

| Sample | S-SB | S-SC | S-SN | S-SR | S-V | S-W | S-Y | S-ZN | S-ZR | S-TH |
|---|---|---|---|---|---|---|---|---|---|---|
| 01 | N | 20 | N | 300 | 150 | N | 70 | N | 300 | N |
| 02 | N | 15 | N | 150 | 150 | N | 50 | N | 300 | N |
| 03 | N | 10 | N | 150 | 100 | N | 50 | N | 500 | N |
| 04 | N | 15 | N | 100 | 100 | N | 50 | N | 500 | N |
| 05 | N | 5 | N | 100 | 50 | N | 70 | N | 200 | N |
| 06 | N | 20 | N | 100 | 150 | N | 70 | N | 300 | N |
| 07 | N | 15 | N | N | 100 | N | 70 | N | 200 | N |
| 08 | N | 20 | N | 200 | 150 | N | 70 | N | 500 | N |
| 09 | N | 50 | N | 300 | 300 | N | 70 | N | 300 | N |
| 10 | N | 50 | N | 200 | 300 | N | 70 | N | 700 | N |
| 11 | N | 30 | N | 100 | 200 | N | 50 | N | 200 | N |
| 12 | N | 30 | N | 200 | 300 | N | 70 | N | 300 | N |
| 13 | N | 30 | N | 200 | 300 | N | 70 | N | 500 | N |
| 14 | N | 15 | N | N | 200 | N | 30 | N | 300 | N |
| 15 | N | 5 | N | 500 | 50 | N | 20 | N | 30 | N |
| 16 | N | 30 | N | 300 | 200 | N | 70 | N | 500 | N |
| 17 | N | 20 | N | 200 | 150 | N | 50 | N | 500 | N |
| 18 | N | 7 | N | 200 | 70 | N | 50 | N | 300 | N |
| 19 | N | 20 | N | 300 | 100 | N | 50 | N | 300 | N |
| 20 | N | 5 | N | <100 | 30 | N | 70 | N | 200 | N |
| 21 | N | 7 | N | N | 70 | N | 100 | N | 500 | N |
| 22 | N | 5 | N | N | 20 | N | 70 | N | 300 | N |
| 23 | N | 20 | N | 150 | 200 | N | 50 | N | 1,000 | N |
| 24 | N | 5 | N | N | 100 | N | 100 | N | 500 | N |
| 25 | N | 50 | N | 300 | 300 | N | 100 | N | 1,000 | N |
| 26 | N | 10 | N | N | 100 | N | 150 | 200 | 500 | N |
| 27 | N | 5 | N | N | 50 | N | 70 | N | 700 | N |
| 28 | N | 50 | N | 300 | 300 | N | 100 | <200 | 500 | N |
| 29 | N | 20 | N | 300 | 200 | N | 50 | <200 | 300 | N |
| 30 | N | 30 | N | 150 | 300 | N | 50 | N | 200 | N |
| 31 | N | 15 | N | 150 | 100 | N | 30 | N | 300 | N |
| 32 | N | 30 | N | 200 | 200 | N | 70 | N | 300 | N |
| 33 | N | 15 | N | 150 | 150 | N | 50 | N | 700 | N |
| 34 | N | 7 | N | 150 | 100 | N | 50 | N | 300 | N |
| 35 | N | 15 | N | 200 | 100 | N | 50 | N | 300 | N |
| 36 | N | 5 | N | 200 | 50 | N | 20 | N | 300 | N |
| 37 | N | 5 | N | 150 | 50 | N | 15 | N | 100 | N |
| 38 | N | 5 | N | 200 | 50 | N | 10 | N | 50 | N |
| 39 | N | 5 | N | 100 | 50 | N | 15 | N | 200 | N |
| 40 | N | 5 | N | N | 30 | N | 70 | N | 300 | N |
| 41 | N | 7 | N | 100 | 70 | N | 50 | N | 1,000 | N |
| 42 | N | 20 | N | 150 | 150 | N | 70 | N | 500 | N |
| 43 | N | 15 | N | 150 | 100 | N | 20 | N | 200 | N |
| 44 | N | 10 | 15 | 150 | 100 | N | 50 | N | 500 | N |
| 45 | N | 7 | 10 | 100 | 100 | N | 50 | N | 300 | N |

Table A1--Data for stream sediment samples from Moses Mountain Wilderness and Dennison Peak Wilderness, California.--continued

