UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Analytical results and sample locality map for stream-sediment and heavy-mineral-concentrate samples from the Rimrock (NM-020-007), Sand Canyon (NM-020-008), Little Rimrock (NM-020-009), Pinyon (NM-020-010), and Petaca Pinta (NM-020-014) Wilderness Study Areas, Cibola County, New Mexico

By

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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 geochemical survey of the Rimrock, Sand Canyon, Little Rimrock, Pinyon, and Petaca Pinta Wilderness Study Areas, Cibola County, New Mexico.

INTRODUCTION

From June to September, 1987, the U.S. Geological Survey conducted a reconnaissance geochemical survey of the Rimrock (NM-020-007), Sand Canyon (NM-020-008), Little Rimrock (NM-020-009), Pinyon (NM-020-010), and Petaca Pinta (NM-020-014) Wilderness Study Areas, Cibola County, New Mexico.

The total area covered by the five wilderness study areas is 71,373 acres (approximately 112 mi^2) and is subdivided as follows: Rimrock, 29,818 acres (47 mi^2), Sand Canyon, 8,566 acres (13 mi^2), Little Rimrock, 9,945 acres (16 mi^2), Pinyon, 12,413 acres (19 mi^2), and Petaca Pinta, 10,631 acres (17 mi^2). The combined wilderness study areas and adjacent sampled terrain are hereafter termed the "study area." The Petaca Pinta Wilderness Study Area is separated from the other four by about 13 mi (fig. 1) and will be termed the "east study area." The combined Rimrock, Sand Canyon, Little Rimrock, and Pinyon Wilderness Study Areas will be termed the "west study area."

The study area (fig. 1) is located in the south-central part of Cibola County. The west study area is 15-40 mi south of Grants, New Mexico. The east study area is about 35 mi southeast of Grants. Access to the west study area is from New Mexico Highway 117. Access to the east study area is from a point on New Mexico Highway 6 about 2 mi south of the intersection with Interstate 40. From that point the east study area is reached by county and ranch roads. Between the east and west study areas are parts of the Acoma and Laguna Indian Reservations. The recently created El Malpais National Monument lies on the west side of the west study area. House Resolution 403, which established the national monument December 31, 1987, also created the Cebolla Wilderness comprising approximately the area included in the Rimrock, Sand Canyon, Little Rimrock, and Pinyon Wilderness Study Areas.

Topography of the west study area consists primarily of sandstone-capped mesas cut by canyons and arroyos. The largest natural arch in New Mexico, La Ventana, is located along Highway 117 in the Rimrock Wilderness Study Area (plate 1). Elevations range from about 6,900 to almost 8,400 ft. Much of the west study area is forrested with old growth pinyon-juniper, but stands of ponderosa pine are common. The forests are interspersed with open grasslands. Topography of the east study area ranges from gently sloping valleys to extremely rugged mesas and canyons with almost vertical cliffs, hundreds of feet in height. Elevations range from about 5,800 to almost 7,300 ft. Parts of the east study area are badlands. The east study area includes extensive areas of open grasslands. Streams throughout the entire study area are generally dry except after heavy precipitation.

Geology of most of the west study area is presented on a 1:62,500-scale map by Maxwell (1986). In brief, bedrock geology of the west study area is comprised of a generally flat-lying sequence of sandstones and shales ranging

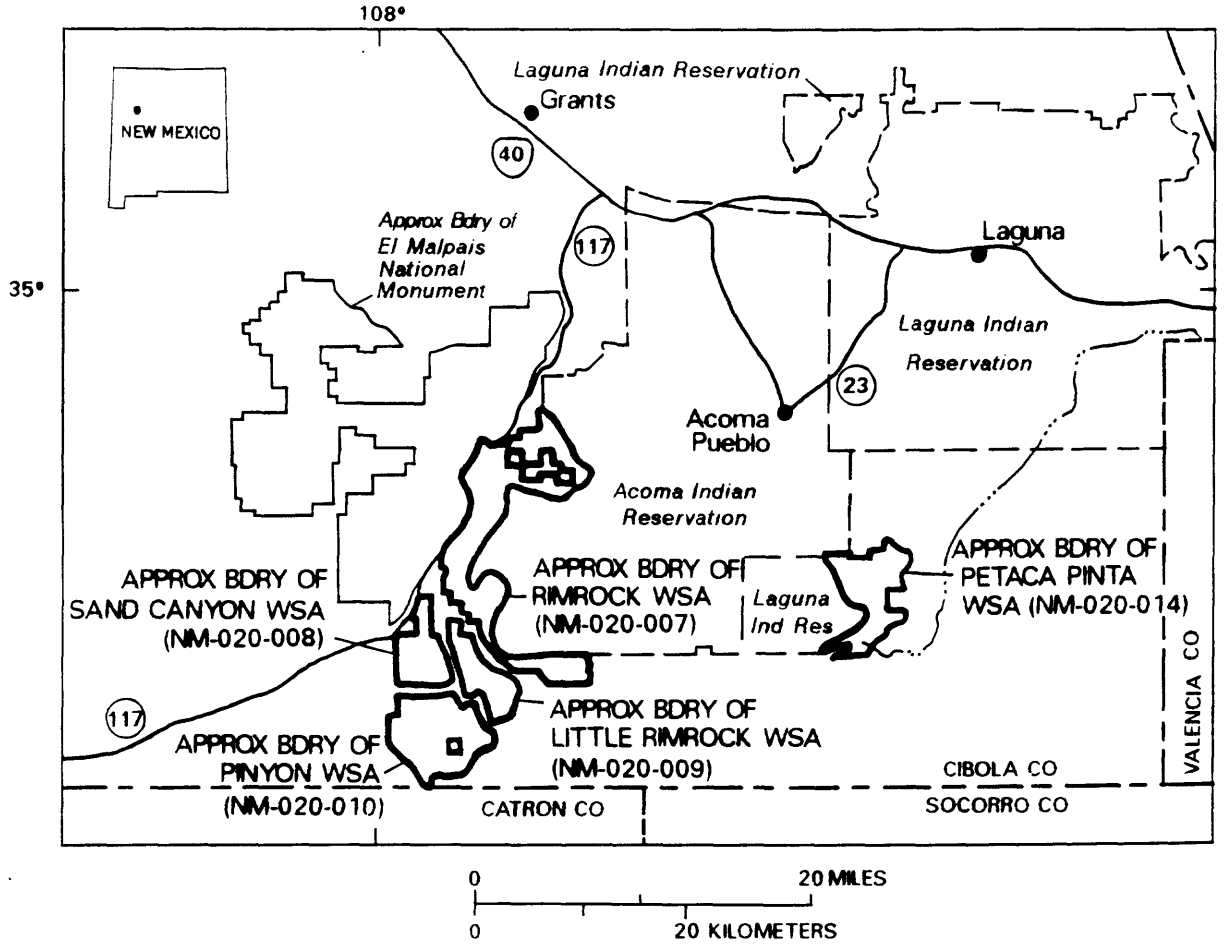

Figure 1. Index map showing location of the Rimrock, Sand Canyon, Little Rimrock, Pinyon, and Petaca Pinta Wilderness Study Areas, Cibola County, New Mexico.

in age from Middle Jurassic to Upper Cretaceous. In map view, the Upper Cretaceous strata overwhelmingly predominate at the surface. However, the highest and most spectacular cliffs are generally formed in Middle Jurassic Zuni Sandstone. Massive landslide deposits form the slopes between most mesas and intervening valleys.

Geology of the east study area is presented on 1:24,000-scale maps by Maxwell (1979, 1988a, b, in press). The east study area is largely covered by Quaternary alluvium, colluvium, and landslide deposits. Bedrock is generally a flat-lying sequence of sandstones and shales ranging from Upper Triassic to Upper Cretaceous in age. Quaternary basalts cap some of the mesas. The Upper Triassic strata are usually limited to the badland-forming Chinle Formation which, in the east study area, is generally covered by landslide deposits. As in the west study area, spectacular cliffs are formed in the Upper Jurassic Zuni Sandstone and also in the underlying Middle Jurassic Entrada Sandstone.

Mineral deposits have not been recognized in the study area except for coal in the west study area (Bigsby and Maxwell, 1981; Logsdon, 1981). A zone of alteration in the east study area, mostly in Jurassic strata, is similar to alteration associated with sandstone uranium mineralization north of the study area, but may be related to deep weathering along fractures (Logsdon, 1981).

METHODS OF STUDY

Sample Media

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

Sample Collection and Preparation

Heavy-mineral-concentrate and stream-sediment samples were collected at 138 sites (plate 1). Sampling density was about one sample site per 0.82 mi^2. The area of the drainage basins sampled ranged from 0.1 mi^2 to 3 mi^2. Samples were collected by Gary A. Nowlan.

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. 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 pulverized to approximately minus 100-mesh (0.15-mm) for analysis.

Heavy-mineral-concentrate samples

Active alluvium from sites 001-100 (plate 1) was screened with a 10-mesh (2.0-mm) screen to obtain about 20 lb of sample after the removal of the

coarse material. At the remaining sites, about 20 lbs of unscreened alluvium were collected. The samples were then panned to remove most of the quartz, feldspar, organic material, and clay-sized material. The resulting concentrate samples weighed an estimated 1-2 oz.

After the samples were oven dried at 90°C, bromoform (specific gravity 2.8) was used to remove the remaining quartz and feldspar. The resultant heavy-mineral sample was separated into two fractions using a large electromagnet (in this case a modified Frantz Isodynamic Separator). The most magnetic material, primarily magnetite, was not analyzed. The second fraction may include nonmagnetic ore minerals, ferromagnesian silicates, iron and manganese oxides, and accessory minerals such as zircon, sphene, apatite, and rutile. The second fraction was split using a Jones splitter. 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.

Sample Analysis

Spectrographic method

The stream-sediment and heavy-mineral-concentrate samples were analyzed using the semiquantitative, direct-current arc emission spectrographic method described by Grimes and Marranzino (1968). The elements analyzed and their 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). Emission spectrographic analyses were performed by John H. Bullock, Jr. and Olga Erlich.

Other methods

Stream-sediment samples from the study area were also analyzed by inductively coupled plasma-atomic emission spectroscopy (ICP) and ultraviolet fluorimetry. The samples were analyzed for arsenic (As), antimony (Sb), bismuth (Bi), cadmium (Cd), and zinc (Zn) using ICP and for uranium (U) using ultraviolet fluorimetry. Limits of determination, precision, and references for the methods are included in table 2. Analysts were Theodore A. Roemer and Brian A. Anderson.

