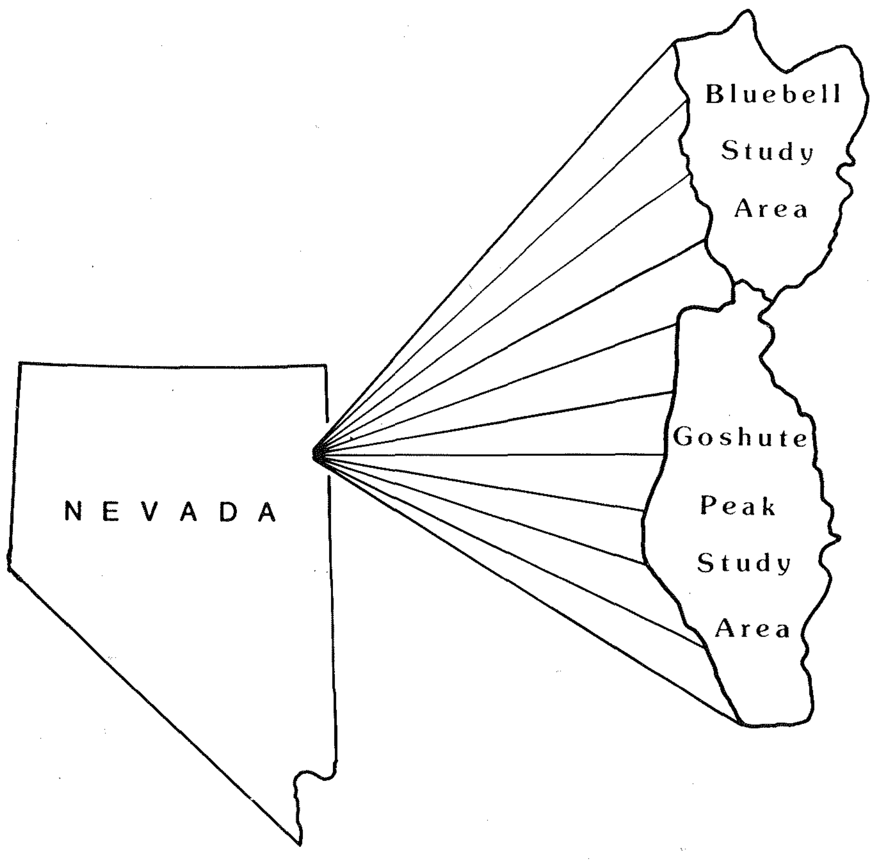
MLA 66-85

Mineral Land Assessment
Open File Report/1985

# Mineral Resources of Part of the Bluebell (NV-010-027) and Goshute Peak (NV-010-033) Wilderness Study Areas, Elko County, Nevada




United States Department of the Interior
Bureau of Mines

# MINERAL RESOURCES OF PART OF THE BLUEBELL (NV-010-027) AND GOSHUTE PEAK (NV-010-033) WILDERNESS STUDY AREAS, ELKO COUNTY, NEVADA

by

S. Don Brown

MLA 66-85
1985

Intermountain Field Operations Center, Denver, Colorado

UNITED STATES DEPARTMENT OF THE INTERIOR
Donald P. Hodel, Secretary

BUREAU OF MINES
Robert C. Horton, Director

# PREFACE

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, 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 mineral survey of parts of Bluebell Study Area (NV-010-027) and the Goshute Peak Study Area (NV-010-033), Elko County, Nevada.

This open-file report summarizes the results of a Bureau of Mines study and will be incorporated in a joint report with the U.S. Geological Survey. The report is preliminary and has not been edited or reviewed for conformity with the Bureau of Mines editorial standards. Work on this study was conducted by personnel from the Branch of Mineral Land Assessment (MLA), Intermountain Field Operations Center, Building 20, Denver Federal Center, Denver, CO 80225.

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UNITS OF MEASURE ABBREVIATION USED IN THIS REPORT

| | |
|---|---|
| ft | foot/feet |
| mi | mile(s) |
| ppb | part(s) per billion |
| ppm | part(s) per million |
| % | percent |
| $mi^2$ | square mile(s) |
| oz | troy ounce(s) |
| oz/t | troy ounce(s) per short ton |
| t | short ton(s) |

# MINERAL RESOURCES OF PART OF THE BLUEBELL (NV-010-027) AND GOSHUTE PEAK (NV-010-033) WILDERNESS STUDY AREAS, ELKO COUNTY, NEVADA

by

S. Don Brown, Bureau of Mines

## SUMMARY

The Bluebell and Goshute Peak study areas are in the southern Toano Range and northern Goshute Mountains, in southern Elko County, Nevada. The Bluebell Wilderness Study Area encompassed 55,665 acres and the Goshute Peak Wilderness Study Area, 69,770 acres. The acreage of the Bureau of Mines study is 41,324 acres for the Bluebell study area and 61,004 acres for the Goshute Peak study area. These are the acreages preliminarily recommended suitable for wilderness classification.

Mines, prospects, and mineralized areas were investigated within and about 2 mi outside the boundary of the study areas during October and November of 1983, and May and June of 1984. The study is authorized by the Federal Land Policy Land Management Act (Public Law 94-579, October 21, 1976).

Two areas with Carlin-type disseminated gold occurrences are within the study areas. At the surface, these occurrences have gold values above or near the cutoff values for other currently mined disseminated gold deposits in Nevada. Duval Corporation drilled both of these areas during June and July 1985.

The majority of rock in the study areas is limestone and dolomite ranging in age from Cambrian to Permian; vast quantities of this limestone could be quarried for high-calcium and industrial limestone.

There is no known mineral production from within the study areas. There has been production from three sites outside and near the study areas. A small amount of copper-silver ore was produced from the Ferguson Springs

mining district, adjacent to the southeast side of the Goshute Peak study area. A small amount of manganese ore was produced from the Decoy mining district about 3,000 ft west of the Bluebell study area. High-calcium limestone is currently being quarried about 2 mi north of the Bluebell study area.

## INTRODUCTION

During 1983-84, the Bureau of Mines conducted a mineral investigation of the Bluebell and Goshute Peak study areas (SA's), Elko County, Nevada (fig. 1) as part of a joint effort with the U.S. Geological Survey. The study areas are on land administered by the U.S. Bureau of Land Management. The Bureau examined mines, prospects, and mineralized areas to appraise reserves and subeconomic resources. The Geological Survey assessed the potential for undiscovered, speculative, and hypothetical mineral resources based on regional geological, geochemical, and geophysical surveys. This report presents the results of the Bureau of Mines study. The Geological Survey will publish results of its study separately, and a joint Bureau of Mines-Geological Survey report will combine and summarize the results.