| Sample | LATITUDE | LONGITUDE | S-FE% | S-MG% | S-CA% | S-TI% | S-MN | S-AG | S-AS | S-AU | S-B | S-BA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 46 | 36 17 57 | 118 47 11 | 5.0 | 1.0 | .7 | .30 | 700 | N | N | N | 70 | 700 |
| 47 | 36 17 56 | 118 47 23 | 5.0 | 1.0 | 1.0 | .70 | 1,000 | 30.0 | N | N | 100 | 500 |
| 48 | 36 17 52 | 118 47 17 | 5.0 | 1.0 | .7 | 1.00 | 700 | N | N | N | 70 | 700 |
| 49 | 36 17 45 | 118 47 13 | 5.0 | 1.5 | 1.5 | .70 | 700 | N | N | N | 50 | 700 |
| 50 | 36 17 21 | 118 47 3 | 3.0 | 1.0 | 1.0 | .50 | 700 | N | N | N | 70 | 700 |
| 51 | 36 14 32 | 118 39 14 | 2.0 | 1.0 | .5 | .20 | 700 | N | N | N | 20 | 100 |
| 52 | 36 14 22 | 118 38 56 | 5.0 | 1.5 | 2.0 | .50 | 1,000 | .5 | N | N | 100 | 200 |
| 53 | 36 17 59 | 118 42 4 | 2.0 | .7 | 1.0 | .30 | 300 | N | N | N | N | 300 |
| 54 | 36 17 30 | 118 42 7 | 1.5 | .3 | .3 | .20 | 500 | N | N | N | 15 | 700 |
| 55 | 36 15 27 | 118 42 41 | 1.5 | .5 | .7 | .20 | 200 | N | N | N | N | 700 |
| 56 | 36 12 10 | 118 39 11 | 3.0 | .7 | .5 | .30 | 300 | N | N | N | 100 | 300 |
| 57 | 36 9 37 | 118 44 34 | 15.0 | .5 | 2.0 | .30 | 1,000 | N | N | N | 10 | 1,000 |
| 58 | 36 10 41 | 118 41 56 | 15.0 | 3.0 | 5.0 | .20 | 1,500 | 7.0 | N | N | 15 | 300 |
| 59 | 36 18 32 | 118 47 26 | 7.0 | .7 | .7 | .50 | 1,500 | 1.0 | N | N | 30 | 1,000 |
| 60 | 36 15 50 | 118 41 45 | 7.0 | 2.0 | .7 | .50 | 1,500 | <.5 | N | N | 20 | 1,000 |
| 61 | 36 16 3 | 118 42 8 | 5.0 | 1.0 | .5 | .30 | 1,000 | N | N | N | 10 | 1,500 |
| 62 | 36 16 50 | 118 41 32 | 7.0 | .5 | .5 | .30 | 1,500 | N | N | N | 10 | 1,000 |
| 63 | 36 17 14 | 118 41 33 | 5.0 | .3 | .5 | .30 | 2,000 | N | N | N | 30 | 1,000 |
| 64 | 36 17 40 | 118 41 44 | 7.0 | .5 | 1.0 | .50 | 1,000 | N | N | N | 50 | 700 |
| 65 | 36 18 10 | 118 41 36 | 5.0 | .7 | 2.0 | .50 | 1,000 | 20.0 | N | N | 10 | 1,000 |
| 66 | 36 16 45 | 118 43 23 | 3.0 | .7 | .7 | .20 | 700 | N | N | N | 20 | 1,000 |
| 67 | 36 16 47 | 118 42 23 | 5.0 | 1.0 | .7 | .50 | 1,500 | N | N | N | 20 | 1,000 |
| 68 | 36 15 55 | 118 42 41 | 5.0 | 1.0 | .5 | .50 | 1,000 | N | N | N | 20 | 1,000 |
| 69 | 36 15 57 | 118 43 29 | 5.0 | .7 | .5 | .30 | 1,500 | N | N | N | 20 | 1,000 |
| 70 | 36 16 5 | 118 44 44 | 10.0 | 1.5 | 1.5 | .20 | 1,000 | N | N | N | 10 | 700 |
| 71 | 36 10 10 | 118 43 30 | 15.0 | 3.0 | 10.0 | 1.00 | 2,000 | N | N | N | 10 | 500 |
| 72 | 36 10 51 | 118 42 56 | 7.0 | 1.0 | .7 | .50 | 1,000 | N | N | N | 20 | 1,000 |
| 73 | 36 18 46 | 118 43 36 | 7.0 | 1.0 | .5 | .70 | 1,000 | N | N | N | 20 | 1,000 |
| 74 | 36 17 55 | 118 44 15 | 2.0 | .5 | .5 | .30 | 1,000 | N | N | N | 20 | 700 |
| 75 | 36 17 20 | 118 44 39 | 7.0 | 2.0 | 2.0 | .50 | 2,000 | N | N | N | 150 | 700 |
| 76 | 36 16 0 | 118 40 16 | 7.0 | 2.0 | 5.0 | .50 | 1,500 | N | N | N | 10 | 500 |
| 77 | 36 10 40 | 118 44 7 | 20.0 | 5.0 | 7.0 | 1.00 | 2,000 | N | N | N | 10 | 700 |
| 78 | 36 18 40 | 118 44 24 | 7.0 | 1.5 | .7 | .50 | 1,000 | N | N | N | 20 | 1,500 |
| 79 | 36 18 0 | 118 46 0 | 5.0 | .7 | .5 | .50 | 1,000 | N | N | N | 20 | 1,500 |
| 80 | 36 18 35 | 118 47 14 | 10.0 | 2.0 | 5.0 | >1.00 | 1,500 | N | N | N | 100 | 700 |
| 81 | 36 15 21 | 118 40 45 | 10.0 | .3 | .7 | 1.00 | 3,000 | N | N | N | 20 | 2,000 |
| 82 | 36 16 51 | 118 41 56 | 2.0 | .5 | .1 | .20 | 700 | N | N | N | 30 | 700 |
| 83 | 36 14 50 | 118 42 44 | 2.0 | 1.0 | 1.0 | .30 | 500 | N | N | N | 15 | 1,000 |
| 84 | 36 14 10 | 118 41 33 | 2.0 | 1.5 | 2.0 | .30 | 500 | N | N | N | <10 | 700 |
| 85 | 36 14 0 | 118 39 1 | 3.0 | 2.0 | 1.0 | .50 | 700 | N | N | N | 100 | 200 |