Analytical results for stream-sediment and heavy-mineral-concentrate samples are listed in tables 3 and 4, respectively.

DATA STORAGE SYSTEM

Upon completion of the analytical work, the results were entered into a U.S. Geological Survey 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, VanTrump and Miesch, 1977) for computerized statistical analysis or publication.

DESCRIPTION OF DATA TABLES

The numeric part of each sample identification in tables 3-4 is the same as the corresponding sampling-site number on plate 1. 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 indicates that an element was observed but was below the lowest reporting value. For ICP analyses, a "less than" symbol (<) entered in the tables indicates that an element was below the lowest reporting value. If an element was above the highest reporting value, a "greater than" symbol (>) was entered in the tables. Because of the formatting used in the computer program that produced tables 3 and 4, some of the elements (Ca, Fe, Mg, Ag, and Ti) carry one or more nonsignificant digits to the right of the significant digits.

Some elements were not detected in any sample by emission spectrography and are omitted from tables 3-4. These elements are As, Au, Bi, Cd, Ge, Mo, Sb, Sn, Th, W, and Zn in stream-sediment samples and P, Ag, As, Au, Bi, Ge, Sb, Th, W, Pd, and Pt in heavy-mineral-concentrate samples. Concentrations of Bi and Sb, as determined by ICP, are all less than the lower limits of determination and thus are omitted from table 3.

ACKNOWLEDGMENTS

We thank the following landowners for access to their property: Pueblo of Aeoma, King Ranch, and Buddy Majors. Garcia Chino of the Pueblo of Acoma provided valuable assistance and guidance during some portions of the field work and Bob Lee of the King Ranch provided useful information.

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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 based on a 5-mg sample, and are therefore two reporting intervals higher than the limits listed, except as noted]

Elements	Lower determination limit	Upper determination limit
	Weight percent	
Calcium (Ca)	0.05	20
Iron (Fe)	0.05	20
Magnesium (Mg)	0.02	10
Sodium (Na)	0.2	5
Phosphorus (P)	0.2	10
Titanium (Ti)	0.002	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 (T)	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.--Analytical methods used other than emission spectrograph

[ICP = inductively coupled plasma-atomic emission spectroscopy; F= ultraviolet fluorimetry]

Element determined	Sample type	Method	Lower determination limit, ppm	Precision, percent relative standard deviation	References
Arsenic (As)	stream sediment	ICP	5	3.5-20	Crock and others, 1987.
Antimony (Sb)	stream sediment	ICP	2	6.4-11	
Bismuth (Bi)	stream sediment	ICP	2	2.2-11.9	
Cadmium (Cd)	stream sediment	ICP	0.1	2.8-8.8	
Zinc (Zn)	stream sediment	ICP	2	1.4-11.9	
Uranium (U)	stream sediment	F	0.1	6.9-14.2	Centanni and others, 1956; O'Leary and Meier, 1986.

TABLE 3.--Results of analyses of stream-sediment samples collected from the Rimrock, Sand Canyon, Little Rimrock, Pinyon, and Petaca Pinta Wilderness Study Areas, Cibola County, New Mexico

[N, not detected; <, less than value shown for As-i and Cd-i, detected below value shown for others. Methods: As-i, Cd-i, and Zn-i, inductively coupled plasma spectroscopy; U-f, ultraviolet fluorimetry; others, emission spectrography. Ca, Fe, Mg, Na, P, and Ti are weight percent; other elements are ppm]

Sample	Latitude	Longitude	Ca	Fe	Mg	Na	P	Ti	Ag	As-i	B	Ba	Be
						Rimrock							
RRA001	34 52 9	107 53 26	.50	2.0	.5	1.0	N	.20	N	<5	10	500	N
RRA002	34 50 28	107 54 24	.20	2.0	.5	1.5	N	.20	N	<5	<10	300	N
RRA003	34 50 34	107 54 6	.70	3.0	.7	1.0	N	.20	N	5	10	300	N
RRA004	34 50 34	107 54 10	1.50	3.0	.7	1.0	N	.20	N	6	<10	300	N
RRA005	34 49 41	107 54 27	.50	5.0	1.0	.7	N	.30	N	7	15	300	<1
RRA038	34 45 20	107 53 39	.30	2.0	.7	1.0	N	.20	N	<5	10	500	N
RRA039	34 45 18	107 53 39	.07	1.5	.2	1.5	N	.10	N	<5	<10	300	N
RRA040	34 45 24	107 52 59	.50	2.0	.5	.7	N	.20	N	<5	15	700	<1
RRA041	34 45 3	107 52 31	.10	3.0	.7	1.5	N	.30	N	<5	10	500	N
RRA042	34 44 11	107 53 32	.30	3.0	.5	1.0	N	.30	N	7	10	700	N
RRA046	34 41 52	107 53 13	.70	3.0	.7	1.5	N	.50	N	<5	15	1,000	<1
RRA047	34 41 39	107 52 57	.20	2.0	.5	.7	N	.30	N	6	<10	500	N
RRA048	34 41 17	107 52 20	1.00	3.0	.5	1.5	N	.50	N	<5	10	500	N
RRA049	34 41 3	107 51 34	.50	2.0	.5	1.5	N	.30	N	<5	15	500	<1
RRA050	34 46 18	107 55 5	.30	2.0	.5	1.5	N	.30	N	<5	10	500	N
RRA051	34 46 11	107 55 12	.20	2.0	.3	1.0	N	.20	N	<5	10	300	N
RRA052	34 45 49	107 55 21	.20	3.0	.5	1.0	N	.50	N	<5	20	500	<1
RRA053	34 44 53	107 55 21	.20	2.0	.3	1.5	N	.15	N	5	N	500	N
RRA054	34 44 36	107 55 9	.70	2.0	.5	1.5	N	.50	N	<5	<10	700	N
RRA055	34 44 18	107 54 51	.50	2.0	.5	1.5	N	.20	N	<5	<10	1,000	<1
RRA059	34 43 43	107 54 16	.50	1.5	.3	1.0	N	.15	N	<5	10	500	N
RRA063	34 47 19	107 54 57	.50	2.0	.3	1.0	N	.30	N	<5	15	500	N
RRA064	34 47 49	107 54 22	.30	2.0	.5	1.5	N	.30	N	<5	15	500	N
RRA065	34 48 9	107 54 14	.50	3.0	.5	1.0	N	.50	N	<5	10	500	N
RRA066	34 48 20	107 53 45	.30	2.0	.5	1.0	N	.30	N	<5	<10	300	N
RRA067	34 48 45	107 53 40	.50	2.0	.5	1.5	N	.30	N	<5	10	700	N
RRA068	34 49 13	107 53 13	1.50	2.0	.5	1.0	N	.50	N	<5	10	500	N
RRA069	34 49 30	107 53 3	2.00	3.0	.7	1.0	N	.30	N	<5	15	500	N
RRA070	34 49 49	107 53 23	.50	3.0	.5	2.0	N	.50	N	<5	<10	500	N
RRA071	34 43 28	107 53 31	.50	2.0	.5	1.0	N	.50	N	<5	<10	500	<1
RRA072	34 43 11	107 53 31	.20	2.0	.5	1.0	N	.30	N	<5	10	300	<1
RRA073	34 42 49	107 53 38	.20	2.0	.3	1.5	N	.30	N	5	15	700	N
RRA077	34 41 1	107 49 47	.15	1.5	.3	1.0	N	.20	N	<5	10	500	N
RRA078	34 40 51	107 49 49	.20	2.0	.5	2.0	N	.30	N	<5	10	700	<1
RRA079	34 40 48	107 49 51	.10	1.0	.2	1.5	N	.15	N	<5	N	700	N
RRA080	34 40 54	107 50 17	.30	2.0	.5	1.0	N	.20	N	<5	10	500	N
RRA081	34 40 50	107 50 53	.30	2.0	.5	1.0	N	.30	N	<5	10	500	<1
RRA083	34 41 6	107 46 53	.15	2.0	.3	1.5	N	.30	N	<5	10	500	<1
RRA084	34 41 9	107 46 56	.10	2.0	.2	1.5	N	.20	N	<5	<10	300	N
RRA085	34 41 24	107 46 54	.20	2.0	.2	2.0	N	.50	N	<5	<10	500	N

TABLE 3.--Results of analyses of stream-sediment samples collected from the Rimrock, Sand Canyon, Little Rimrock, Pinyon, and Petaca Pinta Wilderness Study Areas, Cibola County, New Mexico--Continued

