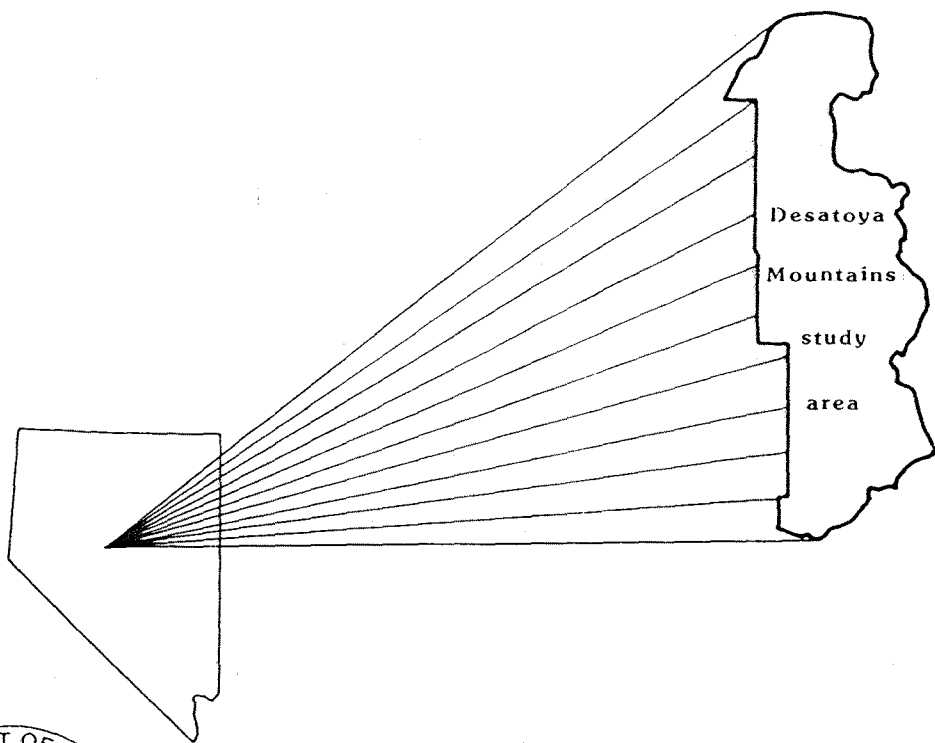


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Mineral Land Assessment/1986
Open File Report

Mineral Resources of the Desatoya Mountains Study Area, Churchill and Lander Counties, Nevada



BUREAU OF MINES
UNITED STATES DEPARTMENT OF THE INTERIOR

MINERAL RESOURCES OF THE DESATOYA MOUNTAINS STUDY
AREA, CHURCHILL AND LANDER COUNTIES, NEVADA

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PREFACE

The Federal Land Policy and Management Act (Public Law 94-579, October 21, 1976) requires the U.S. Geological Survey and U.S. Bureau of Mines to conduct mineral surveys on U.S. Bureau of Land Management administered land designated as Wilderness Study Areas ". . . to determine the mineral values, if any, that may be present" Results must be made available to the public and be submitted to the President and the Congress. This report presents the results of a Bureau of Mines mineral survey of a portion of the Desatoya Mountains Wilderness Study Area (NV-030-110), Churchill and Lander Counties, NV.

This open-file report will be summarized in a joint report published by the U.S. Geological Survey. The data were gathered and interpreted by Bureau of Mines personnel from Western Field Operations Center, E. 360 Third Ave., Spokane, WA 99202. The report has been edited by members of the Branch of Mineral Land Assessment at the field center and reviewed at the Division of Mineral Land Assessment, Washington, DC.

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SUMMARY

At the request of the U.S. Bureau of Land Management, the U.S. Bureau of Mines studied prospects, claims, and mineralized sites in a 43,053-acre portion of the 51,262-acre Desatoya Mountains Wilderness Study Area (NV-030-110) in 1985. The study area, located 50 miles east of Fallon, NV, is underlain by alluvial deposits of Quaternary age and volcanic and volcanic-derived sedimentary rock of Tertiary age.

No mines or recent exploration activity were identified within the area studied. The Gold Basin area, located 1/2 mile to the south has produced 982 ounces of gold and 10,086 ounces of silver. The Cold Springs area, located 1/2 mile to the west, has recently been explored for gold-silver. Mineralization at these two areas apparently did not extend into the study area, but future mining at these areas would likely impact it.

Seven claim groups were examined, in addition to 19 sites with either surface workings and no known claim(s), or, mineralized outcrops. No mineral resources were identified, but several areas of minor gold-silver mineralization warrant further study. The most important of these are two northwest-trending zones of alteration on the Cheyenne and Last Chance claims in the northern portion of the study area. Further work is also warranted at the Rock Creek claims on the western edge of the study area and possibly at several outcrops of altered rock with anomalous gold and/or silver values.

INTRODUCTION

A mineral resource study of a 43,053-acre part of the 51,262-acre Desatoya Mountains WSA (Wilderness Study Area) was conducted jointly by the USGS (U.S. Geological Survey) and the USBM (U.S. Bureau of Mines) to determine if mineral resources are present and to assess the potential for undiscovered resources. This study was performed at the request of the BLM (U.S. Bureau of Land Management). This report presents findings of the USBM's portion of the study which entailed evaluation of prospects, and other mineralized sites during 1985. The USGS performed broader geological, geochemical, and geophysical studies. Combined results will be summarized in a joint report and map which will be published by the USGS. Although the immediate goal of this and other USBM mineral surveys is to provide data for the President, Congress, government agencies, and the public for land-use decisions, the long-term objective is to ensure the Nation has an adequate and dependable supply of minerals at a reasonable cost.

Setting

The study area is in a relatively unpopulated region in north-central Nevada. Gas and food are available at Cold Springs 1 mi (mile) west of the study area. Accommodations are available at Austin, 47 mi by road

east of Cold Springs, and at Fallon, 52 mi by road west of Cold Springs (fig. 1). Access to the southern end of the area studied is by paved road. The east, west, and north ends are accessible by dirt roads (fig. 2).

The physiography of the area is typical of the Basin and Range physiographic province, which is characterized by north-south-trending mountain ranges and broad valleys. Elevations range between 9,973 ft (feet) at Desatoya Peak, and 5,400 ft on the north end of the area. According to Barrows (1971), the area is arid to semiarid. Annual precipitation totals 5 to 7 in. (inches) at the lower elevations, with the range crests receiving as much as 20 in. per year. Most of the precipitation occurs during the winter, but local thunderstorms account for scattered summer precipitation. Extreme temperatures for the region range from -4 °F to 110 °F (degree Fahrenheit). Vegetation consists of sagebrush, juniper, and Pinon pine with Mountain mahogany growing in the higher elevations, and willow, chokecherry, Fremont cottonwood, and aspen near major streams and springs. For a detailed description of the area, see: U.S. Bureau of Land Management (1983) Lahontan Resource Area wilderness technical report.

Previous Studies

Several reports have been published concerning the geology and mineral deposits in or near the study area.

The earliest geologic mapping in the study area was done by Barrows (1971) and McKee and Stewart (1971). More recent geologic work was performed by Riehle, McKee, and Speed (1972) and Stewart and Carlson (1976).

Vanderburg (1940) reported on the mining districts in Churchill County. Willden and Speed (1974) described the mineral deposits of Churchill County, and Stager (1977) published a report on the mineral deposits of Lander County. Wagoner (1978) did stream sediment sampling, and Mitchell and Quade (1982) did rock sampling near the study area for the U.S. Department of Energy. Lovering (1954) and Garside (1973) described radioactive mineral occurrences several miles to the south. Geolife (1979), under contract by the U.S. Department of Energy, did aerial radiometric and magnetic surveys over an area which included the Desatoya WSA. A 75-sample stream sediment sampling program was conducted by Great Basin GEM (Geology, Energy, Minerals) Joint Venture (1983a) to provide data for a GEM report for the BLM.