Table A1--Data for stream sediment samples from Moses Mountain Wilderness and Dennison Peak Wilderness, California.--continued

| Sample | S-BE | S-BI | S-CD | S-CO | S-CR | S-CU | S-LA | S-MO | S-NB | S-NI | S-PB |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 46 | 1.0 | N | N | 15 | 50 | 15 | N | N | N | 10 | 20 |
| 47 | 1.0 | N | N | 15 | 50 | 20 | 30 | N | N | 15 | 15 |
| 48 | 1.0 | N | N | 15 | 70 | 30 | N | N | N | 20 | 30 |
| 49 | 1.5 | N | N | 20 | 70 | 30 | 20 | N | N | 20 | 50 |
| 50 | 1.5 | N | N | 15 | 70 | 20 | 30 | N | N | 15 | 50 |
| 51 | 5.0 | <10 | N | 10 | 30 | 10 | 30 | 70 | N | 20 | 200 |
| 52 | 3.0 | N | N | 20 | 150 | 20 | 100 | N | N | 100 | 50 |
| 53 | 1.0 | N | N | 7 | 20 | <5 | 70 | <5 | N | 5 | 20 |
| 54 | 3.0 | N | N | <5 | 15 | 15 | 70 | 5 | <20 | 5 | 30 |
| 55 | 1.5 | N | N | 5 | 10 | 10 | 50 | <5 | N | 5 | 30 |
| 56 | 1.5 | N | N | 50 | 100 | 20 | 70 | <5 | N | 70 | 30 |
| 57 | N | N | N | 5 | 20 | <5 | 500 | N | N | N | 20 |
| 58 | N | N | N | 15 | 100 | 5 | N | N | N | 10 | 20 |
| 59 | <5.0 | N | N | 5 | 30 | 30 | 100 | 5 | 30 | 10 | 150 |
| 60 | <5.0 | N | N | 5 | 20 | 50 | 100 | 5 | 20 | 5 | 70 |
| 61 | <5.0 | N | N | 5 | 10 | 10 | 50 | N | <20 | N | 30 |
| 62 | <5.0 | N | N | N | 30 | 20 | 200 | 10 | 20 | 10 | 100 |
| 63 | 5.0 | N | N | N | 10 | 10 | 150 | N | 20 | 5 | 70 |
| 64 | N | N | N | 5 | 20 | 5 | 100 | N | <20 | 5 | 50 |
| 65 | N | N | N | 5 | 20 | N | 100 | N | N | N | 30 |
| 66 | N | N | N | 5 | 15 | 7 | 50 | N | N | 10 | 50 |
| 67 | 5.0 | N | N | 10 | 30 | 10 | 150 | N | 20 | 10 | 70 |
| 68 | <5.0 | N | N | 10 | 20 | 10 | 70 | <5 | <20 | 10 | 50 |
| 69 | <5.0 | N | N | 5 | 20 | 15 | 100 | N | <20 | 10 | 70 |
| 70 | N | N | N | 10 | 30 | <5 | N | N | N | 5 | 30 |
| 71 | N | N | N | 20 | 100 | 7 | N | N | N | 10 | 20 |
| 72 | <5.0 | N | N | 7 | 20 | 10 | 100 | N | 20 | 7 | 50 |
| 73 | <5.0 | N | N | 5 | 20 | 10 | 100 | N | <20 | 7 | 50 |
| 74 | 5.0 | N | N | 5 | 30 | 30 | 100 | N | <20 | 10 | 50 |
| 75 | 7.0 | N | N | 20 | 70 | 30 | 200 | <5 | 20 | 20 | 100 |
| 76 | N | N | N | 20 | 50 | 5 | 70 | N | N | 5 | 30 |
| 77 | N | N | N | 30 | 100 | 7 | N | N | N | 15 | 30 |
| 78 | <5.0 | N | N | 5 | 10 | 20 | 100 | N | 30 | 5 | 50 |
| 79 | N | N | N | 5 | 15 | 20 | 50 | N | <20 | 7 | 70 |
| 80 | N | N | N | 20 | 100 | 20 | 50 | N | N | 15 | 30 |
| 81 | 7.0 | N | N | N | 30 | 10 | 200 | 5 | 50 | 10 | 100 |
| 82 | 5.0 | N | N | 7 | 20 | 20 | 150 | 7 | 20 | 15 | 50 |
| 83 | 2.0 | N | N | 7 | 20 | 10 | 100 | N | N | 10 | 20 |
| 84 | 1.0 | N | N | 15 | 30 | 7 | N | N | N | 7 | 30 |
| 85 | 2.0 | N | N | 50 | 150 | 30 | 50 | N | N | 150 | 30 |