### Geographic setting

The Bluebell study area encompasses 41,324 acres of the 55,665 acre wilderness study area and the Goshute Peak study area, 61,004 acres of the 69,770 acre wilderness study area. The study areas are the part of the wilderness study areas preliminarily designated as suitable for wilderness. Both areas are in southern Elko County in northeast Nevada. The SA's are in a rugged northerly trending range in the Basin and Range province, bounded on the west by the Goshute and Antelope Valleys and on the east by the Great Salt Lake Desert. The Bluebell SA generally covers the southern Toano Range, and

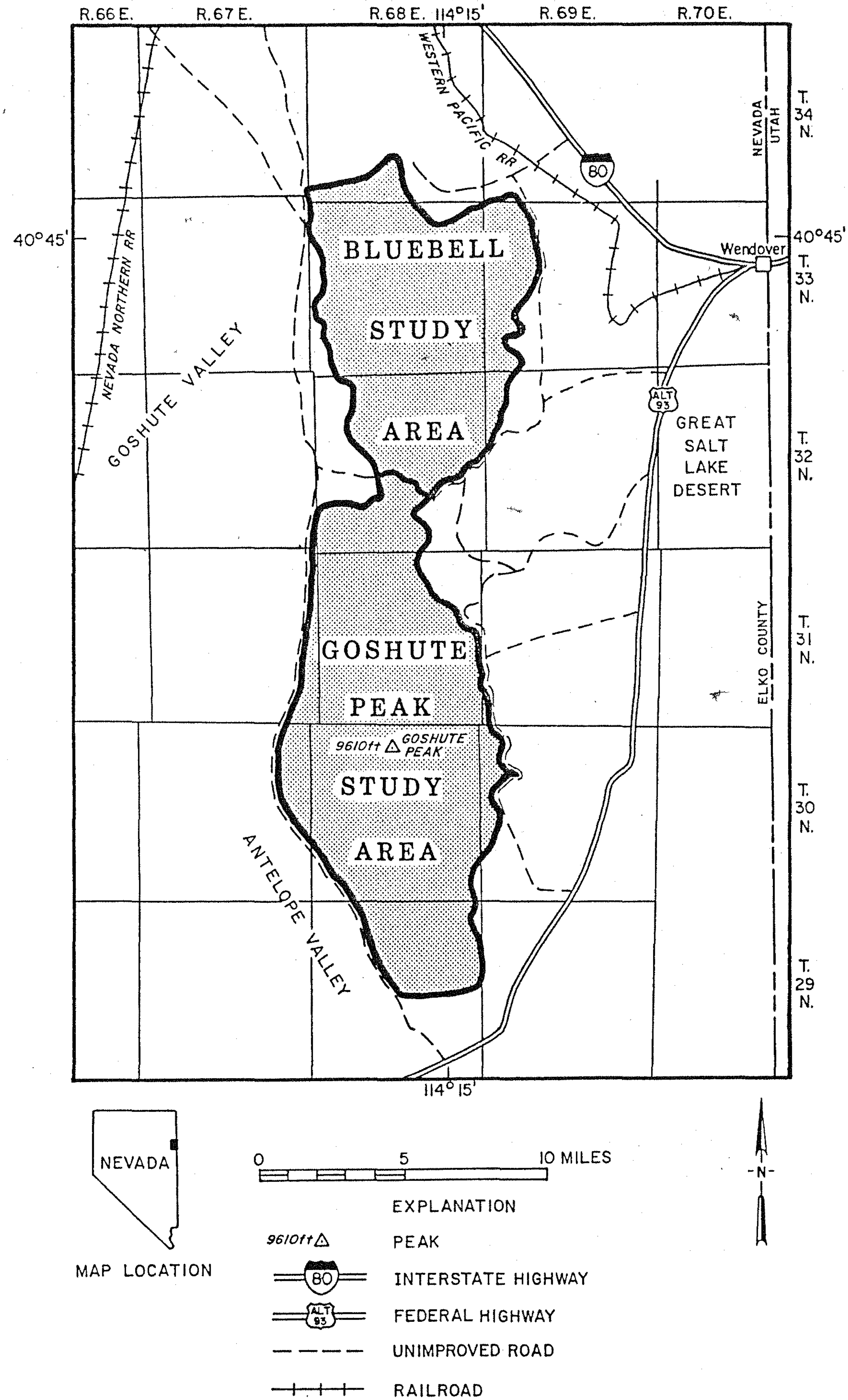


Figure 1.--Index map of the Bluebell and Goshute Peak study areas.

the Goshute Peak SA, just south of the Bluebell WSA, covers the northern Goshute Mountains (fig. 1); a jeep trail separates the two areas. The Toano Range and Goshute Mountains are names for the same mountain range; the division between the two is arbitrary but is generally indicated on topographic maps as being near the boundary of the two study areas. Elevations inside the study areas range from abut 5,140 ft at the northeast boundary of the Bluebell area to 9,610 ft on Goshute Peak. Vegetation is primarily sagebrush and pinion-juniper with some fir, pine, and mountain mahogany. The SA's are in a semi-arid region but may receive intense thunder showers in the summer and heavy snow in the winter.

Wendover, Nevada and Utah, is the nearest community to the study areas and is about 8 mi east of the Bluebell SA, and 15 mi northeast of the Goshute Peak SA. U.S. Highway 93A goes south from Wendover, past the east side of the study areas, and curves past the south end of the Goshute Peak study area about a mile distant. Interstate Highway 80 runs northwest from Wendover and is about 3 mi northeast of the Bluebell study area at the closest proximity. Access to the study areas from these two major highways is via dirt roads. In addition to highway and road access, the Western Pacific Railroad is about 1 1/4 mi from the northeastern boundary of the Bluebell SA, and the Nevada Northern Railroad is about 6 mi from the western Bluebell SA boundary and 8 mi from the western Goshute Peak SA boundary.

## Previous investigations

The best available geologic map of the study areas is by Hope and Coats (1976). The geology, mineralization, and history of the Ferguson Springs mining district, adjacent and southeast of the Goshute Peak SA, was discussed by Hill (1916). The geology, mineralization, and history of the Darky manganese mine in the Decoy mining district, west of the Bluebell SA, was discussed by Pardee and Jones (1920). An unpublished Bureau of Land Management administrative report by Great Basin Geology-Energy-Minerals (GEM) Joint Venture (Contract YA-553-RFP2-1054, for Bureau of Land Management, Denver Service Center, Building 50, Mailroom, Denver Federal Center, Denver, Colorado 80295, May 6, 1983) evaluates the geology and mineral resources of the Bluebell and Goshute Peak Resource Areas.

## Methods of investigation

A comprehensive background search was conducted for information on mines and mineralized areas in and near the Bluebell and Goshute Peak SA's. Literature pertaining to the area was reviewed, and individuals having information on mines and mineralized areas were consulted. Mining claim locations were obtained from the Elko County Courthouse and oil and gas plats were acquired from the Nevada State Office of the Bureau of Land Management.