Present Study

The USBM investigation was conducted by Western Field Operations Center, Spokane, WA, personnel and consisted of prefield research, field work, and report preparation that spanned the years 1984 through 1986.

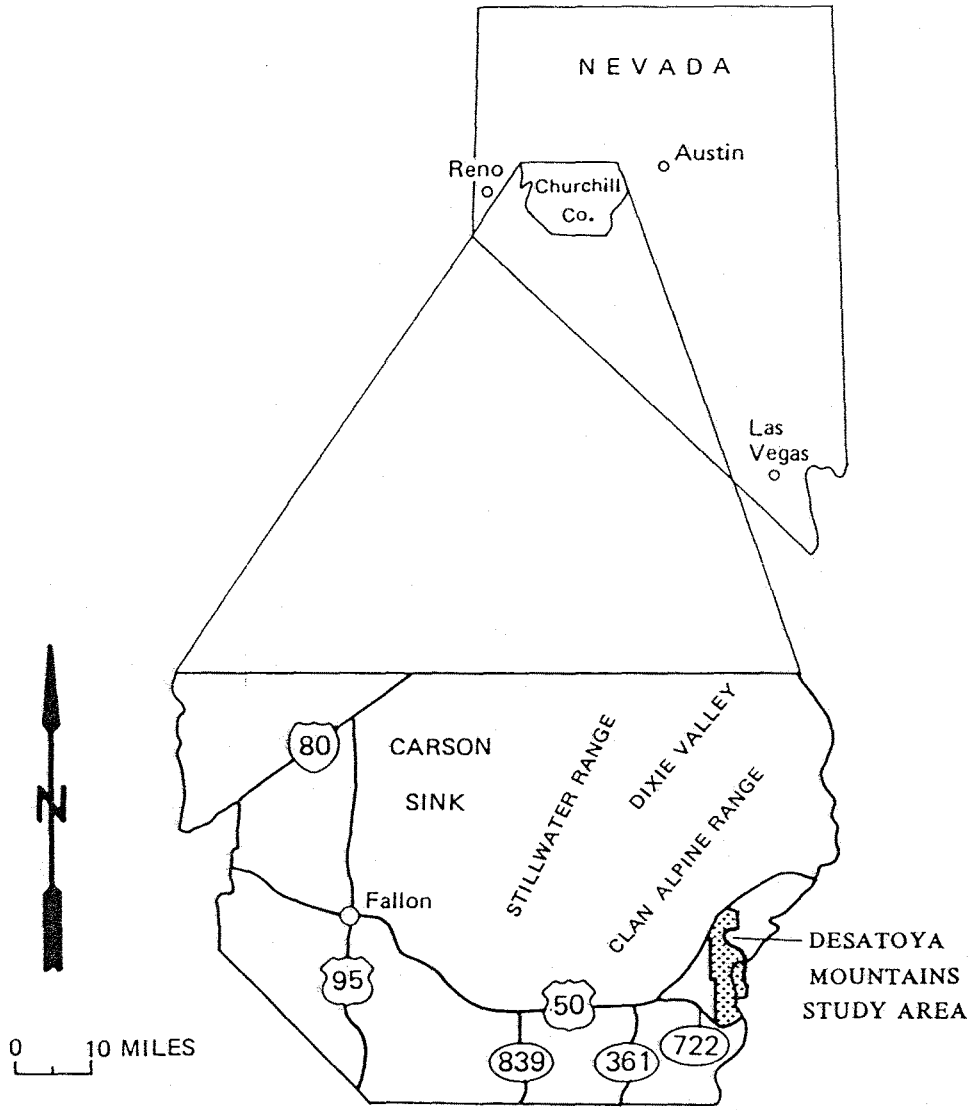


FIGURE 1. - Location of the Desatoya Mountains study area, Churchill and Lander Counties, NV

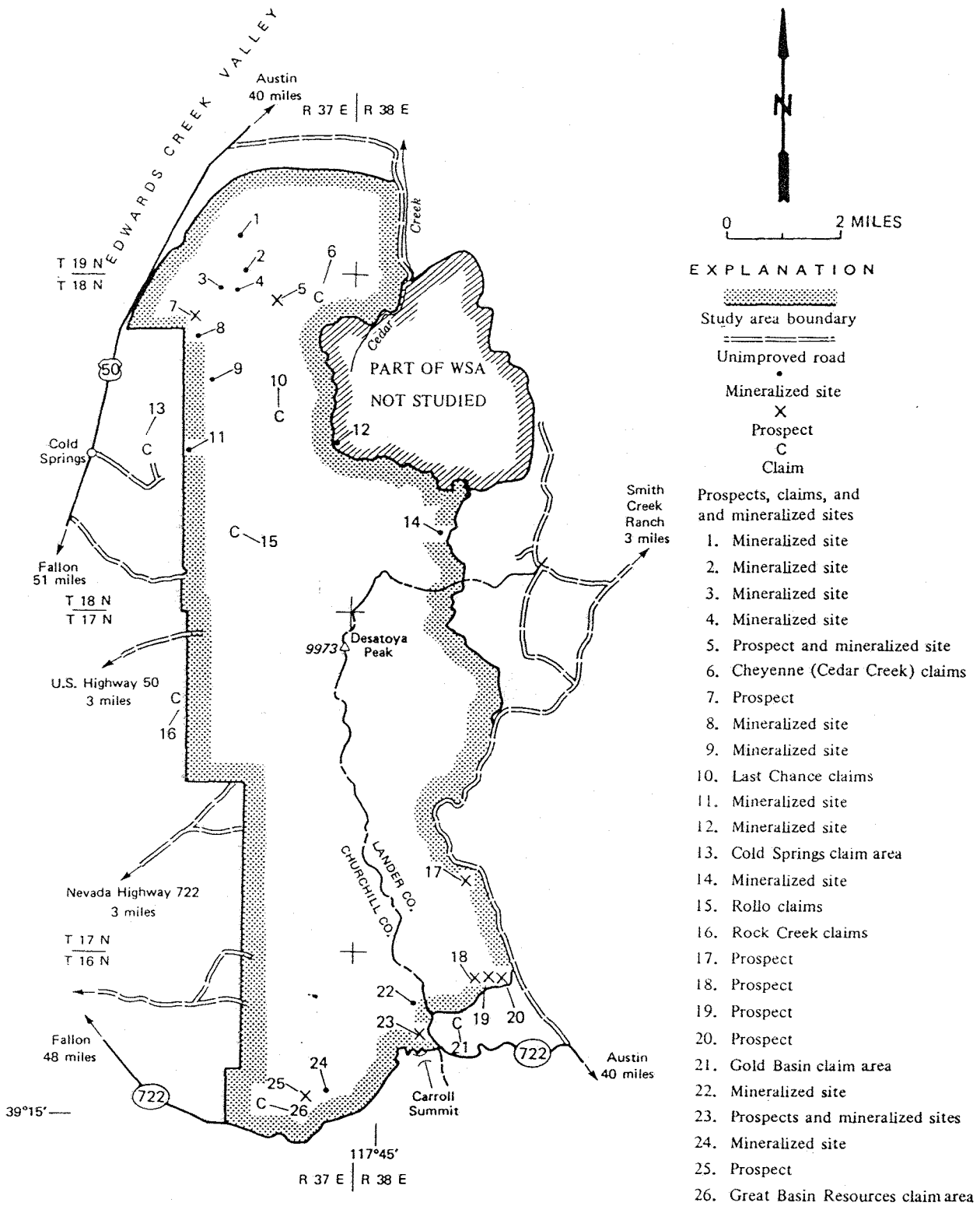


FIGURE 2. - Prospects, claims and mineralized sites in and near the Desatoya Mountains study area, Churchill and Lander Counties, NV

Prefield studies included a literature search and an examination of the Churchill and Lander Counties mining claim and mineral lease records. USBM, State of Nevada, and other mineral property files were searched and pertinent data compiled. Claim owners and lessees were contacted, when possible, for permission to examine properties and publish the results. Field studies included a search for all prospects, mineralized sites, and claims within the area studied. Those found were examined, sampled, and, if warranted, mapped. Prospects and claims close to the study area were also studied to determine if mineralized zones extended into the study area, and to better understand mineral deposits of the region.