Sample	Cd-i	Co	Cr	Cu	Ga	La	Mn	Nb	Ni	Pb	Sc	Sr	U-f	V	Y	Zn-i	Zr
								Rimrock--Continued									
RRA001	<.1	<10	10	7	20	N	300	<20	7	<10	N	<100	.30	50	N	21	70
RRA002	<.1	N	10	7	20	N	150	N	5	10	N	<100	.35	30	N	31	300
RRA003	.2	N	<10	10	15	N	200	N	5	10	N	<100	.50	50	N	32	150
RRA004	.3	<10	10	10	20	N	150	N	5	<10	N	<100	.65	30	N	35	100
RRA005	.4	10	20	20	50	N	200	N	15	20	5	N	.90	70	<10	58	150
RRA038	.3	<10	10	10	20	N	300	N	7	N	<5	<100	.50	70	<10	35	100
RRA039	<.1	N	N	<5	20	N	100	N	<5	<10	N	N	.55	20	N	18	30
RRA040	.2	<10	<10	10	20	N	200	N	5	N	<5	<100	.45	70	<10	37	150
RRA041	<.1	N	N	5	30	N	200	N	<5	15	N	N	.50	30	N	30	150
RRA042	.2	N	<10	7	30	N	150	<20	5	10	<5	N	.50	50	<10	38	150
RRA046	.2	<10	10	10	20	N	200	<20	5	10	5	<100	.55	100	10	36	500
RRA047	.2	N	<10	7	15	N	150	N	5	10	<5	N	.75	70	<10	45	100
RRA048	.3	10	15	10	30	N	300	<20	10	<10	<5	<100	.40	100	<10	36	300
RRA049	.2	<10	10	10	20	N	300	<20	7	10	5	<100	.45	70	10	35	500
RRA050	.3	<10	15	10	20	N	200	N	5	<10	<5	N	.55	70	<10	35	500
RRA051	.2	N	20	5	15	N	200	N	<5	N	N	N	.40	50	N	31	300
RRA052	.3	<10	10	7	20	N	300	<20	7	<10	<5	N	.45	100	10	44	500
RRA053	.2	N	<10	5	20	N	150	N	<5	10	N	N	.50	50	N	37	150
RRA054	.2	10	15	10	30	N	200	N	5	10	<5	N	.50	70	<10	33	200
RRA055	<.1	N	<10	5	15	N	150	N	<5	<10	N	<100	.55	50	<10	35	150
RRA059	.3	N	N	5	10	N	100	N	<5	N	N	N	.40	30	N	27	50
RRA063	.2	<10	10	10	15	N	200	N	<5	10	N	N	.50	50	N	38	150
RRA064	<.1	N	10	10	20	N	150	N	<5	10	N	<100	.40	50	N	32	100
RRA065	.1	10	30	10	20	N	200	N	5	<10	<5	<100	.30	70	<10	37	300
RRA066	.2	N	15	7	15	N	200	N	<5	<10	N	N	.30	30	N	36	50
RRA067	.2	N	<10	7	20	N	200	N	5	10	N	<100	.30	50	N	33	150
RRA068	.3	<10	15	10	20	N	200	N	5	N	<5	N	.60	70	<10	37	500
RRA069	.2	<10	15	10	20	N	200	N	10	<10	<5	100	.60	70	N	28	150
RRA070	.2	10	30	7	20	N	300	N	7	<10	<5	100	.30	70	10	37	200
RRA071	.2	N	20	7	20	N	150	N	5	<10	<5	<100	.50	70	<10	31	300
RRA072	.1	<10	<10	10	20	N	200	N	5	10	N	N	.45	50	N	33	200
RRA073	.1	<10	<10	10	30	N	100	N	<5	10	<5	N	.65	70	<10	36	200
RRA077	.1	N	N	5	10	N	150	N	<5	N	N	N	.65	50	N	30	300
RRA078	.1	10	50	15	50	<50	200	N	5	15	5	<100	.65	70	10	33	150
RRA079	.1	N	N	<5	15	N	100	N	<5	N	N	N	.50	20	N	19	70
RRA080	.2	N	<10	10	15	N	200	N	5	<10	<5	N	.50	70	N	40	100
RRA081	<.1	10	15	15	5	N	200	N	7	<10	<5	<100	.50	70	<10	45	200
RRA083	.2	<10	10	7	20	<50	200	N	<5	10	<5	N	.80	50	N	38	150
RRA084	<.1	N	<10	5	10	N	200	N	<5	10	N	N	.60	30	N	30	100
RRA085	<.1	10	10	10	20	N	300	N	<5	15	N	<100	.55	50	<10	36	150

TABLE 3.--Results of analyses of stream-sediment samples collected from the Rimrock, Sand Canyon, Little Rimrock, Pinyon, and Petaca Pinta Wilderness Study Areas, Cibola County, New Mexico--Continued

Sample	Latitude	Longitude	Ca	Fe	Mg	Na	P	Ti	Ag	As-i	B	Ba	Be
					Rimrock--Continued								
RRA200	34 51 4	107 48 8	.50	3.0	.5	1.5	N	.20	N	11	10	500	N
RRA201	34 51 10	107 48 10	.20	3.0	.5	1.5	N	.30	N	7	15	1,000	<1
RRA202	34 51 5	107 48 8	1.50	3.0	1.0	1.5	<.2	.50	N	<5	15	700	<1
RRA203	34 50 55	107 48 55	.70	2.0	.5	1.5	<.2	.20	N	6	10	500	N
RRA204	34 51 1	107 49 3	.50	3.0	.7	1.0	N	.30	N	6	20	500	<1
RRA205	34 51 32	107 49 34	1.00	5.0	1.5	1.5	N	1.00	N	7	30	500	1
RRA206	34 51 44	107 49 30	.20	2.0	.3	1.5	N	.20	N	7	<10	300	N
RRA207	34 51 16	107 50 11	1.00	2.0	.7	1.5	N	.50	N	<5	10	500	N
RRA208	34 52 1	107 50 8	.30	2.0	.5	2.0	N	.30	N	<5	<10	300	N
RRA209	34 52 27	107 50 15	.50	2.0	.3	2.0	N	.15	N	<5	<10	500	N
RRA210	34 52 54	107 50 3	.70	3.0	.7	1.5	N	.50	N	<5	15	500	N
RRA211	34 53 5	107 49 55	2.00	5.0	1.0	1.5	N	.50	N	<5	20	1,500	N
RRA212	34 53 10	107 49 59	1.50	3.0	1.0	2.0	N	.30	N	<5	<10	300	N
RRA213	34 54 3	107 50 18	1.00	1.5	.5	.5	N	.30	N	6	20	300	N
RRA214	34 53 9	107 51 20	.50	2.0	.7	.7	N	.30	N	7	15	200	N
RRA215	34 52 58	107 51 25	.20	2.0	.5	1.0	N	.30	N	<5	N	300	N
RRA216	34 52 51	107 51 48	.20	2.0	.3	1.0	N	.30	N	<5	N	500	N
RRA217	34 52 21	107 52 44	1.00	3.0	1.0	.5	N	.20	N	6	10	300	N
					Sand Canyon								
SCA006	34 44 7	107 57 51	.30	2.0	.3	2.0	N	.30	N	<5	<10	500	N
SCA007	34 43 45	107 58 14	1.00	3.0	.5	1.0	N	.20	N	6	10	300	N
SCA008	34 40 57	107 57 36	.20	2.0	.3	2.0	N	.20	N	<5	<10	300	N
SCA009	34 40 51	107 57 35	.50	5.0	.5	1.5	N	1.00	N	<5	<10	500	N
SCA010	34 40 35	107 58 23	.30	2.0	.3	1.5	N	.20	N	<5	<10	500	N
SCA026	34 44 39	107 56 15	.10	2.0	.3	1.5	N	.20	N	<5	10	300	N
SCA027	34 44 31	107 56 7	.15	3.0	.5	2.0	N	.30	N	<5	10	500	N
SCA028	34 44 4	107 55 55	.15	2.0	.3	1.5	N	.30	N	<5	<10	500	N
SCA029	34 43 24	107 55 38	.15	2.0	.2	1.5	N	.30	N	<5	<10	300	N
SCA030	34 42 24	107 55 29	.20	3.0	.2	2.0	N	.50	N	<5	10	700	N
SCA036	34 40 35	107 55 51	.30	2.0	.3	1.5	N	.30	N	<5	<10	500	N
SCA037	34 41 2	107 55 46	1.00	2.0	.5	1.5	N	.20	N	<5	10	700	N
SCA056	34 45 4	107 55 55	.20	2.0	.3	2.0	N	.30	N	<5	N	300	N
SCA060	34 44 54	107 57 40	.50	2.0	.5	1.5	N	.50	N	<5	15	700	N
SCA061	34 42 34	107 59 1	.30	1.5	.2	1.5	N	.20	N	<5	10	500	N
SCA062	34 43 15	107 58 13	.20	2.0	.2	1.0	N	.20	N	<5	10	500	N
SCA106	34 39 31	107 58 15	.20	3.0	.3	2.0	N	.30	N	<5	10	500	N
SCA107	34 39 42	107 58 18	.20	3.0	.3	1.5	N	.50	N	<5	<10	500	N
SCA108	34 40 2	107 58 33	.50	3.0	.3	2.0	N	1.00	N	<5	10	700	N
SCA109	34 41 44	107 58 44	.20	1.5	.2	1.5	N	.20	N	<5	N	500	N

TABLE 3.--Results of analyses of stream-sediment samples collected from the Rimrock, Sand Canyon, Little Rimrock, Pinyon, and Petaca Pinta Wilderness Study Areas, Cibola County, New Mexico--Continued

Sample	Cd-i	Co	Cr	Cu	Ga	La	Mn	Nb	Ni	Pb	Sc	Sr	U-f	V	Y	Zn-i	Zr
Rimrock--Continued																	
RRA200	.5	N	<10	7	20	N	200	N	5	10	<5	N	.65	50	<10	38	200
RRA201	.2	N	<10	10	20	N	200	N	7	<10	N	<100	.75	70	10	38	150
RRA202	.4	<10	15	15	15	N	700	<20	10	<10	<5	100	.45	70	<10	39	150
RRA203	.3	N	10	7	20	N	200	N	<5	10	N	N	.45	50	N	31	50
RRA204	.4	<10	15	15	30	N	200	N	7	10	<5	N	.60	70	<10	43	200
RRA205	.7	20	50	30	70	<50	500	<20	20	20	10	100	.85	100	15	57	200
RRA206	.4	<10	10	10	20	N	500	N	<5	10	N	N	.60	30	N	41	50
RRA207	.5	<10	10	7	15	<50	300	N	5	<10	N	100	.45	70	<10	33	150
RRA208	.2	<10	<10	5	30	N	200	N	<5	10	N	N	.70	50	N	28	30
RRA209	.2	N	N	<5	20	N	150	N	N	<10	N	<100	.25	30	N	19	50
RRA210	.4	N	10	20	50	N	500	<20	5	30	<5	N	.55	100	<10	42	100
RRA211	.5	10	15	15	30	N	500	20	10	10	5	100	.45	70	10	39	300
RRA212	.5	<10	15	10	20	N	200	N	5	<10	N	N	.40	50	N	35	70
RRA213	.2	N	N	7	10	N	150	N	<5	N	N	N	.35	50	N	21	150
RRA214	.2	N	10	7	15	N	200	N	<5	<10	N	N	.40	50	N	26	30
RRA215	.3	N	10	5	15	N	200	N	5	N	N	N	.40	50	N	25	150
RRA216	.3	N	<10	5	20	N	100	N	5	N	N	<100	.30	70	N	20	150
RRA217	.3	N	10	7	15	N	150	N	5	<10	N	N	.65	30	<10	28	200
Sand Canyon--Continued																	
SCA006	.1	N	15	5	20	N	300	N	<5	<10	N	100	.40	50	N	27	100
SCA007	.3	N	20	10	30	N	200	N	5	15	<5	<100	1.00	50	<10	41	100
SCA008	.2	N	10	7	30	N	150	N	<5	20	N	N	.70	30	N	32	200
SCA009	.2	10	20	10	20	50	500	<20	7	<10	<5	100	.50	200	10	50	200
SCA010	.1	N	<10	5	15	N	200	N	<5	10	N	N	.40	50	N	29	150
SCA026	.1	N	<10	7	15	N	150	N	<5	<10	N	N	.55	30	N	29	150
SCA027	.1	<10	10	10	30	N	200	N	<5	10	<5	N	.50	50	<10	24	500
SCA028	<.1	<10	<10	7	15	N	500	N	5	<10	N	<100	.50	100	10	27	100
SCA029	.1	<10	<10	5	15	N	300	N	<5	<10	N	<100	.65	50	N	24	200
SCA030	<.1	10	<10	7	20	N	300	<20	5	10	<5	100	.80	70	10	19	300
SCA036	<.1	<10	<10	5	15	N	300	N	<5	<10	N	100	.40	70	N	33	150
SCA037	.2	N	<10	5	20	N	200	N	<5	<10	<5	100	.40	50	<10	30	100
SCA056	<.1	N	<10	<5	15	N	200	N	<5	<10	N	N	.20	30	N	27	70
SCA060	.3	<10	10	7	15	<50	500	N	5	<10	N	100	.40	100	10	35	200
SCA061	.1	<10	<10	<5	10	N	200	N	<5	N	N	100	.40	50	N	30	50
SCA062	.1	<10	10	10	20	N	150	N	<5	<10	N	<100	.60	50	N	31	100
SCA106	<.1	10	15	10	30	N	300	N	7	10	<5	<100	.45	70	<10	37	150
SCA107	.3	<10	10	7	20	N	500	N	<5	<10	N	<100	.40	70	N	51	500
SCA108	.3	10	20	10	50	N	500	<20	7	10	<5	100	.35	100	20	43	300
SCA109	.1	N	N	5	20	N	100	N	<5	10	N	<100	.35	20	N	24	70