Mines, prospects, and mineralized areas were investigated in and within about 2 mi of the SA boundaries. Most dirt roads and jeep trails were driven, and foot traverses were made across areas with mining claims or areas with suspected mineralization. In addition, a helicopter reconnaissance was made to search for workings and mineralization.

Seventy-six rock samples were taken. Fifty-eight samples were fire assayed for gold and silver by both standard fire assay and fire assay combined with inductively coupled plasma analysis. In addition, the 58 samples were analyzed spectrographically for 40 elements. Specific analyses were made for antimony, arsenic, copper, manganese, mercury, phosphorous, and thallium when minerals with these elements were identified or suspected in samples. The types of analyses include atomic absorption spectrophotometry for arsenic, antimony, copper, manganese, and mercury; x-ray fluorescence for phosphorous, and special chemical analysis for thallium. Eighteen of the 76 samples were collected from limestone outcrops and analyzed by the inductively coupled plasma method for purity and suitability for chemical and metallurgical use. Analyses for selected elements were performed by the Bureau of Mines Reno Research Center, by IGAL, Inc. of Cheney, WA, and by Bondar-Clegg of Lakewood, CO. These analyses are summarized in Tables 1-4, and complete analytical data is available for public inspection at the Bureau of Mines, Intermountain Field Operations Center, Building 20, Denver Federal Center, Denver, Colorado 80225.

## Acknowledgments

Special thanks are extended to Dave Blake of Duval Corporation in Battle Mountain, Nevada, and Fred Reisbick of Duval Corporation in Tucson, Arizona. They provided information on Duval's gold prospects inside the study areas.

## Geologic setting

The majority of rock exposed in the study areas is limestone and dolomite ranging in age from Cambrian to Permian. A minor amount of quartzite is associated with some of the limestone units. The Ordovician Pogonip Group (limestone and dolomite) and the Devonian Guilmette and Devils Gate Formations (limestone) make up about half the exposed rock in the study areas. (See Hope and Coats, 1976.) The phosphatic Plympton Formation underlies part of the Bluebell SA. In addition, Tertiary volcanics ranging in composition from rhyolite to dacite cover several square miles of the study areas. The largest occurrence of volcanics is on the east side of the range near the boundary between the two study areas.

The SA's are in a typical Basin and Range horst-type mountain range bounded on the west by high-angle range front faults and by low-angle range front faults on the east (Howard, 1978). The most common structures in the study areas are intersecting normal faults, which form fault-bounded blocks of Paleozoic sedimentary rocks.

## Mining activity

Two mining districts are near the study areas; the Ferguson Springs district (also called the Allegheny district) is adjacent and southeast of the Goshute Peak SA; the Decoy district is west of the Bluebell SA. No mining claims or mine workings extend into the study areas from these two mining districts, but several blocks of unpatented mining claims are near the study areas and 3 other claim blocks (93 unpatented claims) are in the study areas. Mining claims current as of March 21, 1985, are shown on plate 1.

The Ferguson Springs mining district, adjacent to the southeast side of the Goshute Peak SA, was a past producer of copper-silver ore. A small amount of production was first recorded for this district in 1917 (Granger and others, 1957, p. 63). Production was also recorded for the years 1935, 1937, 1949, and 1953. The largest mine in the district, the Dead Cedar Mine, is credited with less than $5,000 in total production (Smith, 1976, p. 67). The workings in this district consist of adits, shafts, prospect pits, and trenches.

Mining and production was recorded from the Decoy mining district, about 3,000 ft west of the Bluebell SA. The Darky Mine produced manganese in 1917 and 1918; the Blackbird Mine in 1952 (note: the Darky Mine and the Blackbird Mine may be the same mine) (fig. 2). Total production is not known but is probably less than 2,000 tons (Smith, 1976, p. 48).

In the study areas, Duval Corporation explored for and drilled the gold showing on their mining claims in June and July 1985. The drill sites are in the south end of the Bluebell SA (near sample sites 33-35, 38-43, pl. 1) and on their claim block on the west side of the Goshute Peak SA, southwest of Goshute Peak (pl. 1). A second drilling program by Duval is currently in the planning stages (Duval Corporation, written commun., August 1985).

About 2 mi north of the Bluebell SA, Marblehead Lime Company is quarrying high-calcium lime at the rate of about 150,000 tons per year (Phil Raines, Marblehead Lime Company, oral commun., May 1985).

No other current mining activity is known in or near the study areas.

### Oil and gas

In September, 1984, oil and gas leases covered most of the Federally administered land in the valleys on both sides of the Bluebell and Goshute Peak study areas. These leases extend into the flanks of the range and cover approximately 14 sq mi of land within the study areas (fig. 3).

Sandberg (1983) rated the oil and gas potential of an area that included the Bluebell and Goshute Peak study areas as low. According to Sandberg, "the ranges themselves are composed mainly of Paleozoic rocks, which are largely overmatured thermally." However, "because of the proximity to economically interesting lacustrine beds and the possibility of some Paleozoic source beds being at optimum maturity," the area is rated to have a low potential, rather than no potential. (See Sandberg, 1983, p. H7, H8.)

## APPRAISAL OF SITES EXAMINED

Disseminated gold occurrences, which may have economic potential, are known in two areas inside the SA's. In addition, vast quantities of limestone, similar to that being quarried north of the Bluebell SA, are in both study areas.

## Gold

Carlin-type disseminated gold occurrences are inside both the Bluebell and Goshute Peak study areas. In the Bluebell area, the mineralized rock with highest gold values is found in three prominent zones, inside an area about 1 mi across (samples 38-43, pl. 1). The largest exposed mineralized zone is about 1,200 ft long and 500 ft across at the widest part. The mineralization consists of moderately to highly iron-stained limestone with prominent brecciation and silicification; some jasperoid and disseminated pyrite are present. The Bureau's six samples taken of the mineralized zones contained from 0.006 to 0.023 oz gold/t (samples 38-43, table 1). Sampling by the Bureau of Land Management from this area indicated as much as 0.064 oz gold/t in one of three samples (Steve Brooks, BLM, Elko District Office, Elko, NV, oral communication, May 1985). In June of 1985, Duval Corporation conducted a preliminary exploration drilling program in this area and reported intercepts of mineralized rock that contained from 0.03 to 0.24 oz gold/t (Duval Corporation, written commun., August 1985).

In addition to the presence of gold, other elements that are indicators of gold mineralization are present in samples from this area. Arsenic values were as high as 450 ppm; antimony values were as high as 43 ppm; thallium values were as high as 6.2 ppm; and mercury values were as high as 2.05 ppm (table 2). All of these elements are closely associated with some disseminated gold deposits in Nevada. These elements are often more widely dispersed than gold and provide exploration guides for gold.