Ground and aerial surveys were performed to locate unknown workings and claims with vague location descriptions. All major ridges in the study area were traversed on foot. Distances between traverses were usually never more than 1 mi. A scintillometer was carried during most ground traverses.

Rock samples collected during this study were of three types: 1) chip - a regular series of rock fragments generally taken in a continuous line across a mineralized zone; 2) random chip - a collection of rock chips taken from many places on the surface of a mineralized zone; 3) grab - rock pieces taken unsystematically from a dump, stockpile, float (loose rock on the ground), or other loose material. All samples were analyzed for gold and silver, except five samples analyzed for zeolites. Three of the samples analyzed for gold and silver were also analyzed for uranium. Twenty percent of the samples analyzed for gold-silver, or gold-silver-uranium were submitted for semiquantitative spectrographic analysis for 40 elements ^{1/} to detect the presence of unsuspected elements. Gold and silver results were acquired by combined fire assay-inductively coupled plasma analysis with detection limits of 0.007 and 0.3 ppm (parts per million), respectively. Uranium results were acquired by one of several special methods with a detection limit of 0.5 ppm. Zeolite results were acquired by x-ray diffraction. Detailed sample results are available from the Bureau of Mines, Western Field Operations Center, E. 360 Third Ave., Spokane, WA 99202.

ACKNOWLEDGEMENTS

The author was ably assisted by Jerry Olson during prefield and field work. Appreciation is extended to Nicholas T. Zilka who assisted with part of the field work and to Mr. P. A. Patnoudé for allowing us to set up base camp at Cold Springs, NV. Mr. Stan Maestretti supplied information about the Gold Basin and Cheyenne claim areas.

^{1/} Aluminum, antimony, arsenic, barium, beryllium, bismuth, boron, cadmium, calcium, chromium, cobalt, copper, gallium, gold, iron, lanthanum, lead, lithium, magnesium, manganese, molybdenum, nickel, niobium, palladium, phosphorous, platinum, potassium, scandium, silicon, silver, sodium, strontium, tantalum, tellurium, tin, titanium, vanadium, yttrium, zinc, zirconium.

GEOLOGIC SETTING

The Desatoya study area is mainly underlain by gently east-dipping Tertiary volcanic and volcanic-derived sedimentary rock (fig. 3). According to Mitchell and Quade (1982), the area is located in a large volcano-tectonic trough (a volcanic subsidence feature). The study area is composed of a thick sequence of quartz latitic and rhyodacitic ash-flow tuffs, local rhyolite flows, and a shallow dacite intrusive. Lacustrine tuffaceous sands were deposited locally on the flows between periods of volcanic activity. Quaternary alluvium fills the stream channels and low lying areas in and adjacent to the study area.

MINING HISTORY

The Desatoya Mountains have experienced very little mining activity. The first claims were staked in 1907 in the area near Cold Springs (no. 13, fig. 2). The Cold Springs area has undergone limited exploration work to the present time. Most recent exploration work has been done by Phelps Dodge Corporation and ASARCO. In 1911-1912, the Cedar Creek area (no. 6, fig. 2) and the Gold Basin area (no. 21, fig. 2) were explored. The Gold Basin area had minor gold-silver production in 1911-1912 and 1940-1941. The Cedar Creek area was restaked in 1985 as the Cheyenne claims, 73 years after being initially claimed. In 1915 the Rock Creek claims (no. 16, fig. 2) were staked and have undergone minor surface exploration. In 1919 the Last Chance claims (no. 10, fig. 2) were located near the divide between Cold Springs settlement and Cedar Creek. This area was explored using limited surface and underground methods. In 1921 the Rollo claims (no. 15, fig. 2) were staked and explored by minor surface workings. The Great Basin Resources claims (no. 26, fig. 2) were staked in 1981 in the southwest corner of the study area; no workings are on these claims.

MINES, CLAIMS, PROSPECTS, AND MINERALIZED AREAS

BLM and historical mining claim records indicate at least seven areas of claims are in or within 1/2 mi of the study area (fig. 2). Six of these areas (nos. 6, 10, 13, 16, 21, and 26) are described in detail in the following paragraphs. The seventh claim area, Rollo claims (no. 15), does not warrant a detailed description because the minor workings present yielded poor sample results. Historical mining claim records indicate several other claims may have been staked in or near the study area, but the location information is too vague for field identification. Nineteen additional sites with either surface workings and no known claim(s), or, mineralized outcrops were also examined (fig. 2). Summary descriptions of the 26 prospects, claims, and mineralized sites examined are presented in table 1.

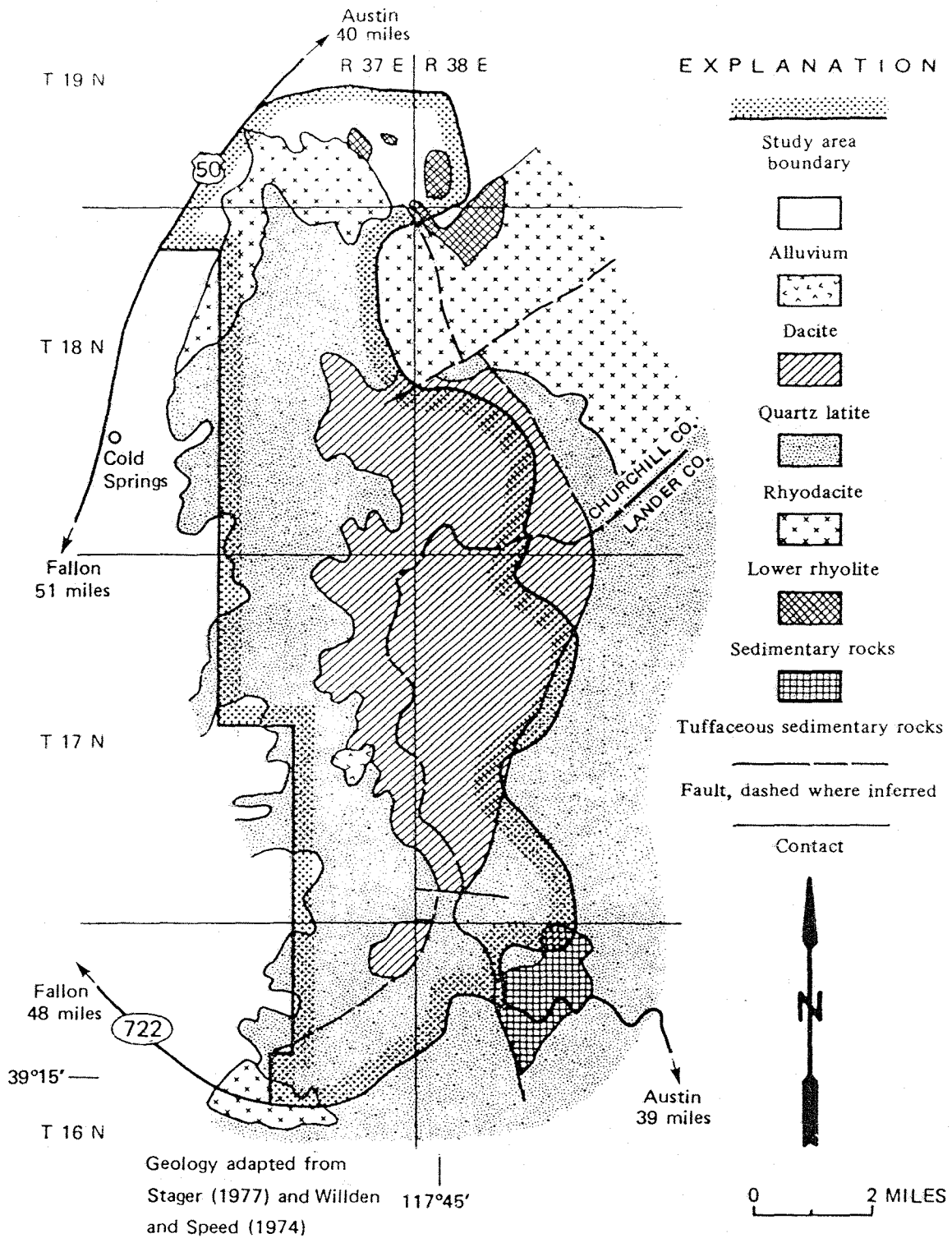


FIGURE 3. – Generalized geologic map of the Desatoya Mountains study area, Churchill and Lander Counties, NV