Table A1--Data for stream sediment samples from Moses Mountain Wilderness and Dennison Peak Wilderness, California.--continued

| Sample | S-SB | S-SC | S-SN | S-SR | S-V | S-W | S-Y | S-ZN | S-ZR | S-TH |
|---|---|---|---|---|---|---|---|---|---|---|
| 46 | N | 15 | N | 150 | 150 | N | 20 | N | 500 | N |
| 47 | N | 30 | N | 150 | 200 | N | 50 | N | 1,000 | N |
| 48 | N | 20 | N | 150 | 200 | N | 30 | N | 500 | N |
| 49 | N | 30 | N | 200 | 200 | N | 30 | N | 700 | N |
| 50 | N | 30 | N | 150 | 200 | N | 30 | N | 1,000 | N |
| 51 | N | 10 | N | N | 50 | N | 70 | N | 150 | N |
| 52 | N | 20 | N | 200 | 150 | N | 70 | <200 | 200 | N |
| 53 | N | 10 | N | 200 | 150 | N | 30 | N | 200 | N |
| 54 | N | 5 | <10 | N | 30 | N | 100 | N | 500 | N |
| 55 | N | 7 | N | 200 | 50 | N | 30 | N | 200 | N |
| 56 | N | 15 | N | 100 | 200 | N | 30 | N | 200 | N |
| 57 | N | -- | N | 200 | 150 | N | 70 | N | -- | N |
| 58 | N | -- | N | 300 | 200 | N | 50 | N | -- | N |
| 59 | N | -- | N | N | 50 | N | 100 | N | -- | N |
| 60 | N | -- | 20 | 100 | 30 | N | 100 | <200 | -- | N |
| 61 | N | -- | 30 | N | 20 | N | 50 | N | -- | N |
| 62 | N | -- | N | N | 20 | N | 150 | N | -- | N |
| 63 | N | -- | N | N | 15 | N | 100 | N | -- | N |
| 64 | N | -- | N | 300 | 50 | N | 70 | N | -- | N |
| 65 | N | -- | N | 500 | 100 | N | 20 | N | -- | N |
| 66 | N | -- | N | 100 | 50 | N | 50 | N | -- | N |
| 67 | N | -- | 20 | N | 50 | N | 100 | N | -- | N |
| 68 | N | -- | 10 | N | 50 | N | 70 | N | -- | N |
| 69 | N | -- | N | 100 | 50 | N | 70 | N | -- | N |
| 70 | N | -- | N | 300 | 200 | N | 50 | N | -- | N |
| 71 | N | -- | N | 300 | 300 | N | 70 | N | -- | N |
| 72 | N | -- | N | 100 | 70 | N | 70 | N | -- | N |
| 73 | N | -- | N | 100 | 50 | N | 70 | N | -- | N |
| 74 | N | -- | N | N | 50 | N | 70 | N | -- | N |
| 75 | N | -- | 30 | 200 | 30 | N | 100 | 500 | -- | N |
| 76 | N | -- | N | 500 | 200 | N | 50 | N | -- | N |
| 77 | N | -- | N | 500 | 300 | N | 100 | N | -- | N |
| 78 | N | -- | 20 | 100 | 50 | N | 70 | N | -- | N |
| 79 | N | -- | N | 100 | 30 | N | 50 | N | -- | N |
| 80 | N | -- | N | 300 | 200 | N | 50 | N | -- | N |
| 81 | N | -- | 10 | N | 30 | N | 150 | N | -- | N |
| 82 | N | 10 | 10 | N | 70 | N | 150 | N | 300 | N |
| 83 | N | 10 | N | 200 | 150 | N | 50 | N | 700 | N |
| 84 | N | 20 | N | 200 | 150 | N | 30 | N | 300 | N |
| 85 | N | 15 | N | 150 | 150 | N | 50 | N | 300 | N |

Table A2--Data for heavy-mineral, non-magnetic concentrate samples from Moses Mountain Wilderness and Dennison Peak Wilderness, California.

