UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Analytical results and sample locality map of stream-sediment, heavy-mineral-concentrate, and rock samples from the Alvord Desert and East Alvord Wilderness Study Areas, (OR-002-074 and OR-002-073A) Malheur and Harney Counties, Oregon

By

Janet L. Jones*, M.S. Erickson*,

and Robert L. Turner*

Open-File Report 89-21

*U.S. Geological Survey, DFC, Box 25046, MS 973, Denver, CO 80225

1989

CONTENTS

Page

Studies Related to Wilderness..... 1
Introduction..... 1
Methods of Study..... 1
  Sample Media..... 1
  Sample Collection..... 3
    Stream-sediment samples..... 3
    Heavy-mineral-concentrate samples..... 3
    Rock samples..... 3
  Sample Preparation..... 3
  Sample Analysis..... 4
    Spectrographic method..... 4
    Chemical methods..... 4
Data Storage Systemq..... 4
Description of Data Tables..... 4
Acknowledgments..... 4
References Cited..... 4

ILLUSTRATIONS

Figure 1. Location map of the Alvord Desert and East Alvord Wilderness Study Area, Malheur and Harney Counties, Oregon..... 2
Plate 1. Map showing geochemical sample sites from the Alvord Desert and East Alvord Wilderness Study Areas, Malheur and Harney Counties, Oregon.....in pocket

TABLES

Table 1. Limits of determination for spectrographic analysis of rocks and stream sediments..... 6
Table 2. Chemical methods used..... 7
Table 3. Analytical results of stream-sediment samples collected from the Alvord Desert Wilderness Study Area, Oregon..... 8
Table 4. Analytical results of heavy-mineral-concentrate samples collected from the Alvord Wilderness Study Area, Oregon..... 11
Table 5. Analytical results of rock samples collected from the Alvord Desert Wilderness Study Area, Oregon..... 14
Table 6. Analytical results of stream-sediment samples collected from the East Alvord Wilderness Study Area, Oregon..... 15
Table 7. Analytical results of heavy-mineral-concentrate samples collected from the East Alvord Wilderness Study Area, Oregon..... 18
Table 8. Analytical results of rock samples collected from the East Alvord Wilderness Study Area, Oregon..... 21

STUDIES RELATED TO WILDERNESS

Bureau of Land Management Wilderness Study Areas

The Federal Land Policy and Management Act (Public Law 94-579, October 21, 1976) requires the U.S. Geological Survey and the U.S. Bureau of Mines to conduct mineral surveys on certain areas to determine their mineral values, if any. Results must be made available to the public and be submitted to the President and the Congress. This report presents the results of a geochemical survey of the Alvord Desert and East Alvord Wilderness Study Areas (OR-002-074 and OR-002-073A) Malheur and Harney Counties, Oregon.

INTRODUCTION

In July 1986, the U.S. Geological Survey conducted a reconnaissance geochemical survey of the Alvord Desert and East Alvord Wilderness Study Areas, Oregon (fig 1).

The Alvord Desert Wilderness Study Area comprises about 69,165 acres (100.6 sq mi) in central, western Malheur County and central, eastern Harney County. The East Alvord Wilderness Study Area encompasses about 15,785 acres (23.7 sq mi) in central, eastern Harney County. The study areas are about 25 miles north of the small town of Fields, Oregon. Access to the areas is limited to an unpaved road running along the eastern edge of the Alvord Desert and to a few unpaved and four-wheel drive roads which essentially define the perimeter of the areas.

The topographic relief in the study area is moderate to low with elevations ranging from about 5,300 ft in the northern part of East Alvord to about 4,000 ft on the eastern side of the Alvord playa. The areas are covered with volcanic extrusive rocks of Miocene and Pliocene age and these are locally overlain by lacustrine and aeolian sediments of Pleistocene and recent age (written comm. Tom Lovering). The climate of the areas is arid and there is little vegetation other than low lying shrubs which are dominantly sage.

METHODS OF STUDY

Sample Media

Analyses of the stream-sediment samples represent the chemistry of the rock material eroded from the drainage basin upstream from each sample site. Such information is useful in identifying those basins which contain concentrations of elements that may be related to mineral deposits. Heavy-mineral-concentrate samples provide information about the chemistry of certain minerals in rock material eroded from the drainage basin upstream from each sample site. The selective concentration of minerals, many of which may be ore related, permits determination of some elements that are not easily detected in stream-sediment samples.

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

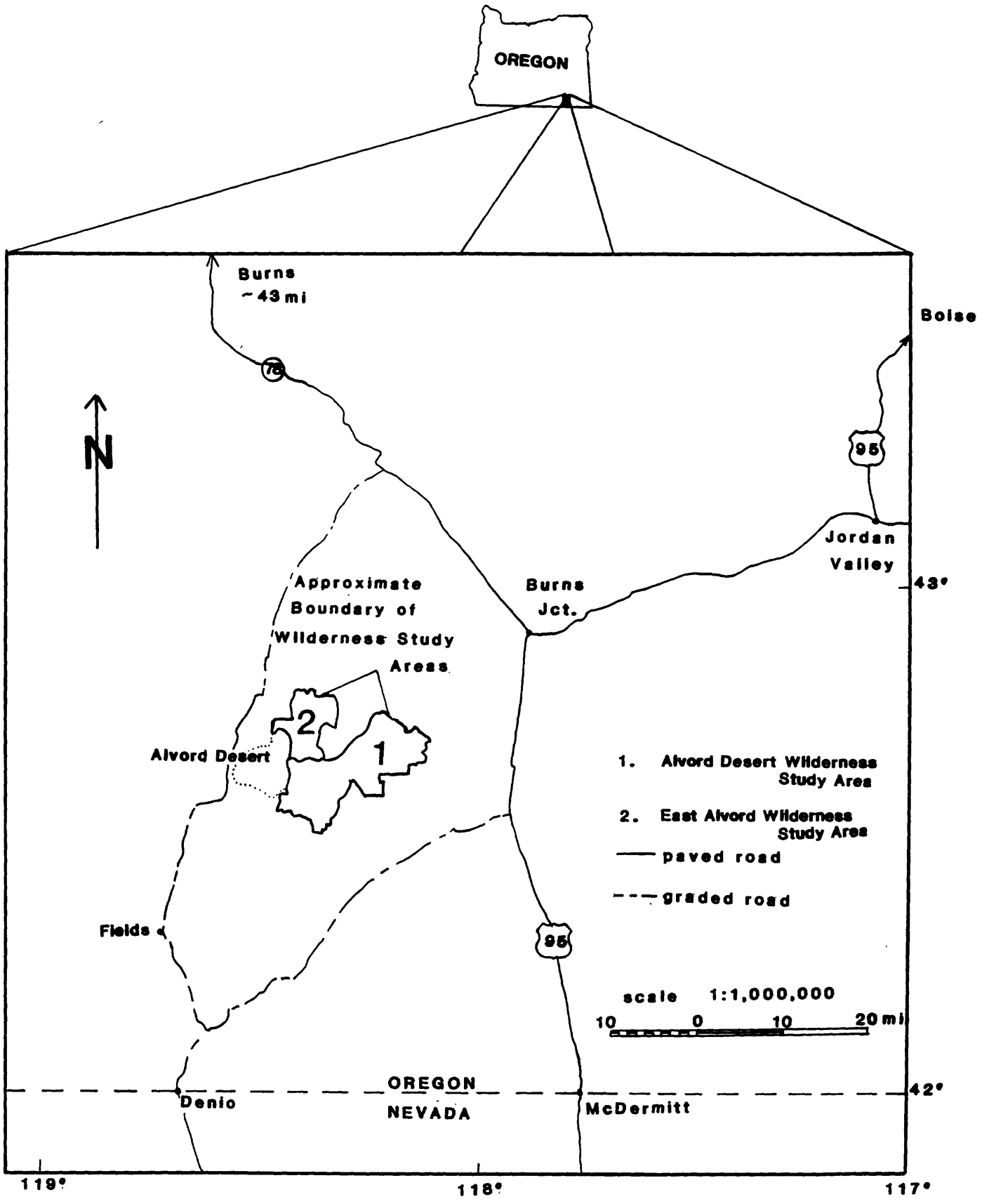

Figure 1. Location map of the Alvord Desert and East Alvord Wilderness Study Areas, Malheur and Harney Counties, Oregon.

