

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

GEOCHEMICAL ASSESSMENT OF MINERAL RESOURCES IN THE GOSHUTE CANYON
SURVEY AREA (NV 040-015), EAST-CENTRAL NEVADA

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Open-File Report
84-101

This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards and stratigraphic nomenclature. Any use of trade names is for descriptive purposes only and does not imply endorsement by the USGS.

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ABSTRACT

A stream-sediment geochemical survey of the Goshute Canyon Resource Survey Area (NV 040-015), was conducted as part of the Bureau of Land Management Phase II mineral resource evaluation. During the summer of 1983, stream-sediment samples were collected from 45 first-order drainage basins within the survey area. The minus-80-mesh fraction of the stream-sediment samples and the nonmagnetic fraction of panned concentrate stream-sediment samples were analyzed. Anomalous concentrations for the elements Ag, Au, Cu, Pb, Sn, W, and Zn were identified in the panned concentrate samples. The geochemical analyses and the geological setting and structure suggest that undiscovered base- and precious-metal mineral deposits may be present in the area. A comparison of the geochemical characteristics and geologic setting of the known mineral deposits in the Cherry Creek mining district, south of the survey area, suggests that the identified trace-element suite found within the survey area may be genetically related to a hidden porphyry-type mineral deposit.

INTRODUCTION

The Goshute Canyon Bureau of Land Management Resource Survey Area (NV 040-015) is located approximately 53 miles north of Ely, Nevada, within the central portion of the Cherry Creek Range (figure 1), and covers 31,343 acres. The town of Cherry Creek is located near the southern boundary of the area.

The survey area is a northeast-trending Basin and Range fault block consisting predominantly of west dipping Paleozoic marine sedimentary rocks. Early Tertiary monzonitic to quartz monzonitic igneous stocks have been intruded locally within, and in the vicinity, of the study area. Mid-Tertiary volcanic rocks occur locally to the west of the survey area. Extensive mining

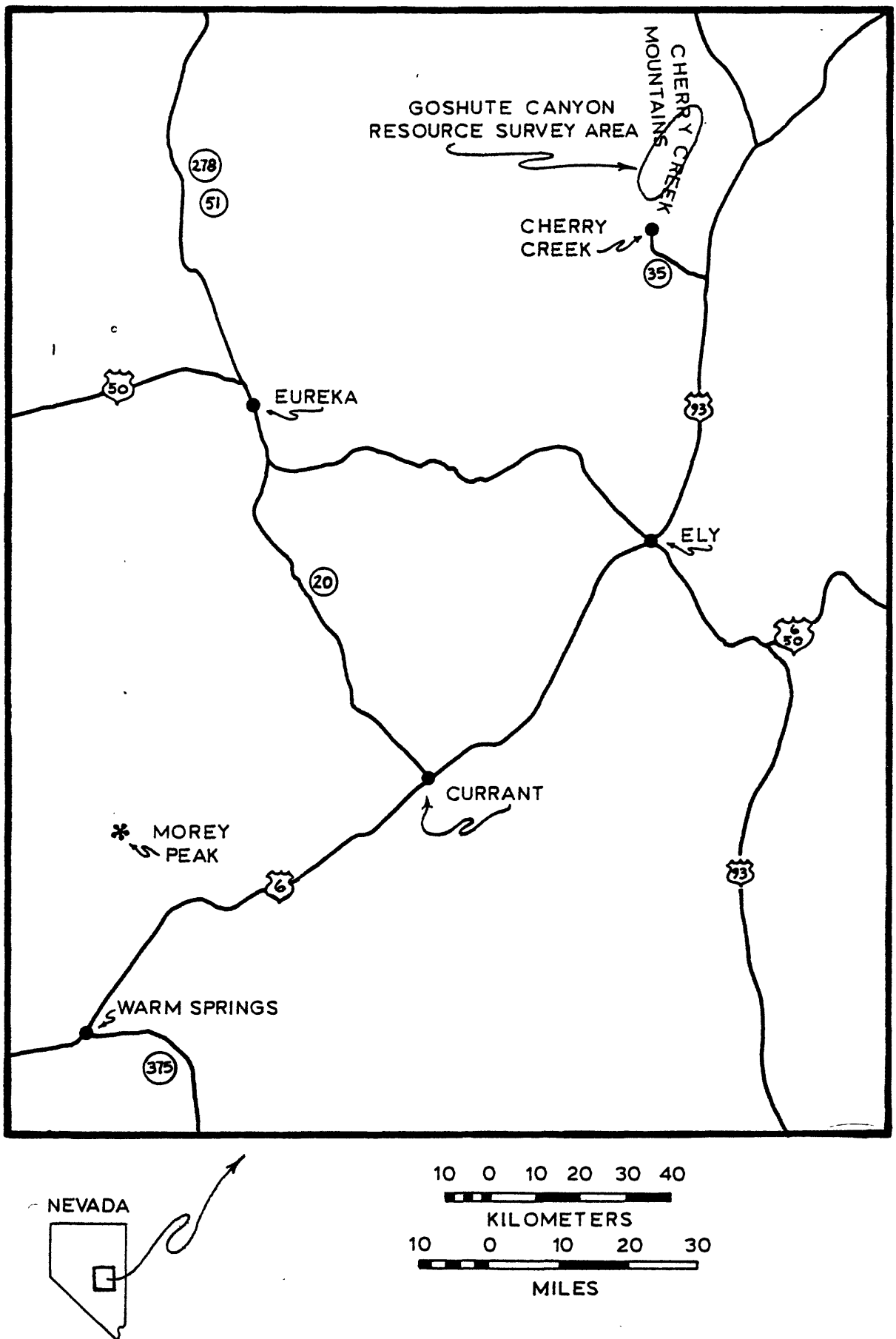


Figure 1.--Index map of the Goshute Canyon Resource Survey Area,
east-central Nevada.

activity has occurred in the region within and immediately south of the survey area boundary. The major mining effort was undertaken in the late 1800's, when rich deposits containing Au, Ag, and to a lesser extent, W, Pb, and Cu were mined. The ore minerals occurred primarily in quartz veins and(or) quartz-carbonate veins (Bureau of Land Management, 1983). At present there is only sporadic mining activity in the Cherry Creek district, which encompasses the southern end of the resource survey area.

A stream-sediment geochemical survey of the Goshute Canyon Resource Survey Area (NV-040-015) was conducted in the summer of 1983, as part of the Bureau of Land Management Phase II mineral resource evaluation of areas under consideration for wilderness classification. Minus-80-mesh stream sediments and panned concentrates from stream-sediment samples were collected in this survey.

SAMPLE COLLECTION AND ANALYTICAL TECHNIQUES

A composite stream-sediment sample was collected at each of 45 sites. The composite sample consisted of not less than five points collected along approximately 100 feet of the stream drainage (figure 2). Approximately 10-15 pounds of minus-2 millimeter sediment were collected in a large gold pan and hand mixed. About 0.5 pounds of the mixed sediment was placed in a kraft paper bag and was later sieved to minus-80-mesh.

The minus-80-mesh fraction of the stream-sediment sample was oven dried at 90°C, was analyzed for 30 elements by the six-step D.C.-arc semiquantitative emission spectrographic method of Grimes and Marranzino (1968). All of the analytical values are reported as six steps per order of magnitude (1, 1.5, 2, 3, 5, 7, or multiples of 10). These values approximate the geometric midpoints of successive concentration ranges (Grimes and Marranzino, 1968). This analytical method utilizes a series of elemental

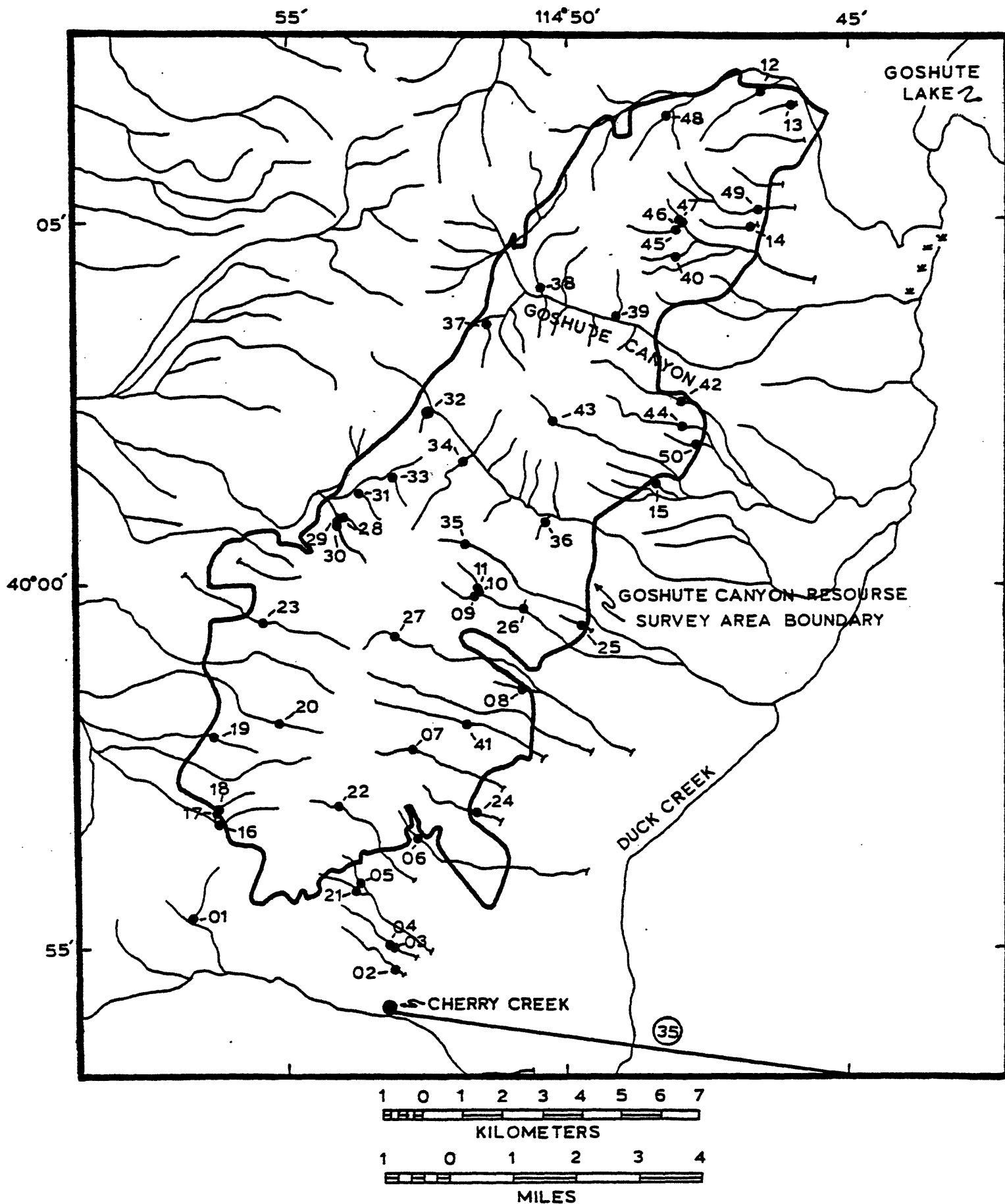


Figure 2.--Sampling location in the Goshute Canyon Resource Survey Area, east-central Nevada.

standards against which the elemental concentrations in the samples are compared. If a sample contains elemental concentrations above the highest standard used in the six-step D.C.-arc spectrographic method, the elemental concentration is given a "G" code. If a sample contains elemental concentrations below the lowest standard used in the six-step D.C.-arc spectrographic method, two code designations can be assigned for the concentration; if the sample concentration is slightly below the lowest standard the elemental concentration is given an "L" code; if the sample concentration is not detected the elemental concentration is given an "N" code. Analytical data for the stream-sediment samples are given in Appendix 1.