TABLE 3.--Results of analyses of stream-sediment samples collected from the Rimrock, Sand Canyon, Little Rimrock, Pinyon, and Petaca Pinta Wilderness Study Areas, Cibola County, New Mexico—Continued

Sample	Latitude	Longitude	Ca	Fe	Mg	Na	P	Ti	Ag	As-i	B	Ba	Be
					Sand Canyon--Continued								
SCA110	34 41 56	107 59 2	.50	5.0	.5	2.0	N	1.00	N	<5	<10	500	N
					Little Rimrock								
LRA031	34 42 16	107 55 18	.50	2.0	.5	1.5	N	.30	N	<5	<10	500	N
LRA032	34 41 59	107 55 18	.50	5.0	.3	1.0	N	1.00	N	<5	<10	700	N
LRA033	34 41 23	107 55 28	.20	3.0	.2	1.5	N	.70	N	<5	10	300	N
LRA034	34 40 59	107 55 33	.20	2.0	.3	1.5	N	.30	N	<5	10	500	N
LRA035	34 40 27	107 55 35	.20	3.0	.2	1.5	N	.20	N	<5	<10	500	N
LRA043	34 42 21	107 53 55	.50	3.0	.7	1.5	N	.50	N	<5	15	500	<1
LRA044	34 42 19	107 53 47	.15	2.0	.5	1.5	N	.20	N	<5	10	300	N
LRA045	34 41 51	107 53 30	.15	2.0	.5	2.0	N	.30	N	<5	N	500	N
LRA057	34 43 7	107 55 23	.30	3.0	.5	1.5	N	.70	N	<5	10	500	N
LRA058	34 43 28	107 54 21	.50	3.0	.5	1.5	N	.20	N	<5	10	500	N
LRA074	34 41 28	107 53 24	.30	2.0	.3	1.5	N	.50	N	<5	<10	500	N
LRA075	34 41 17	107 52 46	.50	2.0	.5	1.5	N	.30	N	<5	20	700	N
LRA076	34 40 51	107 51 54	.15	2.0	.3	1.0	N	.30	N	<5	10	300	N
LRA082	34 39 57	107 50 57	.30	3.0	.2	2.0	N	.50	N	<5	N	700	N
LRA086	34 38 14	107 51 21	.07	2.0	.2	1.0	N	.30	N	<5	<10	300	N
LRA087	34 38 12	107 51 25	.20	3.0	.3	1.5	N	.70	<.5	<5	10	700	<1
LRA100	34 38 29	107 52 14	.30	3.0	.5	1.5	N	.30	N	<5	15	500	N
LRA101	34 38 11	107 52 31	.30	3.0	.5	1.5	N	.30	N	<5	10	700	<1
LRA102	34 38 7	107 52 28	.20	2.0	.3	1.5	N	.20	N	<5	<10	500	N
LRA103	34 39 13	107 51 35	.20	3.0	.5	1.5	N	.30	N	<5	15	500	N
LRA104	34 38 47	107 51 58	.30	3.0	.7	2.0	N	.50	N	<5	15	700	<1
					Pinyon								
PNA011	34 39 20	107 57 58	.20	3.0	.2	1.5	N	.50	N	<5	<10	500	N
PNA012	34 38 26	107 58 10	.20	5.0	.5	2.0	N	.70	N	<5	<10	300	N
PNA013	34 36 31	107 57 4	.15	2.0	.2	.7	N	.30	N	<5	10	500	<1
PNA014	34 36 46	107 56 35	.15	2.0	.3	.7	N	.30	N	<5	10	500	<1
PNA015	34 36 39	107 55 55	.15	3.0	.3	1.0	N	.50	N	<5	15	300	N
PNA016	34 36 59	107 55 31	.15	2.0	.2	1.5	N	.30	N	<5	10	500	N
PNA017	34 36 57	107 55 30	.30	3.0	.3	1.5	N	.30	N	<5	<10	700	N
PNA018	34 35 54	107 57 11	.20	3.0	.2	1.0	N	.50	N	<5	10	700	N
PNA019	34 35 32	107 56 59	.20	2.0	.5	.7	N	.30	2.0	<5	15	500	<1
PNA020	34 35 14	107 56 46	.20	2.0	.5	1.0	N	.30	N	<5	10	500	<1
PNA021	34 34 51	107 56 33	.15	3.0	.3	.7	N	.50	N	<5	10	300	<1
PNA022	34 35 41	107 54 41	.10	2.0	.3	1.0	N	.20	N	<5	<10	300	N
PNA023	34 36 52	107 58 14	.15	3.0	.2	1.5	N	.50	N	<5	<10	300	N
PNA024	34 37 39	107 57 56	.20	1.5	.3	2.0	N	.20	N	<5	10	500	N
PNA025	34 37 41	107 57 57	.10	3.0	.2	1.5	N	.50	N	<5	<10	300	N

TABLE 3.--Results of analyses of stream-sediment samples collected from the Rimrock, Sand Canyon, Little Rimrock, Pinyon, and Petaca Pinta Wilderness Study Areas, Cibola County, New Mexico--Continued

Sample	Cd-i	Co	Cr	Cu	Ga	La	Mn	Nb	Ni	Pb	Sc	Sr	U-f	V	Y	Zn-i	Zr
Sand Canyon--Continued																	
SCA110	.2	15	50	10	70	N	700	N	15	10	<5	150	.60	150	10	44	700
Little Rimrock--Continued																	
LRA031	.2	<10	N	7	15	N	300	N	<5	10	N	<100	.30	50	<10	34	200
LRA032	.2	15	30	10	20	N	500	<20	15	<10	5	<100	.35	150	10	36	200
LRA033	.2	10	10	5	20	N	500	<20	5	<10	N	<100	.30	100	N	33	200
LRA034	.1	<10	10	7	15	N	200	N	<5	10	N	N	.30	70	N	35	150
LRA035	<.1	10	15	7	20	N	200	N	5	<10	N	<100	.55	70	N	35	100
LRA043	.2	<10	15	10	20	N	200	<20	7	<10	5	<100	.50	70	<10	37	200
LRA044	.2	<10	<10	7	20	N	100	N	<5	10	N	N	.50	50	N	40	70
LRA045	<.1	N	<10	5	20	N	100	N	<5	<10	N	N	.40	50	N	31	150
LRA057	<.1	10	10	10	20	N	300	<20	7	<10	<5	<100	.55	70	<10	34	200
LRA058	.2	N	15	7	20	N	500	N	<5	<10	N	100	.35	100	N	28	150
LRA074	<.1	N	N	5	20	N	150	N	<5	<10	N	<100	.60	50	N	29	30
LRA075	<.1	N	<10	5	15	N	200	N	<5	N	N	100	.45	70	N	30	200
LRA076	.1	<10	20	15	20	N	150	N	5	<10	<5	N	1.10	70	N	45	150
LRA082	.1	<10	10	7	30	N	300	N	5	10	N	150	.35	70	N	34	100
LRA086	.1	10	15	10	10	N	200	N	5	<10	N	N	.45	50	N	39	300
LRA087	.3	15	15	20	30	N	300	<20	10	10	5	<100	.65	100	10	46	300
LRA100	.2	<10	<10	5	10	N	300	N	<5	<10	N	100	.30	100	N	35	200
LRA101	.2	20	20	20	20	<50	300	<20	15	10	5	100	.60	100	15	41	300
LRA102	.2	<10	10	10	15	<50	200	N	<5	<10	N	<100	.45	50	<10	36	100
LRA103	.2	10	20	20	20	N	200	<20	10	10	5	<100	.65	70	10	45	100
LRA104	.2	15	100	15	20	N	300	<20	15	<10	<5	100	.45	100	<10	46	150
Pinyon--Continued																	
PNA011	.2	<10	15	15	15	N	300	N	<5	<10	N	<100	.75	100	N	36	100
PNA012	.3	10	20	10	30	N	500	N	5	10	N	N	.65	100	N	56	500
PNA013	.1	10	15	15	20	<50	150	N	7	10	5	N	.70	50	10	43	100
PNA014	.2	10	10	10	20	N	150	N	<5	<10	<5	N	1.10	70	<10	44	100
PNA015	.2	10	10	10	20	N	500	N	5	10	<5	<100	1.00	70	<10	48	100
PNA016	.2	10	10	10	20	N	150	N	5	<10	N	<100	.90	50	N	43	150
PNA017	.1	10	15	15	30	N	200	N	7	<10	<5	100	.80	70	<10	43	150
PNA018	.1	10	15	10	20	N	500	<20	5	<10	5	100	.90	70	10	40	1,000
PNA019	.2	<10	10	15	20	<50	300	N	10	10	<5	<100	.90	70	<10	45	150
PNA020	.2	10	50	10	20	<50	300	<20	7	10	<5	100	1.10	70	10	36	300
PNA021	.3	15	15	20	20	N	300	N	10	10	<5	<100	1.40	70	<10	54	200
PNA022	.2	N	N	5	10	N	200	N	<5	<10	N	<100	.75	30	N	38	70
PNA023	.2	<10	10	7	20	N	500	N	<5	10	N	N	.60	70	N	52	70
PNA024	.1	N	<10	7	15	N	300	N	<5	<10	N	100	.50	50	<10	28	70
PNA025	.2	10	<10	10	20	N	300	N	5	10	N	N	.70	70	N	43	150