Sample Collection

Heavy-mineral-concentrate and stream-sediment samples were collected at 23 sites in the Alvord Desert Wilderness Study Area and at 29 sites in the East Alvord Wilderness Study Area. At site 86EA005, however, there was insufficent sample for heavy-mineral concentrate analysis and as such, at this site only a stream sediment was analyzed (plate 1). Rock samples were collected at 6 sites in the Alvord Desert and at 20 sites in East Alvord. Sampling density for stream-sediments and heavy-mineral concentrates was about one sample site per 4 sq mi for Alvord Desert and about 1 site per sq mi in East Alvord.

Stream-sediment samples

The stream-sediment samples consisted of active alluvium collected primarily from first-order (unbranched) and second-order (below the junction of two first-order) streams as shown on USGS topographic map (scale = 1:24000).

Heavy-mineral-concentrate samples

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

Rock samples

Rock samples were collected from various types of occurrences in the vicinity of the plotted site location. Samples were collected from unaltered and\or altered and\or mineralized rocks.

Sample Preparation

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

After air drying, bromoform (specific gravity 2.8) was used to remove the remaining quartz and feldspar from the heavy-mineral-concentrate samples that had been panned in the field. The resultant heavy-mineral sample was separated into three fractions using a large electromagnet (in this case a modified Frantz Isodynamic Separator). The most magnetic material, primarily magnetite, was not analyzed. The second fraction, largely ferromagnesian silicates and iron oxides, was saved for archival storage. The third fraction (the least magnetic material which may include the nonmagnetic ore minerals, zircon, sphene, etc.) 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, and a current of 0.6 ampere to split the remainder of the sample into paramagnetic and nonmagnetic fractions.

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

Sample Analysis

Spectrographic method

The stream-sediment, heavy-mineral-concentrate, and rock samples were analyzed for 31 elements using semiquantitative, direct-current arc emission spectrographic methods (Grimes and Marranzino 1968). The elements analyzed and their lower limits of determination are listed in table 1. Spectrographic results were obtained by visual comparison of spectra derived from the sample against spectra obtained from standards made from pure oxides and carbonates. Standard concentrations are geometrically spaced over any given order of magnitude of concentration as follows: 100, 50, 20, 10, and so forth. Samples whose concentrations are estimated to fall between those values are assigned values of 70, 30, 15, and so forth. The precision of the analytical method is approximately plus or minus one reporting interval at the 83 percent confidence level and plus or minus two reporting intervals at the 96 percent confidence level (Motooka and Grimes, 1976). Values determined for the major elements, iron, magnesium, calcium, and titanium, are given in weight percent; all others are given in parts per million (micrograms/gram). Analytical data for samples from the Alvord Desert and East Alvord Wilderness Study Areas are listed in tables 3-8. Samples from Alvord Desert will have the prefix AD and samples from East Alvord will have the prefix EA.

Chemical methods

Other analytical methods used on samples from the Alvord Desert and East Alvord Wilderness Study Areas are summarized in table 2.

Analytical results for stream-sediment, heavy-mineral-concentrate, and rock samples are listed in tables 3 through 8, respectively.

DATA STORAGE SYSTEM

Upon completion of all analytical work, the analytical results were entered into either the Branch of Geochemistry computer data base called PLUTO or the Rock Analysis Storage System (RASS). This data base contains both descriptive geological information and analytical data. Any or all of this information may be retrieved and converted to a binary form (STATPAC) for computerized statistical analysis or publication (VanTrump and Miesch, 1977).

DESCRIPTION OF DATA TABLES

Tables 3-8 list the results of analyses for the samples of stream sediment, heavy-mineral concentrate, and rock, respectively. For the six tables, the data are arranged so that column 1 contains the USGS-assigned sample numbers. These numbers correspond to the numbers shown on the site location map (plate 1). Columns in which the element headings show the letter "s" below the element symbol are emission spectrographic analyses; "icp" indicates inductively coupled plasma-atomic emission spectrosocpy; and "aa" indicates atomic absorption analyses. A letter "N" in the tables indicates that a given element was looked for but not detected at the lower limit of determination shown for that element in table 1. For emission spectrographic

analyses, a "less than" symbol (<) entered in the tables in front of the lower limit of determination indicates that an element was observed but was below the lowest reporting value. For AA and ICP analyses, a "less than" symbol (<) entered in the tables in front of the lower limit of determination indicates that an element was below the lowest reporting value. If an element was observed but was above the highest reporting value, a "greater than" symbol (>) was entered in the tables in front of the upper limit of determination. If an element was not looked for in a sample, two dashes (--) are entered in tables 3-8 in place of an analytical value. Because of the formatting used in the computer program that produced tables 3-8, some of the elements listed in these tables (Fe, Mg, Ca, Ti, Ag, and Be) carry one or more nonsignificant digits to the right of the significant digits. The analysts did not determine these elements to the accuracy suggested by the extra zeros.

ACKNOWLEDGMENTS

A number of our colleagues also participated in preparation and analyses of these samples: analyses, David Fey, Carol Gant, and Kay Kennedy.

REFERENCES CITED

Crock, J. G., Briggs, P. H., Jackson, L. L., and Lichte, F. F., 1987, Analytical methods for the analysis of stream sediments and rocks from wilderness study areas: U.S. Geological Survey Open-File Report 87-84, p.22-28.

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.

Koirtyohann, S. R., and Khalil, Moheb, 1976, Variables in the determination of mercury by cold vapor atomic absorption: Analytical Chemistry, 48, p. 136-139.

Motooka, J. M., and Grimes, D. J., 1976, Analytical precision of one-sixth order semiquantitative spectrographic analyses: U.S. Geological Survey Circular 738, 25 p.

Thompson, C. E., Nakagawa, H. M., and Van Sickle, G. H., 1968, Rapid analysis for gold in geologic materials, in Geological Survey research 1968: U.S. Geological Survey Professional Paper 600-B, p. B130-B132.

VanTrump, George, Jr., and Miesch, A. T., 1977, The U.S. Geological Survey RASS-STATPAC system for management and statistical reduction of geochemical data: Computers and Geosciences, v. 3, p. 475-488.

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

[The spectrographic limits of determination for heavy-mineral-concentrate samples are based on a 5-mg sample, and are therefore two reporting intervals higher than the limits given for rocks.]