| Sample | S-BE | S-BI | S-CD | S-CO | S-CR | S-CU | S-LA | S-MO | S-NB | S-NI | S-PB |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 02 | 1 | N | N | N | 100 | 15 | 300 | <5 | 30 | N | 15 |
| 03 | 1 | N | N | 10 | 70 | 15 | 150 | <5 | 30 | N | 30 |
| 09 | 1 | 200 | N | N | 50 | 7 | 1,000 | N | 20 | N | 30 |
| 10 | 1 | N | N | N | 30 | 5 | >1,000 | N | <20 | N | 30 |
| 11 | 1 | 300 | N | 70 | 70 | 5 | 200 | 10 | 20 | N | 150 |
| 12 | 1 | 70 | N | 50 | 50 | 5 | 300 | N | <20 | N | 50 |
| 13 | 1 | 50 | N | 100 | 70 | 20 | 700 | 7 | <20 | N | 20 |
| 16 | 1 | N | N | 15 | N | 5 | 300 | N | <20 | N | 100 |
| 17 | 1 | 20 | N | N | 20 | 10 | 200 | N | <20 | N | 300 |
| 19 | 1 | N | N | 10 | 20 | 7 | 300 | N | 30 | N | 70 |
| 21 | 1 | >1,000 | N | N | <10 | <5 | >1,000 | 7 | 50 | N | 500 |
| 23 | 1 | N | N | N | <10 | N | 100 | N | N | N | 30 |
| 24 | 1 | >1,000 | N | 200 | 15 | 50 | >1,000 | 50 | 20 | N | 3,000 |
| 25 | 1 | 70 | N | N | N | N | >1,000 | N | N | N | N |
| 28 | 1 | 500 | N | 20 | 100 | 5 | 200 | N | <20 | N | 15 |
| 30 | 1 | 100 | N | 100 | 150 | 10 | 500 | N | <20 | N | 150 |
| 31 | 1 | 1,000 | N | 10 | 30 | 5 | 1,000 | N | 30 | N | 100 |
| 33 | 1 | N | N | N | 20 | <5 | 1,000 | N | 20 | N | 100 |
| 34 | 1 | N | N | N | N | N | >1,000 | 10 | 1,000 | N | 50 |
| 35 | 1 | 50 | N | N | 70 | N | >1,000 | <5 | 1,000 | N | 70 |
| 36 | 1 | 500 | N | N | 30 | <5 | >1,000 | N | 150 | N | 70 |
| 38 | 1 | N | N | N | 20 | N | >1,000 | N | 50 | N | 20 |
| 42 | 1 | >1,000 | N | N | 10 | 7 | >1,000 | 20 | 20 | N | N |
| 43 | 1 | 50 | N | N | N | 7 | 100 | N | N | N | 15 |
| 44 | 2 | >1,000 | N | 5 | 50 | 10 | 200 | 20 | 200 | N | 500 |
| 47 | N | 200 | N | 15 | 70 | 10 | 150 | <5 | N | N | 200 |
| 48 | <1 | 20 | N | 10 | 50 | 5 | 50 | <5 | N | N | 50 |
| 49 | 1 | N | N | 5 | 70 | <5 | 70 | N | N | N | 300 |
| 50 | 2 | N | N | 5 | 50 | N | 50 | N | N | 15 | 20 |
| 53 | N | N | N | <10 | 70 | 10 | 500 | 30 | 100 | 10 | 50 |
| 54 | 2 | N | N | N | 20 | <10 | 200 | N | <50 | 20 | 70 |
| 56 | 3 | N | N | <10 | 200 | 20 | 70 | N | N | 30 | 30 |
| 57 | N | N | N | N | N | N | 700 | N | N | N | 30 |
| 58 | N | N | N | 10 | <20 | <10 | 150 | N | N | N | 70 |
| 59 | <2 | >2,000 | N | <10 | N | 10 | N | 70 | 50 | N | 700 |
| 62 | 2 | 30 | N | N | N | 10 | 70 | 10 | N | N | 50 |
| 63 | 3 | <20 | N | N | N | N | 200 | N | 50 | N | 30 |
| 64 | 2 | 50 | N | N | 20 | N | 700 | 70 | 50 | N | 100 |
| 65 | 2 | 100 | N | N | N | N | 500 | 10 | 70 | N | 50 |
| 66 | 3 | 70 | N | N | N | N | N | N | N | N | 20 |
| 67 | 2 | 50 | N | N | N | N | 200 | N | <50 | N | 30 |
| 68 | 3 | 30 | N | N | N | 10 | N | 100 | N | N | 50 |
| 69 | 3 | 200 | N | N | <20 | N | 500 | 10 | N | N | 30 |
| 70 | 3 | 200 | N | N | N | N | 50 | N | N | N | 30 |
| 71 | <2 | 150 | N | N | <20 | 10 | N | N | N | N | 20 |

Table A2--Data for heavy-mineral, non-magnetic concentrate samples from Moses Mountain Wilderness and Dennison Peak Wilderness, California.