The second sample collected at each site was panned to remove the bulk of the common rock-forming minerals such as feldspar, quartz, and calcite. The concentrate was dried and sieved to minus-35-mesh and was then placed in bromoform (specific gravity = 2.86) to remove the remaining feldspar, quartz, calcite, and other rock-forming minerals which are lighter than bromoform. The resultant heavy-mineral separates, which are heavier than bromoform, may contain minerals such as magnetite, ilmenite, sphene, barite, biotite, hornblende, sulfides, and certain oxides. The magnetite and ilmenite were removed using an electromagnet that was placed horizontally with mylar over the poles. The electromagnet was set to 0.4 amperes. The concentrate was placed on a mylar covered tray which was moved slowly to a distance approximately 4-6 inches below the poles which attracted the magnetite to the magnet. The magnetite was removed from the poles. The electromagnet was then set at 1.8 amperes. The tray was brought in contact with the magnet and moved slowly across the opening between the poles. This procedure removes minerals that are magnetic at a 0.6 ampere setting when a Frantz Isodynamic Separator

is used as discussed in Flinter (1959), Hess (1956), and Nickel (1968, 1969) with 15° forward slope and 10° side slope. The mineral grains left on the tray were nonmagnetic at a 0.6 amperage. The varying magnetic susceptibility depends primarily on the degree of paramagnetism exhibited by the mineral, which reflects the amount of substitution into the crystal lattice by ions such as Fe^{2+} (McAndrew, 1957; Rosenblum, 1958; Hurlbut, 1971). The magnetic splits of the panned concentrates may contain minerals such as biotite, sphene, pyroxene, hornblende, and garnet. The nonmagnetic splits may contain minerals such as topaz, sphene, rutile, hematite, sulfides, and some sulfates, carbonates, and oxides.

Representative samples of the nonmagnetic split were pulverized in an agate crucible and analyzed by a modified version of the six-step D.C.-arc semiquantitative emission spectrographic method described by Grimes and Marranzino (1968). A modification of the method was necessary for the analysis of the nonmagnetic heavy-mineral concentrate samples to eliminate spectral interferences produced by matrix effects characteristic of this sample type. The effect of this modification was a loss of sensitivity resulting in an increase of all lower limits of determination by two reporting units. The six-step D.C.-arc emission spectrographic method provides reproducibility within one reporting unit of the reported value approximately 88 percent of the time and within two reporting units of the reported value approximately 96 percent of the time (Motooka and Grimes, 1976). The analytical results for the nonmagnetic fraction of the panned concentrates are given in Appendix 2.

INTERPRETATION OF THE NONMAGNETIC FRACTION OF PANNED CONCENTRATES

The nonmagnetic fraction of the panned concentrate from the stream-sediment samples were valuable for determining geochemical characteristics of known mineralized areas and in assessing the mineral resource potential of the survey area. Known mineral deposits occur in the basins upstream from sites 02, 03, 04, 05, 06, 07, and 21 (figure 2). The concentrates from these basins contain anomalous concentrations of many ore and pathfinder elements (Appendix 2). The mineralized areas were characterized by anomalous concentrations of Pb, Sn, and W with Cu, Zn, Ag, Mo, and Au occurring at some sites. Elemental distribution in basins with mining activity was compared to distribution of the same elements in basins with no known mining activity.

The upwelling mineralizing fluids appear to have reacted with certain rock units and(or) were restricted to certain horizons or rock units in the Precambrian section, possibly due to impermeable shale units (Hose and Blake, 1976). Of particular note is site 22 where elevated concentrations of Ag, Pb, Sn, and W occur, and sites 27 and 31 where Ag and Au were detected. The rocks in these basins warrant further geochemical investigation. The distribution of elevated Ag and Au concentrations are shown in figure 3, Cu and Zn are shown in figure 4, Mo, Sn, and W are shown in figure 5 Pb is shown in figure 6, and Nb and Y are shown in figure 7.

The geologic evidence also suggests that the Cherry Creek district is underlain by a buried stock. A set of circular faults in sedimentary rocks of the Cherry Creek district is interpreted as reflecting the emplacement of a stock beneath the Cherry Creek district.

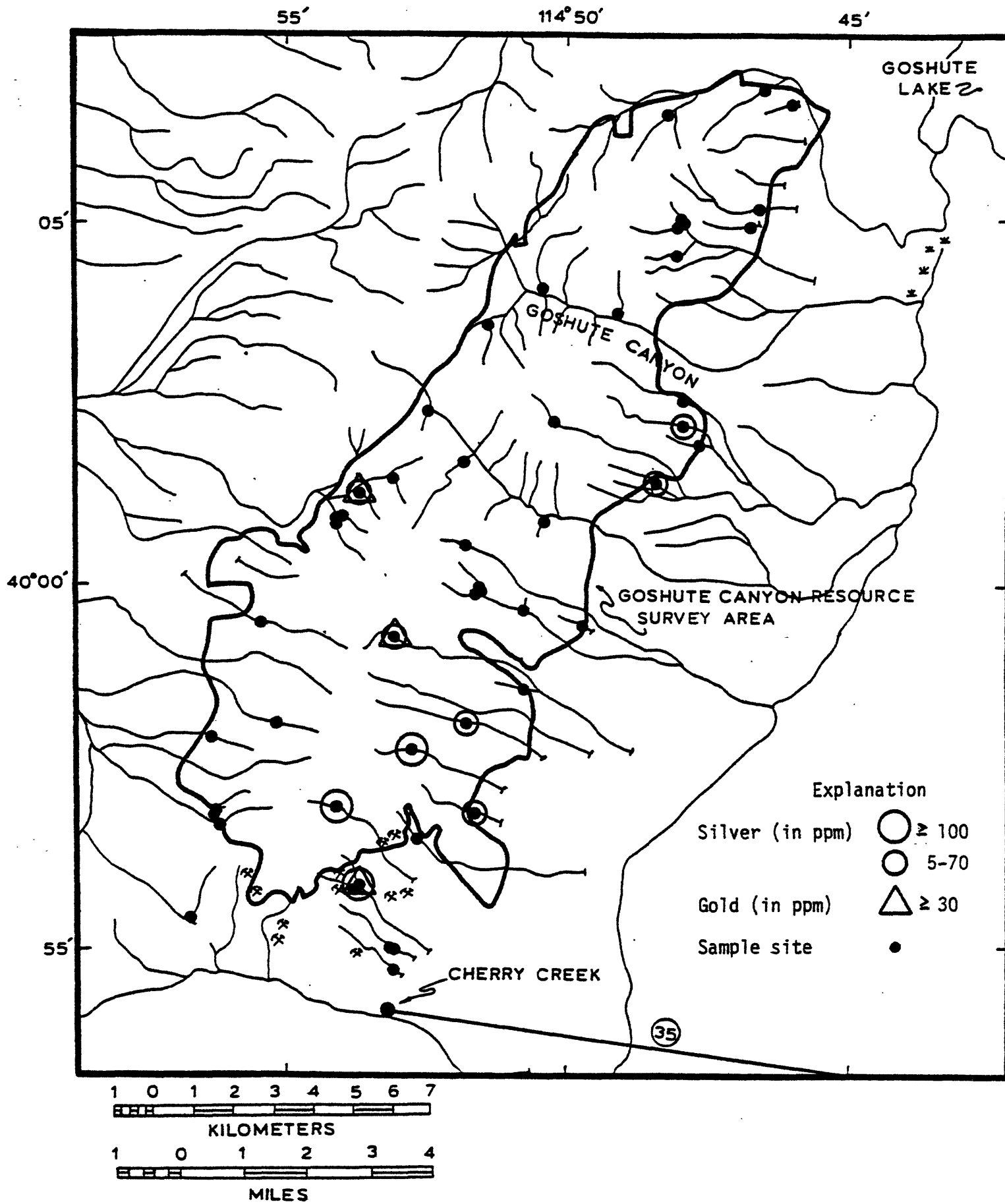


Figure 3.--Distribution of elevated silver and gold concentrations from the nonmagnetic fraction of the panned concentrate from the stream sediment samples in the Goshute Canyon Resource Survey Area, east-central Nevada.