Elements	Lower determination limit	Upper determination limit
	Percent	
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	2000
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 2.--Commonly used chemical methods

[AA = atomic absorption; ICP = inductively coupled plasma spectroscopy]

Element or constituent determined	Sample type	Method	Determination limit (micrograms/ gram or ppm)	Reference
Gold (Au)	rock	AA	.1	Modification of Thompson and others, 1968.
Mercury (Hg)	rock	AA	0.02	Koirtyohann and Khalil, 1976.
Arsenic (As)	rock	ICP	5	Crock and others, 1987.
Antimony (Sb)	rock	ICP	2	
Zinc (Zn)	rock	ICP	2	
Bismuth (Bi)	rock	ICP	2	
Cadmium (Cd)	rock	ICP	0.1	

TABLE 3. ANALYTICAL RESULTS OF STREAM-SEDIMENT SAMPLES COLLECTED FROM THE ALVORD DESERT WILDERNESS STUDY AREA, OREGON

Sample	Latitude	Longitude	Fe-pct. s	Mg-pct. s	Ca-pct. s	Ti-pct. s	Mn-ppm s	Ag-ppm s	As-ppm s	Au-ppm s	B-ppm s	Ba-ppm s
86AD001S	42 32 49	118 23 12	7	2.0	7	>1	1,000	N	N	N	100	500
86AD002S	42 36 38	118 10 32	7	1.5	5	>1	1,000	N	N	N	150	500
86AD003S	42 32 36	118 22 52	7	2.0	7	>1	1,000	N	N	N	50	500
86AD004S	42 34 56	118 11 12	7	2.0	5	>1	1,000	N	N	N	50	500
86AD005S	42 31 32	118 22 54	10	2.0	5	>1	1,000	N	N	N	200	500
86AD006S	42 34 50	118 13 15	10	2.0	5	>1	1,500	N	N	N	30	500
86AD007S	42 30 45	118 23 10	5	2.0	10	1	700	N	N	N	150	500
86AD009S	42 30 38	118 23 11	7	2.0	7	>1	1,000	N	N	N	150	700
86AD010S	42 34 48	118 14 11	10	2.0	5	>1	1,000	N	N	N	100	700
86AD011S	42 28 52	118 22 36	5	1.5	3	>1	700	N	N	N	30	500
86AD013S	42 35 57	118 11 54	10	2.0	5	>1	1,000	N	N	N	50	700
86AD015S	42 35 37	118 11 44	10	3.0	5	>1	1,500	N	N	N	70	700
86AD017S	42 35 17	118 11 22	7	2.0	3	>1	1,000	N	N	N	70	500
86AD018S	42 33 13	118 19 4	7	2.0	3	>1	1,000	N	N	N	50	500
86AD019S	42 33 16	118 14 58	7	1.5	2	>1	1,000	N	N	N	50	500
86AD020S	42 33 16	118 13 14	7	2.0	2	>1	700	N	N	N	50	500
86AD021S	42 31 38	118 14 18	3	1.5	2	>1	1,000	N	N	N	70	500
86AD022S	42 30 27	118 17 56	5	2.0	3	>1	1,000	N	N	N	30	500
86AD023S	42 31 44	118 15 47	7	2.0	2	>1	1,000	N	N	N	50	300
86AD024S	42 28 28	118 21 17	5	2.0	2	>1	700	N	N	N	50	500
86AD025S	42 30 1	118 20 21	5	1.5	2	>1	1,000	N	N	N	70	500
86AD026S	42 28 22	118 21 59	5	1.5	3	>1	700	N	N	N	30	500
86AD027S	42 29 37	118 20 55	7	2.0	3	>1	700	N	N	N	50	500

TABLE 3. ANALYTICAL RESULTS OF STREAM-SEDIMENT SAMPLES COLLECTED FROM THE ALVORD DESERT WILDERNESS STUDY AREA, OREGON--Continued

Sample	Be-ppm s	Bi-ppm s	Cd-ppm s	Co-ppm s	Cr-ppm s	Cu-ppm s	La-ppm s	Mo-ppm s	Nb-ppm s	Ni-ppm s	Pb-ppm s	Sb-ppm s	Sc-ppm s	Sn-ppm s
86AD001S	1.0	N	N	20	150	70	30	N	N	30	30	N	20	N
86AD002S	1.0	N	N	20	50	70	100	<5	<20	20	50	N	20	N
86AD003S	1.0	N	N	20	200	100	50	N	N	30	15	N	20	N
86AD004S	1.0	N	N	20	50	70	N	N	N	30	20	N	20	N
86AD005S	1.0	N	N	20	200	100	30	N	N	30	30	N	20	N
86AD006S	1.0	N	N	20	150	50	30	N	<20	30	20	N	20	N
86AD007S	1.0	N	N	15	100	30	30	N	N	30	20	N	15	N
86AD009S	1.0	N	N	20	150	100	50	N	N	30	15	N	20	N
86AD010S	1.0	N	N	20	100	70	50	N	N	30	30	N	20	N
86AD011S	1.0	N	N	15	100	50	70	N	N	20	<10	N	20	N
86AD013S	1.0	N	N	30	100	70	50	N	N	30	30	N	30	N
86AD015S	1.0	N	N	20	150	100	100	N	N	50	30	N	20	N
86AD017S	1.0	N	N	20	70	70	50	N	N	50	30	N	20	N
86AD018S	1.0	N	N	20	100	70	30	N	N	30	20	N	20	N
86AD019S	<1.0	N	N	30	200	70	N	N	<20	20	20	N	20	N
86AD020S	<1.0	N	N	20	200	70	N	N	<20	50	20	N	20	N
86AD021S	1.5	N	N	20	100	50	30	N	<20	20	20	N	15	N
86AD022S	<1.0	N	N	30	100	70	50	N	<20	20	20	N	20	N
86AD023S	<1.0	N	N	30	150	100	30	N	<20	20	20	N	20	N
86AD024S	1.0	N	N	20	100	50	30	N	<20	20	20	N	20	N
86AD025S	1.0	N	N	20	150	30	70	N	<20	20	15	N	15	N
86AD026S	1.0	N	N	20	200	50	50	N	<20	20	20	N	20	N
86AD027S	1.0	N	N	30	200	70	50	N	<20	30	20	N	20	N

TABLE 3. ANALYTICAL RESULTS OF STREAM-SEDIMENT SAMPLES COLLECTED FROM THE ALVORD DESERT WILDERNESS STUDY AREA, OREGON--Continued