Samples 44-48 were taken from small jasperoid outcrops south of the three main mineralized zones. The gold values were low (as much as 0.0017 ppm), but gold indicator elements (arsenic, antimony, thallium, and mercury) were detected (table 1) and suggests that gold mineralization may have occurred in the area. These jasperoid outcrops may be fringes of the gold mineralized rock to the north. Samples 37 and 49 were taken from barren-looking limestone. Assay values for all indicator elements were below the detection limit for sample 37, but gold, thallium, and mercury were detected in sample 49.

A second disseminated gold occurrence is in the Goshute Peak study area about 3 mi southwest of Goshute Peak (see claim block, pl. 1). This occurrence was not examined by the Bureau, but information was provided by Dave Blake (oral commun., May 1985) and Fred Reisbick (oral commun., October 1985) of Duval Corporation. In this area, structurally controlled jasperoids are associated with andesite porphyry dikes and sills. Blake noted the largest jasperoid outcrop is approximately 500 x 100 ft at the surface. Of the surface samples taken by Duval, the highest assay value for gold was 1.36 ppm (0.04 oz/t). Quartz veins containing galena, tetrahedrite, and copper oxide minerals were also observed in this area (Dave Blake, oral commun., May 1985). Drilling was conducted during July 1985, and results were favorable enough to warrant more drilling (Fred Reisbick, oral commun., October 1985). Keith Ketner (U.S. Geological Survey, written commun., April 1985) mapped about 10 jasperoid and(or) brecciated chert occurrences in an area that includes part of the claim block (pl. 1). The largest mapped exposure is about 750 ft long and up to 500 ft wide.

Wilkins (1984) lists the statistics for a number of sedimentary-hosted, disseminated gold deposits in the Great Basin portion of the Basin and Range Province. The size of the listed gold deposits ranges from 130 thousand oz at the Tonkin Springs deposit to 5,670 million oz at the Carlin deposit (these

Table 1.--Commodity Statistics for gold and lime.

[From U.S. Bureau of Mines Mineral Commodity Summaries (1985).]

| Commodity | Estimated domestic mine production | Apparent consumption | Units | Major import sources | Net import reliance percent | Average 1984 domestic price ($U.S.) | Price unit | Expected U.S. demand through 1990 | Major uses |
|---|---|---|---|---|---|---|---|---|---|
| Gold | 2,300,000 | 4,800,000 | oz | Canada, Switzerland, Uruguay | 16 | 365 | oz | Annual increase rate of 2.0% | Jewelry and arts, industrial, dental, investment |
| Lime | 16,100,000 | 16,320,000 | short tons | Canada, Mexico | 1 | 53 | short ton units | Annual increase rate of 3.7% | Steel furnaces, water treatment, construction, sulfur removal from stack gases, paper and pulp |

figures include both production and estimated reserves). At $325/oz gold, the value of these deposits ranges from $42 million and $1.8 billion respectively. Commodity statistics for gold are on Table 1. Mapping and surface and subsurface sampling of the occurrences in the SA's would be required to estimate the amount of gold present at these occurrences.

## Non-metallic commodities

### Limestone

The majority of rock exposed in both study areas is limestone. Eighteen samples were taken from limestone outcrops in and near the study areas to test for chemical purity. Analysis of eight of these samples revealed the presence of high-calcium lime (96% or more $CaCO_3$; table 3), suggesting that this limestone would be suitable for high-calcium lime and other industrial uses. Commodity statistics for lime are on Table 1.

Marblehead Lime Company is currently quarrying high-calcium limestone from the upper Devonian Guilmette and Devils Gate Formations, about 2 mi north of the Bluebell study area. The limestone quarry is adjacent to rail transportation.

### Phosphate

Hope and Coates (1976) mapped an area in the northern end of the Bluebell study area as the Park City Group, and Ketner in later detailed work mapped this area as the Plympton Formation (a formation within the Park City Group) (oral commun., July 1985). Phosphate deposits are known in the Plympton Formation in the Pequop Mountains about 15 mi west of the SA's (Wood, 1985). Bureau personnel made traverses across the mapped area in an attempt to locate either phosphate or phosphatic material. No phosphate-bearing material was found and no distinctive dark chert beds or shale associated with phosphate rock were seen.

Near the southeast side of the Goshute Peak area Hope and Coats (1976) show the Park City Group cropping out within 3,700 ft of the SA. Here, a small amount of phosphatic float was identified, about 3,400 ft outside the SA (sample 68, pl. 1).

### Construction material

Other than high purity limestone, the rocks inside the study areas can be used for common construction purposes, but have no unique characteristics to make them more useful than rocks outside the SA's.

## CONCLUSION

Two known areas with Carlin-type disseminated gold mineralization are present in the study areas and further work may identify additional zones. In the Bluebell SA, three mineralized zones in an area about 1 mi across contain gold; the largest zone is about 1,200 ft long and up to 500 ft wide. All Bureau samples from the three areas contain gold. Drilling in the SA by Duval Corporation in 1985 revealed higher gold values at depth than in outcrop. The higher assay values (0.023 oz/t) from outcrop samples from the SA are near grades mined at some disseminated gold deposits in Nevada.

The second disseminated gold occurrence is on the west side of the Goshute Peak study area. Bureau personnel were unaware of this mineralized area at the time of the field investigation. Information provided by Duval Corporation about this area indicates that jasperoid outcrops up to about 500 x 100 ft in size at the surface and contain up to 0.04 oz gold/t gold. This gold value is above the cutoff grade for most disseminated gold mines in

Nevada. Drilling in this area revealed sufficient gold values and continuity to warrant additional drilling (Fred Reisbick, oral commun.).

Both the Bluebell and Goshute Peak study areas contain vast quantities of limestone, both high-calcium limestone and limestone that could be used for other industrial purposes. Marblehead Lime Company is currently quarrying high-calcium limestone from equivalent rock units about 2 mi north of the Bluebell SA.

## RECOMMENDATIONS FOR FURTHER STUDY

Additional gold deposits may exist in the study areas, more detailed reconnaissance is warranted. Geochemical work in the form of detailed outcrop or soil sampling would help delineate a mineralization pattern and provide data to compare with other gold deposits. The nature of any further work in the area of the two known gold occurrences will depend upon the results of Duval's preliminary drilling program.