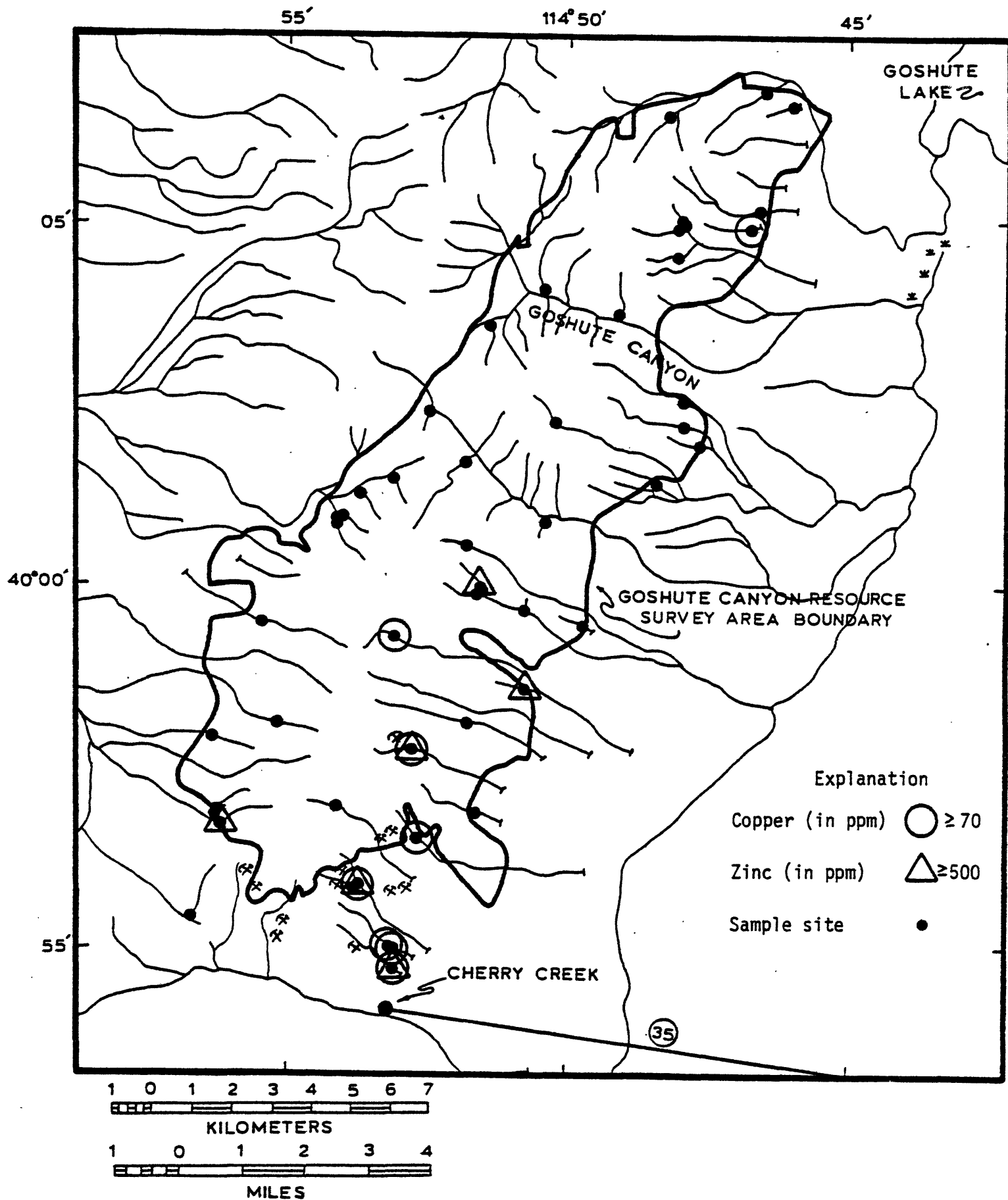


Figure 4.--Distribution of elevated copper and zinc concentrations from the nonmagnetic fraction of the panned concentrate from the stream sediment samples in the Goshute Canyon Resource Survey Area, east-central Nevada.

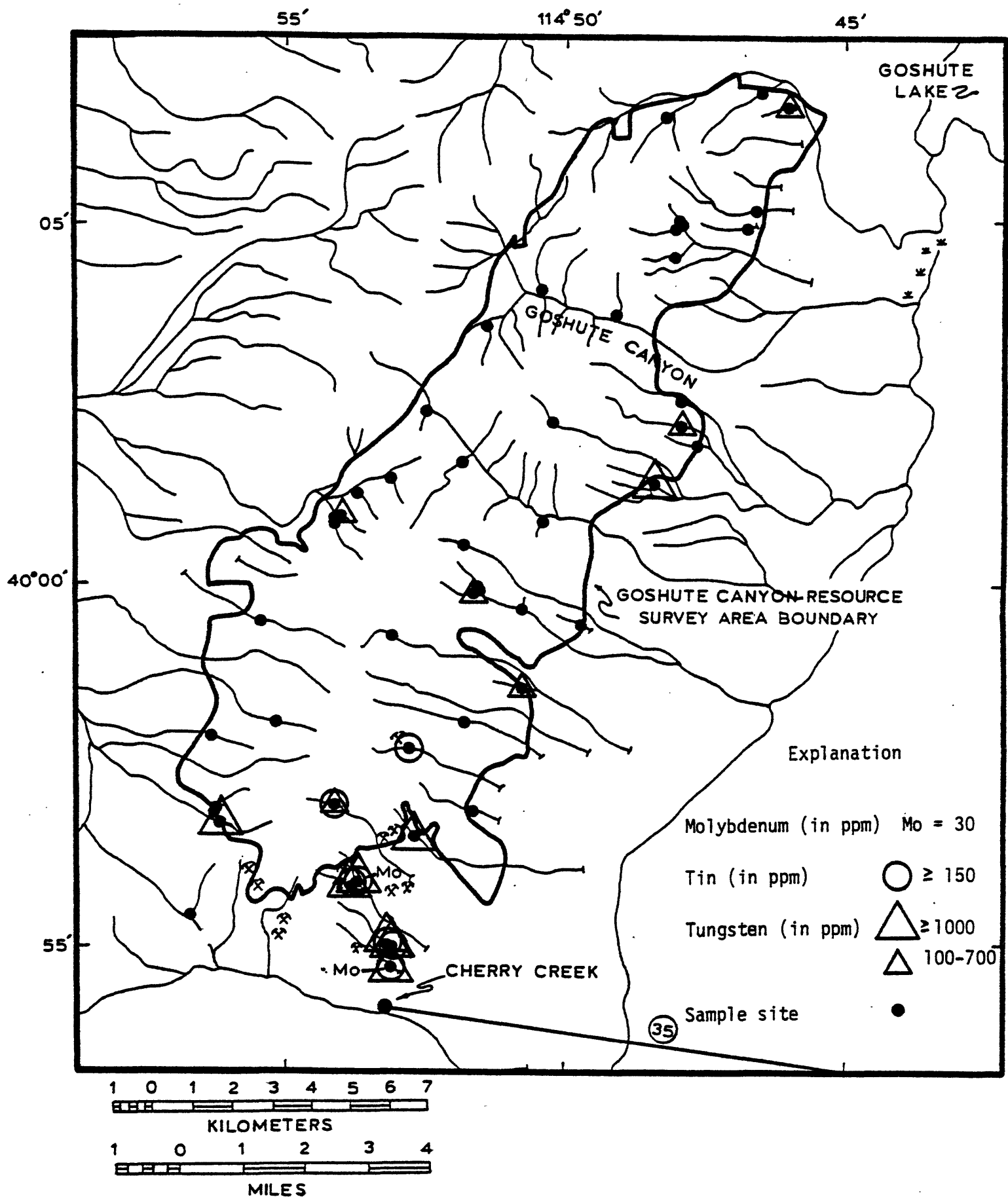


Figure 5.--Distribution of elevated molybdenum, tin, and tungsten concentrations from the nonmagnetic fraction of the panned concentrate from the stream sediment samples in the Goshute Canyon Resource Survey Area, east-central Nevada.

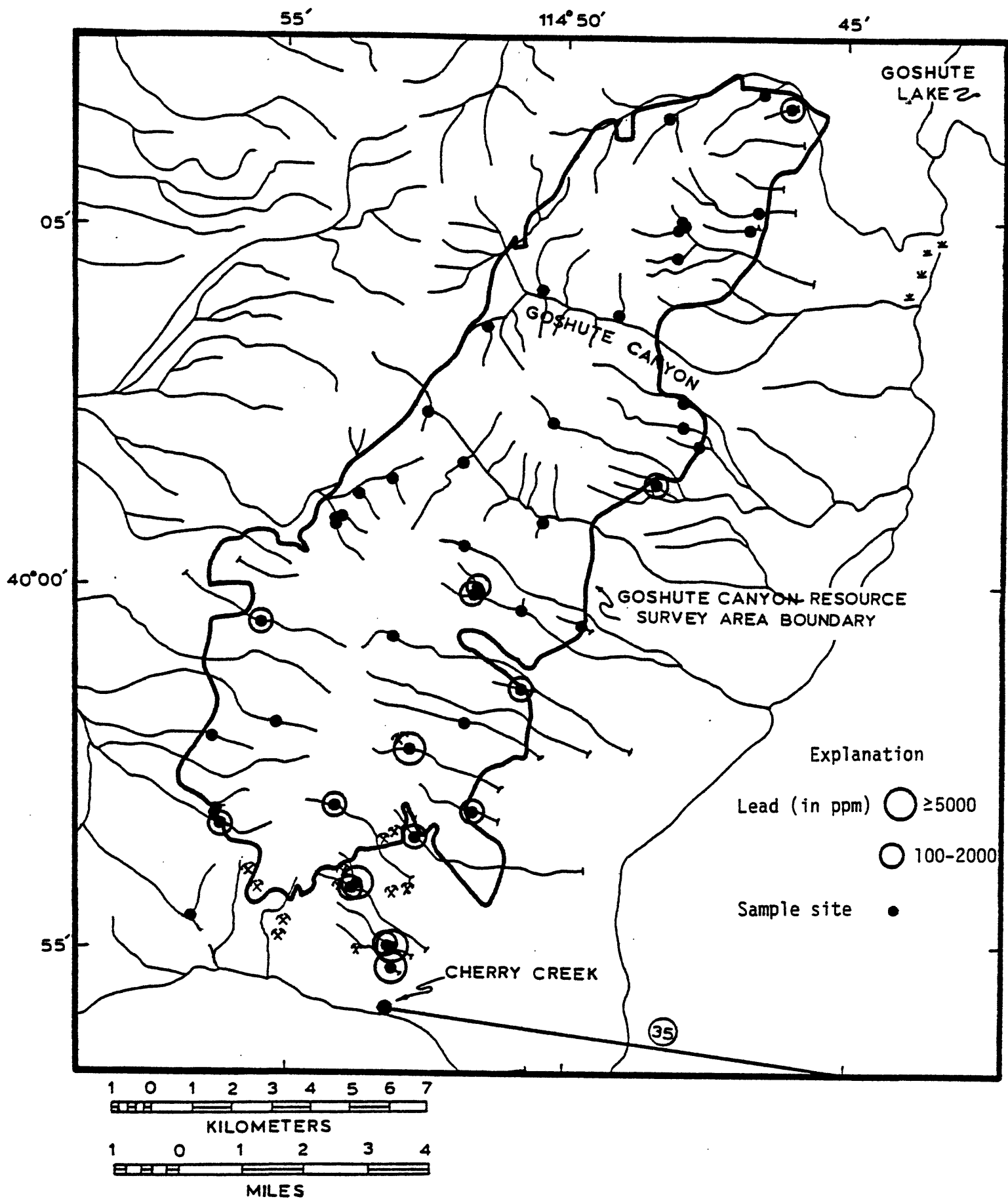


Figure 6.--Distribution of elevated lead concentrations from the nonmagnetic fraction of the panned concentrate from the stream sediment samples in the Goshute Canyon Resource Survey Area, east-central Nevada.