Sample	Sr-ppm s	V-ppm s	W-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Th-ppm s	Au-ppm aa	Hg-ppm aa	As-ppm icp	Bi-ppm icp	Cd-ppm icp	Sb-ppm icp	Zn-ppm icp
86AD001S	500	200	N	30	N	200	N	<.1	<.02	13	<2	<.1	<2	44
86AD002S	300	150	N	50	N	200	N	<.1	<.02	8	<2	<.1	<2	53
86AD003S	700	200	N	30	N	150	N	<.1	<.02	12	2	<.1	<2	45
86AD004S	500	200	N	30	N	200	N	<.1	<.02	6	<2	<.1	<2	41
86AD005S	500	200	N	30	N	200	N	<.1	<.02	20	2	<.1	<2	55
86AD006S	300	200	N	30	N	100	N	<.1	<.02	<5	<2	<.1	<2	75
86AD007S	500	150	N	30	N	150	N	<.1	<.02	11	<2	<.1	<2	26
86AD009S	1,500	200	N	50	<200	100	N	<.1	<.02	8	<2	<.1	<2	31
86AD010S	500	200	N	50	<200	150	N	<.1	<.02	<5	<2	<.1	<2	49
86AD011S	500	150	N	30	<200	150	N	<.1	<.02	<5	<2	<.1	<2	40
86AD013S	500	150	N	50	<200	150	N	<.1	<.02	<5	<2	<.1	<2	49
86AD015S	700	200	N	50	<200	200	N	<.1	<.02	<5	<2	<.1	<2	47
86AD017S	500	150	N	50	<200	150	N	<.1	<.02	<5	<2	<.1	<2	47
86AD018S	300	200	N	30	<200	300	N	<.1	<.02	5	2	<.1	<2	46
86AD019S	300	150	N	30	N	100	N	<.1	<.02	5	<2	<.1	<2	48
86AD020S	300	150	N	20	N	100	N	<.1	<.02	<5	2	<.1	<2	45
86AD021S	500	150	N	30	N	150	N	<.1	<.02	<5	<2	<.1	<2	45
86AD022S	500	150	N	30	N	200	N	<.1	<.02	<5	5	<.1	<2	53
86AD023S	300	150	N	30	N	150	N	<.1	.04	<5	3	<.1	<2	62
86AD024S	300	100	N	30	N	150	N	<.1	<.02	<5	<2	<.1	<2	49
86AD025S	500	100	N	30	N	200	N	<.1	<.02	5	<2	<.1	<2	47
86AD026S	500	150	N	30	N	200	N	<.1	<.02	<5	<2	<.1	<2	46
86AD027S	300	150	N	30	N	200	N	<.1	<.02	<5	<2	<.1	<2	48

TABLE 4. ANALYTICAL RESULTS OF HEAVY-MINERAL-CONCENTRATE SAMPLES COLLECTED FROM THE ALVORD DESERT WILDERNESS STUDY AREA, OREGON

Sample	Latitude	Longitude	Fe-pct. s	Mg-pct. s	Ca-pct. s	Ti-pct. s	Mn-ppm s	Ag-ppm s	As-ppm s	Au-ppm s
86AD001H	42 32 49	118 23 12	1.0	.70	10	>2	500	N	N	N
86AD002H	42 36 38	118 10 32	1.5	1.50	7	>2	500	N	N	N
86AD003H	42 32 36	118 22 52	1.0	.50	5	>2	200	N	N	N
86AD004H	42 34 56	118 11 12	2.0	2.00	7	>2	500	N	N	N
86AD005H	42 31 32	118 22 54	1.5	1.00	10	>2	700	N	N	N
86AD006H	42 34 50	118 13 15	1.0	.50	7	>2	500	N	N	N
86AD007H	42 30 45	118 23 10	1.0	.70	7	>2	500	N	N	N
86AD009H	42 30 38	118 23 11	1.5	1.00	7	>2	500	N	N	N
86AD010H	42 34 48	118 14 11	1.0	1.00	5	>2	500	N	N	N
86AD011H	42 28 52	118 22 36	1.0	.50	7	>2	500	N	N	N
86AD013H	42 35 57	118 11 54	1.0	1.00	5	>2	500	N	N	N
86AD015H	42 35 37	118 11 44	1.0	.70	7	>2	500	N	N	N
86AD017H	42 35 17	118 11 22	1.0	.50	5	>2	500	N	N	N
86AD018H	42 33 13	118 19 4	1.5	1.50	10	>2	700	N	N	N
86AD019H	42 33 16	118 14 58	.5	.10	10	>2	300	N	N	N
86AD020H	42 33 16	118 13 14	.5	.15	7	>2	300	N	N	N
86AD021H	42 31 38	118 14 18	.5	.07	7	>2	300	N	N	N
86AD022H	42 30 27	118 17 56	.5	.10	10	>2	300	N	N	N
86AD023H	42 31 44	118 15 47	.5	.15	7	>2	500	N	N	N
86AD024H	42 28 28	118 21 17	.5	.20	7	>2	500	N	N	N
86AD025H	42 30 1	118 20 21	.5	.20	7	>2	300	N	N	N
86AD026H	42 28 22	118 21 59	.5	.10	7	>2	500	N	N	N
86AD027H	42 29 37	118 20 55	.7	.15	7	>2	500	N	N	N

TABLE 4. ANALYTICAL RESULTS OF HEAVY-MINERAL-CONCENTRATE SAMPLES COLLECTED FROM THE ALVORD DESERT WILDERNESS STUDY AREA, OREGON--Continued

Sample	B-ppm s	Ba-ppm s	Be-ppm s	Bi-ppm s	Cd-ppm s	Co-ppm s	Cr-ppm s	Cu-ppm s	La-ppm s	Mo-ppm s	Nb-ppm s
86AD001H	50	<50	<2	N	N	<10	100	50	500	N	70
86AD002H	50	2,000	<2	N	N	<10	200	50	300	N	<50
86AD003H	70	150	<2	N	N	<10	50	15	200	N	50
86AD004H	70	500	<2	N	N	10	200	50	300	N	50
86AD005H	100	100	<2	N	N	<10	150	70	500	N	<50
86AD006H	50	300	<2	N	N	<10	100	30	500	N	50
86AD007H	100	200	<2	N	N	<10	100	50	300	N	<50
86AD009H	100	300	<2	N	N	<10	200	50	200	N	50
86AD010H	50	300	<2	N	N	<10	100	30	200	N	<50
86AD011H	50	200	<2	N	N	<10	100	50	500	N	50
86AD013H	50	300	<2	N	N	10	100	50	300	N	<50
86AD015H	50	300	<2	N	N	<10	100	20	200	N	<50
86AD017H	50	300	<2	N	N	<10	70	30	300	N	<50
86AD018H	100	100	<2	N	N	15	150	70	700	N	50
86AD019H	50	150	<2	N	N	N	20	30	1,000	N	<50
86AD020H	70	100	<2	N	N	<10	30	30	1,500	N	70
86AD021H	50	300	<2	N	N	<10	50	20	1,500	N	50
86AD022H	70	100	<2	N	N	<10	20	30	1,500	N	<50
86AD023H	50	50	<2	N	N	<10	30	20	1,000	N	<50
86AD024H	70	150	<2	N	N	<10	50	20	1,000	N	<50
86AD025H	70	200	<2	N	N	<10	50	15	700	N	N
86AD026H	70	50	<2	N	N	<10	20	20	1,500	N	<50
86AD027H	100	<50	<2	N	N	<10	20	30	1,000	N	50

TABLE 4. ANALYTICAL RESULTS OF HEAVY-MINERAL-CONCENTRATE SAMPLES COLLECTED FROM THE ALVORD DESERT WILDERNESS STUDY AREA, OREGON--Continued