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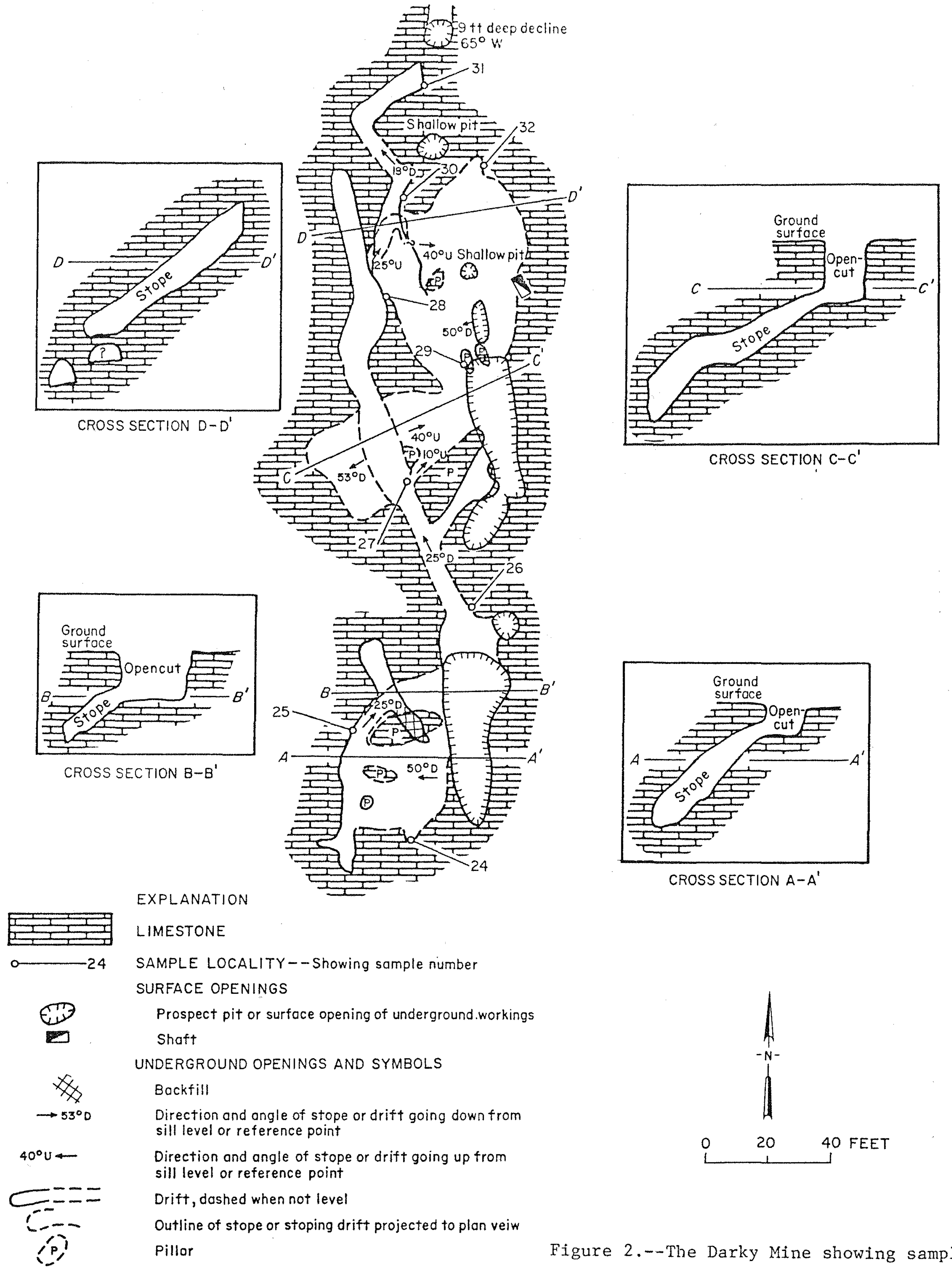


Assay data for samples taken from the Darky Mine.

[Tr, trace; ---, analyzed but not detected.]

| Sample No. | Length of chip (ft) | Au (oz/t) | Ag (oz/t) | Mn (%) | Remarks |
|---|---|---|---|---|---|
| 24 | 3.5 | --- | --- | 7.5 | Edge of stope; fault gouge, limonite, manganese. |
| 25 | 4.0 | --- | --- | 17.5 | Bottom of stope; gossan zone, gouge, limonite, abundant manganese. |
| 26 | 7.0 | --- | --- | .09 | Rib of decline; wide altered zone, gossan, clayey gouge, limonite, manganese, minor jasperoid. |
| 27 | 4.5 | --- | --- | 5.4 | Level between stopes; major mineralized structure; manganese-limonite gouge, silicified limestone. |
| 28 | 3.0 | --- | --- | 5.6 | Lower level drift; gouge, manganese, limonite, iron staining, barite. |
| 29 | 3.0 | --- | --- | 30.0 | Pillar in stope; manganese gossan, limonitic gouge, altered limestone. |
| 30 | 1.0 | --- | --- | 44.0 | Drift at bottom of stope; abundant manganese minor calcite. |
| 31 | 2.5 | Tr | --- | 6.6 | Face of drift; manganese, limonite, calcite, gouge, iron staining. |
| 32 | 2.0 | --- | --- | 8.4 | Side of stope; minerals similar to sample 31. |

Figure 2.--The Darky Mine showing sample localities and assay data for samples 24-32.