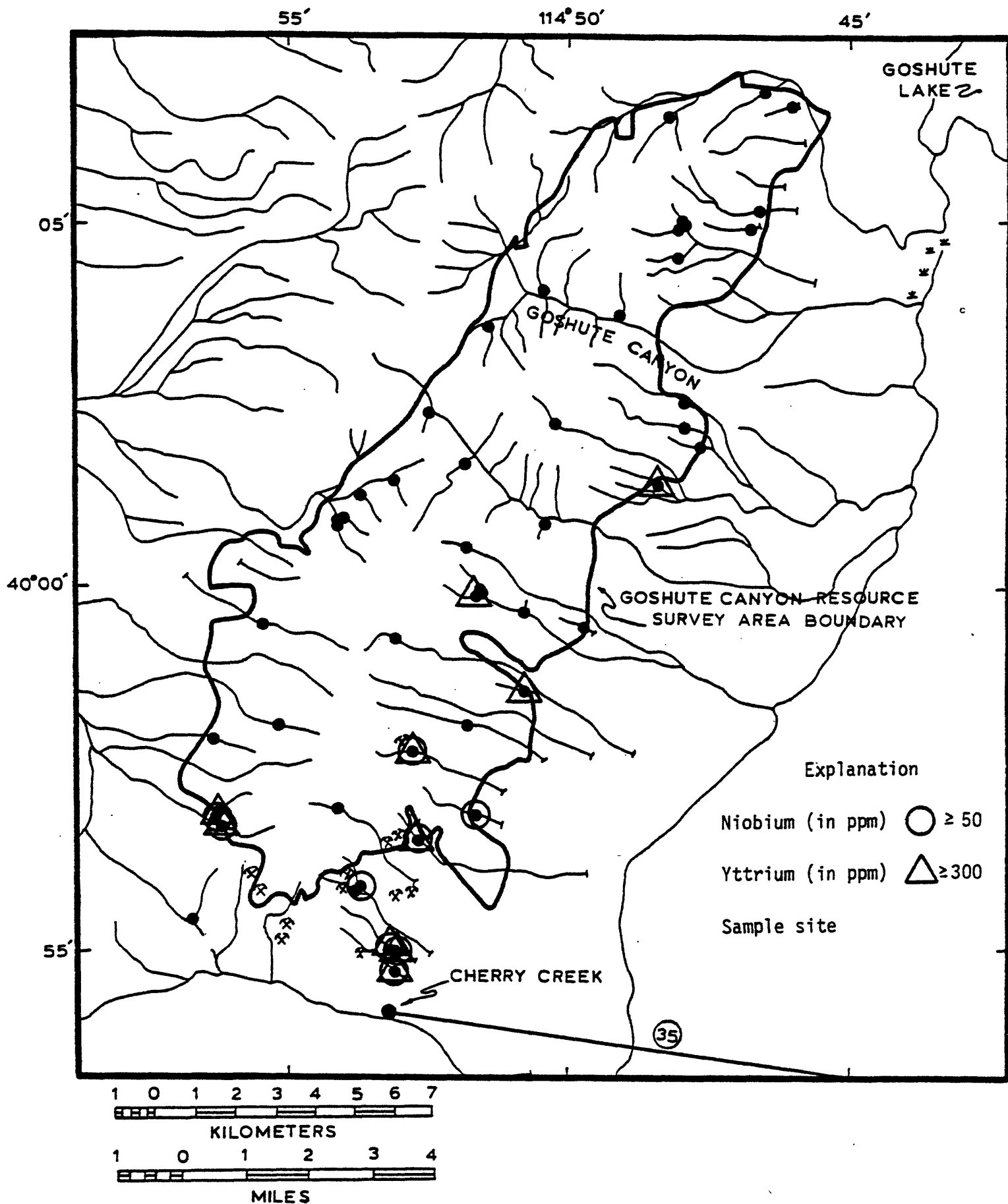


Figure 7.--Distribution of elevated niobium and yttrium concentration from the nonmagnetic fraction of the panned concentrate from the stream sediment samples in the Goshute Canyon Resource Survey Area, east-central Nevada.

GEOLOGY

The Goshute Canyon Resource Survey Area, located within the central portion of the Cherry Creek Range, is a fault block typical of the Basin and Range province. The southern portion of the Cherry Creek Range trends northeast then swings to the northwest near the Elko-White Pine county line. The rocks are predominantly Paleozoic marine sediments that have been locally intruded by Early Tertiary monzonitic to quartz monzonitic composition bodies.

Many portions of the survey area are very rugged, with steep cliffs and deep canyons. The elevation of several peaks exceed 10,000 feet. The western portion of the survey area drains into Butte Valley while the eastern portion drains into the Steptoe Valley.

A detailed description of the rock units, structural geology and tectonics, paleontology, and historical geology is presented in the G-E-M Resources Area report (U.S. Bureau of Land Management, 1983).

ENERGY AND MINERAL RESOURCES

The Cherry Creek district is located near the town of Cherry Creek and extends into the southern boundary of the resource survey area. The district has produced Au and Ag, with lesser amounts of W, Cu, and Pb. The Gypsy silver-tungsten mine, the Black Metal gold-silver-base metal mine, the Chance silver-tungsten mine, the Exchequer and Fillmore gold-silver mines (Hose and others, 1976) all lie within or on the boundary of the survey area.

Small prospects occur north of the Cherry Creek district (Hose and others, 1976) and recent exploration surveys have occurred within and in the vicinity of the survey area. Jasperoid occurs in the central part of the survey area.

A detailed discussion of mining claims and mineral economics is found in the G-E-M Resources Area report for Goshute Canyon (U.S. Bureau of Land Management, 1983).

Precious metals and precious metal containing base-metal sulfide mineral deposits are found in nearly all rock types exposed in the Cherry Creek district. Four stratigraphic horizons in Cambrian formations are the most favorable hosts for mineralization (Hose and others, 1976). Gold-quartz veins occur only where quartzite of the Prospect Mountain Formation forms at least one wall. Quartz or quartz-calcite veins and replacement bodies with silver, gold, base metals and sometimes tungsten, occur in all types of rocks. Calcite or calcite-quartz pods and lenses bearing scheelite occur in brecciated Cambrian carbonate beds. These favorable mineralized carbonate horizons often underlie shaly units (Hose and others 1976). The mineralization in the Cherry Creek district may be related to the nearby Tertiary intrusions but more probably to a hidden stock underlying the district, or possibly to an apophysis of a Tertiary intrusion.

The Cherry Creek district has many of the same geochemical characteristics as the Alunite Ridge-Deer Trail Mountain area in south central Utah, which is postulated to overlie a hidden porphyry-type mineral deposit (Cunningham and Steven, 1979). Other areas that are geochemically and geologically similar are Pine Grove, in the Wah Wah Mountains, Utah (Westra and Keith, 1981) and Red Mountain, Colorado (Wallace and others, 1978; Mutschler and others, 1981) both of which have porphyry-type mineral deposits associated with precious- and base-metal mineral deposits.

A detailed description of nonmetallic mineral resources, including known deposits, prospects, claims, deposit types, and economics is given in the G-E-M Resources Area report for Goshute Canyon (U.S. Bureau of Land Management, 1983). Descriptions of energy resources, oil and gas resources, and geothermal resources are also presented in the G-E-M report.

E. Strategic and Critical Minerals and Metals

The Bureau of Land Management uses the following definitions of strategic and critical metals: strategic metals are those listed for stockpiling; critical metals are those for which import reliance is 50% or more.

The strategic and(or) critical metals, tungsten, silver, lead, copper, and zinc have been produced within the Cherry Creek district which includes parts of the resource survey area. One occurrence of the strategic and critical mineral fluorite is known near the survey area.

LAND CLASSIFICATION FOR G-E-M RESOURCES POTENTIAL

Land classification areas are numbered starting with the number 1 in each category of resources. Metallic mineral land classification areas have the prefix M; e.g., M1-4D. Uranium and thorium areas have the prefix U. Nonmetallic mineral areas have the prefix N. Oil and gas areas have the prefix OG. Geothermal areas have the prefix G. Sodium and potassium areas have the prefix S. The favorability (number 1-4) and confidence levels (letters A-D) are defined in Table 1.

Land classifications have been made here only for the areas that encompass segments of the resource survey area, and are shown on a 1:250,000 scale.

A. Locatable Resources

1. Metallic minerals

M1-4D. This classification covers the southeast corner of the Resource Survey Area (figure 8). Where several mines are present that have produced gold, silver, copper, lead and tungsten. Silver, copper and lead are strategic metals, and tungsten is a strategic and critical metal. The occurrence of productive mines, numerous prospects, and geochemical analysis give high favorability and the high confidence to this classification.

Table 1.--Bureau of Land Management classification scheme and level of confidence scheme

Classification Scheme

1. The geologic environment and the inferred geologic processes do not indicate favorability for accumulation of mineral resources.
2. The geologic environment and the inferred geologic processes indicate low favorability for accumulation of mineral resources.
3. The geologic environment, the inferred geologic processes, and the reported mineral occurrences indicate moderate favorability for accumulation of mineral resources.
4. The geologic environment, the inferred geologic processes, the reported mineral occurrences, and the known mines or deposits indicate high favorability for accumulation of mineral resources.

Level of Confidence Scheme

- A. The available data are either insufficient and/or cannot be considered as direct evidence to support or refute the possible existence of mineral resources within the respective area.
- B. The available data provide indirect evidence to support or refute the possible existence of mineral resources.
- C. The available data provide direct evidence, but are quantitatively minimal to support or refute the possible existence of mineral resources.
- D. The available data provide abundant direct and indirect evidence to support or refute the possible existence of mineral resources.