Sample	Ni-ppm s	Pb-ppm s	Sb-ppm s	Sc-ppm s	Sn-ppm s	Sr-ppm s	V-ppm s	W-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Th-ppm s
86AD001H	30	N	N	<10	50	500	200	N	500	N	>2,000	N
86AD002H	50	N	N	<10	<20	500	200	N	700	N	>2,000	N
86AD003H	30	N	N	<10	50	500	100	N	200	N	>2,000	N
86AD004H	50	N	N	<10	<20	700	200	N	200	N	>2,000	N
86AD005H	30	N	N	<10	100	500	200	N	700	N	>2,000	N
86AD006H	10	70	N	<10	20	500	200	N	300	N	>2,000	N
86AD007H	15	N	N	<10	N	700	200	N	200	N	>2,000	N
86AD009H	20	N	N	<10	N	700	200	N	150	N	>2,000	N
86AD010H	20	N	N	<10	N	700	200	N	200	N	>2,000	N
86AD011H	20	N	N	<10	N	500	200	N	200	N	>2,000	N
86AD013H	30	N	N	<10	<20	700	200	N	200	N	>2,000	N
86AD015H	30	N	N	<10	N	700	150	N	200	N	>2,000	N
86AD017H	30	N	N	<10	N	500	200	N	200	N	>2,000	N
86AD018H	50	N	N	<10	50	300	300	N	500	N	>2,000	N
86AD019H	<10	N	N	<10	150	300	200	N	700	N	>1,000	N
86AD020H	<10	N	N	<10	50	200	200	200	500	N	>1,000	N
86AD021H	<10	N	N	<10	30	500	200	N	500	N	>1,000	N
86AD022H	<10	N	N	<10	100	500	200	N	500	N	>1,000	N
86AD023H	15	N	N	<10	150	200	200	N	700	N	>1,000	N
86AD024H	10	N	N	<10	500	200	200	N	500	N	>1,000	N
86AD025H	10	N	N	<10	N	500	200	N	500	N	>1,000	N
86AD026H	10	N	N	<10	50	300	200	N	500	N	>1,000	N
86AD027H	10	N	N	<10	200	200	200	N	700	N	>1,000	N

TABLE 5. ANALYTICAL RESULTS OF ROCK SAMPLES COLLECTED FROM THE ALVORD DESERT WILDERNESS STUDY AREA, OREGON

Sample	Latitude	Longitude	Fe-pct. s	Mg-pct. s	Ca-pct. s	Ti-pct. s	Mn-ppm s	Ag-ppm s	As-ppm s	Au-ppm s	B-ppm s	Ba-ppm s
86AD001R	42 32 49	118 23 12	1.0	.10	.15	.20	200	N	N	N	100	300
86AD004P	42 34 56	118 11 12	.5	.05	.07	.05	100	N	N	N	100	150
86AD008R	42 34 55	118 13 34	2.0	.50	.50	.30	500	N	N	N	100	1,000
86AD011R	42 28 52	118 22 36	2.0	.10	1.50	.15	500	N	N	N	50	100
86AD018R	42 33 13	118 19 4	1.5	.20	.10	.10	200	N	N	N	50	100

Sample	Be-ppm s	Bi-ppm s	Cd-ppm s	Co-ppm s	Cr-ppm s	Cu-ppm s	La-ppm s	Mo-ppm s	Nb-ppm s	Ni-ppm s	Pb-ppm s	Sb-ppm s	Sc-ppm s	Sn-ppm s
86AD001R	2.0	N	N	N	<10	10	20	15	20	5	<10	N	7	N
86AD004R	1.5	N	N	N	10	5	N	N	<20	5	10	N	N	N
86AD008R	2.0	N	N	<5	10	10	100	10	20	5	50	N	7	N
86AD011R	3.0	N	N	N	<10	7	70	N	<20	5	30	N	7	N
86AD018R	2.0	N	N	N	<10	5	50	N	20	5	20	N	5	N

Sample	Sr-ppm s	V-ppm s	W-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Th-ppm s	Au-ppm aa	Hg-ppm aa	As-ppm icp	Bi-ppm icp	Cd-ppm icp	Sb-ppm icp	Zn-ppm icp
86AD001R	150	50	N	15	<200	300	N	<.1	.05	26	<2	<.1	<2	18
86AD004R	<100	30	<50	10	<200	200	N	<.1	<.02	<5	<2	<.1	<2	7
86AD008R	150	50	N	100	<200	700	N	<.1	<.02	<5	<2	<.1	<2	21
86AD011R	<100	70	N	30	<200	500	N	<.1	<.02	74	<2	<.1	<2	81
86AD018R	<100	15	N	30	<200	700	N	<.1	<.02	<5	<2	<.1	<2	52

TABLE 6. ANALYTICAL RESULTS OF STREAM-SEDIMENT SAMPLES COLLECTED FROM THE EAST ALVORD WILDERNESS STUDY AREA, OREGON

Sample	Latitude	Longitude	Fe-pct. s	Mg-pct. s	Ca-pct. s	Ti-pct. s	Mn-ppm s	Ag-ppm s	As-ppm s	Au-ppm s	B-ppm s	Ba-ppm s
86EA001S	42 35 38	118 22 33	7	2	5	>1	1,000	N	N	N	150	500
86EA002S	42 37 8	118 21 48	10	2	5	>1	1,000	N	N	N	100	500
86EA004S	42 36 50	118 21 49	7	2	5	>1	700	N	N	N	150	500
86EA005S	42 38 5	118 21 30	10	3	5	>1	700	N	N	N	20	500
86EA006S	42 36 18	118 22 23	7	2	5	>1	1,000	N	N	N	100	500
86EA007S	42 38 27	118 21 10	10	3	5	>1	700	N	N	N	20	500
86EA008S	42 35 57	118 22 16	15	2	5	>1	2,000	N	N	N	100	700
86EA010S	42 35 3	118 22 7	5	2	5	>1	700	N	N	N	100	500
86EA012S	42 39 20	118 19 38	7	2	5	>1	2,000	N	N	N	50	500
86EA014S	42 39 28	118 18 43	7	2	5	>1	2,000	N	N	N	50	500
86EA015S	42 39 22	118 19 23	7	2	5	>1	700	N	N	N	50	500
86EA016S	42 39 27	118 17 48	10	2	5	>1	1,500	N	N	N	100	500
86EA017S	42 39 28	118 17 52	10	2	5	>1	2,000	N	N	N	30	500
86EA018S	42 38 27	118 16 30	10	2	5	>1	2,000	N	N	N	100	500
86EA019S	42 38 30	118 16 29	10	2	5	>1	2,000	N	N	N	70	500
86EA020S	42 37 32	118 16 39	10	2	5	>1	2,000	N	N	N	50	500
86EA021S	42 37 16	118 17 19	15	2	5	>1	2,000	N	N	N	70	500
86EA022S	42 37 41	118 18 33	10	2	5	>1	1,000	N	N	N	100	500
86EA023S	42 37 32	118 19 6	10	2	5	>1	1,500	N	N	N	50	500
86EA024S	42 37 31	118 19 20	7	2	5	>1	2,000	N	N	N	50	700
86EA025A	42 37 6	118 19 15	5	2	5	>1	1,000	N	N	N	100	500
86EA025B	42 37 6	118 20 50	5	2	5	>1	1,500	N	N	N	50	500
86EA026S	42 33 58	118 20 44	7	2	5	>1	1,000	N	N	N	50	500
86EA027S	42 33 55	118 20 32	7	2	5	>1	1,000	N	N	N	50	1,000
86EA028S	42 34 3	118 20 41	7	2	5	>1	1,000	N	N	N	50	700
86EA029S	42 34 3	118 19 4	7	2	5	>1	1,500	N	N	N	50	700
86EA031S	42 33 17	118 19 8	7	2	5	>1	2,000	N	N	N	50	500
86EA032S	42 36 18	118 18 43	5	2	5	>1	1,000	N	N	N	50	500
86EA033S	42 33 29	118 19 32	7	2	3	>1	1,000	N	N	N	50	500

TABLE 6. ANALYTICAL RESULTS OF STREAM-SEDIMENT SAMPLES COLLECTED FROM THE EAST ALVORD WILDERNESS STUDY AREA, OREGON--Continued