TABLE 3.--Results of analyses of stream-sediment samples collected from the Rimrock, Sand Canyon, Little Rimrock, Pinyon, and Petaca Pinta Wilderness Study Areas, Cibola County, New Mexico--Continued

Sample	Latitude	Longitude	Ca	Fe	Mg	Na	P	Ti	Ag	As-i	B	Ba	Be
					Pinyon--Continued								
PNA105	34 38 1	107 58 28	.15	2.0	.3	1.5	N	.30	N	<5	10	500	N
					Petaca Pinta								
PPA157	34 42 4	107 32 45	3.00	2.0	1.0	.7	N	.50	N	<5	20	500	N
PPA158	34 42 7	107 32 41	1.50	5.0	1.5	2.0	N	.30	N	<5	15	500	N
PPA159	34 42 17	107 32 18	5.00	3.0	1.0	1.0	N	.50	N	<5	20	500	N
PPA160	34 42 41	107 31 38	2.00	2.0	1.5	1.0	N	.20	N	<5	20	200	N
PPA161	34 42 35	107 31 23	1.50	2.0	1.0	.5	N	.20	N	<5	20	500	N
PPA162	34 42 47	107 31 1	.70	2.0	.7	.5	N	.20	N	<5	30	300	N
PPA163	34 41 47	107 30 1	.70	1.5	.5	.7	N	.15	N	<5	10	1,000	N
PPA164	34 42 19	107 30 9	1.00	3.0	1.0	1.0	N	.30	N	<5	20	2,000	<1
PPA165	34 43 1	107 29 47	1.00	2.0	.7	.7	N	.20	N	<5	<10	200	N
PPA166	34 43 11	107 29 47	1.00	2.0	.7	.3	N	.20	N	<5	10	300	N
PPA167	34 43 13	107 29 46	.70	1.5	.5	.2	N	.20	7.0	<5	15	700	N
PPA168	34 43 43	107 28 11	1.00	2.0	.7	1.0	N	.15	N	<5	<10	1,500	N
PPA169	34 44 31	107 27 39	1.50	3.0	1.0	.7	N	.30	N	<5	20	500	<1
PPA170	34 45 10	107 27 26	.70	1.0	.2	<.2	N	.15	N	<5	<10	300	N
PPA171	34 46 51	107 27 57	1.00	2.0	.7	1.0	N	.30	N	<5	20	500	N
PPA172	34 46 53	107 27 59	.70	2.0	.5	1.0	N	.20	N	<5	10	1,000	N
PPA173	34 47 29	107 28 11	2.00	3.0	1.5	1.0	N	.30	N	<5	15	1,500	<1
PPA174	34 47 13	107 28 54	1.00	3.0	1.5	1.5	N	.30	N	<5	20	300	<1
PPA175	34 45 37	107 30 25	2.00	2.0	1.0	.5	N	.30	N	<5	20	1,000	<1
PPA176	34 46 9	107 30 42	2.00	3.0	1.0	.7	N	.30	N	<5	70	500	<1
PPA177	34 46 39	107 30 48	1.00	2.0	.5	.3	N	.20	N	<5	15	500	N
PPA178	34 47 14	107 30 58	.50	1.5	.5	.3	N	.15	N	<5	20	300	N

TABLE 3.--Results of analyses of stream-sediment samples collected from the Rimrock, Sand Canyon, Little Rimrock, Pinyon, and Petaca Pinta Wilderness Study Areas, Cibola County, New Mexico--Continued

Sample	Cd-i	Co	Cr	Cu	Ga	La	Mn	Nb	Ni	Pb	Sc	Sr	U-f	V	Y	Zn-i	Zr
							Pinyon--Continued										
PNA105	<.1	15	15	15	30	N	150	<20	10	10	<5	<100	.55	70	<10	41	150
							Petaca Pinta--Continued										
PPA157	.3	10	20	10	20	N	200	<20	15	<10	5	<100	.55	50	10	19	300
PPA158	.4	15	150	15	50	N	150	N	20	<10	N	N	.55	70	<10	32	150
PPA159	.4	10	20	15	15	N	500	<20	15	<10	<5	100	.55	100	<10	32	500
PPA160	.2	N	<10	7	10	N	300	N	7	10	<5	N	.70	50	<10	17	150
PPA161	.3	<10	15	15	20	N	500	N	15	<10	5	<100	.75	50	10	18	300
PPA162	.3	<10	10	7	10	N	300	N	10	<10	N	N	.75	30	N	19	100
PPA163	.3	N	<10	7	7	N	300	N	<5	N	N	N	.65	50	N	17	100
PPA164	.6	10	30	30	30	N	700	N	15	<10	<5	<100	.80	100	<10	29	200
PPA165	.4	N	30	5	10	N	300	N	10	N	N	N	.45	50	N	26	70
PPA166	.3	N	<10	7	10	N	300	N	5	N	N	N	.60	50	N	16	200
PPA167	.2	N	<10	7	15	N	200	N	5	N	N	N	.65	50	N	11	200
PPA168	.3	N	<10	7	7	N	500	N	<5	<10	N	<100	.60	30	N	12	150
PPA169	.3	10	30	15	20	N	500	N	7	<10	<5	<100	.55	70	N	13	150
PPA170	.2	N	N	5	5	N	200	N	<5	N	N	<100	.35	20	N	7	30
PPA171	.3	<10	15	10	20	N	300	N	10	<10	<5	N	.90	50	N	14	100
PPA172	.4	N	20	10	10	N	300	N	<5	<10	N	N	.60	30	N	14	150
PPA173	.7	10	20	20	20	N	500	N	15	10	<5	<100	.80	100	<10	19	100
PPA174	.4	<10	20	20	30	N	500	N	7	10	<5	N	1.10	50	<10	17	50
PPA175	.3	<10	10	15	20	N	500	N	10	<10	<5	<100	.65	70	<10	17	200
PPA176	.3	<10	10	15	20	N	500	N	15	<10	5	100	.75	70	<10	16	300
PPA177	.3	N	150	7	15	N	200	N	5	N	<5	N	.55	70	N	15	700
PPA178	.3	N	<10	5	10	N	150	N	5	N	N	N	.60	30	N	9	150

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TABLE 4.--Results of analyses of heavy-mineral-concentrate samples collected from the Rimrock, Sand Canyon, Little Rimrock, Pinyon, and Petaca Pinta Wilderness Study Areas, Cibola County, New Mexico

[N, not detected; <, detected below value shown; >, greater than value shown. Analyses by emission spectrography. Ca, Fe, Mg, Na, and Ti are weight percent; other elements are ppm]

Sample	Latitude	Longitude	Ca	Fe	Mg	Na	Ti	B	Ba	Be	Cd	Co	Cr	Cu
						Rimrock								
RRH001	34 52 9	107 53 26	.50	20	1.5	<.5	2.0	<20	500	N	N	70	300	50
RRH002	34 50 28	107 54 24	1.00	20	2.0	.5	>2.0	<20	300	N	N	70	700	70
RRH003	34 50 34	107 54 6	1.50	15	2.0	<.5	>2.0	20	1,500	N	N	100	500	70
RRH004	34 50 34	107 54 10	1.50	15	2.0	<.5	>2.0	20	700	N	N	100	500	70
RRH005	34 49 41	107 54 27	2.00	15	3.0	1.0	2.0	30	500	N	N	70	300	50
RRH038	34 45 20	107 53 39	.30	15	3.0	N	2.0	20	>10,000	N	N	70	700	50
RRH039	34 45 18	107 53 39	2.00	20	3.0	<.5	>2.0	200	3,000	<2	N	100	1,000	100
RRH040	34 45 24	107 52 59	.30	15	.3	N	1.5	50	>10,000	<2	N	20	200	50
RRH041	34 45 3	107 52 31	<.10	10	.5	N	1.5	50	>10,000	N	N	20	700	30
RRH042	34 44 11	107 53 32	.30	15	.5	N	1.5	30	>10,000	N	N	30	100	70
RRH046	34 41 52	107 53 13	.20	15	1.5	N	>2.0	20	>10,000	N	N	50	150	50
RRH047	34 41 39	107 52 57	.50	20	2.0	N	2.0	<20	>10,000	N	N	70	200	100
RRH048	34 41 17	107 52 20	.70	30	2.0	N	>2.0	70	>10,000	N	N	150	700	150
RRH049	34 41 3	107 51 34	.50	15	3.0	<.5	2.0	30	5,000	N	N	70	500	100
RRH050	34 46 18	107 55 5	.50	20	3.0	N	>2.0	20	>10,000	N	N	150	700	100
RRH051	34 46 11	107 55 12	1.00	15	3.0	<.5	2.0	30	5,000	N	N	70	700	70
RRH052	34 45 49	107 55 21	.30	20	1.5	N	>2.0	<20	5,000	N	N	100	700	100
RRH053	34 44 53	107 55 21	.20	15	2.0	N	2.0	20	>10,000	N	N	70	500	70
RRH054	34 44 36	107 55 9	.50	15	2.0	N	>2.0	70	>10,000	<2	N	70	1,500	100
RRH055	34 44 18	107 54 51	.70	15	1.0	N	>2.0	70	>10,000	<2	N	70	1,000	70
RRH059	34 43 43	107 54 16	1.00	15	1.0	N	>2.0	200	>10,000	2	N	50	300	100
RRH063	34 47 19	107 54 57	1.00	20	3.0	N	>2.0	30	7,000	N	N	100	1,000	70
RRH064	34 47 49	107 54 22	1.00	20	2.0	.5	>2.0	20	2,000	N	N	70	1,000	70
RRH065	34 48 9	107 54 14	.50	20	3.0	N	>2.0	20	7,000	N	N	100	1,000	100
RRH066	34 48 20	107 53 45	1.00	20	5.0	N	>2.0	20	2,000	N	N	100	700	70
RRH067	34 48 45	107 53 40	2.00	20	3.0	N	>2.0	30	5,000	N	N	100	700	70
RRH068	34 49 13	107 53 13	.50	20	5.0	N	>2.0	20	10,000	N	N	100	700	100
RRH069	34 49 30	107 53 3	1.50	20	5.0	<.5	>2.0	30	7,000	N	N	100	500	100
RRH070	34 49 49	107 53 23	.70	20	3.0	N	>2.0	<20	3,000	N	N	100	500	70
RRH071	34 43 28	107 53 31	.30	15	2.0	N	>2.0	30	>10,000	N	N	70	300	70
RRH072	34 43 11	107 53 31	.20	20	5.0	N	2.0	20	2,000	N	N	100	700	70
RRH073	34 42 49	107 53 38	.30	20	1.0	N	2.0	50	>10,000	<2	N	50	300	70
RRH077	34 41 1	107 49 47	.30	20	2.0	N	>2.0	20	>10,000	<2	N	70	1,000	70
RRH078	34 40 51	107 49 49	.70	15	2.0	N	>2.0	200	3,000	<2	N	70	2,000	150
RRH079	34 40 48	107 49 51	.15	15	.7	N	>2.0	70	10,000	<2	N	30	700	70
RRH080	34 40 54	107 50 17	1.00	20	5.0	<.5	2.0	30	5,000	N	N	100	1,000	100
RRH081	34 40 50	107 50 53	.70	20	5.0	.5	1.5	20	5,000	N	N	100	700	100
RRH083	34 41 6	107 46 53	.50	20	1.5	N	>2.0	50	>10,000	N	N	70	500	100
RRH084	34 41 9	107 46 56	.50	20	2.0	<.5	>2.0	150	700	<2	N	100	1,500	150
RRH085	34 41 24	107 46 54	.70	20	2.0	<.5	>2.0	20	300	<2	N	70	300	70