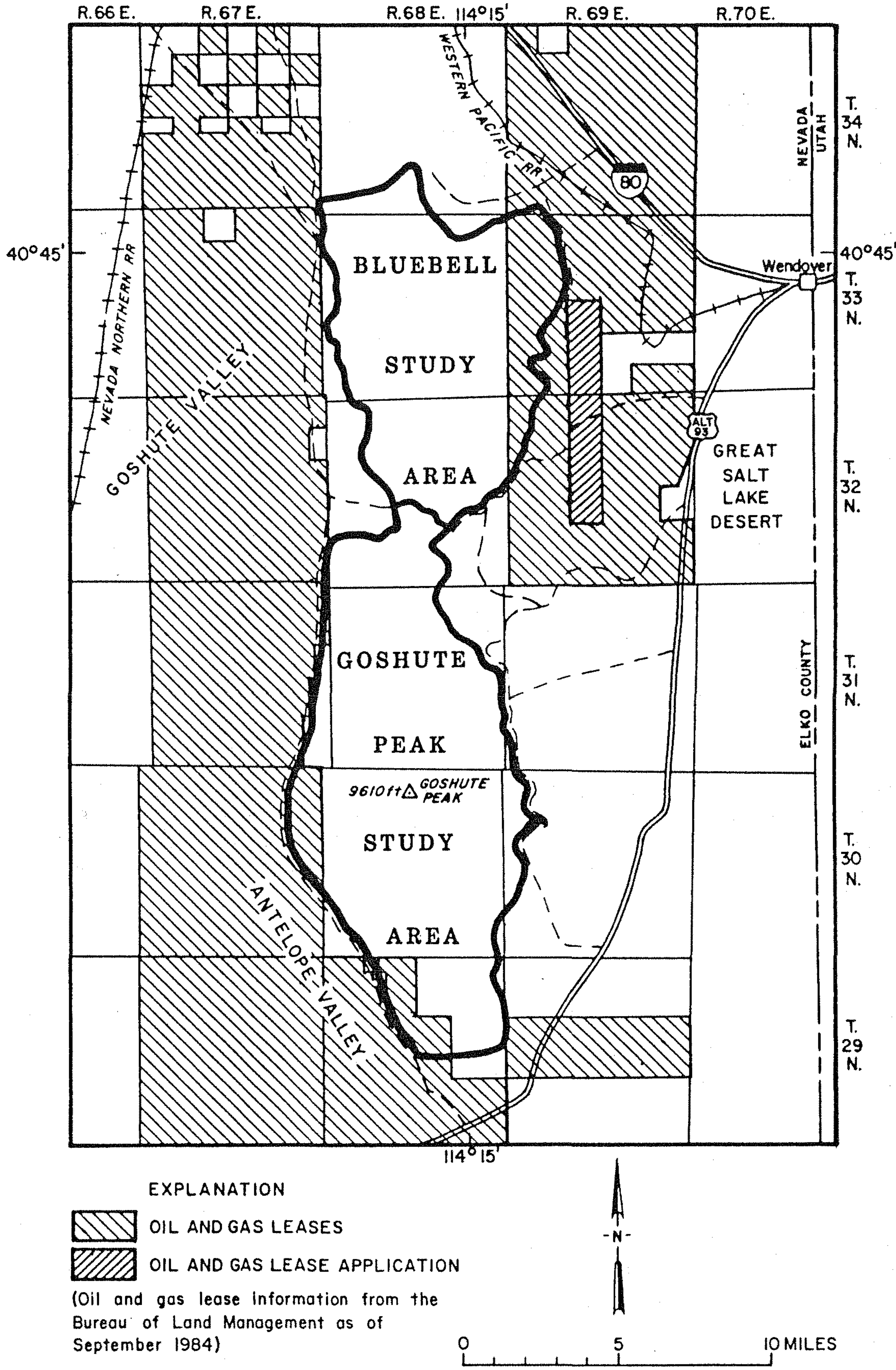


Figure 3.--Oil and gas leases in the vicinity of the Bluebell and Goshute Peak study areas.

Table 2.--Assay data for samples other than limestone.

[NA, not applicable; <, less than; ppm, parts per million; ppb, parts per billion; xxx, not assayed for.]

| Sample No. | Sample Type | Sample Length (ft) | Assay data Au (oz/t) | Assay data Ag (oz/t) | Assay data Cu (%) | Assay data As (ppm) | Assay data Sb (ppm) | Assay data Tl (ppm) | Assay data Hg (ppb) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| 4 | grab | NA | <0.005 | 1.5 | 0.14 | xxx | xxx | xxx | xxx | Dump of 12-ft-long cut in rock; silicified limestone; quartz, gossan, small pods of lead-antimony sulfur salt, malachite and azurite stains. |
| 5 | select | NA | <.005 | 13.3 | 1.33 | xxx | xxx | xxx | xxx | Stockpile at 18-ft-deep shaft; minerals similar to sample 4. |
| 6 | chip | 3.0 | <.005 | .3 | xxx | xxx | xxx | xxx | xxx | Shaft, 15-ft-deep; fault oriented N. 30° E., 65° NW.; altered and silicified limestone, limonitic-clayey gouge. |
| 7 | do. | 1.5 | <.005 | .2 | xxx | xxx | xxx | xxx | xxx | Fault in prospect pit; same fault as sample 6. |
| 8 | do. | 2.5 | Tr | .2 | xxx | xxx | xxx | xxx | xxx | Decline, 60 ft; thick zone of breccia, fractured and altered limestone, limonitic and clayey gouge, calcite; oriented N. 50° E., 53° NW. |
| 9 | do. | 3.0 | Tr | .1 | xxx | xxx | xxx | xxx | xxx | Same decline and breccia zone as sample 8. |
| 11 | do. | NA | <0.0002 | .009 | xxx | <2 | <2 | xxx | xxx | Limestone outcrop; no apparent mineralization. |
| 12 | grab | NA | <.005 | .2 | xxx | xxx | xxx | xxx | xxx | Quartzite outcrop, iron-stained surface. |
| 13 | chip (random) | NA | <.0002 | .009 | xxx | <2 | <2 | xxx | xxx | Do. |
| 14 | do. | NA | <.0002 | .009 | xxx | <2 | <2 | xxx | xxx | Do. |
| 15 | do. | NA | <.0002 | .009 | xxx | <2 | 5 | xxx | xxx | Do. |
| 33 | do. | NA | <.0002 | <.009 | xxx | 13 | <2 | xxx | xxx | Do. |
| 34 | do. | NA | <.0002 | <.009 | xxx | <2 | <2 | 0.302 | 0.302 | Do. |
| 35 | grab (select) | NA | <.005 | <.1 | xxx | xxx | xxx | xxx | xxx | Limestone outcrop; iron staining. |
| 36 | do. | NA | <.005 | <.1 | xxx | xxx | xxx | xxx | xxx | Do. |
| 37 | chip (random) | 10 | <0.0002 | <0.009 | xxx | <2 | <2 | xxx | xxx | Limestone outcrop; no apparent mineralization. |
| 38 | do. | 50 | .006 | .06 | xxx | 59 | 8 | 1.03 | 115 | Limestone outcrop; altered, silicified, brecciated, iron stained. |
| 39 | do. | 75 | .014 | .022 | xxx | 35 | 6 | 3.10 | 145 | Limestone outcrop; alteration similar to sample 38. |