Sample	Be-ppm s	Bi-ppm s	Cd-ppm s	Co-ppm s	Cr-ppm s	Cu-ppm s	La-ppm s	Mo-ppm s	Nb-ppm s	Ni-ppm s	Pb-ppm s	Sb-ppm s	Sc-ppm s	Sn-ppm s
86EA001S	<1	N	N	20	150	100	50	N	N	20	20	N	20	N
86EA002S	1	N	N	30	100	100	30	N	N	20	20	N	20	N
86EA004S	<1	N	N	20	70	100	30	N	N	20	20	N	20	N
86EA005S	1	N	N	30	50	150	N	N	N	50	15	N	20	N
86EA006S	1	N	N	20	150	70	N	N	N	15	20	N	20	N
86EA007S	1	N	N	30	100	100	N	N	<20	50	20	N	20	N
86EA008S	<1	N	N	30	150	100	50	N	N	30	20	N	30	N
86EA010S	1	N	N	20	100	50	30	N	<20	20	15	N	20	N
86EA012S	1	N	N	30	150	100	30	N	N	30	20	N	20	N
86EA014S	1	N	N	20	100	50	50	N	N	20	20	N	20	N
86EA015S	<1	N	N	30	150	50	50	N	N	30	20	N	20	N
86EA016S	<1	N	N	30	150	100	N	N	N	30	50	N	20	N
86EA017S	<1	N	N	30	200	100	100	N	N	30	20	N	30	N
86EA018S	<1	N	N	30	100	70	30	N	N	30	30	N	20	N
86EA019S	<1	N	N	30	100	70	N	N	N	30	30	N	20	N
86EA020S	1	N	N	30	100	50	30	N	<20	30	20	N	30	N
86EA021S	<1	N	N	30	150	100	50	N	<20	30	20	N	30	N
86EA022S	1	N	N	20	70	50	30	N	N	30	20	N	20	N
86EA023S	1	N	N	20	150	70	30	N	N	30	30	N	20	N
86EA024S	1	N	N	30	100	100	50	N	N	30	20	N	20	N
86EA025A	1	N	N	20	100	70	30	N	N	30	20	N	20	N
86EA025B	1	N	N	20	100	100	50	N	<20	30	30	N	30	N
86EA026S	1	N	N	20	100	70	50	<5	<20	30	20	N	30	N
86EA027S	1	N	N	20	150	100	50	N	<20	30	30	N	50	N
86EA028S	1	N	N	20	100	70	30	N	N	30	30	N	20	N
86EA029S	1	N	N	20	200	70	50	N	N	30	30	N	20	N
86EA031S	<1	N	N	20	200	100	30	N	<20	30	20	N	30	N
86EA032S	1	N	N	20	150	50	30	N	<20	30	20	N	20	N
86EA033S	1	N	N	20	100	50	70	N	N	30	30	N	15	N

TABLE 6. ANALYTICAL RESULTS OF STREAM-SEDIMENT SAMPLES COLLECTED FROM THE EAST ALVORD WILDERNESS STUDY AREA, OREGON--Continued

Sample	Sr-ppm s	V-ppm s	W-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Th-ppm s	Au-ppm aa	Hg-ppm aa	As-ppm icp	Bi-ppm icp	Cd-ppm icp	Sb-ppm icp	Zn-ppm icp
86EA001S	700	150	N	50	N	200	N	<.1	<.02	10	2	<.1	<2	24
86EA002S	500	200	N	50	N	200	N	<.1	<.02	10	<2	<.1	<2	31
86EA004S	500	200	N	30	N	150	N	<.1	.04	13	<2	<.1	<2	30
86EA005S	500	150	N	30	<200	100	N	<.1	<.02	<5	2	.8	<2	60
86EA006S	500	200	N	30	N	200	N	<.1	<.02	6	<2	<.1	<2	31
86EA007S	700	150	N	30	<200	100	N	<.1	<.02	<5	<2	.7	<2	53
86EA008S	700	300	N	50	N	150	N	<.1	<.02	10	3	<.1	<2	42
86EA010S	500	150	N	50	N	200	N	<.1	<.02	10	<2	.1	<2	28
86EA012S	700	150	N	30	N	100	N	<.1	.04	6	<2	<.1	<2	45
86EA014S	500	200	N	30	N	150	N	<.1	<.02	6	<2	<.1	<2	44
86EA015S	300	200	N	50	N	150	N	<.1	<.02	6	<2	<.1	<2	44
86EA016S	500	200	N	30	N	100	N	<.1	<.02	7	2	<.1	<2	49
86EA017S	500	300	N	30	N	200	N	<.1	<.02	<5	<2	<.1	<2	49
86EA018S	500	150	N	30	N	100	N	<.1	<.02	7	<2	<.1	<2	47
86EA019S	700	150	N	30	N	100	N	<.1	<.02	6	3	<.1	<2	46
86EA020S	700	200	N	50	N	150	N	<.1	<.02	6	3	<.1	<2	47
86EA021S	500	300	N	50	N	200	N	<.1	<.02	<5	2	<.1	<2	54
86EA022S	500	150	N	30	N	150	N	<.1	<.02	6	<2	<.1	<2	44
86EA023S	500	200	N	30	N	100	N	<.1	<.02	6	<2	<.1	<2	50
86EA024S	700	200	N	50	N	100	N	<.1	<.02	<5	<2	<.1	<2	47
86EA025A	500	150	N	20	N	100	N	<.1	<.02	12	<2	<.1	<2	42
86EA025B	700	200	N	50	N	150	N	<.1	<.02	5	<2	<.1	<2	46
86EA026S	700	150	N	50	N	100	N	<.1	<.02	7	<2	<.1	<2	36
86EA027S	700	200	N	50	N	200	N	<.1	<.02	6	<2	<.1	<2	39
86EA028S	500	200	N	30	N	100	N	<.1	<.02	6	<2	<.1	<2	32
86EA029S	1,000	150	N	50	N	200	N	<.1	<.02	5	<2	<.1	<2	39
86EA031S	500	200	N	50	N	200	N	<.1	<.02	6	<2	<.1	<2	54
86EA032S	500	200	N	30	N	150	N	<.1	<.02	5	<2	<.1	<2	45
86EA033S	500	150	N	30	N	150	N	<.1	<.02	7	<2	<.1	<2	43

TABLE 7. ANALYTICAL RESULTS OF HEAVY-MINERAL-CONCENTRATE SAMPLES COLLECTED FROM THE EAST ALVORD WILDERNESS STUDY AREA, OREGON