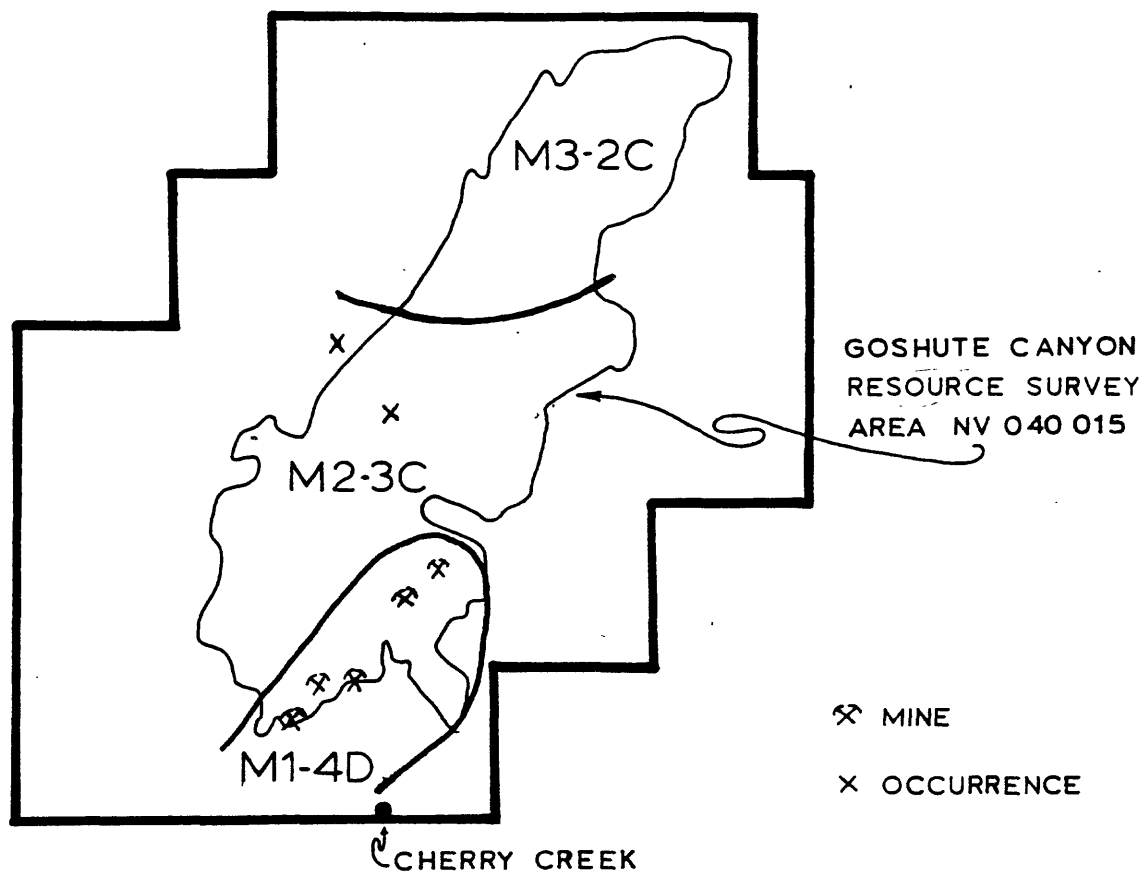


Figure 8.--Land classification for metallic mineral occurrences in the Goshute Canyon Resource Survey Area, east-central Nevada.

M2-3C. This classification area covers part of the central portion of the survey area. Within the survey area is an area of jasperoid and other types of alteration drilled by Amselco, and just outside the survey area is the prospect shown by Hose and others (1976). The geochemical analysis suggest that as yet undiscovered vein-type precious- and base-metal mineral deposits may occur in some of the basins within the area. Much of this area overlies a postulated hidden stock that may contain porphyry-type mineralization.

M3-2C. This classification area covers the northern portion of the survey area. No known prospects or claims has been identified in the area but the geochemical analyses from basins in the area show some elevated concentrations of some elements.

2. Uranium and thorium

U1-2B. This classification covers most of the survey area (figure 9). The area is overlain by Precambrian to Permian limestones and sandstones, and minor exposures of Tertiary quartz monzonite. The area has low favorability for fracture filled uranium deposits that are associated with intrusion of quartz monzonite into Precambrian and Cambrian sedimentary rocks in the southeastern part of the survey area. The area has low favorability for thorium in pegmatites associated with quartz monzonitic intrusions.

U2-2B. This land classification covers small areas on the margins of the survey area (figure 9). These areas are covered by Quaternary alluvium and have low favorability for epigenetic sandstone-type uranium deposits. The Tertiary volcanic rocks to the west of the resource area are a possible source of uranium, an element that can be leached by ground water and redeposited in the alluvium where the ground water encounters a reducing environment (i.e., organic matter).

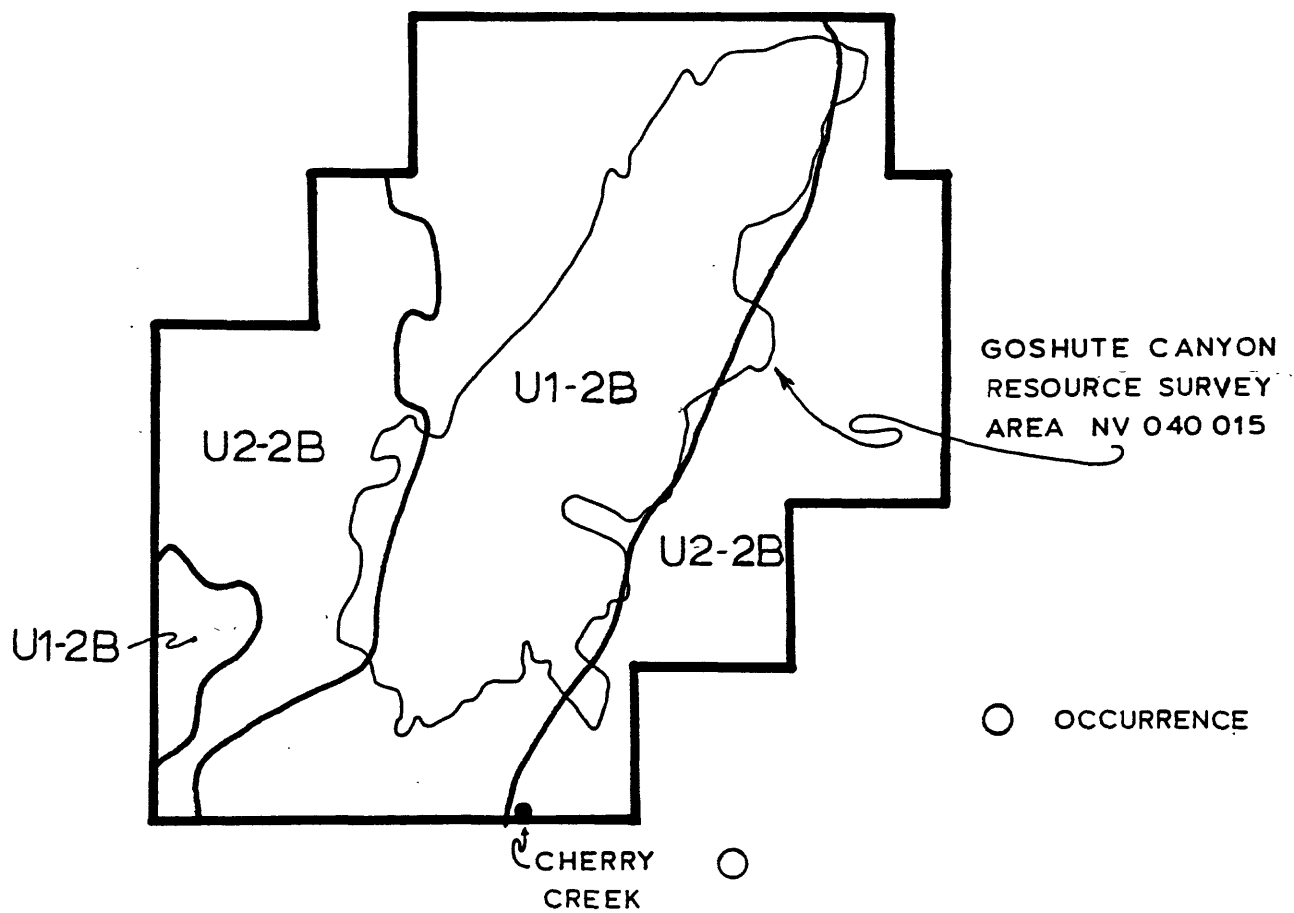


Figure 9.--Land classification for uranium and thorium occurrences in the Goshute Canyon Resource Survey Area, east-central Nevada.

In alluvium to the east of the resource survey area, where pegmatitic source rocks may be present, the area has low favorability for thorium as placer concentrations.

3. Nonmetallic minerals

N1-3C. This classification area covers most of the resource survey area (figure 10). Where Paleozoic sedimentary rocks and Cambrian sedimentary rock are exposed, the limestone and dolomite may have industrial usage. The moderate level of favorability assigned here stems from the known presence of these rocks, although none is known to have been mined. The quality of the material is not known, which is the reason for the moderate level of confidence.

N2-1A. This classification area covers the southeastern part of the resource survey area and a narrow strip northward near the east edge of the survey area where Cambrian sedimentary rocks of mostly clastic content crop out (figure 10). These clastic rocks have no known application for nonmetallic minerals.

N3-3C. This classification area covers small parts of the eastern edge of the resource survey area where Quaternary alluvium is mapped. Alluvium by definition contains sand and gravel. The presence of sand and gravel, though none is known to have been mined in or adjacent to the survey area, is the reason for the moderately favorable classification.