Table 2.--Assay data for samples other than limestone--Continued

| Sample No. | Sample Type | Sample Length (ft) | Assay data Au (oz/t) | Ag (oz/t) | Cu (%) | As (ppm) | Sb (ppm) | Tl (ppm) | Hg (ppb) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| 40 | chip (random) | 50 | .018 | <.009 | xxx | 60 | 8 | 1.48 | 2,050 | Same altered outcrop as sample 39; moderate iron staining on surface, minor jasperoid. |
| 41 | do. | 100 | .007 | .017 | xxx | 360 | 5 | 2.05 | 840 | Limestone outcrop; altered, silicified, brecciated, iron staining, minor jasperoid. |
| 42 | do. | 50 | .023 | .015 | xxx | 450 | 43 | 6.20 | 1,400 | Same outcrop as sample 41; alteration similar to sample 41, minor pyrite. |
| 43 | do. | 50 | .011 | <.009 | xxx | 180 | 7 | 2.15 | 810 | Same altered zone as samples 41 and 42; same type of mineralization. |
| 44 | grab | NA | <.005 | .2 | xxx | xxx | xxx | xxx | xxx | Float; limestone country rock; jasperoid, limonitic gouge. |
| 45 | do. | NA | .0002 | <.009 | xxx | xxx | xxx | .595 | 115 | Float, same location as sample 44, same rock. |
| 46 | do. | NA | <.005 | .2 | xxx | xxx | xxx | xxx | xxx | Float; limestone country rock; jasperoid, limonitic gouge. |
| 47 | do. | NA | .0017 | <.009 | xxx | 33 | 9.7 | .550 | 190 | Float, same location and rock as sample 46. |
| 48 | do. | NA | .0004 | <.009 | xxx | 46 | 20.5 | 1.08 | 240 | Prospect pit; contact between altered limestone and rhyolite; jasperoid, manganese and iron staining. |
| 49 | do. | NA | .0004 | <.009 | xxx | <2 | <2 | .050 | 20 | Limestone outcrop; 100 ft from contact with rhyolite; no apparent mineralization. |
| 50 | select | NA | <.005 | <.1 | xxx | xxx | xxx | xxx | xxx | Prospect pit; limestone country rock; minor limonitic gouge. |
| 51 | chip (random) | 50 | .0002 | <.009 | xxx | 35 | <2 | xxx | xxx | Rhyolite outcrop, near contact with limestone; moderate to heavy iron staining. |
| 53 | grab | NA | .0007 | <.009 | xxx | xxx x | xxx | xxx | xxx | Dump of prospect pit; extremely altered aphanitic rock. |
| 54 | do. | NA | <.0002 | <.009 | xxx | xxx | xxx | xxx | xxx | Trench; aphanitic dike rock. |
| 55 | grab (select) | NA | <.0002 | .50 | 2.64 | 3,900 | 730 | xxx | xxx | Trench, 30-ft deep; quartz in altered mafic dike; country rock limestone; malachite and azurite staining; specks of a dull, gray metallic mineral. |
| 56 | grab | NA | <0.0002 | <0.009 | 0.06 | xxx | xxx | xxx | xxx | Same trench as sample 55; dike rock, extremely altered; prominent iron staining, minor limonitic gouge and pyrite pseudomorphs. |
| 57 | chip | 1.0 | <.0002 | <.009 | .01 | xxx | xxx | xxx | xxx | Same trench as sample 55; sample from limestone country rock from each side of altered dike; minor alteration and iron staining. |

Table 2.--Assay data for samples other than limestone--Continued

| Sample No. | Type | Length (ft) | Au oz/t | Ag oz/t | Cu % | As ppm | Sb ppm | Tl ppm | Hg ppb | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| 58 | chip | 0.5 | <.0002 | <.009 | .004 | xxx | xxx | xxx | xxx | Trench; in altered and brecciated limestone country rock, footwall side of quartz vein in mafic dike. |
| 59 | do. | 1.5 | <.0002 | <.009 | .009 | xxx | xxx | xxx | xxx | Same trench as sample 58; footwall side of quartz vein; fine grained, limonite specks and stringers. |
| 60 | do. | 2.5 | <.0002 | .032 | .139 | xxx | xxx | xxx | xxx | Same trench as sample 58; sample from quartz vein in mafic dike; fractured, abundant iron staining, minor malachite and azurite staining, N. 45° W., 83° SW. |
| 61 | do. | 2.0 | <.0002 | <.009 | .025 | xxx | xxx | xxx | xxx | Same trench as sample 58; mafic dike, hanging wall side of quartz vein, altered near quartz vein. |
| 62 | grab | NA | <.0002 | <.002 | xxx | xxx | xxx | xxx | xxx | Prospect pit; brecciated, silicified limestone, limonite staining. |
| 63 | do. | NA | <.005 | .2 | .003 | xxx | xxx | xxx | xxx | Contact between altered rhyolite and limestone, iron stained. |
| 66 | chip | 2.5 | Tr | .4 | .67 | xxx | xxx | xxx | xxx | Adit; 55-ft-deep winze, 80 ft from portal; mineralized fault N. 45° E., 65° NW.; fractured and altered limestone, limonitic gouge, disseminated barite, minor malachite. |
| 67 | do. | 2.5 | .01 | .5 | 1.49 | xxx | xxx | xxx | xxx | Same adit as sample 66, similar mineralization. |
| 68 | select | NA | <.0002 | .029 | xxx | xxx | xxx | xxx | xxx | Phosphate-bearing float, bluish-white staining, associated with shale and black chert; majority of country rock is limestone; $P_2O_5$: 20.8%, $V_2O_5$: 0.012, determined by x-ray flouresence analysis. |
| 69 | grab | NA | <.005 | .4 | .02 | xxx | xxx | xxx | xxx | Dump of 35-ft-deep shaft; wide mineralized zone in limestone country rock; limonitic gouge, brecciated and vuggy, barite, jasperoid, abundant manganese staining. |
| 70 | select | NA | <.005 | .8 | 3.2 | xxx | xxx | xxx | xxx | Dump of 50-ft-long adit; 8-ft-thick fault N. 10° E., 75° W. in limestone country rock; limonitic gouge, brecciated and vuggy, manganese and malachite staining. |
| 71 | grab | NA | --- | 0.3 | 0.71 | xxx | xxx | xxx | xxx | Dump of Dead Cedar Mine; approx. 1,000 ft of underground workings; limestone country rock; large bodies of gossan, prominent alteration and oxidation, barite, manganese, malachite. |
| 75 | chip | 2.0 | --- | .2 | .006 | xxx | xxx | xxx | xxx | Backhoe trench, 40 ft long; fault oriented N. 40° W., 23° NE. in altered rhyolite country rock; clayey gouge, 2 ft thick, color banded black, white, red. |
| 76 | do. | 5.0 | --- | --- | .003 | xxx | xxx | xxx | xxx | Trench, 18 ft long; altered rhyolite country rock; quartz vein, N. 42° W., 66° E., 6 ft thick, highly fractured, abundant limonite stains, minor malachite stains. |

Tabl --As ata ime sam

[NA, not applicable; <, less than.]