Sample	Latitude	Longitude	Fe-pct. s	Mg-pct. s	Ca-pct. s	Ti-pct. s	Mn-ppm s	Ag-ppm s	As-ppm s	Au-ppm s
86EA001H	42 35 38	118 22 33	1.5	1.5	10	>2	500	N	N	N
86EA002H	42 37 8	118 21 48	1.5	1.0	7	>2	500	N	N	N
86EA004H	42 36 50	118 21 49	1.5	1.0	7	>2	500	N	N	N
86EA006H	42 36 18	118 22 23	1.0	.7	7	>2	500	N	N	N
86EA007H	42 40 38	118 20 42	1.5	1.5	7	>2	500	N	N	N
86EA008H	42 35 57	118 22 16	2.0	1.0	7	>2	700	N	N	N
86EA010H	42 35 3	118 22 7	1.0	1.0	10	>2	500	N	N	N
86EA012H	42 39 20	118 19 38	1.5	1.5	7	>2	700	N	N	N
86EA014H	42 39 28	118 18 43	1.0	1.0	7	>2	500	N	N	N
86EA015H	42 39 22	118 19 23	1.5	2.0	7	>2	700	N	N	N
86EA016H	42 39 27	118 17 48	1.5	2.0	5	>2	300	N	N	N
86EA017H	42 39 28	118 17 52	2.0	2.0	3	>2	1,000	N	N	N
86EA018H	42 38 27	118 16 30	1.5	1.5	10	>2	500	N	N	N
86EA019H	42 38 30	118 16 29	2.0	2.0	10	>2	700	N	N	N
86EA020H	42 37 32	118 16 39	2.0	2.0	7	>2	700	N	N	N
86EA021H	42 37 16	118 17 19	3.0	3.0	7	>2	1,000	N	N	N
86EA022H	42 37 41	118 18 33	3.0	3.0	10	>2	1,000	N	N	N
86EA023H	42 37 32	118 19 6	1.5	1.0	7	>2	700	N	N	N
86EA024H	42 37 31	118 19 20	2.0	2.0	10	>2	700	N	N	N
86EA025A	42 37 6	118 19 15	1.5	2.0	10	>2	1,000	N	N	N
86EA025B	42 37 6	118 20 50	1.0	1.0	5	>2	500	N	N	N
86EA026H	42 33 58	118 20 44	1.0	1.0	10	>2	500	N	N	N
86EA027H	42 33 55	118 20 32	1.5	2.0	10	>2	500	N	N	N
86EA028H	42 34 3	118 20 41	1.5	2.0	10	>2	700	N	N	N
86EA029H	42 34 3	118 19 4	1.0	1.0	7	>2	500	N	N	N
86EA031H	42 33 17	118 19 8	.7	.2	5	>2	300	N	N	N
86EA032H	42 36 18	118 18 43	.7	.3	5	>2	300	N	N	N
86EA033H	42 33 29	118 19 32	1.0	1.0	7	>2	500	N	N	N

TABLE 7. ANALYTICAL RESULTS OF HEAVY-MINERAL-CONCENTRATE SAMPLES COLLECTED FROM THE EAST ALVORD WILDERNESS STUDY AREA, OREGON--Continued

Sample	B-ppm s	Ba-ppm s	Be-ppm s	Bi-ppm s	Cd-ppm s	Co-ppm s	Cr-ppm s	Cu-ppm s	La-ppm s	Mo-ppm s	Nb-ppm s
86EA001H	100	200	<2	N	N	<10	200	50	300	N	50
86EA002H	70	200	<2	N	N	<10	150	70	500	N	70
86EA004H	70	200	<2	N	N	<10	200	70	300	N	50
86EA006H	100	300	<2	N	N	<10	100	30	200	N	<50
86EA007H	70	300	<2	N	N	15	200	50	500	N	<50
86EA008H	50	<50	<2	N	N	<10	300	70	500	N	50
86EA010H	100	50	<2	N	N	<10	100	50	700	N	70
86EA012H	70	100	<2	N	N	10	200	70	500	N	<50
86EA014H	50	200	<2	N	N	<10	100	50	200	N	<50
86EA015H	100	150	<2	N	N	10	200	100	500	N	<50
86EA016H	50	300	<2	N	N	<10	100	30	100	N	<50
86EA017H	100	200	<2	N	N	20	300	100	300	N	<50
86EA018H	50	500	<2	N	N	<10	100	50	500	N	<50
86EA019H	50	100	<2	N	N	20	300	100	500	N	<50
86EA020H	70	150	<2	N	N	30	300	70	200	N	<50
86EA021H	50	150	<2	N	N	30	300	100	300	N	N
86EA022H	50	200	<2	N	N	20	300	100	300	N	50
86EA023H	50	<50	<2	N	N	<10	200	100	500	N	50
86EA024H	50	300	<2	N	N	20	300	100	500	N	50
86EA025A	70	50	<2	N	N	10	300	100	1,000	N	50
86EA025B	70	200	<2	N	N	10	100	50	200	N	<50
86EA026H	100	200	<2	N	N	<10	100	70	500	N	70
86EA027H	50	N	<2	N	N	10	300	150	1,000	N	70
86EA028H	50	200	<2	N	N	10	200	100	500	N	70
86EA029H	50	150	<2	N	N	10	150	50	500	N	70
86EA031H	50	150	<2	N	N	<10	20	20	300	N	<50
86EA032H	70	150	<2	N	N	<10	20	15	200	N	<50
86EA033H	100	200	<2	N	N	10	100	70	300	N	<50

TABLE 7. ANALYTICAL RESULTS OF HEAVY-MINERAL-CONCENTRATE SAMPLES COLLECTED FROM THE EAST ALVORD WILDERNESS STUDY AREA, OREGON--Continued

Sample	Ni-ppm s	Pb-ppm s	Sb-ppm s	Sc-ppm s	Sn-ppm s	Sr-ppm s	V-ppm s	W-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Th-ppm s
86EA001H	30	N	N	<10	N	700	200	N	500	N	>2,000	N
86EA002H	30	N	N	<10	20	500	200	N	500	N	>2,000	N
86EA004H	30	N	N	<10	20	700	200	N	500	N	>2,000	N
86EA006H	20	N	N	<10	N	700	100	N	500	N	>2,000	N
86EA007H	50	N	N	<10	N	1,000	200	N	200	N	>1,000	N
86EA008H	50	N	N	<10	50	200	300	N	700	N	>2,000	N
86EA010H	20	N	N	<10	50	500	300	N	500	N	>2,000	N
86EA012H	50	2,000	N	<10	N	300	200	N	500	N	>2,000	N
86EA014H	20	N	N	<10	50	500	200	N	500	N	>2,000	N
86EA015H	50	N	N	<10	150	200	300	N	700	N	>2,000	N
86EA016H	30	N	N	<10	50	700	100	N	500	N	>2,000	N
86EA017H	50	N	N	10	N	700	200	N	500	N	>2,000	N
86EA018H	20	N	N	<10	<20	700	200	N	500	N	>2,000	N
86EA019H	50	N	N	<10	20	300	300	N	700	N	>2,000	N
86EA020H	70	N	N	15	<20	300	200	N	500	N	>2,000	N
86EA021H	50	N	N	20	50	300	200	N	700	N	>2,000	N
86EA022H	50	N	N	15	30	300	200	N	500	N	>2,000	N
86EA023H	30	N	N	<10	70	300	200	N	700	N	>2,000	N
86EA024H	50	N	N	<10	50	500	200	N	1,000	N	>2,000	N
86EA025A	50	N	N	<10	70	300	300	N	1,500	N	>2,000	N
86EA025B	30	N	N	<10	N	500	200	N	300	N	>2,000	N
86EA026H	20	N	N	<10	20	500	200	N	500	N	>2,000	N
86EA027H	70	N	N	<10	70	200	300	N	700	N	>2,000	N
86EA028H	50	N	N	<10	30	500	300	N	500	N	>2,000	N
86EA029H	20	N	N	<10	<20	500	200	N	300	N	>2,000	N
86EA031H	20	N	N	<10	<20	500	150	N	500	N	>2,000	N
86EA032H	20	N	N	<10	N	500	150	N	500	N	>2,000	N
86EA033H	20	N	N	<10	70	500	200	N	500	N	>2,000	N