TABLE 1.--Prospects, claims, and mineralized sites in and near the Desatoya Mountains study area
 (* outside study area)

Location (fig. 2)	Name	Summary	Workings	Sample data
1	Mineralized site	Twenty-ft-wide east-striking breccia zone, bleached blue-white, with a siliceous matrix and argillized clasts is in volcanic rocks.	None.	One random chip sample contained 0.049 ppm gold and 0.45 ppm silver.
2	Mineralized site	Irregular shaped (up to 200 ft wide), north-trending, breccia zone is in volcanic rocks. Overall zone is slightly silicified and argillized, with moderate iron oxides. Isolated areas of highly silicified rock, as much as 8 ft wide, are present in the breccia zone.	None.	One random chip sample of slightly silicified rock contained 0.061 ppm gold and 0.67 ppm silver. One chip sample of highly silicified rock contained nil <u>1</u> /gold and 0.994 ppm silver.
3	Mineralized site	Twenty- to thirty-ft-wide, N. 60° E. striking breccia zone in volcanic rocks is silicified and has iron oxides on fracture surfaces.	None.	One random chip sample contained nil gold and 1.698 ppm silver.
4	Mineralized site	Irregular shaped zone of volcanic breccia with silicified and argillized clasts is in tuff. The breccia has moderate iron oxides on fracture surfaces.	None.	One random chip sample contained nil gold and 1.001 ppm silver.
5	Prospect and mineralized site	Exposed in the pit is a 5-ft-wide N. 80° E. striking, 70° S. dipping, silicified zone in tuff. An 18-in.-wide, N. 65° E. striking, 55° S. dipping, 100-ft-long, quartz vein in tuff crops out 100 ft to the southwest.	Shallow pit on crest of hill.	One chip sample from pit contained 0.155 ppm gold and 9.196 ppm silver. One chip sample from the quartz vein contained 0.068 ppm gold and 3.164 ppm silver.
6	Cheyenne claims	Area (fig. 4) was first claimed in 1911-1912 (16 claims in all). Mr. Stan Maestretti restaked the area in 1985 as the Cheyenne claims. A N. 60° W. trending zone of silicified, argillized breccia containing minor quartz veins is in rhyodacite tuff. The zone is irregular along and perpendicular to strike. The zone is as much as 750 ft thick, and contains many sections of fresh-looking, barren tuff. The zone extends for at least 4,000 ft along strike.	One 10-ft shaft, four trenches, and 14 pit	Twelve chip samples (table 2) from veins, breccia zones, and country rock contained nil to 0.204 ppm gold and nil to 11.55 ppm silver. Eight grab samples from dump material contained nil to 0.259 ppm gold and 0.54 ppm to 8.835 ppm silver.
7	Prospect	North to N. 15° W. striking zone of scattered breccia zones are in lithic tuff. Breccia zones are less than 20 ft thick and composed of weakly to strongly silicified fragments and matrix. Some fragments are also argillized and bleached. Moderate iron- and manganese-oxides are present on fracture surfaces.	Old claim marker.	Three random chip samples from scattered breccia zones contained from nil to 0.033 ppm gold and nil to 1.436 ppm silver.
8	Mineralized site	An irregular shaped zone of sparse quartz veinlets in a silicified tuff, 30 to 50 ft wide, strikes north.	None.	One random chip sample contained 0.042 ppm gold and nil silver.

TABLE 1.--Prospects, claims, and mineralized sites in and near the Desatoya Mountains study area--Continued

Location (fig. 2)	Name	Summary	Workings	Sample data
9	Mineralized site	Irregular shaped zone, as much as 50 ft wide, of sparse quartz veinlets is in an iron-oxide-stained lithic tuff. Silicified and argillized pods are also scattered throughout the zone.	None.	One random chip sample contained 0.118 ppm gold and 0.64 ppm silver.
10	Last Chance claims	No claims have been filed in the area (fig.5) since the original claims in 1919. A N. 60° W. trending zone of shears that locally contain quartz veins cuts a rhyodacite tuff. Many portions of the zone contain fresh-looking barren tuff. The zone is irregular in shape along and perpendicular to strike. The zone is as thick as 400 ft and extends for at least 1,200 ft along strike.	One 50 ft adit, one trench, and four pits.	Three chip samples (table 3) from the adit contained 0.048 to 0.088 ppm gold and 2.105 to 12.02 ppm silver. Seven chip samples from workings and outcrop contained nil to 0.066 ppm gold and nil to 9.168 ppm silver. Four grab samples from dump material contained 0.018 to 0.094 ppm gold and 0.4 to 8.544 ppm silver.
11	Mineralized site	Iron-oxide-stained silicified and argillized tuff float is present at this site.	None.	One float sample contained 0.045 ppm gold and 0.35 ppm silver.
12	Mineralized site*	Weakly fractured, moderately iron oxide-stained tuff float is present at this site. Rock looks very similar to sample no. 13 at Last Chance claim area. Shear zone from Last Chance claims may extend southeast to this site.,	None.	One float sample contained nil gold and 1.16 ppm silver.
13	Cold Springs claim area*	Area was first claimed in 1907. In the 1950's the area was restaked as the Oroplata claims by Mr. Gale Peer who drove 2,000 ft of adits and drifts, 400 ft of shaft, and performed surface stripping with a bulldozer. From 1979 to 1985 minor exploration work was undertaken by Phelps Dodge and ASARCO, Inc. No production is recorded. A large silicified breccia zone in rhyodacite tuffs trends N. 20° to 80° W. through the area. The breccia zone does not appear to extend into the study area.	Several shafts, adits, pits, trenches, and drill pads.	Four chip samples taken from quartz vein material and silicified tuff contained from 0.077 to 2.716 ppm gold and 2.552 to 31 ppm silver. Four dump grab samples contained from 0.039 to 4.13 ppm gold and 0.5 to 80 ppm silver.
14	Mineralized site	An irregular shaped, several hundred feet in diameter outcrop of volcanic autobreccia has a silicified matrix and minor iron and manganese oxides on fracture surfaces.	None.	Two random chip samples contained 0.079 and 0.252 ppm gold and nil and 0.42 ppm silver.
15	Rollo claims	Claims were originally staked in 1921 but no claims have been staked in the area since. N. 45° to 60° W. striking zones of alteration are in rhyodacite tuff. Zones are vague in outline, as wide as 100 ft, and several hundred ft long. Alteration consisted of: argillization, bleaching, iron oxide staining, and minor quartz veining.	Two shallow pits and a 10-ft adit.	One chip sample from the adit contained 0.018 ppm gold and nil silver. One dump grab sample from a pit contained 0.036 ppm gold and nil silver. One float sample contained nil gold and 0.926 ppm silver.