| Sample | LATITUDE | LONGITUDE | S-FE% | S-MG% | S-CA% | S-TI% | S-MN | S-AG | S-AS | S-AU | S-B | S-BA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 02 | 36 18 19 | 118 39 44 | .50 | .30 | 7.00 | 1.00 | 700 | N | N | N | 70 | 100 |
| 03 | 36 18 8 | 118 39 41 | .50 | 2.00 | 5.00 | >1.00 | 700 | N | N | N | 50 | 70 |
| 09 | 36 14 30 | 118 37 4 | .30 | .70 | 5.00 | >1.00 | 700 | 2.0 | N | N | 1,000 | 100 |
| 10 | 36 14 27 | 118 37 1 | .50 | .30 | 3.00 | >1.00 | 700 | 3.0 | N | N | 500 | 150 |
| 11 | 36 14 1 | 118 37 50 | .50 | .30 | 3.00 | >1.00 | 500 | 2.0 | N | N | 300 | 100 |
| 12 | 36 13 57 | 118 37 49 | .70 | .70 | 3.00 | >1.00 | 700 | 2.0 | 2,000 | N | 500 | 70 |
| 13 | 36 13 28 | 118 38 25 | 2.00 | .70 | 5.00 | >1.00 | 700 | N | N | N | 300 | 70 |
| 16 | 36 11 27 | 118 40 8 | .50 | .10 | 3.00 | >1.00 | 500 | N | N | N | 20 | 150 |
| 17 | 36 10 11 | 118 42 23 | .20 | .05 | 3.00 | >1.00 | 300 | N | N | N | 20 | 100 |
| 19 | 36 11 25 | 118 44 51 | .20 | .20 | 5.00 | >1.00 | 700 | N | N | N | 30 | 150 |
| 21 | 36 17 52 | 118 46 30 | .50 | .03 | .50 | >1.00 | 200 | N | 300 | N | 20 | 70 |
| 23 | 36 13 8 | 118 47 25 | .10 | .03 | .50 | 1.00 | 100 | N | N | N | 30 | 100 |
| 24 | 36 18 7 | 118 47 18 | 1.00 | .05 | 3.00 | >1.00 | 700 | 2.0 | 10,000 | 10 | 1,000 | 150 |
| 25 | 36 18 28 | 118 48 28 | .05 | .02 | .07 | .30 | 70 | N | N | N | N | 100 |
| 28 | 36 13 24 | 118 36 59 | .20 | .70 | 3.00 | >1.00 | 200 | N | N | N | 150 | 70 |
| 30 | 36 11 59 | 118 38 8 | 1.00 | 1.50 | 3.00 | >1.00 | 500 | N | 500 | N | 1,500 | 500 |
| 31 | 36 11 39 | 118 41 33 | .20 | .15 | 5.00 | >1.00 | 300 | N | N | N | 30 | 100 |
| 33 | 36 10 59 | 118 41 34 | .20 | .10 | 3.00 | >1.00 | 200 | N | N | N | N | 150 |
| 34 | 36 9 16 | 118 45 6 | .05 | .05 | .20 | .02 | 70 | N | N | N | N | 70 |
| 35 | 36 11 23 | 118 46 7 | .15 | .10 | .20 | .10 | 200 | N | N | N | 500 | 500 |
| 36 | 36 18 45 | 118 41 37 | .10 | .05 | 5.00 | >1.00 | 200 | N | N | N | N | 100 |
| 38 | 36 18 30 | 118 42 59 | .20 | .05 | 2.00 | .30 | 200 | N | N | N | 700 | 20 |
| 42 | 36 15 40 | 118 44 10 | .50 | .03 | 2.00 | >1.00 | 200 | N | 500 | N | N | 70 |
| 43 | 36 19 7 | 118 47 40 | .10 | .02 | .10 | .70 | 100 | N | N | N | 100 | 100 |
| 44 | 36 18 18 | 118 47 2 | .70 | .10 | 2.00 | >1.00 | 300 | 30.0 | N | N | 20 | 300 |
| 47 | 36 17 56 | 118 47 23 | 1.00 | .50 | 3.00 | >1.00 | 500 | N | N | N | 2,000 | 300 |
| 48 | 36 17 52 | 118 47 17 | 1.00 | .30 | 3.00 | 1.00 | 500 | N | N | N | 200 | 500 |
| 49 | 36 17 45 | 118 47 13 | 1.50 | .30 | 5.00 | 1.00 | 700 | N | N | N | 300 | 150 |
| 50 | 36 17 21 | 118 47 3 | .30 | .05 | .70 | 1.00 | 100 | N | N | N | 150 | 300 |
| 53 | 36 17 59 | 118 42 4 | .50 | .20 | 5.00 | >2.00 | 500 | N | N | N | 100 | <50 |
| 54 | 36 17 30 | 118 42 7 | .70 | .10 | 1.00 | 1.50 | 300 | N | N | N | 100 | 50 |
| 56 | 36 12 10 | 118 39 11 | 1.00 | .50 | 1.00 | .50 | 300 | N | N | N | 200 | 150 |
| 57 | 36 9 37 | 118 44 34 | .30 | .05 | .50 | .20 | 70 | N | N | N | N | 200 |
| 58 | 36 10 41 | 118 41 56 | .30 | <.05 | 2.00 | >2.00 | 100 | N | N | N | N | 150 |
| 59 | 36 18 32 | 118 47 26 | 1.00 | .30 | .20 | 2.00 | 200 | 50.0 | N | 30 | N | 300 |
| 62 | 36 16 50 | 118 41 32 | 1.50 | .70 | .70 | .50 | 300 | N | N | N | <20 | 200 |
| 63 | 36 17 14 | 118 41 33 | .70 | <.05 | 2.00 | 1.00 | 150 | N | N | N | N | 150 |
| 64 | 36 17 40 | 118 41 44 | .50 | .05 | 1.00 | 2.00 | 200 | N | N | N | 100 | 100 |
| 65 | 36 18 10 | 118 41 36 | .30 | <.05 | 2.00 | >2.00 | 200 | N | N | N | N | 50 |
| 66 | 36 16 45 | 118 43 23 | .70 | .05 | .10 | .70 | 150 | N | N | N | N | 300 |
| 67 | 36 16 47 | 118 42 23 | 1.00 | .07 | .20 | 2.00 | 300 | N | N | N | N | 50 |
| 68 | 36 16 3 | 118 42 8 | 1.50 | .07 | .10 | 1.00 | 150 | N | N | N | N | 200 |
| 69 | 36 15 57 | 118 43 29 | 1.00 | .07 | .15 | 1.00 | 200 | N | N | N | 20 | 100 |
| 70 | 36 16 5 | 118 44 44 | .50 | .05 | 1.00 | 2.00 | 150 | N | N | N | 30 | 100 |
| 71 | 36 15 10 | 118 43 30 | .50 | .05 | 1.50 | >2.00 | 150 | N | N | N | N | 70 |