TABLE 8. ANALYTCAL RESULTS OF ROCK SAMPLES COLLECTED FROM THE EAST ALVORD WILDERNESS STUDY AREA, OREGON

Sample	Latitude	Longitude	Fe-pct. s	Mg-pct. s	Ca-pct. s	Ti-pct. s	Mn-ppm s	Ag-ppm s	As-ppm s	Au-ppm s	B-ppm s	Ba-ppm s
86EA002R	42 37 8	118 21 48	10.0	3.00	3.00	>1.000	1,000	N	N	N	20	500
86EA03F1	42 40 37	118 20 43	.2	.10	.15	.070	70	N	N	N	500	50
86EA003R	42 40 37	118 20 43	.5	.15	.20	.100	70	N	N	N	300	300
86EA004R	42 36 50	118 21 49	7.0	3.00	5.00	>1.000	1,000	N	N	N	15	500
86EA006R	42 36 18	118 22 23	10.0	2.00	5.00	>1.000	3,000	N	N	N	50	500
86EA008R	42 35 57	118 22 16	7.0	2.00	3.00	>1.000	1,500	N	N	N	70	500
86EA014R	42 39 28	118 18 43	10.0	3.00	5.00	>1.000	2,000	N	N	N	<10	1,000
86EA15R1	42 39 22	118 19 23	1.5	.15	.15	.100	500	N	N	N	100	100
86EA015R	42 39 22	118 19 23	1.5	.05	.05	.015	300	N	N	N	70	70
86EA016R	42 39 27	118 17 48	7.0	3.00	5.00	>1.000	1,000	N	N	N	N	300
86EA018R	42 38 27	118 16 30	7.0	3.00	7.00	>1.000	700	N	N	N	<10	700
86EA023R	42 37 32	118 19 6	3.0	1.00	.20	.150	500	N	N	N	100	100
86EA26R1	42 33 58	118 20 50	3.0	.50	1.00	.700	1,000	N	N	N	50	700
86EA026R	42 33 58	118 20 50	10.0	2.00	5.00	>1.000	2,000	N	N	N	<10	1,000
86EA027R	42 33 55	118 20 44	7.0	2.00	7.00	>1.000	1,000	N	N	N	<10	500
86EA028R	42 34 3	118 20 32	7.0	1.50	3.00	>1.000	1,500	N	N	N	20	1,000
86EA029R	42 34 3	118 20 41	10.0	2.00	5.00	>1.000	1,500	N	N	N	20	1,000
86EA031R	42 33 17	118 19 8	1.0	.05	.10	.100	300	N	N	N	50	100
86EA33R1	42 33 29	118 18 43	.7	.10	.10	.070	200	N	N	N	50	100
86EA033R	42 33 29	118 18 43	1.5	.20	.70	.100	500	1.5	N	N	100	100

TABLE 8. ANALYTCAL RESULTS OF ROCK SAMPLES COLLECTED FROM THE EAST ALVORD WILDERNESS STUDY AREA, OREGON--Continued

Sample	Be-ppm s	Bi-ppm s	Cd-ppm s	Co-ppm s	Cr-ppm s	Cu-ppm s	La-ppm s	Mo-ppm s	Nb-ppm s	Ni-ppm s	Pb-ppm s	Sb-ppm s	Sc-ppm s	Sn-ppm s
86EA002R	<1.0	N	N	30	N	500	30	N	N	15	20	N	30	N
86EA03R1	50.0	N	N	N	<10	5	N	N	N	5	N	N	<5	N
86EA003R	20.0	N	N	N	10	7	N	20	N	5	N	100	5	N
86EA004R	<1.0	N	N	50	10	200	N	N	N	15	10	N	50	N
86EA006R	<1.0	N	N	50	<10	200	N	N	N	15	10	N	50	N
86EA008R	1.0	N	N	30	20	150	N	N	N	20	<10	N	30	N
86EA014R	<1.0	N	N	30	<10	20	N	N	N	5	<10	N	50	N
86EA15R1	2.0	N	N	N	<10	10	100	N	20	5	70	N	<5	N
86EA015R	N	N	N	<5	10	5	N	N	N	<5	N	N	N	N
86EA016R	<1.0	N	N	30	200	100	N	N	N	30	10	N	30	N
86EA018R	<1.0	N	N	30	<10	70	20	N	N	10	15	N	30	N
86EA023R	3.0	N	N	N	10	15	100	10	20	7	50	N	5	N
86EA26R1	1.5	N	N	N	<10	5	30	N	N	5	20	N	15	N
86EA026R	1.5	N	N	15	<10	15	50	N	<20	5	15	N	20	N
86EA027R	1.5	N	N	30	30	300	N	N	N	15	<10	N	30	N
86EA028R	2.0	N	N	15	<10	15	50	N	<20	5	15	N	30	N
86EA029R	1.5	N	N	15	10	20	50	N	<20	5	30	N	30	N
86EA031R	2.0	N	N	N	<10	5	100	N	20	5	50	N	5	N
86EA33R1	3.0	N	N	N	<10	5	50	N	<20	5	<10	N	<5	N
86EA033R	3.0	N	N	<5	<10	10	150	10	20	5	50	N	N	N

TABLE 8. ANALYTCAL RESULTS OF ROCK SAMPLES COLLECTED FROM THE EAST ALVORD WILDERNESS STUDY AREA, OREGON--Continued

Sample	Sr-ppm s	V-ppm s	W-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Th-ppm s	Au-ppm aa	Hg-ppm aa	As-ppm icp	Bi-ppm icp	Cd-ppm icp	Sb-ppm icp	Zn-ppm icp
86EA002R	300	150	N	30	<200	150	N	<.1	<.02	10	<2	<.1	<2	84
86EA03R1	150	20	<50	N	<200	<10	N	<.1	20.00	7	<2	<.1	3	3
86EA003R	700	50	<50	N	<200	50	N	<.1	69.00	35	<2	<.1	14	4
86EA004R	500	200	N	30	<200	200	N	<.1	.06	6	4	<.1	<2	80
86EA006R	500	200	N	30	<200	150	N	<.1	.04	7	3	<.1	<2	43
86EA008R	700	200	N	30	<200	150	N	<.1	<.02	9	3	<.1	<2	72
86EA014R	500	150	N	50	<200	150	N	<.1	<.02	<5	4	<.1	<2	68
86EA15R1	N	20	N	100	<200	500	N	<.1	<.02	<5	<2	<.1	<2	39
86EA015R	<100	70	<50	N	<200	N	N	<.1	<.02	30	<2	<.1	<2	5
86EA016R	500	200	N	20	<200	100	N	<.1	<.02	<5	<2	<.1	<2	43
86EA018R	500	150	N	30	<200	100	N	<.1	<.02	<5	3	<.1	<2	74
86EA023R	100	30	N	150	<200	500	N	<.1	<.02	<5	<2	<.1	<2	22
86EA26R1	200	<10	N	30	N	200	N	<.1	<.02	<5	<2	<.1	<2	39
86EA026R	700	50	N	70	<200	200	N	<.1	<.02	7	<2	<.1	<2	36
86EA027R	700	200	N	50	<200	150	N	<.1	<.02	<5	5	<.1	<2	77
86EA028R	500	30	N	70	<200	200	N	<.1	<.02	<5	3	<.1	<2	110
86EA029R	500	50	N	50	<200	200	N	<.1	<.02	<5	<2	<.1	<2	110
86EA031R	<100	15	N	50	<200	500	N	<.1	<.02	<5	<2	<.1	<2	27
86EA33R1	<100	20	N	50	<200	500	N	<.1	<.02	5	<2	<.1	<2	21
86EA033R	<100	20	N	100	<200	500	N	<.1	.05	15	<2	<.1	<2	26