TABLE 1.--Prospects, claims, and mineralized sites in and near the Desatoya Mountains study area--Continued

Location (fig. 2)	Name	Summary	Workings	Sample data
16	Rock Creek claims*	Area was first staked in 1915; no claims have been staked in the area since 1928. A N. 80° E. striking zone of strongly silicified rhyodacite with minor quartz veinlets trends through the area. The zone has strong iron oxides on fracture surfaces. The zone is at least 20 ft wide.	Shallow pit 400 ft west of the study area boundary.	Grab sample of dump material contained 0.116 ppm gold and 25.32 ppm silver. Two outcrop chip samples contained 0.045 and 0.047 ppm gold and 1.822 and 3.868 ppm silver.
17	Prospect	Argillized and iron-stained volcanic rock was prospected.	Shallow pit.	One random chip of outcrop and one dump grab sample contained nil gold and silver.
18	Prospect	Argillized and bleached lithic tuff with moderate iron oxides on fracture surfaces was prospected.	Shallow pit.	One random chip contained nil gold and silver.
19	Prospect	Lithic tuff with minor iron oxides on fracture surfaces was prospected.	Two shallow pits.	Grab from dump contained nil gold and silver.
20	Prospect	A 1-ft wide, N. 45° E. striking, 40° N. dipping argillized fault zone is along contact between lithic tuff and a 5-ft-thick, dark, fine-grained dike.	One 6-ft-long adit.	One chip sample contained nil gold and silver.
21	Gold Basin claim area*	Since the early 1970's the Thunder claims have covered the area (Mr. Charles Winrod and Mr. Stan Maestretti, owners). The country rock in the area is rhyolite ash-flow tuff. Rock in the mined area has been bleached, argillized, and silicified. Areas of brecciation with moderate to strong iron oxides are common. Individual zones of alteration trend N. 40° W. to N. 20° E. The mineral deposits do not appear to extend into the study area.	During 1911-1912 a 250-ft-deep shaft was sunk with 700 ft of underground workings, producing 751 oz gold and 8,677 oz silver. During 1940-1941 1,384 short tons were produced with 231 oz gold and 1,409 oz silver recovered. Presently the workings consist of four bulldozer cuts, a caved shaft, and an adit.	Four chip samples from altered rock exposed both in workings and outcrop contained 0.103 to 0.193 ppm gold and 1.142 to 4.826 ppm silver.
22	Mineralized site	A 100-ft diameter zone of autobreccia, with minor iron and manganese oxides on fracture surfaces is present at this site.	None.	One random chip sample contained 0.148 ppm gold and 0.4 ppm silver.
23	Prospects and mineralized sites	Isolated masses of brecciated, silicified, and argillized rock are present in an area several hundred feet in diameter. Country rock is ash flow tuff. Quartz veins 2 in. to 6 ft thick are also present in this area. The isolated masses of altered rock and the veins strike N. 45° E. to N. 20° W.	Two shallow pits.	Two chip and one grab sample from the workings contained nil to 0.022 ppm gold and 0.4 ppm to 0.66 ppm silver. Three random chip samples of outcrops of altered rock contained nil to 0.019 ppm gold and nil to 0.42 ppm silver. One chip sample of an outcropping vein 2 in. wide contained 0.163 ppm gold and 0.904 ppm silver.

TABLE 1.--Prospects, claims, and mineralized sites in and near the Desatoya Mountains study area--Continued

Location (fig. 2)	Name	Summary	Workings	Sample data
24	Mineralized site	Five ft thick, N. 70° W. striking zone of silicified volcanic breccia is present.	None.	One random chip sample contained 0.062 ppm gold and nil silver.
25	Prospect	Argillized, silicified (minor) volcanic breccia with strong iron oxides was prospected.	Shallow pit.	Dump grab sample contained 0.034 ppm gold and nil silver.
26	Great Basin Resources claim area	Country rock in the area is mudstone, rhyolite ash fall tuff, and intrusive and extrusive rhyolite. No evidence of mining activity or mineralized areas were observed. The reason for the claims is unknown.	Claim posts.	Fifteen chip and one grab (float) samples were taken. Thirteen samples contained nil gold and silver. One sample contained 0.021 ppm gold and nil silver. Three of the 13 samples were analyzed for uranium; no anomalous values were obtained. Three samples were also analyzed for zeolites; none were detected. Two samples of rhyolite taken several hundred ft east of the claims contained 0.036 and 0.100 ppm gold and nil silver.

^{1/} The term "nil" as used in table 1 means that the element was not detected in the sample. The detection limits for gold and silver were 0.007 and 0.3 ppm, respectively.

Cheyenne Claims

The Cheyenne claims area (no. 6, fig. 2), first located in 1911-1912, included 16 claims and remained unclaimed until June 21, 1985, when Mr. Stan Maestretti restaked them as the Cheyenne claims. Workings consist of 1 shaft, 4 trenches, and 14 pits.

The country rock is a rhyodacite tuff (Willden and Speed, 1974) cut by a N. 60° W. trending, irregular zone of silicified, argillized breccia containing minor quartz veins. The zone is as much as 750 ft thick and contains many sections of fresh-looking, barren tuffs. Beginning on the east side of Cedar Creek, the zone extends for 4,000 ft to the northwest. West of the ridge on which samples 79 through 82 and 207 were taken (fig. 4), the zone appears to die out but may continue further to the northwest to sites 1 through 5 (fig. 2 and table 1). Results from twenty samples, shown on table 2, indicate altered rock and quartz veins in the zone locally contain gold or silver. These mineralized portions of the zone appear to be too small, too low in grade, and too widely spaced to constitute individual or collective gold-silver resources. However, because the zone is large and widely mineralized, subsurface exploration might disclose resources.

Last Chance Claims

The Last Chance group (no. 10, fig. 2), consisting of three claims, were first located in 1919. No other claims have been filed on the property since they were first staked. Workings include one adit, one trench, and four pits.

Rhyodacite tuff country rock (Willden and Speed, 1974) in the area hosts a N. 60° W. trending, irregular argillized zone of shears that locally contain quartz veins. Many portions of the zone contain fresh-looking barren tuff. The zone is as much as 400 ft thick and extends for at least 1,200 ft along strike (fig. 5). The same zone may be exposed 1,500 ft to the southeast on the ridge separating Cedar Canyon and Edwards Creek Valley (no. 13, fig. 5). Float, located 1 mi further east (no. 12, fig. 2), may indicate that the altered zone extends even further east. The zone may also continue on to the northwest (nos. 7, 8, and 9, fig. 2). Results of fourteen samples, shown on table 3, indicate that minor gold-silver mineralization was associated with the alteration, shearing, and quartz veining of the zone. The exposed mineralized portions of the zone appear to be too small and too low in grade to constitute individual or collective gold-silver resources. Because of the large size of the mineralized zone, the area merits additional study.

Cold Springs Claim Area

The Cold Springs mineralized area is 0.5 mi west of the study area (no. 13, fig. 2 and table 1). First claimed in 1907, the area was again held by assessment work between 1915 and 1928 (about 50 claims filed) and then reclaimed in 1950 by Mr. Gale Peer, as the Oroplata claims.