Table A2--Data for heavy-mineral, non-magnetic concentrate samples from Moses Mountain Wilderness and Dennison Peak Wilderness, California.

| Sample | S-SB | S-SC | S-SN | S-SR | S-V | S-W | S-Y | S-ZN | S-ZR | S-TH |
|---|---|---|---|---|---|---|---|---|---|---|
| C2 | N | 10 | 30 | N | 100 | <50 | 200 | N | 1,000 | 200 |
| C3 | N | 10 | 50 | N | 100 | <50 | 300 | N | >1,000 | <100 |
| C9 | N | 15 | 70 | N | 100 | N | 700 | N | >1,000 | N |
| 10 | N | 15 | 30 | N | 100 | N | 300 | N | >1,000 | N |
| 11 | N | 15 | 50 | N | 100 | 200 | 500 | N | >1,000 | N |
| 12 | N | 15 | 30 | 100 | 100 | N | 300 | N | >1,000 | N |
| 13 | N | 15 | 50 | 200 | 100 | 150 | 500 | N | >1,000 | N |
| 16 | N | 15 | 30 | N | 100 | N | 700 | N | >1,000 | 1,000 |
| 17 | N | 15 | 30 | N | 100 | N | 500 | N | >1,000 | 1,000 |
| 19 | N | 15 | 70 | N | 100 | N | 500 | N | >1,000 | 700 |
| 21 | 100 | 15 | 300 | N | 100 | N | 700 | N | >1,000 | 300 |
| 23 | N | 15 | <10 | N | 100 | <50 | 500 | N | >1,000 | 1,000 |
| 24 | 100 | 15 | 500 | N | 100 | 100 | 2,000 | N | >1,000 | 300 |
| 25 | N | 15 | N | N | 100 | N | 300 | N | >1,000 | 300 |
| 28 | N | 15 | 50 | N | 100 | N | 500 | N | >1,000 | N |
| 30 | <100 | 15 | 30 | N | 100 | <50 | 300 | N | >1,000 | N |
| 31 | N | 15 | 100 | N | 100 | N | 500 | N | >1,000 | 1,000 |
| 33 | N | 15 | 50 | N | 100 | N | 700 | N | >1,000 | 1,000 |
| 34 | <100 | 15 | 10 | N | 100 | N | 1,500 | N | >1,000 | 1,500 |
| 35 | <100 | 15 | <10 | N | 100 | N | 1,500 | N | >1,000 | 700 |
| 36 | N | 15 | 50 | N | 100 | <50 | 1,500 | N | >1,000 | 500 |
| 38 | N | 15 | 50 | N | 100 | 50 | 200 | N | >1,000 | 1,000 |
| 42 | N | 15 | 30 | N | 100 | 200 | 200 | N | >1,000 | 1,000 |
| 43 | N | 15 | N | N | 100 | N | 300 | N | >1,000 | 700 |
| 44 | N | 10 | 100 | N | 100 | 200 | 700 | N | >1,000 | N |
| 47 | N | 15 | 20 | N | 300 | N | 200 | N | >1,000 | 200 |
| 48 | N | 10 | 20 | 100 | 150 | N | 150 | N | >1,000 | 500 |
| 49 | N | 10 | N | N | 150 | N | 300 | N | >1,000 | 200 |
| 50 | N | 10 | N | N | 20 | N | 700 | N | >1,000 | 1,500 |
| 53 | N | 15 | 200 | N | 300 | N | 500 | N | 2,000 | 700 |
| 54 | N | 15 | 50 | N | 20 | <100 | 700 | N | >2,000 | <200 |
| 56 | N | 15 | N | <200 | 300 | N | 20 | N | 500 | N |
| 57 | N | 30 | 20 | N | N | <100 | 200 | N | >2,000 | 500 |
| 58 | N | 30 | 70 | N | 300 | N | 200 | N | >2,000 | 5,000 |
| 59 | N | 50 | 50 | N | 70 | N | 150 | N | 2,000 | 300 |
| 62 | N | 30 | <20 | N | 100 | N | 500 | N | >2,000 | <200 |
| 63 | N | 30 | N | N | 20 | <100 | 500 | N | >2,000 | 300 |
| 64 | N | 30 | 50 | N | 100 | 150 | 500 | N | >2,000 | 1,000 |
| 65 | N | 30 | 100 | N | 200 | N | 300 | N | >2,000 | 1,000 |
| 66 | 200 | 30 | 20 | N | 20 | <100 | 200 | N | >2,000 | N |
| 67 | N | 30 | 150 | N | 100 | N | 500 | N | >2,000 | 200 |
| 68 | N | 30 | 50 | N | 50 | 200 | 300 | N | >2,000 | 300 |
| 69 | N | 30 | 30 | N | 50 | 200 | 500 | N | >2,000 | <200 |
| 70 | N | 30 | 50 | N | 70 | <100 | 300 | N | >2,000 | 200 |
| 71 | N | 30 | 70 | N | 300 | <100 | 200 | N | >2,000 | 200 |