TABLE 4.--Results of analyses of heavy-mineral-concentrate samples collected from the Rimrock, Sand Canyon, Little Rimrock, Pinyon, and Petaca Pinta Wilderness Study Areas, Cibola County, New Mexico--Continued

Sample	Ga	La	Mn	Mo	Nb	Ni	Pb	Sc	Sn	Sr	V	Y	Zn	Zr
						Rimrock--Continued								
RRH001	20	100	1,500	N	<50	100	20	<10	N	N	200	100	N	>2,000
RRH002	50	N	2,000	N	N	100	<20	10	N	N	200	100	N	>2,000
RRH003	70	100	2,000	N	50	100	30	15	N	N	500	150	N	>2,000
RRH004	50	<100	2,000	N	<50	100	70	15	N	N	300	200	N	>2,000
RRH005	100	<100	2,000	N	<50	150	50	10	N	N	200	70	N	>2,000
RRH038	50	<100	1,500	N	<50	300	<20	N	N	700	200	70	N	>2,000
RRH039	30	200	2,000	N	50	200	20	30	N	<200	300	500	N	>2,000
RRH040	50	100	2,000	N	<50	30	20	N	N	2,000	150	100	N	>2,000
RRH041	50	150	1,000	N	<50	70	20	<10	N	200	100	200	N	>2,000
RRH042	70	<100	1,500	N	<50	50	30	N	N	3,000	150	70	N	>2,000
RRH046	50	N	1,500	N	<50	100	<20	N	N	5,000	500	100	N	>2,000
RRH047	50	N	2,000	N	<50	200	30	<10	N	500	500	100	N	>2,000
RRH048	100	200	5,000	N	<50	200	30	20	N	<200	700	300	N	>2,000
RRH049	50	<100	1,500	N	<50	150	30	<10	N	N	200	200	N	>2,000
RRH050	70	300	3,000	N	<50	300	N	15	N	300	500	200	N	>2,000
RRH051	50	100	2,000	N	<50	200	50	10	N	N	300	150	N	>2,000
RRH052	70	<100	2,000	N	<50	150	N	10	N	N	500	100	N	>2,000
RRH053	50	<100	1,500	N	<50	200	N	<10	N	500	300	100	N	>2,000
RRH054	70	500	5,000	N	<50	150	20	20	50	300	500	500	N	>2,000
RRH055	50	200	2,000	N	<50	150	20	20	N	700	200	500	N	>2,000
RRH059	70	500	2,000	N	50	70	70	20	N	5,000	300	1,500	N	>2,000
RRH063	70	150	3,000	N	<50	200	20	10	N	<200	300	300	N	>2,000
RRH064	50	<100	2,000	N	<50	100	50	<10	N	N	200	150	N	>2,000
RRH065	50	150	1,500	N	N	200	20	15	N	N	200	150	N	>2,000
RRH066	50	150	2,000	N	<50	200	20	10	N	N	300	150	N	>2,000
RRH067	50	300	3,000	N	50	200	30	20	N	<200	500	200	N	>2,000
RRH068	50	100	2,000	N	<50	500	20	<10	N	700	300	100	N	>2,000
RRH069	100	<100	5,000	N	<50	300	50	10	N	3,000	500	100	N	>2,000
RRH070	50	N	2,000	N	N	300	N	<10	N	N	300	70	N	>2,000
RRH071	50	200	2,000	N	<50	300	20	<10	N	<200	200	200	N	>2,000
RRH072	50	150	1,500	N	N	300	<20	N	N	N	200	300	N	>2,000
RRH073	50	150	1,500	N	<50	100	<20	<10	N	<200	200	200	N	>2,000
RRH077	70	300	2,000	N	<50	150	20	20	N	500	500	1,000	N	>2,000
RRH078	50	300	2,000	N	<50	100	20	70	N	<200	300	1,000	N	>2,000
RRH079	30	500	1,500	N	N	50	<20	15	N	<200	200	500	N	>2,000
RRH080	100	100	2,000	N	<50	300	50	10	N	N	300	200	N	>2,000
RRH081	50	<100	2,000	N	<50	200	30	<10	N	N	300	50	N	>2,000
RRH083	70	200	3,000	N	<50	70	20	<10	N	1,500	500	200	N	>2,000
RRH084	70	500	2,000	N	<50	70	50	70	N	<200	300	1,000	N	>2,000
RRH085	30	<100	1,500	N	<50	100	<20	<10	N	N	300	100	N	>2,000

TABLE 4.--Results of analyses of heavy-mineral-concentrate samples collected from the Rimrock, Sand Canyon, Little Rimrock, Pinyon, and Petaca Pinta Wilderness Study Areas, Cibola County, New Mexico--Continued

Sample	Latitude	Longitude	Ca	Fe	Mg	Na	Ti	B	Ba	Be	Cd	Co	Cr	Cu
						Rimrock--Continued								
RRH200	34 51 4	107 48 8	.70	20	2.0	<.5	1.0	70	5,000	N	N	50	500	50
RRH201	34 51 10	107 48 10	.15	15	1.5	N	.7	<20	>10,000	N	N	30	300	100
RRH202	34 51 5	107 48 8	1.00	20	5.0	.5	>2.0	70	7,000	<2	N	70	200	100
RRH203	34 50 55	107 48 55	.70	20	3.0	N	>2.0	30	>10,000	N	N	100	200	150
RRH204	34 51 1	107 49 3	1.50	20	3.0	<.5	>2.0	200	2,000	<2	N	100	300	150
RRH205	34 51 32	107 49 34	1.00	15	2.0	<.5	2.0	50	3,000	<2	N	70	150	100
RRH206	34 51 44	107 49 30	1.00	15	3.0	.5	2.0	150	5,000	<2	N	70	150	150
RRH207	34 51 16	107 50 11	1.00	20	2.0	<.5	>2.0	20	10,000	N	N	100	300	150
RRH208	34 52 1	107 50 8	1.50	15	3.0	1.0	>2.0	30	300	N	N	100	200	100
RRH209	34 52 27	107 50 15	2.00	15	2.0	.7	>2.0	30	200	N	N	100	300	150
RRH210	34 52 54	107 50 3	2.00	15	3.0	.5	>2.0	100	1,500	N	N	70	300	100
RRH211	34 53 5	107 49 55	.50	15	5.0	<.5	1.5	20	>10,000	N	N	100	300	100
RRH212	34 53 10	107 49 59	.50	15	3.0	<.5	2.0	20	5,000	N	N	100	300	100
RRH213	34 54 3	107 50 18	.70	15	2.0	<.5	>2.0	20	1,500	N	N	50	200	100
RRH214	34 53 9	107 51 20	.70	20	2.0	<.5	>2.0	200	10,000	N	N	100	500	150
RRH215	34 52 58	107 51 25	.50	20	1.5	N	2.0	<20	1,500	N	N	100	200	100
RRH216	34 52 51	107 51 48	1.00	20	2.0	N	>2.0	20	2,000	N	N	100	300	100
RRH217	34 52 21	107 52 44	.70	15	1.5	<.5	>2.0	30	5,000	N	N	70	150	100
						Sand Canyon								
SCH006	34 44 7	107 57 51	.50	20	.7	N	>2.0	<20	200	N	N	100	300	100
SCH007	34 43 45	107 58 14	3.00	15	3.0	<.5	>2.0	50	500	N	N	70	700	70
SCH008	34 40 57	107 57 36	2.00	10	3.0	.5	>2.0	50	1,500	N	N	50	300	50
SCH009	34 40 51	107 57 35	.70	30	.7	N	>2.0	<20	2,000	N	N	100	700	100
SCH010	34 40 35	107 58 23	.50	20	1.0	N	>2.0	20	500	N	N	100	700	100
SCH026	34 44 39	107 56 15	.70	20	2.0	<.5	>2.0	70	1,000	N	N	100	700	100
SCH027	34 44 31	107 56 7	.30	30	2.0	N	>2.0	<20	500	N	N	100	1,000	100
SCH028	34 44 4	107 55 55	.30	50	1.0	N	>2.0	<20	300	N	N	150	700	100
SCH029	34 43 24	107 55 38	1.00	50	2.0	N	>2.0	50	200	N	N	150	1,000	150
SCH030	34 42 24	107 55 29	2.00	15	5.0	.7	>2.0	50	500	N	N	100	500	100
SCH036	34 40 35	107 55 51	1.50	30	3.0	<.5	>2.0	20	700	N	N	100	1,000	100
SCH037	34 41 2	107 55 46	1.50	20	2.0	<.5	>2.0	50	3,000	N	N	70	300	70
SCH056	34 45 4	107 55 55	.70	20	1.5	N	>2.0	20	200	N	N	70	700	70
SCH060	34 44 54	107 57 40	.50	30	.7	N	>2.0	<20	300	N	N	70	1,000	100
SCH061	34 42 34	107 59 1	.50	30	1.5	N	>2.0	<20	200	N	N	70	700	70
SCH062	34 43 15	107 58 13	1.50	20	3.0	.7	>2.0	50	500	N	N	100	1,000	70
SCH106	34 39 31	107 58 15	.70	30	1.5	<.5	>2.0	30	1,000	N	N	100	1,000	150
SCH107	34 39 42	107 58 18	<.10	50	.7	N	>2.0	<20	700	N	N	150	700	100
SCH108	34 40 2	107 58 33	.50	30	1.0	N	>2.0	20	2,000	N	N	100	700	150
SCH109	34 41 44	107 58 44	3.00	15	3.0	.5	>2.0	50	700	N	N	100	500	100