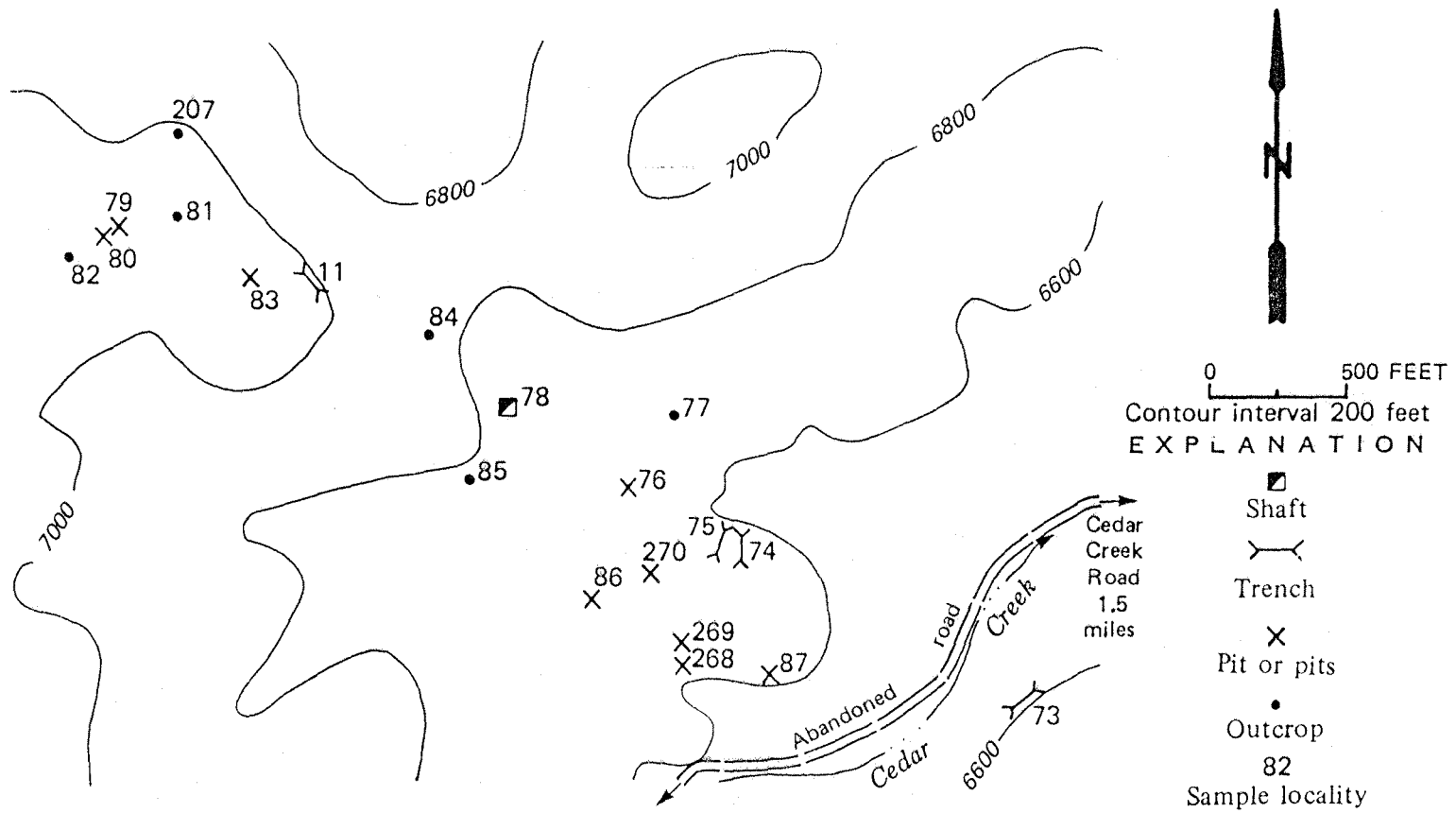


FIGURE 4. - Cheyenne claims, workings and sample locations

Table 2.--Selected data for samples taken at the Cheyenne claims

(N, none detected; --, not determined; NA, not applicable)

Sample					
No.	Type	Length (ft)	Description	Gold (ppm)	Silver (ppm)
11	Chip	6.0	Quartz veinlets striking N. 65° W. with iron oxides along fracture planes-----	N	0.73
73	Grab	NA	Bleached crystal-lithic tuff with minor iron oxides on trench dump-----	N	.46
74	do--	NA	Brecciated, moderately iron oxide stained volcanic rocks with quartz veinlets on trench dump-----	N	1.375
75	do--	NA	Silicified, deep-red tuff on trench dump-----	N	.52
76	do--	NA	Brecciated, bleached, silicified volcanic rocks with minor quartz veining on dumps of six small pits-----	0.259	8.657
77	Chip	3.0	Silicified breccia zone striking N. 70° W. and dipping 60° S. in tuff. Argillized zone several feet thick surrounds the breccia zone. Sample from silicified zone-----	N	2.017
78	do--	5.0	A 5-ft-thick, N. 80° W. striking, 75° S. dipping, silicified breccia zone in tuff in 10-ft-deep shaft-----	.112	5.931
79	do--	.5	A 0.5-ft-wide quartz vein striking N. 20° W. and dipping 90° in tuff in pit-----	.204	11.55
80	do--	1.0	A quartz vein 1 ft wide in tuff, striking N. 50° E. and dipping 60° N. in pit-----	N	6.611

Table 2.--Selected data for samples taken at the Cheyenne claims--Continued

No.	Type	Sample		Gold (ppm)	Silver (ppm)
		Length (ft)	Description		
81	Chip	NA	Random chip of partly silicified tuff. Sample appears to be on the eastern limit of the alteration zone-----	N	1.414
82	do--	NA	Random chip of tuff with minor quartz in fractures. Sample appears to be on the western limit of the alteration zone----	N	1.215
83	do--	1.0	One-ft-wide quartz vein striking N. 60° W. in volcanic rocks--	N	1.86
84	do--	3.0	Three-ft-wide, N. 60° W. striking, silicified breccia zone in lithic tuff with moderate iron oxides-----	N	2.942
85	do--	NA	Random chip of fresh volcanic tuff-----	N	N
86	do--	1.0	Numerous thin breccia zones striking N. 50° W. in volcanic rocks in pit-----	N	1.336
87	Grab	NA	Argillized lithic tuff on pit dump-----	N	.54
207	Chip	NA	Random chip of silicified volcanic rocks-----	N	.88
268	Grab	NA	Bleached, silicified tuff on dump of 6-ft-deep pit-----	0.069	6.696
269	do--	NA	Silicified, brecciated tuff with weak iron oxides on dump of 6-ft-deep pit-----	.105	8.835
270	do--	NA	Tuff similar to 269 on dump of 8-ft-deep pit-----	N	2.76

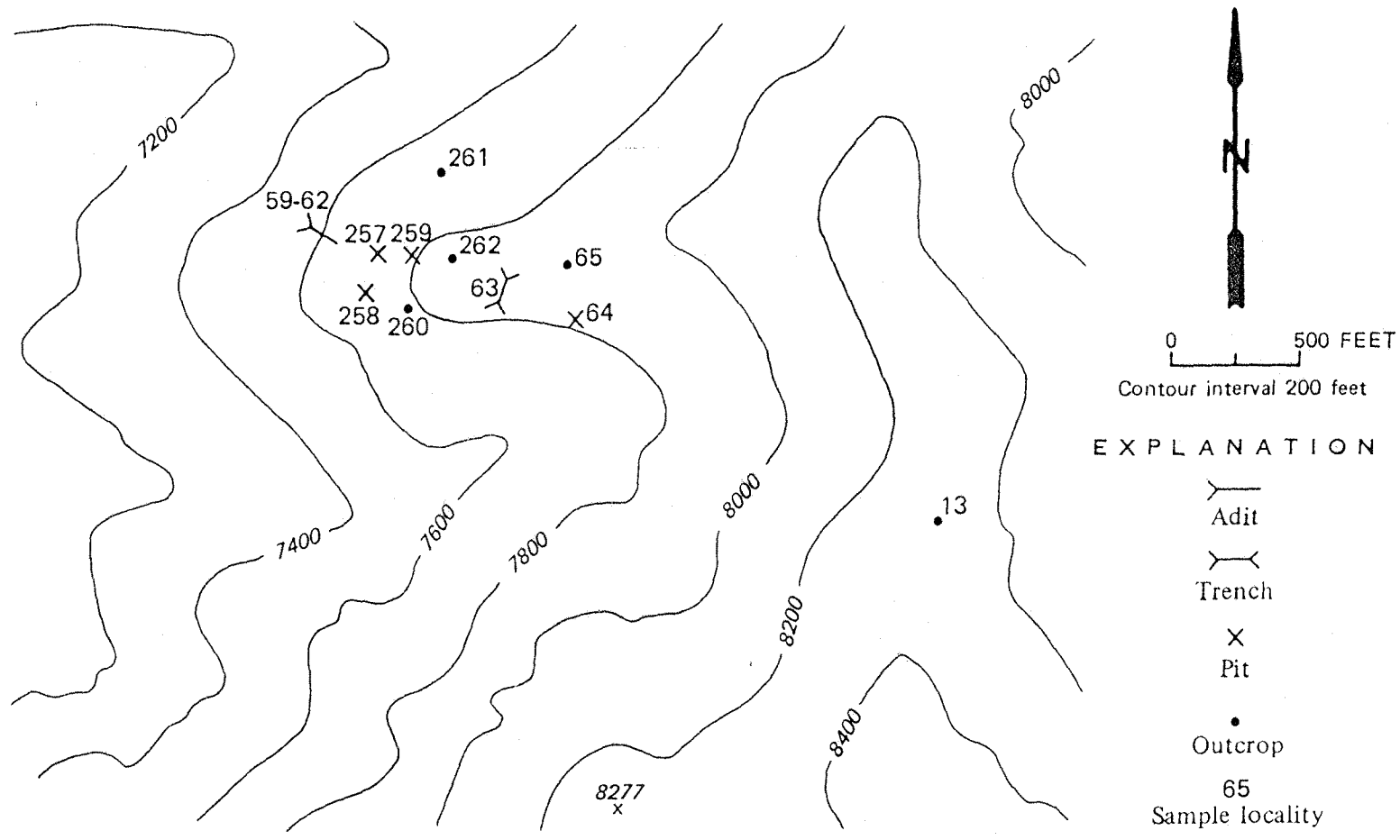


FIGURE 5. - Last Chance claims, workings and sample locations

Table 3.--Selected data for samples taken at the Last Chance claims

(N, none detected; NA, not applicable)