B. Leasable Resources

1. Oil and gas

OG1-1C. The resource survey area is underlain by Precambrian and Cambrian through Mississippian sedimentary rocks, all of which are highly faulted and generally in dipping fault blocks. This stratigraphic section is older than the producing oil reservoir source rocks in the Basin and Range

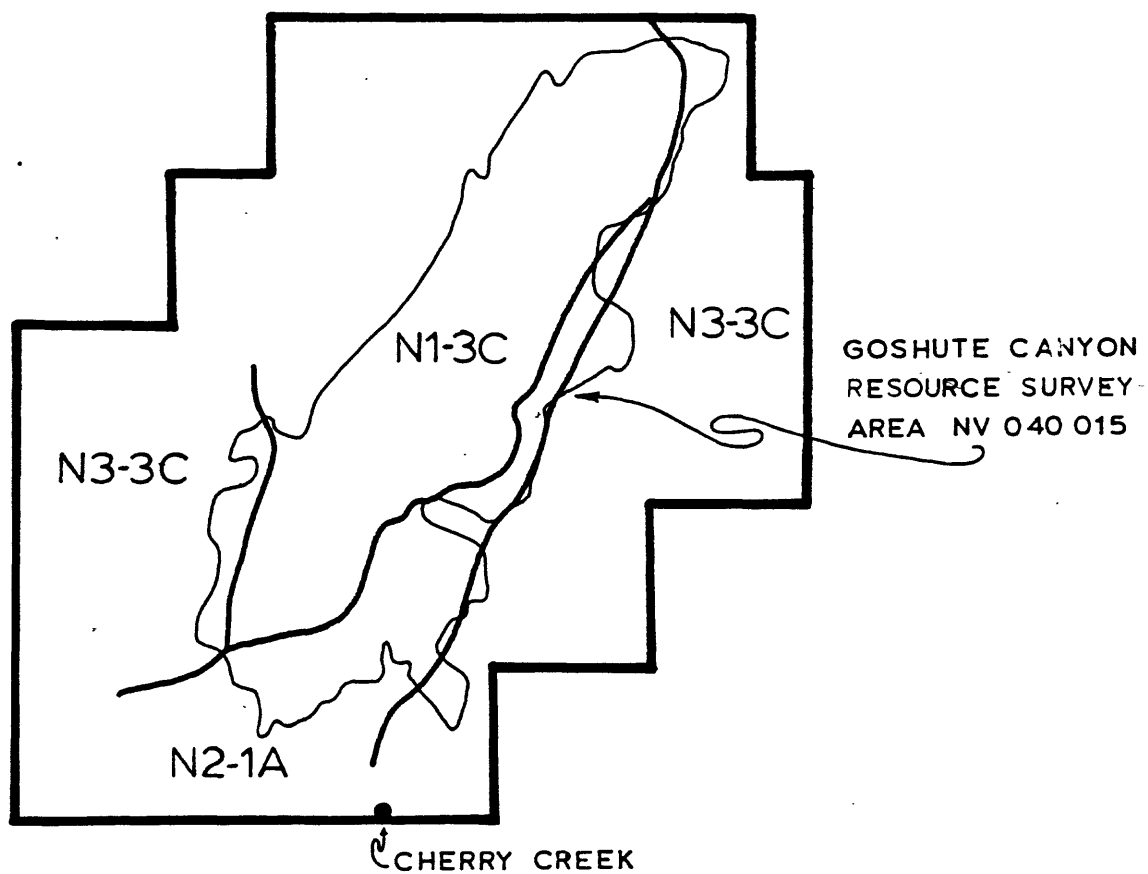


Figure 10.--Land classification for nonmetallic mineral occurrences in the Goshute Canyon Resource Survey Area, east-central Nevada.

province (figure 11). therefore the area is not considered favorable for oil and gas occurrences.

OG2-2A. This classification includes those portions of the survey area which are underlain by Quaternary valley fill (figure 11). These areas may be structurally separated from the mountain ranges at reasonably shallow depth by range-front faults. The Shell Oil Company exploratory well in the Steptoe Valley, some four miles from the mountains, penetrated over 1 mile of sediments before entering Paleozoic-age rocks. A similar environment could be present in valleys within the survey area. The land classification is given in figure 11.

2. Geothermal

G1-3A. This classification covers the range-front areas which have or may have faulting similar to that which acts as conduits to the Cherry Creek Hot Springs area south of the resource survey area (figure 12). These thermal waters, which are presently commercially exploitable at 149°F, the thermal waters in the Shell Oil Company well (304°F), and the waters at the Collar and Elbow Spring (92°F), show this geologic environment as having favorable potential for geothermal resources.

G2-2A. The remaining areas underlying the survey area, comprising mostly the faulted Cherry Creek Range and a small valley portion in Butte Valley, are in close enough proximity to the favorable Steptoe Valley thermal area to have at least low potential for geothermal resources (figure 12).

3. Sodium and potassium

S1-1D. The survey area is not known to have any potential for sodium and potassium, and is classified in its entirety as S1-1D.

C. Saleable Resources

Saleable resources have been considered in connection with nonmetallic minerals.

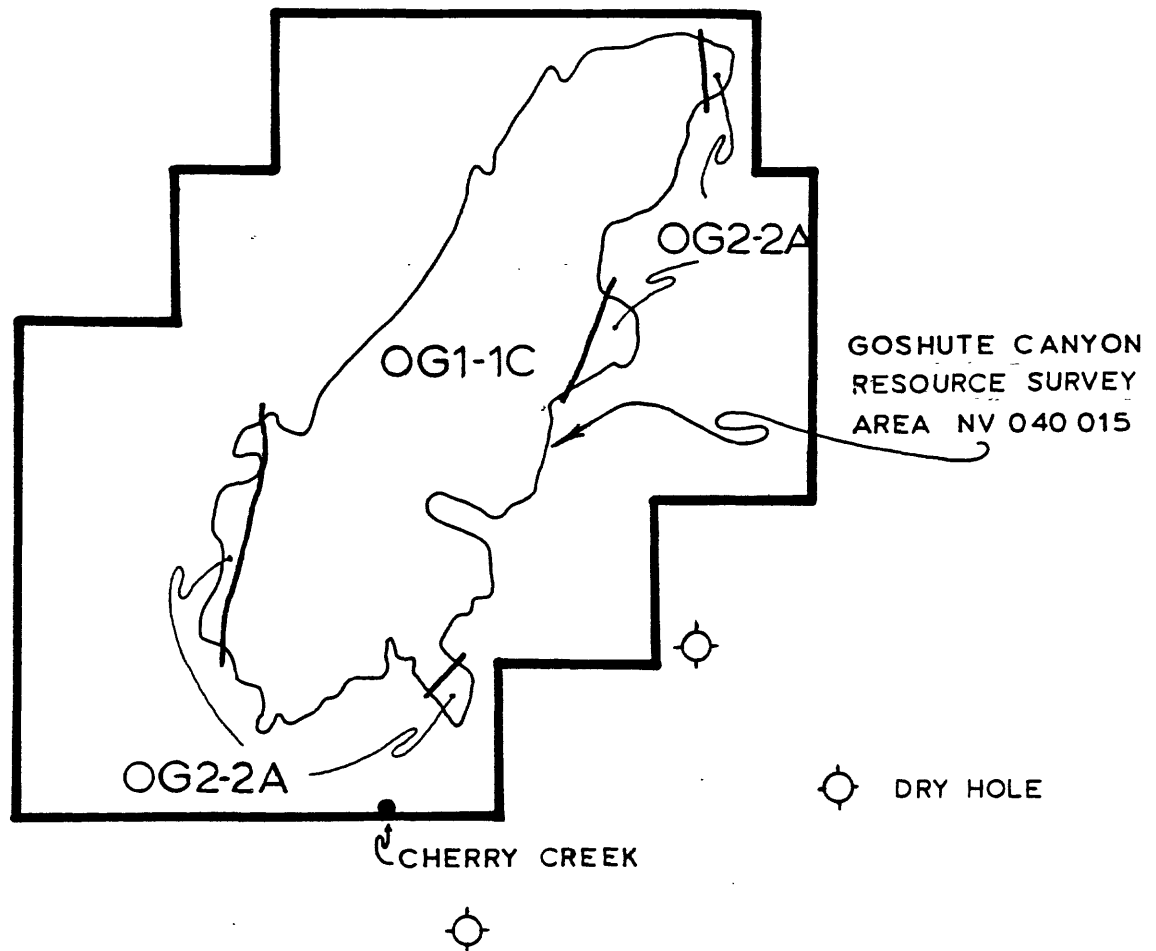


Figure 11.--Land classification for oil and gas leasable resources
in the Goshute Canyon Resource Survey Area, east-central Nevada.

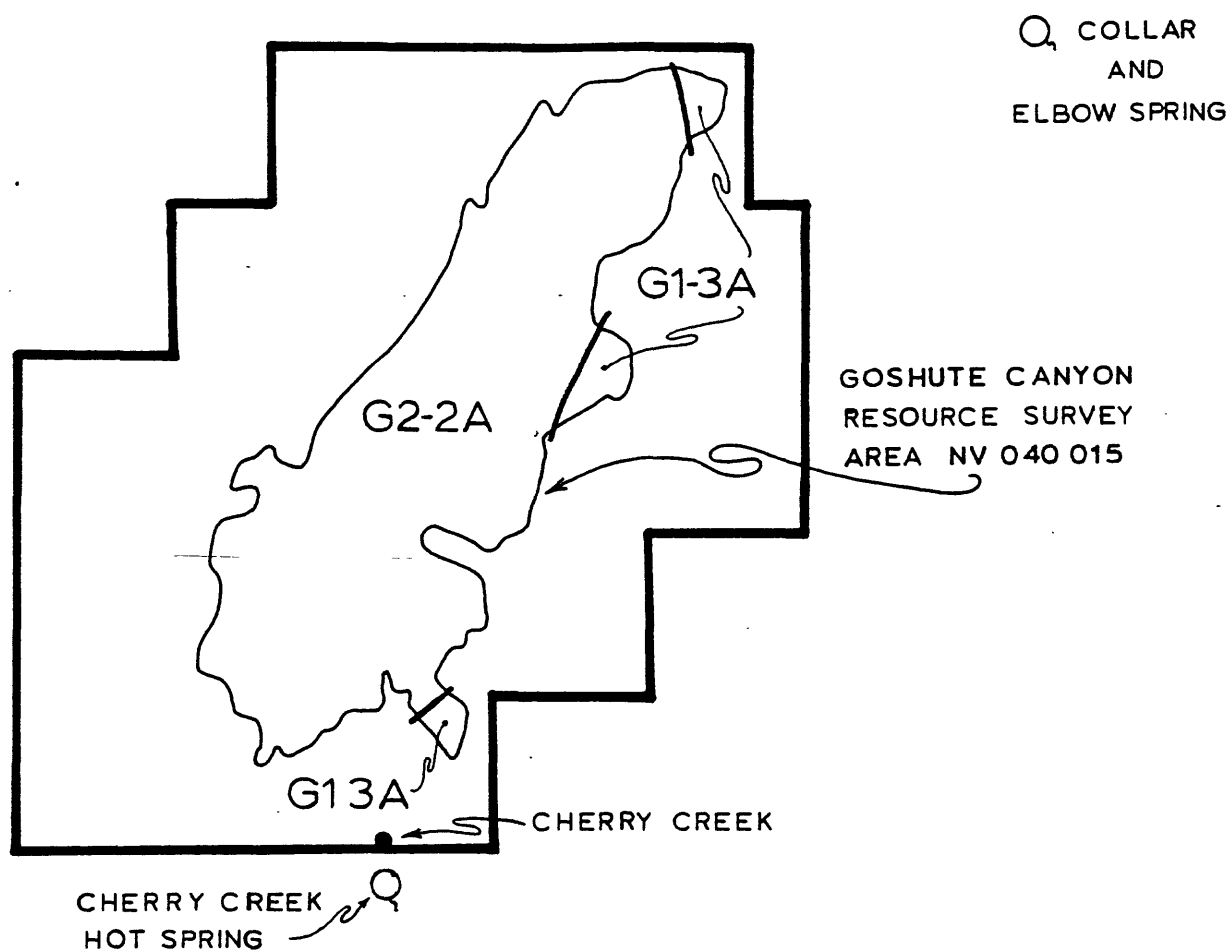


Figure 12.--Land classification for geothermal leasable resources in the Goshute Canyon Resource Survey Area, east-central Nevada.