| Sample | | | Assay data | | | | | | | | | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | Type | Length (ft) | $CaCO_3$ | $MgCO_3$ | $SiO_2$ | $SO_3$ | $Fe_2O_3$ | $Al_2O_3$ | LOI | $K_2O$ | $Na_2O$ | $P_2O_5$ | $TiO_2$ | Limestone ages from Hope and Coates, (1976) |
| | | | | | % | | | | | | ppm | | | |
| 1 | grab | NA | 98.1 | 0.54 | 0.53 | 0.25 | 0.035 | 0.34 | 29.44 | 0.17 | 60 | 360 | 130 | Upper Devonian limestone; prospect pit. |
| 2 | random chip | 25 | 87.8 | 6.48 | 7.6 | .13 | .19 | .23 | 37.51 | .17 | 330 | 1,500 | 130 | Upper Devonian limestone; scattered chert nodules. |
| 3 | do. | 30 | 91.4 | 1.61 | 2.4 | .23 | .13 | .25 | 37.22 | .032 | <50 | <100 | 120 | Do. |
| 10 | do. | 35 | 96.0 | 2.51 | .98 | .17 | .064 | .11 | 40.20 | <0.02 | <50 | <100 | <50 | Upper Ordovician and Lower Silurian limestone; minor silt. |
| 16 | do. | 17 | 98.3 | .92 | .55 | .33 | .061 | .099 | 38.37 | .11 | 1,000 | 240 | 64 | Upper Pennsylvanian and lower Permian limestone. |
| 17 | do. | 40 | 97.8 | 2.30 | .89 | .44 | .099 | .20 | 39.68 | <.02 | <50 | <100 | 110 | Do. |
| 18 | do. | 23 | 97.8 | 1.07 | .49 | .45 | .052 | .10 | 39.41 | <.02 | <50 | <100 | 51 | Do. |
| 19 | do. | 20 | 97.3 | 1.61 | 1.6 | .53 | .12 | .28 | 38.00 | .25 | 700 | 350 | 140 | Upper Devonian and lower Mississippian limestone; several hundred feet of this formation. |
| 20 | do. | 25 | 88.0 | 1.78 | .55 | .53 | .047 | .081 | 39.74 | <.02 | <50 | <100 | 44 | Upper Devonian limestone. |
| 21 | do. | 5 | 97.5 | .92 | 1.4 | .52 | .065 | .15 | 38.57 | <.02 | <50 | <100 | 71 | Lower Permian limestone. |
| 22 | do. | 50 | 97.1 | 1.21 | .93 | .16 | .08 | .11 | 35.71 | .20 | 350 | 390 | 56 | Upper Pennsylvanian and Lower Permian limestone; scattered chert nodules. |
| 23 | do. | 50 | 89.8 | 1.15 | 4.0 | .28 | .093 | .31 | 37.27 | .096 | 93 | <100 | 220 | Lower Pennsylvanian limestone. |
| 52 | do. | 15 | 89.2 | 1.19 | 6.9 | .23 | .25 | .51 | 36.08 | .026 | <50 | 230 | 300 | Lower and middle Ordovician limestone; base of cliff; silt and chert. |
| 64 | do. | 15 | 82.6 | 10.9 | 1.6 | .25 | .089 | .19 | 40.41 | <.02 | <50 | <100 | 92 | Upper Ordovician and lower Silurian limestone and dolomite; about 300 ft of exposure. |
| 65 | do. | 15 | 91.4 | .84 | .76 | .27 | .11 | .32 | 38.80 | <.02 | <50 | <100 | 150 | Lower and middle Devonian limestone; large exposure of this formation in area. |
| 72 | do. | 5 | 51.0 | 39.1 | 7.9 | .15 | .21 | .70 | 40.90 | .13 | <50 | <100 | 300 | Upper Devonian limestone; base of 60-ft cliff. |
| 73 | do. | 20 | 88.3 | 8.58 | 2.3 | .47 | .15 | .30 | 40.11 | <.02 | <50 | <100 | 160 | Upper Devonian limestone and dolomite. Sample from middle of exposure. |
| 74 | do. | 15 | 62.1 | 36.2 | 1.00 | .31 | .11 | .25 | 42.83 | <.091 | 190 | <100 | 120 | Upper Devonian limestone; sample from base of exposure. |

Table 4--Miscellaneous mineral occurrences.

| Map nos. | Property Name | Summary | Number and type of workings | Sample data |
|---|---|---|---|---|
| 53-62 | Unknown | Inside Goshute Peak SA. Majority of workings dug on quartz pods and discontinuous veins in mafic dike. Dike 2-6 ft thick, N. 35-45° W., 83° S., strike length at surface about 550 ft; at places dike extremely altered with limonitic gouge, pyrite, pyrite pseudomorphs. Quartz contains malachite, azurite, unidentified dull gray metallic mineral. | Two trenches, one is 30 ft deep. Three small prospect pits. | Ten samples - 2 contained 0.50 and 0.032 oz/t silver, no gold; 7 samples had copper values, 1 has 2.64%, 6 ranged from 0.004% to 0.139%. |
| | Ferguson Springs Mining District | Outside of southeast boundary of Goshute Peak SA. Mineralization associated with faults and fissures in limestone, most ore highly oxidized, fissure fillings and replacement bodies; largest working is the Dead Cedar Mine, approximately 1,000 ft of underground workings, credited with less than $5,000 total production (Smith, 1976). | Numerous adits, shafts, prospect pits, and trenches. | Seven samples - silver values ranged from 0.2 oz/t to 0.8 oz/t, copper values ranged from 0.003% to 3.2%, two samples had 0.01 oz/t and trace gold. |
| | Unknown | About 1 mi north of Bluebell SA. Silver-copper mineralization in small faults and fissures associated with silicified limestone, gossan, quartz. | 60-ft-deep decline, two shafts 15 and 18 ft deep, several pits. | Six samples - two samples had 13.3 and 1.5 oz/t silver, four ranged from 0.1 to 0.3 oz/t silver; two samples had 0.14% and 1.33% copper; two samples had a trace of gold. |
| | Darky Manganese Mine | About 3,000 ft outside the western boundary of the Bluebell SA. Manganese ore bodies in and along a north-striking fault zone, both replacement and fissure filling, by psilomelane, pyrolusite, wad; ore selected for shipment was about 45% manganese and less than 5% silica, (Pardee and Jones, 1920); less than 2,000 tons production (Smith, 1976). | Drifts and stopes about 250 ft along strike, up to 80 ft down dip. | Nine samples - eight samples ranged from 5.4% to 44.0% manganese; one sample had a trace of gold. |

United States Department of the Interior

BUREAU OF MINES

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Intermountain Field Operations Center

December 11, 1985

Mr. John H. Schilling
Director and State Geologist
Nevada Bureau of Mines and Geology
University of Nevada
Reno, NV 89557-0088

Mr. Schilling:

Please attach the enclosed errata sheets to the open-file report MLA 66-85, Mineral Resources of part of the Bluebell (NV-010-027) and Goshute Peak (NV-010-033) Wilderness Study Areas, Elko County, Nevada. The report was distributed in November 1985.

Sincerely,

Uldis Jansons

Uldis Jansons, Chief
MLA Branch

Enclosures-5
(listed above)

cc: Project File

DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

OPEN FILE REPORT
MLA 66-85
PLATE 1


Base from U.S. Geological Survey, 1:24,000
Ferguson Mtn, 1972; Goshute Pk, 1982; Lion Spring, 1972; Morgan Pass, 1972; Ola, 1972; Pilot, 1971; Spring Gulch, 1972; West Morris Basin, 1971; White Horse Mtn, 1982; White Horse Pass, 1972.

Field work completed in 1984 by S. Don Brown; assisted by David C. Scott, Clarence E. Ellis, Robert H. Wood II, Robert A. Welsh.

# MINE AND PROSPECT MAP OF THE BLUEBELL AND GOSHUTE PEAK STUDY AREAS, ELKO COUNTY, NEVADA

BY

S. DON BROWN, U.S. BUREAU OF MINES

1985