No.	Type	Sample		Gold (ppm)	Silver (ppm)
		Length (ft)	Description		
13	Chip	NA	Random chip of a 20-ft-wide weak fracture zone in volcanic rocks striking N. 60° W. with moderate iron oxides on fracture surfaces, and minor quartz veinlets-----	N	1.211
59	do--	0.5	A 50-ft-long S. 60° E. trending adit in volcanic tuff follows a N. 60° W. trending shear zone that dips 60° S. The shear zone is composed of a core of clay gouge 2 to 12 in. thick. The hanging wall is a breccia zone with moderate iron oxides and quartz stockwork veining. The footwall is competent fresh-looking volcanic rock. Sample taken 10 ft from portal in clay gouge-----	0.088	12.02
60	do--	2.4	Taken 20 ft from portal across 3-in.-thick gouge and quartz stockwork veins in the hanging wall-----	.081	4.856
61	do--	4.0	Taken from back of adit at face across 2-in.-thick clay gouge and quartz stockwork material (hanging wall)-----	.048	2.105
62	do--	5.0	Taken just north of portal of tuff with minor quartz stringers that strike N. 60° W. and dip 70° S. in the footwall. Moderate iron oxides on fracture surfaces-----	.046	3.641
63	Grab	NA	Iron-stained, silicified volcanic fragments on trench dump----	.094	8.544

Table 3.--Selected data for samples taken at the Last Chance claims--Continued

No.	Type	Length (ft)	Sample		Gold (ppm)	Silver (ppm)
			Description			
64	Chip	1.0	A 1-ft-thick silicified breccia zone striking N. 65° W. and dipping 65° S. in volcanic rocks in pit-----		0.066	9.168
65	do--	NA	Random chip of breccia zone with moderate iron oxides, argillized clasts, and siliceous matrix-----		.021	.68
257	Grab	NA	Quartz-cemented lithic tuff breccia with minor iron oxides on pit dump-----		.024	5.022
258	do--	NA	Unaltered lithic tuff on pit dump-----		.018	.4
259	do--	NA	Quartz cemented lithic tuff breccia with minor iron oxides on pit dump-----		.026	3.015
260	Chip	NA	Random chip of unaltered lithic tuff-----		.023	.51
261	do--	NA	do-----		.024	N
262	do--	NA	do-----		.019	.36

According to USBM production records, Mr. Peer drove 2,000 ft of adits and drifts, 400 ft of shaft, and performed surface stripping with a bulldozer. No production is recorded. In 1979 Phelps Dodge Corp. located the Gate claims around the Oroplata claims. Minor drilling was undertaken, but Phelps Dodge dropped the claims. The Gate claims were restaked as the Cold Springs claims in 1982 by ASARCO, Inc. and by Mr. Fitzgerald who also owns the Oroplata claims. ASARCO, in 1985, released its interest in the claims to Mr. Fitzgerald.

Interest has centered on a large, silicified breccia zone in rhyodacite tuffs (Willden and Speed, 1974). The zone strikes N. 20° to 80° W. and is very irregular in width and along strike. The altered area is at least 2,000 ft long and up to several hundred feet wide. Veins and stringers of quartz, several inches to several feet thick, containing moderate to strong iron and manganese oxides are in the altered areas. Some barite is with the quartz.

Surface studies, undertaken east of the Cold Springs area, indicated that the silicified breccia zone does not extend into the study area. Eight samples were taken. Four grab samples, intended to be high-grade samples, contained from 0.039 to 4.13 ppm gold and 0.5 to 80 ppm silver. Three chip samples of vein material and silicified tuff contained from 0.092 to 2.716 ppm gold and from 3.465 to 31 ppm silver. One random chip sample of only silicified tuff ran 0.077 ppm gold and 2.552 ppm silver. This limited sampling shows that gold and silver are in the veins, veinlets, and altered rock in the Cold Springs area. More exploration work would be needed to determine if an economic mineral deposit exists. Future mining in the Cold Springs area would likely impact the study area and might uncover mineralized zones extending into the study area that are not apparent in outcrop.

Rock Creek Claims

The Rock Creek claims (no. 16, fig. 2 and table 1), first staked in 1915 and then in 1928, are not presently active. The area is located 4 mi south of the Cold Springs claim area, just outside of the study area.

A pit is on a N. 80° E. striking zone of silicified rhyodacite tuff with minor quartz veinlets (Willden and Speed, 1974). The rock is light gray with strong iron oxides in voids and fractures. The thickness of the zone was not determined, but is at least 20 ft thick. A random grab of dump material contained 0.116 ppm gold and 25.32 ppm silver and a 20-ft-long chip sample cut perpendicular to the zone near the pit contained 0.045 ppm gold and 3.868 ppm silver. Four hundred ft north of the pit, a random chip of similar rock had 0.047 ppm gold and 1.822 ppm silver. These results are similar to values obtained at Cold Springs and may indicate resources exist adjacent to the study area.

Gold Basin Claim Area

The Gold Basin area is 2,000 ft east of the study area (no. 21, fig. 2 and table 1). According to USBM production records, 751 oz gold and 8,677 oz silver were produced during 1911-1912 from a 250-ft-deep shaft and 700 ft of underground workings. The area lay idle until 1940-1941 when 1,384 short tons were produced containing 231 oz gold and 1,409 oz silver. Since the early 1970s, the Thunder claims, owned by Mr. Charles Winrod and Mr. Stan Maestretti, have covered the area.

According to Barrows (1971), the country rock is composed of rhyolite ash-flow tuff. Rock in the mined area has been bleached blue-white, argillized, and in places silicified. Areas of brecciation with moderate to strong iron oxides are common. The altered zone trend was not evident, but individual brecciation-alteration zones trend N. 40° W. to N. 20° E.

Originally, the area was explored with at least one adit and one inclined shaft. The area has since been reworked with a bulldozer, possibly destroying other workings. Presently, the workings are composed of a core area of three 50-ft-long, parallel northwest-trending dozer cuts, one 50-ft-long, northeast-trending dozer cut located 75 ft south of the three cuts, a caved inclined shaft located 125 ft west of the three cuts, and a southeast-trending adit located 175 ft north of the three cuts.

Four chip samples from workings and outcrop in the mined area contained 0.103 to 0.193 ppm gold and 1.142 to 4.826 ppm silver. Surface studies undertaken west and north of the Gold Basin area indicate that the deposits do not extend into the study area. More exploration work would be necessary to determine if the deposits are minable. Future mining in the Gold Basin area would likely impact the study area and might uncover mineralized zones extending into the study area that are not apparent in outcrop.

Great Basin Resources Claim Area

According to the BLM claim records, the Great Basin Resources claims are located 1/2 mi west of the study area. Ground traverses were undertaken in this area, but no signs of claim or mining activity were observed. During a search for other claims vaguely described in historical records, the Great Basin Resources claim posts were discovered in an area 1 mi east of the location given in the BLM records (no. 26, fig. 2 and table 1).

Before starting the field work, an attempt was made to contact Great Basin Resources Co., but there was no response. Other claim holders in the area had no information about the company or claims.