RECOMMENDATIONS FOR ADDITIONAL WORK

The geochemical data and geological evidence suggest that the Resource Survey Area may contain as yet undiscovered vein-type mineral deposits and that a porphyry-type mineral deposit may underlie the Cherry Creek district. Further geochemical work could include more detailed stream-sediment sampling, rock sampling and mineral identification from the nonmagnetic fraction of the panned concentrate samples. Detailed geologic mapping is warranted.

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Appendix 1.--Analytical results for the minus-80-mesh fraction of the stream sediment samples from the Goshute Canyon Resource Survey Area, east-central Nevada.

Sample	LATITUDE	LONGITUDE	Fe %	Mg %	Ca %	Ti %	Mn ppm	B ppm	Ba ppm	Be ppm	Co ppm	Cr ppm	Cu ppm
01	39 55 37	114 57 0	2.0	2.0	3.0	.20	1,000	100	500	3	10	50	30
02	39 54 39	114 53 28	5.0	.5	.5	.30	1,000	70	700	5	15	50	70
03B02	39 54 55	114 53 9	2.0	.5	.7	.20	700	100	700	3	10	50	50
04S03	39 54 56	114 53 10	2.0	.5	.7	.20	1,000	70	700	3	10	70	70
04ADP	39 54 56	114 53 10	3.0	.5	1.0	.50	1,000	150	500	5	15	30	70
05	39 55 57	114 53 55	2.0	2.0	10.0	.50	700	70	200	1	15	50	70
06	39 56 21	114 52 31	2.0	2.0	3.0	.50	1,000	100	500	2	15	50	150
07	39 57 35	114 52 39	2.0	1.0	5.0	.50	700	70	300	1	10	50	100
08	39 58 27	114 50 59	2.0	2.0	5.0	.50	700	100	300	2	15	50	100
09	39 59 40	114 52 3	1.0	2.0	10.0	.10	1,000	150	300	3	5	50	20
10B09	39 59 42	114 52 8	2.0	5.0	7.0	.20	500	70	200	1	10	50	150
11S010	39 59 46	114 52 10	2.0	3.0	5.0	.20	500	100	200	1	10	50	100
12	40 6 56	114 46 53	1.0	5.0	5.0	.15	700	100	500	2	10	100	50
13	40 6 52	114 46 18	2.0	3.0	7.0	.20	500	70	500	1	10	30	70
14	40 4 32	114 47 2	1.0	2.0	3.0	.20	500	70	200	2	10	30	100
15	40 1 43	114 49 33	2.0	3.0	10.0	.20	500	70	300	2	10	30	100
16	39 56 1	114 56 20	3.0	2.0	5.0	.50	700	100	700	2	15	50	100
17B016	39 56 53	114 56 12	2.0	1.0	2.0	.20	1,000	150	500	3	10	100	50
18S017	39 56 54	114 56 11	2.0	2.0	3.0	.20	1,000	150	500	3	10	70	50
18ADP	39 56 54	114 56 11	3.0	2.0	5.0	.30	1,000	200	500	7	15	50	50
19	39 56 56	114 56 23	1.0	5.0	5.0	.10	500	70	200	1	7	70	20
20	39 58 10	114 55 20	1.0	2.0	5.0	.10	700	70	200	2	7	70	20
21	39 55 54	114 54 10	2.0	1.0	5.0	.20	700	100	500	2	15	100	30
22	39 57 8	114 54 17	2.0	2.0	10.0	.20	1,000	100	500	3	10	70	70
23	39 59 27	114 55 24	1.0	5.0	5.0	.15	700	100	200	2	10	70	30
24	39 56 49	114 51 33	2.0	.5	.7	.20	1,000	150	700	3	10	50	30
25	39 59 5	114 50 30	1.0	2.0	10.0	.20	1,000	70	500	3	7	50	20
26	39 59 9	114 51 34	1.0	.7	10.0	.20	1,000	100	700	3	15	70	30
27	39 59 16	114 52 59	1.0	2.0	1.0	.10	700	100	500	2	10	100	20
28	40 0 38	114 54 15	1.0	2.0	5.0	.20	700	150	500	3	7	50	20
29B028	40 0 44	114 54 32	1.0	2.0	10.0	.20	700	100	500	3	10	70	30
30S029	40 0 46	114 54 30	1.0	5.0	10.0	.10	500	100	200	2	5	50	15
30ADP	40 0 46	114 54 30	1.0	5.0	10.0	.10	700	150	300	2	10	100	20
31	40 1 9	114 53 35	1.0	2.0	10.0	.10	700	70	150	1	7	70	10
32	40 2 21	114 52 38	2.0	.3	.5	.20	700	150	500	3	15	70	30
33	40 1 29	114 53 15	1.0	.3	.7	.20	700	100	700	2	10	100	20
34	40 1 46	114 51 50	1.0	2.0	10.0	.20	700	70	300	2	10	50	15
35	40 0 29	114 51 40	1.0	2.0	5.0	.20	700	100	500	3	10	70	50
36	40 0 49	114 50 15	1.0	1.0	10.0	.20	1,000	100	500	3	7	30	50
37	40 3 27	114 51 29	2.0	.5	.3	.20	700	150	500	5	15	70	30
38	40 3 54	114 50 9	1.0	5.0	10.0	.20	700	100	500	3	10	50	50
39	40 3 38	114 49 7	1.0	2.0	5.0	.20	700	150	500	2	7	50	50
40	40 4 20	114 47 56	2.0	1.0	2.0	.20	1,000	150	500	3	10	50	50
41	39 58 3	114 51 50	2.0	1.0	5.0	.20	700	100	500	3	15	70	50
42	40 3 5	114 48 8	1.0	1.0	5.0	.20	1,000	100	700	3	15	50	50

Appendix 1.--Analytical results for the minus-80-mesh fraction of the stream sediment samples from the Goshute Canyon Resource Survey Area, east-central Nevada.--continued

Sample	La ppm	Ni ppm	Pb ppm	Sc ppm	Sr ppm	V ppm	Y ppm	Zr ppm
01	30	20	70	7	200	70	10	100
02	100	15	150	10	300	100	30	300
03B002	50	20	70	10	200	100	10	200
04S003	50	20	100	10	200	100	30	200
04ADP	50	50	70	7	200	100	30	300
05	30	30	70	10	200	70	15	100
06	50	30	100	10	200	100	20	300
07	30	30	70	10	200	70	15	200
08	20	50	70	10	100	100	20	200
09	30	30	70	7	200	100	20	100
10B009	20	30	70	50	100	100	10	150
11S010	20	50	70	50	200	100	20	150
12	30	20	70	10	200	70	20	100
13	20	30	70	50	200	70	15	200
14	50	30	70	50	100	100	10	200
15	20	30	70	10	200	50	15	150
16	50	30	70	10	200	100	30	200
17B016	50	30	70	10	200	100	30	150
18S017	30	20	70	10	200	100	20	150
18ADP	50	30	50	10	200	100	30	300
19	N	10	70	5	200	30	15	50
20	N	10	70	5	100	50	15	100
21	50	30	70	15	300	70	30	150
22	30	20	100	10	200	100	20	200
23	30	10	70	7	200	50	20	70
24	50	15	70	15	300	100	30	200
25	30	20	30	7	200	100	30	150
26	30	30	70	10	500	100	30	150
27	N	30	70	10	200	70	30	150
28	30	20	70	7	200	70	20	150
29B028	N	30	70	10	200	70	20	150
30S029	N	30	70	5	200	50	15	70
30ADP	30	30	70	7	100	70	10	100
31	30	15	50	5	200	30	15	70
32	20	50	20	10	200	100	30	200
33	50	20	50	10	200	70	30	200
34	N	30	50	5	200	100	20	150
35	20	50	70	10	200	100	30	200
36	20	15	70	7	200	100	20	150
37	30	70	50	10	200	100	30	200
38	30	30	100	10	200	100	30	150
39	30	20	70	7	200	50	20	150
40	30	20	70	10	200	70	30	200
41	30	20	70	15	200	100	30	200
42	N	30	70	10	300	100	30	200

Appendix 1.--Analytical results for the minus-80-mesh fraction of the stream sediment samples from the Goshute Canyon Resource Survey Area, east-central Nevada.--continued

Sample	LATITUDE	LONGITUDE	Fe %	Mg %	Ca %	Ti %	Mn ppm	B ppm	Ba ppm	Be ppm	Co ppm	Cr ppm	Cu ppm
43	40 2 11	114 49 46	.7	2.0	20.0	.10	500	30	200	1	5	50	10
44	40 2 39	114 48 22	1.0	2.0	2.0	.10	700	100	500	2	10	100	50
45	40 4 50	114 48 2	1.0	2.0	5.0	.15	700	150	500	1	10	70	50
46B045	40 4 53	114 47 59	1.0	2.0	10.0	.20	700	70	300	3	10	50	30
47SD46	40 4 57	114 48 2	1.0	5.0	10.0	.20	700	100	300	2	10	50	20
47ADP	40 4 57	114 48 2	1.0	5.0	10.0	.20	700	150	300	3	10	50	30
48	40 6 38	114 47 56	1.0	1.0	3.0	.20	700	150	500	2	10	70	50
49	40 5 8	114 46 45	2.0	1.0	5.0	.20	700	100	500	3	10	50	70
50	40 2 17	114 48 19	1.0	1.0	10.0	.20	700	100	700	3	10	100	70

Appendix 1.--Analytical results for the minus-80-mesh fraction of the stream sediment samples from the Goshute Canyon
Resource Survey Area, east-central Nevada.--continued

Sample	La ppm	Ni ppm	Pb ppm	Sc ppm	Sr ppm	V ppm	Y ppm	Zr ppm
43	N	10	50	5	200	30	15	70
44	20	20	100	10	200	70	30	200
45	30	20	70	7	200	70	30	200
46B045	N	30	70	10	200	70	20	100
47S046	20	30	70	10	200	100	20	100
47ADP	30	20	50	7	150	70	20	200
48	30	30	70	10	200	70	20	150
49	30	20	70	10	200	100	20	200
50	N	30	70	10	200	70	30	200

Appendix 2.---Analytical results for the nonmagnetic fraction of the panned concentrate samples from the Goshute Canyon Resource Survey Area, east-central Nevada.