TABLE 4.--Results of analyses of heavy-mineral-concentrate samples collected from the Rimrock, Sand Canyon, Little Rimrock, Pinyon, and Petaca Pinta Wilderness Study Areas, Cibola County, New Mexico--Continued

Sample	Ga	La	Mn	Mo	Nb	Ni	Pb	Sc	Sn	Sr	V	Y	Zn	Zr
						Rimrock--Continued								
RRH200	50	<100	1,500	N	<50	150	30	<10	N	<200	200	100	N	>2,000
RRH201	70	150	2,000	<10	<50	150	30	N	N	5,000	150	100	N	>2,000
RRH202	100	200	1,500	N	50	500	50	15	N	<200	200	300	N	>2,000
RRH203	100	150	2,000	N	50	500	30	10	N	200	500	200	N	>2,000
RRH204	100	200	2,000	N	<50	300	20	15	N	<200	300	300	N	>2,000
RRH205	70	<100	1,500	N	<50	200	30	<10	N	N	200	70	N	>2,000
RRH206	100	150	1,500	N	<50	300	70	10	N	<200	300	300	N	>2,000
RRH207	150	100	1,500	N	<50	150	<20	15	N	<200	500	150	N	>2,000
RRH208	100	N	1,500	N	<50	150	50	15	N	N	500	150	N	>2,000
RRH209	100	<100	1,500	N	<50	100	30	20	N	N	700	200	N	>2,000
RRH210	70	100	2,000	N	<50	100	30	15	N	N	500	200	N	>2,000
RRH211	70	100	1,500	<10	N	300	30	<10	N	2,000	200	200	N	>2,000
RRH212	70	150	1,500	N	<50	300	20	<10	N	N	300	200	N	>2,000
RRH213	50	N	1,500	N	N	70	20	<10	N	N	300	150	N	>2,000
RRH214	70	<100	3,000	<10	N	150	30	10	N	700	500	200	N	>2,000
RRH215	50	<100	2,000	N	N	70	30	<10	N	N	500	150	N	>2,000
RRH216	70	100	2,000	N	<50	200	<20	10	N	N	500	100	N	>2,000
RRH217	100	<100	1,500	N	<50	150	20	<10	N	N	300	100	N	>2,000
						Sand Canyon--Continued								
SCH006	100	<100	2,000	N	<50	100	50	10	N	N	700	100	N	>2,000
SCH007	70	150	3,000	N	50	100	30	20	N	<200	500	200	N	>2,000
SCH008	50	100	2,000	N	<50	70	20	15	N	N	200	150	N	>2,000
SCH009	70	100	2,000	N	<50	100	20	15	N	N	700	100	N	>2,000
SCH010	50	150	1,500	N	N	100	20	15	N	N	500	200	N	>2,000
SCH026	50	100	2,000	N	<50	100	30	15	N	N	500	200	N	>2,000
SCH027	30	<100	2,000	N	N	70	<20	10	N	N	500	200	N	>2,000
SCH028	100	<100	2,000	N	<50	100	20	<10	N	N	700	100	N	>2,000
SCH029	70	500	3,000	N	N	150	20	30	N	N	700	500	N	>2,000
SCH030	100	150	2,000	N	<50	100	50	20	N	<200	500	200	N	>2,000
SCH036	100	100	3,000	N	N	100	20	15	N	<200	500	150	<500	>2,000
SCH037	70	<100	2,000	N	<50	70	20	<10	N	<200	300	50	N	>2,000
SCH056	50	100	2,000	N	<50	100	<20	15	N	N	300	150	N	>2,000
SCH060	100	<100	2,000	N	<50	100	<20	10	N	N	500	100	N	>2,000
SCH061	70	N	2,000	N	<50	100	<20	<10	N	N	200	70	N	>2,000
SCH062	70	150	3,000	N	<50	100	50	15	N	<200	200	150	N	>2,000
SCH106	100	150	2,000	N	<50	100	<20	15	N	N	700	150	N	>2,000
SCH107	70	N	1,500	N	N	70	N	<10	N	N	700	50	N	>2,000
SCH108	70	<100	2,000	N	N	100	<20	10	N	N	700	150	N	>2,000
SCH109	100	100	3,000	N	<50	150	50	30	20	N	500	300	N	>2,000

TABLE 4.--Results of analyses of heavy-mineral-concentrate samples collected from the Rimrock, Sand Canyon, Little Rimrock, Pinyon, and Petaca Pinta Wilderness Study Areas, Cibola County, New Mexico--Continued

Sample	Latitude	Longitude	Ca	Fe	Mg	Na	Ti	B	Ba	Be	Cd	Co	Cr	Cu
						Sand Canyon--Continued								
SCH110	34 41 56	107 59 2	.20	30	.5	N	>2.0	20	100	N	N	100	500	100
						Little Rimrock								
LRH031	34 42 16	107 55 18	.50	20	1.0	N	>2.0	<20	5,000	N	N	100	300	100
LRH032	34 41 59	107 55 18	.50	20	1.0	N	>2.0	20	2,000	N	N	100	700	150
LRH033	34 41 23	107 55 28	.30	20	1.0	N	>2.0	<20	3,000	N	N	100	500	150
LRH034	34 40 59	107 55 33	1.00	20	3.0	<.5	>2.0	<20	3,000	N	N	100	700	100
LRH035	34 40 27	107 55 35	1.00	30	2.0	<.5	>2.0	30	700	N	N	100	700	100
LRH043	34 42 21	107 53 55	1.00	30	1.0	N	>2.0	<20	1,500	N	N	100	1,000	100
LRH044	34 42 19	107 53 47	1.50	20	1.5	N	>2.0	20	1,500	N	N	70	500	100
LRH045	34 41 51	107 53 30	1.50	20	2.0	<.5	>2.0	20	1,500	N	N	70	500	100
LRH057	34 43 7	107 55 23	1.00	20	1.0	N	>2.0	50	3,000	N	N	50	300	100
LRH058	34 43 28	107 54 21	.50	30	.7	N	>2.0	<20	1,500	N	N	100	1,000	100
LRH074	34 41 28	107 53 24	1.00	30	3.0	.7	>2.0	20	3,000	N	N	150	1,500	100
LRH075	34 41 17	107 52 46	1.00	30	2.0	N	>2.0	20	2,000	N	N	100	700	100
LRH076	34 40 51	107 51 54	2.00	20	5.0	.5	>2.0	50	1,500	N	N	100	500	100
LRH082	34 39 57	107 50 57	.50	20	1.5	N	>2.0	30	1,000	N	N	100	500	100
LRH086	34 38 14	107 51 21	.50	30	2.0	N	>2.0	200	1,500	<2	N	150	2,000	100
LRH087	34 38 12	107 51 25	.50	20	1.0	N	2.0	20	500	N	N	50	500	50
LRH100	34 38 29	107 52 14	1.50	30	2.0	<.5	>2.0	50	700	N	N	150	700	150
LRH101	34 38 11	107 52 31	1.00	20	2.0	<.5	>2.0	50	500	N	N	100	500	100
LRH102	34 38 7	107 52 28	1.00	15	2.0	N	>2.0	100	5,000	N	N	70	700	70
LRH103	34 39 13	107 51 35	1.00	15	2.0	<.5	>2.0	50	>10,000	N	N	100	1,500	70
LRH104	34 38 47	107 51 58	.50	20	1.0	N	>2.0	20	500	N	N	100	700	100
						Pinyon								
PNH011	34 39 20	107 57 58	.50	20	1.0	N	>2.0	<20	1,000	N	N	70	300	70
PNH012	34 38 26	107 58 10	.70	30	1.0	N	>2.0	30	700	N	N	150	700	100
PNH013	34 36 31	107 57 4	.30	20	.7	N	>2.0	50	1,000	N	N	50	700	70
PNH014	34 36 46	107 56 35	2.00	20	2.0	.5	>2.0	30	2,000	<2	N	70	200	100
PNH015	34 36 39	107 55 55	.70	15	1.5	N	>2.0	20	700	N	N	70	500	70
PNH016	34 36 59	107 55 31	1.00	15	2.0	.7	>2.0	70	5,000	N	N	50	500	70
PNH017	34 36 57	107 55 30	2.00	20	3.0	.5	>2.0	100	3,000	<2	N	70	700	100
PNH018	34 35 54	107 57 11	.50	30	.5	N	>2.0	<20	700	N	N	100	700	100
PNH019	34 35 32	107 56 59	1.50	15	2.0	1.0	2.0	20	500	N	N	70	500	70
PNH020	34 35 14	107 56 46	1.50	20	2.0	<.5	>2.0	30	150	N	N	70	500	70
PNH021	34 34 51	107 56 33	1.00	20	3.0	.5	>2.0	30	200	N	N	100	700	70
PNH022	34 35 41	107 54 41	1.50	20	3.0	<.5	>2.0	70	2,000	N	N	70	700	50
PNH023	34 36 52	107 58 14	.20	30	1.0	N	>2.0	<20	300	N	N	100	500	100
PNH024	34 37 39	107 57 56	1.00	15	3.0	<.5	>2.0	50	200	N	70	70	700	70
PNH025	34 37 41	107 57 57	.30	50	.7	N	>2.0	<20	2,000	N	N	100	500	100