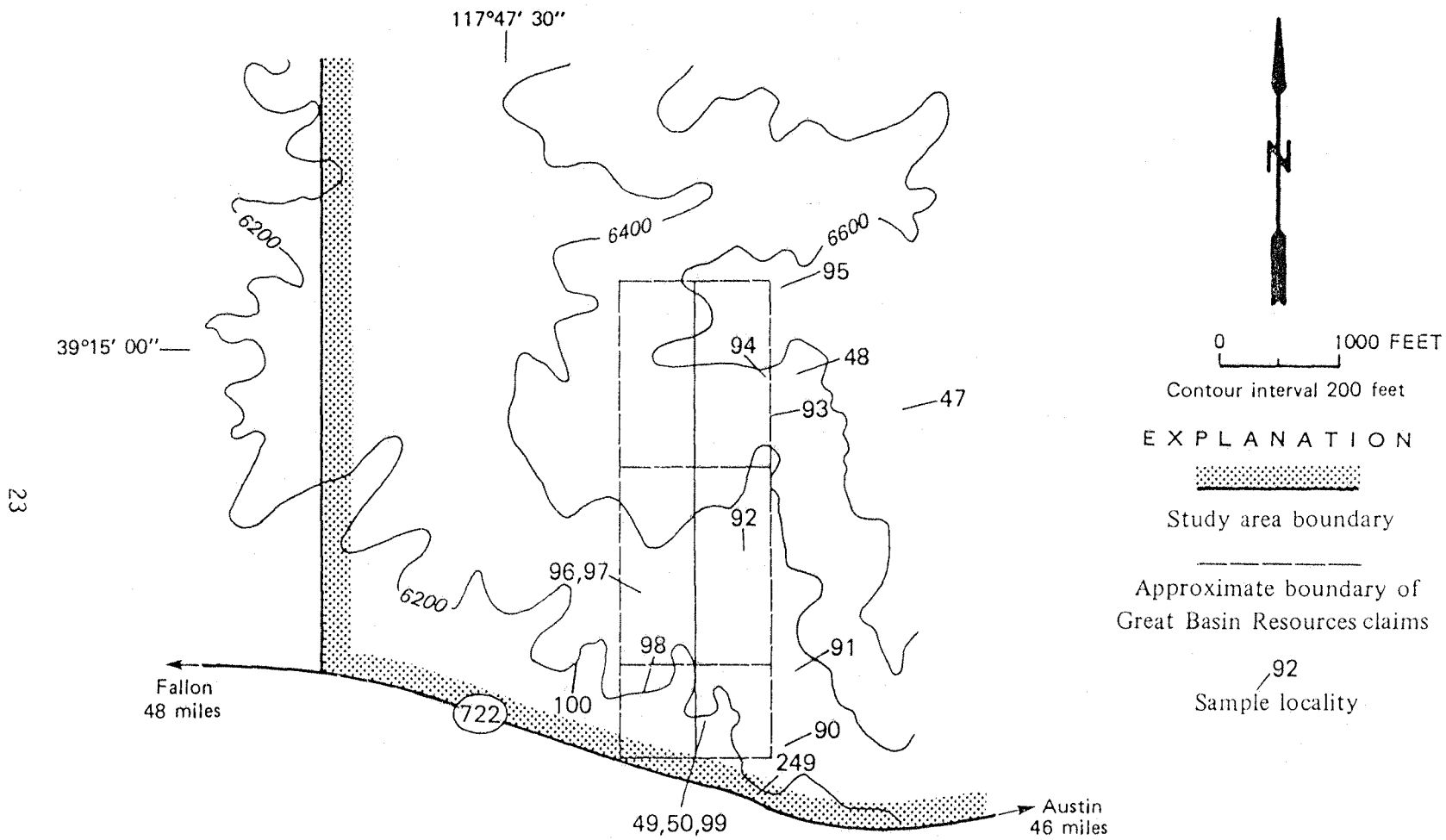


FIGURE 6. - Great Basin Resources claim area, sample locations

Table 4.--Selected data for samples taken at the Great Basin Resources claims

(N, none detected; --, not determined; NA, not applicable)

Sample							
No.	Type	Length (ft)	Description	Gold (ppm)	Silver (ppm)	Uranium (ppm)	Zeolites
47	Chip	NA	Random chip of dark red intrusive rhyolite-----	0.100	N	--	--
48	do--	NA	Random chip of breccia zone in welded tuff. Strong bright red iron oxides-----	.036	N	--	--
49	do--	NA	Random chip of red air-fall waterlain tuff-----	N	N	3.1	--
50	do--	NA	Random chip of tuff similar to 49 except buff in color-----	N	N	2.8	--
90	do--	NA	Random chip of volcanic breccia with moderate iron oxides on fracture surfaces-----	N	N	--	--
91	do--	NA	do-----	N	N	--	--
92	Grab	NA	Float. Argillized (bleached white) and silicified breccia with very strong iron and manganese oxides and some boxwork-----	N	N	--	--
93	Chip	NA	Random chip across N. 20° W. striking contact between autobreccia and volcanic tuff. Zone is highly fractured and strongly iron stained	N	N	--	--
94	do--	10.0	Volcanic breccia with strong iron oxides on fracture surfaces-----	N	N	--	--

Table 4.--Selected data for samples taken at the Great Basin Resources claims--Continued

No.	Type	Sample		Gold (ppm)	Silver (ppm)	Uranium (ppm)	Zeolites
		Length (ft)	Description				
95	do--	NA	Random chip of volcanic breccia with moderate iron oxides on fracture surfaces-----	N	N	--	--
96	do--	NA	Random chip of air fall waterlain tuff-----	N	N	3.0	--
97	do--	NA	do-----	--	--	--	N
98	do--	6.0	Buff-colored air fall waterlain tuff-----	--	--	--	N
99	do--	6.0	Orange-colored air fall waterlain tuff-----	--	--	--	N
100	do--	4.0	Friable, poorly cemented, volcanic mudflow bed with iron-oxide-rich matrix-----	N	N	--	--
249	do--	NA	Random chip of fractured volcanic rocks with strong iron oxides on fracture surfaces-----	0.021	N	--	--

According to Barrows (1971), the country rock in the area includes conglomeratic mudstone, rhyolite ash fall tuff, and intrusive and extrusive rhyolite. No evidence of mining activity was observed. Because of the geologic setting and lack of background information, the area was examined for gold-silver, uranium, and zeolite deposits. A scintillometer was carried during field traverses in the area, but no anomalous readings were observed. Sixteen samples were taken in the area (fig. 6). Only three of thirteen samples of iron-stained volcanic breccia were above detection for gold; no silver was detected. The ash fall tuffs were analyzed for zeolites; none were detected. Three samples were analyzed for uranium; no anomalous values were obtained. Sample results are shown in table 4.

Because no mineralized areas were observed during the USBM examination of the Great Basin Resources claims, the reason for the claims is unknown. Two samples, anomalous in gold, located east of the claim block suggest further sampling in this area may be warranted.

APPRAISAL OF MINERAL RESOURCES

No resources were identified within or adjacent to the study area. However, several areas of minor gold-silver mineralization in and adjacent to it may attract future interest. Interest would likely center on two large, mineralized northwest-trending zones (Cheyenne and Last Chance claims) in the northern portion of the study area, and two large, mineralized zones (Cold Springs and Gold Basin areas) that are adjacent to the study area. According to the Great Basin GEM Joint Venture report (1983b), the extreme northeastern portion of the study area has a low favorability for diatomite and zeolites. No zeolites were detected in samples, and no diatomite was found.

RECOMMENDATIONS FOR FURTHER STUDY

Geophysical studies along the four major zones, the Cheyenne, Last Chance, Cold Springs, Gold Basin, may help to determine the presence and extent of buried economic gold-silver deposits. Further surface sampling is needed in: 1) the Rock Creek claims area, 2) just east of the Great Basin resources claims, 3) at several of the sites listed in table 1 (nos. 5, 7, 9, 14, and 22) to ascertain if the initial sampling is an indicator of significant gold-silver deposits.

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