Sample	LATITUDE	LONGITUDE	Fe %	Mg %	Ca %	Ti %	Mn ppm	Ag ppm	Au ppm	B ppm	Ba ppm	Be ppm	Bi ppm
01	39 55 37	114 57 0	2.0	2.0	5	.50	700	N	N	70	700	5	N
02	39 54 39	114 53 28	1.5	.2	2	>2.00	300	N	N	50	700	5	150
03B002	39 54 55	114 53 9	2.0	.5	5	>2.00	300	N	N	70	1,000	5	1,000
04S003	39 54 56	114 53 10	2.0	.7	2	>2.00	300	N	N	70	1,000	2	150
04ADP	39 54 56	114 53 10	2.0	.5	2	>2.00	500	N	N	150	1,000	2	100
05	39 55 57	114 53 55	2.0	.7	10	2.00	200	700	30	20	>10,000	2	N
06	39 56 21	114 52 31	2.0	1.0	7	>2.00	500	N	N	150	7,000	5	N
07	39 57 35	114 52 39	5.0	5.0	50	.50	500	100	N	50	20,000	5	100
08	39 58 27	114 50 59	5.0	1.5	50	.50	700	N	N	70	>10,000	2	N
09	39 59 40	114 52 3	5.0	5.0	20	.50	500	N	N	100	>10,000	2	N
10B009	39 59 42	114 52 8	2.0	5.0	10	.20	200	N	N	70	>10,000	<2	N
11S010	39 59 46	114 52 10	2.0	5.0	20	.20	300	N	N	50	>10,000	2	N
11ADP	39 59 46	114 52 10	2.0	5.0	20	.50	300	N	N	150	>10,000	2	N
13	40 6 52	114 46 18	2.0	7.0	20	.50	300	N	N	50	700	2	50
14	40 4 32	114 47 2	2.0	5.0	20	.50	300	N	N	50	7,000	2	N
15	40 1 43	114 48 33	5.0	2.0	20	.30	500	15	N	30	>10,000	N	N
16	39 56 1	114 56 20	2.0	1.5	15	.70	200	N	N	30	>10,000	2	N
17B016	39 56 53	114 56 12	2.0	2.0	30	.20	500	N	N	50	>10,000	2	N
18S017	39 56 54	114 56 11	1.5	2.0	20	.15	500	N	N	200	>10,000	2	<20
19	39 57 56	114 56 23	.7	20.0	20	.30	500	N	N	20	1,000	N	N
21	39 55 54	114 54 10	1.5	10.0	20	2.00	500	N	N	20	500	N	N
22	39 57 8	114 54 17	1.5	20.0	20	.50	500	70	N	20	>10,000	N	N
23	39 59 27	114 55 24	1.0	20.0	20	.50	300	N	N	20	2,000	N	N
24	39 56 49	114 51 33	2.0	5.0	10	>2.00	700	N	N	70	700	2	N
25	39 59 5	114 50 30	.7	10.0	20	.50	200	N	N	20	1,500	N	N
27	39 59 16	114 52 59	1.5	20.0	30	.50	500	7	30	20	700	N	N
28	40 0 38	114 54 15	.5	10.0	20	.20	200	N	N	20	>10,000	N	N
30S029	40 0 46	114 54 30	1.0	10.0	20	.20	200	N	N	20	7,000	N	N
30ADP	40 0 46	114 54 30	.5	10.0	20	.10	200	N	N	50	>10,000	N	N
31	40 1 9	114 53 35	1.0	20.0	20	.20	500	5	30	20	10,000	N	N
34	40 1 46	114 51 50	1.0	10.0	20	.50	200	N	N	20	>10,000	N	N
38	40 3 54	114 50 9	1.5	20.0	20	.20	500	N	N	20	700	N	N
41	39 58 3	114 51 50	2.0	5.0	20	2.00	300	7	N	70	1,000	2	N
42	40 3 5	114 48 8	2.0	10.0	20	1.00	700	N	N	30	1,500	<2	N
44	40 2 39	114 48 22	1.0	10.0	20	.20	200	5	N	20	1,500	N	N
45	40 4 50	114 48 2	1.0	10.0	20	.20	200	N	N	<20	1,500	N	N
46B045	40 3 53	114 47 59	1.0	10.0	20	.50	200	N	N	20	1,000	N	N
47S046	40 4 57	114 48 2	1.0	10.0	20	.10	200	N	N	20	1,500	N	N
47ADP	40 4 57	114 48 2	1.0	10.0	20	.10	200	N	N	50	1,500	N	N

Appendix 2.--Analytical results for the nonmagnetic fraction of the panned concentrate samples from the Goshute Canyon Resource Survey Area, east-central Nevada.--continued

Sample	Co ppm	Cr ppm	Cu ppm	La ppm	Mo ppm	Nb ppm	Ni ppm	Pb ppm	Sb ppm	Sc ppm	Sn ppm	Sr ppm	V ppm
01	N	70	30	100	N	50	10	50	500	10	N	500	50
02	N	200	200	700	30	2,000	10	7,000	N	70	300	200	500
03BD02	N	500	70	700	N	1,000	10	5,000	N	70	150	200	200
04SD03	N	500	70	300	N	1,000	10	150	N	10	150	200	150
04ADP	N	300	150	200	N	300	10	20	N	70	70	500	200
05	10	150	200	500	50	50	10	10,000	1,000	10	500	5,000	100
06	N	700	70	300	N	300	10	150	N	70	N	500	150
07	N	150	150	200	N	N	20	50,000	N	20	3,000	2,000	150
08	70	70	50	700	N	N	70	200	N	10	N	5,000	50
09	70	50	30	300	N	N	50	200	N	10	N	1,000	70
10BD09	N	70	20	N	N	N	10	20	N	10	N	2,000	100
11SD10	N	100	20	150	N	N	10	100	700	10	N	1,000	50
11ADP	20	100	30	200	N	N	70	70	700	10	N	1,000	100
13	N	100	20	100	N	50	10	150	N	10	N	200	100
14	N	70	70	100	N	N	10	50	N	10	N	700	50
15	70	150	50	300	N	N	50	500	N	10	N	5,000	50
16	N	300	30	1,500	N	100	10	300	N	10	N	5,000	150
17BD16	N	700	30	700	N	N	10	70	N	10	N	3,000	200
18SD17	N	150	20	500	N	N	10	500	N	10	20	2,000	70
19	N	N	10	50	N	N	10	20	200	30	N	N	20
21	10	70	10	70	N	N	10	1,000	N	20	300	200	70
22	N	N	10	50	N	N	10	2,000	700	10	150	1,000	50
23	N	N	10	50	N	N	10	200	N	20	N	N	20
24	N	300	50	200	N	150	10	150	N	50	300	200	150
25	N	N	10	50	N	N	10	50	N	20	N	200	20
27	N	20	10	50	N	N	10	20	N	20	N	500	20
28	N	N	10	N	N	N	10	N	N	10	N	1,000	20
30SD29	N	N	20	N	N	N	10	20	N	10	N	200	20
30ADP	N	150	30	N	N	N	10	50	N	10	N	200	20
31	N	N	10	N	N	N	10	N	N	20	N	200	20
34	N	N	10	50	N	N	10	50	N	10	N	2,000	20
38	N	N	10	N	N	N	10	20	N	N	N	N	20
41	10	N	20	200	N	70	10	70	N	10	N	500	70
42	N	70	30	300	N	N	10	100	N	20	N	1,000	70
44	N	N	10	50	N	N	10	70	N	10	N	300	20
45	N	N	10	50	N	N	10	20	N	N	N	200	20
46BD45	N	N	20	50	N	N	10	70	N	20	N	200	20
47SD46	N	N	30	N	N	N	10	20	N	N	N	200	20
47ADP	N	70	30	N	N	N	10	20	N	10	N	200	20

Appendix 2.--Analytical results for the nonmagnetic fraction of the panned concentrate samples from the Goshute Canyon Resource Survey Area, east-central Nevada.--continued

Sample	W ppm	Y ppm	Zn ppm	Zr ppm
01	N	100	N	>2,000
02	5,000	700	700	>2,000
03B002	5,000	700	N	>2,000
04S003	5,000	500	N	>2,000
04ADP	2,000	500	N	>2,000
05	20,000	200	5,000	>2,000
06	1,000	500	N	>2,000
07	N	300	5,000	>5,000
08	100	700	700	>2,000
09	500	500	N	>2,000
10B009	N	50	N	1,500
11S010	N	150	500	1,500
11ADP	N	150	700	2,000
13	200	150	N	>2,000
14	N	150	N	>2,000
15	1,000	300	N	>2,000
16	2,000	500	2,000	>2,000
17B016	N	700	N	2,000
18S017	N	200	N	>2,000
19	N	100	N	>2,000
21	3,000	100	N	>2,000
22	150	100	N	>2,000
23	N	200	N	>2,000
24	N	700	N	>2,000
25	N	100	N	>2,000
27	N	100	N	>2,000
28	500	150	N	>2,000
30S029	N	50	N	>2,000
30ADP	N	20	N	>2,000
31	N	70	N	>2,000
34	N	300	N	>2,000
38	N	20	N	2,000
41	N	300	N	>2,000
42	N	300	N	>2,000
44	100	70	N	>2,000
45	N	50	N	>2,000
46B045	N	100	N	>2,000
47S046	N	20	N	2,000
47ADP	N	30	N	2,000