TABLE 4.--Results of analyses of heavy-mineral-concentrate samples collected from the Rimrock, Sand Canyon, Little Rimrock, Pinyon, and Petaca Pinta Wilderness Study Areas, Cibola County, New Mexico--Continued

Sample	Ga	La	Mn	Mo	Nb	Ni	Pb	Sc	Sn	Sr	V	Y	Zn	Zr
						Sand Canyon--Continued								
SCH110	50	<100	2,000	N	N	100	20	<10	30	N	500	100	N	>2,000
						Little Rimrock--Continued								
LRH031	70	100	2,000	N	<50	100	20	15	N	N	700	150	N	>2,000
LRH032	30	150	2,000	N	N	70	20	10	N	N	500	200	N	>2,000
LRH033	50	<100	1,500	N	<50	70	30	<10	N	N	500	100	N	>2,000
LRH034	50	<100	2,000	N	N	70	<20	10	N	N	500	100	N	>2,000
LRH035	70	100	2,000	N	<50	100	30	15	N	N	500	200	N	>2,000
LRH043	100	<100	2,000	N	<50	100	<20	20	N	N	500	300	N	>2,000
LRH044	50	150	2,000	N	<50	70	<20	15	N	N	300	150	N	>2,000
LRH045	70	<100	3,000	N	N	70	<20	15	N	N	500	200	N	>2,000
LRH057	100	100	3,000	N	<50	70	50	10	N	N	700	200	N	>2,000
LRH058	70	150	3,000	N	<50	100	<20	15	N	N	700	150	N	>2,000
LRH074	100	100	2,000	N	<50	150	<20	20	N	N	300	300	N	>2,000
LRH075	70	150	3,000	N	<50	100	20	20	N	N	500	200	N	>2,000
LRH076	70	100	3,000	N	50	100	30	20	N	N	500	150	N	>2,000
LRH082	50	100	2,000	N	<50	100	<20	10	N	N	500	150	N	>2,000
LRH086	50	300	5,000	N	<50	200	30	20	N	<200	500	1,000	N	>2,000
LRH087	50	100	5,000	N	N	50	30	N	N	N	200	200	N	>2,000
LRH100	150	<100	5,000	N	<50	100	50	20	N	N	700	200	N	>2,000
LRH101	150	100	3,000	N	<50	100	50	15	N	N	500	200	N	>2,000
LRH102	100	150	2,000	N	<50	100	30	15	N	<200	500	300	N	>2,000
LRH103	100	100	3,000	N	<50	100	20	15	N	<200	300	200	N	>2,000
LRH104	100	<100	2,000	N	<50	100	<20	10	N	N	500	100	N	>2,000
						Pinyon--Continued								
PNH011	70	<100	2,000	N	<50	70	<20	<10	N	N	700	50	N	>2,000
PNH012	100	150	2,000	N	<50	150	30	15	N	N	700	100	N	>2,000
PNH013	20	100	1,500	N	N	70	<20	<10	N	N	300	200	N	>2,000
PNH014	50	100	2,000	N	50	150	70	10	N	N	500	150	N	>2,000
PNH015	20	100	2,000	N	<50	100	20	10	N	N	500	150	N	>2,000
PNH016	70	<100	1,500	N	<50	70	50	15	N	N	200	100	N	>2,000
PNH017	70	300	3,000	N	<50	150	70	20	N	<200	500	500	N	>2,000
PNH018	70	100	2,000	N	<50	150	20	15	N	N	500	100	N	>2,000
PNH019	150	N	2,000	N	<50	100	100	<10	N	<200	300	150	N	>2,000
PNH020	100	100	2,000	N	<50	100	20	15	N	N	300	200	N	>2,000
PNH021	70	<100	2,000	N	<50	150	30	15	N	N	200	200	N	>2,000
PNH022	70	200	3,000	N	N	150	<20	20	N	<200	300	300	N	>2,000
PNH023	100	N	2,000	N	<50	100	20	10	N	N	500	70	N	>2,000
PNH024	70	100	2,000	N	<50	100	30	15	N	N	500	150	N	>2,000
PNH025	100	100	2,000	N	N	100	20	10	N	N	700	100	<500	>2,000

TABLE 4.--Results of analyses of heavy-mineral-concentrate samples collected from the Rimrock, Sand Canyon, Little Rimrock, Pinyon, and Petaca Pinta Wilderness Study Areas, Cibola County, New Mexico--Continued

Sample	Latitude	Longitude	Ca	Fe	Mg	Na	Ti	B	Ba	Be	Cd	Co	Cr	Cu
						Pinyon--Continued								
PNH105	34 38 1	107 58 28	.70	20	1.5	N	>2.0	20	1,000	N	N	70	1,500	100
						Petaca Pinta								
PPH157	34 42 4	107 32 45	2.00	15	3.0	N	>2.0	70	>10,000	<2	N	100	100	100
PPH158	34 42 7	107 32 41	1.50	15	3.0	N	>2.0	50	>10,000	N	N	100	200	100
PPH159	34 42 17	107 32 18	.30	50	1.0	N	>2.0	100	10,000	N	N	150	700	100
PPH160	34 42 41	107 31 38	.50	30	1.0	<.5	>2.0	100	10,000	<2	N	150	500	150
PPH161	34 42 35	107 31 23	1.00	20	2.0	N	.7	100	>10,000	N	N	70	1,000	70
PPH162	34 42 47	107 31 1	.50	20	1.5	N	1.0	20	10,000	N	N	50	300	50
PPH163	34 41 47	107 30 1	1.50	15	5.0	.5	1.0	20	>10,000	N	N	70	500	50
PPH164	34 42 19	107 30 9	1.00	15	3.0	N	1.5	30	>10,000	N	N	70	500	70
PPH165	34 43 1	107 29 47	1.50	15	7.0	.5	.7	20	1,500	N	N	100	700	70
PPH166	34 43 11	107 29 47	1.00	15	5.0	1.0	.7	20	10,000	N	N	70	700	70
PPH167	34 43 13	107 29 46	.50	10	3.0	N	1.0	150	>10,000	N	N	50	1,500	50
PPH168	34 43 43	107 28 11	.50	15	1.0	N	1.0	50	>10,000	N	N	30	1,000	50
PPH169	34 44 31	107 27 39	.70	20	2.0	<.5	2.0	300	>10,000	N	N	70	1,000	70
PPH170	34 45 10	107 27 26	1.00	15	3.0	<.5	>2.0	500	>10,000	N	N	100	1,000	70
PPH171	34 46 51	107 27 57	.70	15	2.0	N	>2.0	500	>10,000	N	N	70	2,000	70
PPH172	34 46 53	107 27 59	.70	20	1.5	N	2.0	150	>10,000	N	N	50	1,000	70
PPH173	34 47 29	107 28 11	1.00	10	7.0	<.5	.7	<20	>10,000	N	N	70	300	30
PPH174	34 47 13	107 28 54	2.00	15	3.0	.3	1.5	200	>10,000	N	N	50	150	50
PPH175	34 45 37	107 30 25	1.00	10	1.0	N	1.5	200	>10,000	N	N	30	1,500	50
PPH176	34 46 9	107 30 42	.50	10	.5	N	1.0	150	>10,000	N	N	20	1,500	30
PPH177	34 46 39	107 30 48	.30	15	.3	N	1.0	100	>10,000	N	N	<20	1,000	30
PPH178	34 47 14	107 30 58	1.50	10	.5	N	1.5	700	>10,000	N	N	<20	2,000	50

TABLE 4.--Results of analyses of heavy-mineral-concentrate samples collected from the Rimrock, Sand Canyon, Little Rimrock, Pinyon, and Petaca Pinta Wilderness Study Areas, Cibola County, New Mexico--Continued

Sample	Ga	La	Mn	Mo	Nb	Ni	Pb	Sc	Sn	Sr	V	Y	Zn	Zr
						Pinyon--Continued								
PNH105	70	100	2,000	N	N	70	<20	10	N	N	500	200	N	>2,000
						Petaca Pinta--Continued								
PPH157	30	N	2,000	<10	N	100	<20	15	N	300	500	70	N	>2,000
PPH158	30	N	2,000	N	<50	70	<20	15	N	200	300	70	N	>2,000
PPH159	150	<100	2,000	N	<50	200	100	<10	N	<200	700	50	N	>2,000
PPH160	70	<100	1,500	N	<50	150	70	<10	N	<200	700	50	N	>2,000
PPH161	30	N	2,000	N	N	200	20	N	N	500	300	70	N	>2,000
PPH162	50	N	1,500	N	N	150	70	N	N	N	500	30	N	>2,000
PPH163	30	<100	2,000	N	<50	300	50	N	N	200	700	50	N	>2,000
PPH164	50	<100	2,000	N	N	300	20	N	N	1,000	700	50	N	>2,000
PPH165	30	N	1,500	N	N	300	20	N	N	N	300	<20	N	>2,000
PPH166	70	N	1,500	N	N	300	20	N	N	300	300	20	N	>2,000
PPH167	15	N	1,500	N	N	200	<20	N	N	200	500	100	N	>2,000
PPH168	15	<100	1,500	N	N	150	20	N	N	5,000	500	100	N	>2,000
PPH169	30	<100	1,500	N	<50	100	50	<10	N	<200	500	100	N	>2,000
PPH170	50	200	2,000	N	<50	200	70	10	N	200	1,000	200	N	>2,000
PPH171	20	200	1,500	N	N	150	<20	10	N	300	1,500	700	N	>2,000
PPH172	30	100	1,500	N	<50	100	30	N	N	500	700	150	N	>2,000
PPH173	20	150	1,500	N	N	300	20	N	N	1,500	1,000	50	N	2,000
PPH174	50	100	2,000	N	<50	150	50	N	N	300	500	70	N	2,000
PPH175	20	150	1,500	<10	N	100	20	N	N	5,000	1,000	200	N	>2,000
PPH176	15	300	1,500	N	N	30	30	N	N	7,000	1,500	300	N	>2,000
PPH177	15	150	1,500	N	N	30	<20	N	N	3,000	700	200	N	>2,000
PPH178	10	500	2,000	10	N	20	30	10	N	10,000	2,000	1,000	N	>2,000