Table A2--Data for heavy-mineral, non-magnetic concentrate samples from Moses Mountain Wilderness and Dennison Peak Wilderness, California.--continued

| Sample | LATITUDE | LONGITUDE | S-FE% | S-MG% | S-CA% | S-TI% | S-MN | S-AG | S-AS | S-AU | S-B | S-BA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 72 | 36 10 51 | 118 42 56 | .70 | .05 | 2.00 | >2.00 | 150 | N | N | N | N | 200 |
| 73 | 36 18 46 | 118 43 36 | .70 | .10 | 1.00 | 2.00 | 200 | N | N | N | N | 200 |
| 74 | 36 17 55 | 118 44 15 | .70 | .05 | 1.00 | >2.00 | 200 | N | N | N | N | 70 |
| 75 | 36 17 20 | 118 44 39 | 2.00 | .50 | .70 | 2.00 | 300 | N | N | N | N | 70 |
| 76 | 36 16 0 | 118 40 16 | 1.00 | .50 | 7.00 | 1.50 | 1,000 | N | N | N | 500 | 150 |
| 77 | 36 10 40 | 118 44 7 | .20 | <.05 | 1.00 | >2.00 | 150 | N | N | N | N | 100 |
| 78 | 36 18 40 | 118 44 24 | 1.50 | .05 | .50 | 2.00 | 700 | N | N | N | N | 200 |
| 79 | 36 13 0 | 118 46 0 | .70 | .05 | .50 | >2.00 | 200 | N | N | N | N | 150 |
| 80 | 36 18 35 | 118 47 14 | 1.00 | .20 | .50 | 1.50 | 300 | N | N | N | 200 | 200 |
| 81 | 36 15 21 | 118 40 45 | 2.00 | <.05 | <.10 | 2.00 | 300 | N | N | N | N | 150 |
| 83 | 36 14 50 | 118 42 44 | 1.50 | .10 | .20 | 2.00 | 300 | N | N | N | 70 | 70 |
| 84 | 36 14 10 | 118 41 33 | .50 | .10 | 2.00 | 2.00 | 300 | N | N | N | 50 | 100 |
| 85 | 36 14 0 | 118 39 1 | 1.00 | 1.00 | 1.00 | 2.00 | 300 | N | N | N | 500 | 150 |

Table A2--Data for heavy-mineral, non-magnetic concentrate samples from Moses Mountain Wilderness and Dennison Peak Wilderness, California.--continued

| Sample | S-BE | S-BI | S-CD | S-CO | S-CR | S-CU | S-LA | S-MO | S-NB | S-NI | S-PB |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 72 | <2 | N | N | 10 | <20 | 10 | 300 | N | 50 | N | 100 |
| 73 | 2 | N | N | N | <20 | <10 | N | 30 | 70 | N | 20 |
| 74 | N | N | N | N | <20 | 10 | N | N | <50 | N | 30 |
| 75 | 2 | 1,000 | N | 10 | 70 | 30 | N | 10 | N | 50 | 50 |
| 76 | <2 | <20 | N | 15 | 20 | <10 | N | N | 50 | N | 30 |
| 77 | 3 | N | N | N | N | <10 | N | N | N | N | 20 |
| 78 | 2 | 20 | N | N | N | 10 | N | 15 | 50 | N | 30 |
| 79 | 3 | 50 | N | N | N | <10 | N | N | 50 | N | 30 |
| 80 | 5 | N | N | N | N | N | N | 20 | N | N | 30 |
| 81 | 2 | N | N | N | N | N | N | <10 | 100 | N | 30 |
| 83 | N | 50 | N | 20 | 20 | 30 | 2,000 | N | 50 | 50 | 1,000 |
| 84 | N | N | N | N | 20 | 15 | 100 | N | 50 | 50 | 1,000 |
| 85 | 2 | N | N | 15 | 150 | 70 | 200 | N | 70 | 30 | 200 |

Table A2--Data for heavy-mineral, non-magnetic concentrate samples from Moses Mountain Wilderness and Dennison Peak Wilderness, California.--continued

| Sample | S-SB | S-SC | S-SN | S-SR | S-V | S-W | S-Y | S-ZN | S-ZR | S-TH |
|---|---|---|---|---|---|---|---|---|---|---|
| 72 | N | 30 | 100 | N | 300 | N | 300 | N | >2,000 | >5,000 |
| 73 | N | 30 | 70 | N | 150 | N | 300 | N | >2,000 | 700 |
| 74 | N | 30 | 70 | N | 20 | <100 | 1,000 | N | >2,000 | 500 |
| 75 | N | 30 | 30 | N | 50 | N | 1,000 | N | >2,000 | <200 |
| 76 | N | 30 | 30 | N | 30 | 100 | 150 | N | >2,000 | N |
| 77 | N | 30 | 30 | N | 100 | 100 | 200 | N | >2,000 | <200 |
| 78 | N | 30 | 30 | N | 30 | N | 300 | N | >2,000 | 200 |
| 79 | N | 30 | 50 | N | 20 | N | 300 | N | >2,000 | 700 |
| 80 | N | 30 | N | N | 50 | 100 | 200 | N | >2,000 | 1,000 |
| 81 | N | 30 | 20 | N | <20 | N | 150 | N | >2,000 | N |
| 83 | N | 15 | 50 | N | 50 | N | 700 | N | >2,000 | 500 |
| 84 | 500 | 15 | 500 | N | 150 | N | 500 | N | >2,000 | 200 |
| 85 | N | 15 | 70 | <200 | 300 | N | 150 | N | >2,000 | N |