



United States Department of the Interior

BUREAU OF LAND MANAGEMENT
District Office
801 N. Plaza Street
Carson City, Nevada 89701

145
item 2
IN REPLY REFER TO:

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(N-037.2)

March 19, 1974

John H. Schilling, Director
Nevada Bureau of Mines and Geology
MacKay School of Mines
University of Nevada, Reno
Reno, Nevada 89507

Dear Mr. Schilling:

As per your request of March 13, enclosed is a copy of Mineral Resources of the Proposed Blue Lake Primitive Area, Humboldt County, Nevada by R. Bennett. The report contains no confidential information and can be placed in your files for public inspection.

Sincerely,

L. Paul Applegate
L. Paul Applegate
District Manager

Enclosure:
copy of report

145

item 2

Serial Number

Form 3980-1
(September 1970)
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UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

State Nevada

MINERAL REPORT

MINERAL RESOURCES

of the

BLUE LAKE

Proposed Primitive Area

Humboldt County, Nevada

(Title)

LANDS INVOLVED

Mount Diablo Base and Meridian

T. 46 N., R. 30 E.: S $\frac{1}{2}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 28; Sec. 29; S $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 30;
Secs. 31, 32, 33; SW $\frac{1}{4}$, W $\frac{1}{2}$ NW $\frac{1}{4}$ Sec. 34.
T. 45 N., R. 30 E.: W $\frac{1}{2}$ Sec. 3; Secs. 4, 5, 6; N $\frac{1}{2}$ N $\frac{1}{2}$ Sec. 7; N $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$
Sec. 8; N $\frac{1}{2}$, N $\frac{1}{2}$ S $\frac{1}{2}$ Sec. 9; Sec. 10; NE $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 15.
T. 44 N., R. 30 E.: S $\frac{1}{2}$, S $\frac{1}{2}$ N $\frac{1}{2}$ Sec. 7; SW $\frac{1}{4}$, W $\frac{1}{2}$ NW $\frac{1}{4}$ Sec. 17; Secs. 18, 19.
T. 43 N., R. 29 E.: W $\frac{1}{2}$ Sec. 19.
Unsurveyed lands within: T. 44 N., R. 29 E.; T. 44 N., R. 28 E.; T. 43 N., R. 29 E.;
T. 43 N., R. 28 E.

November 8, 1973

(Date)

By

R. E. Bennett*

Technical Review

Management Review

*Geologist, Carson City District

GPO 830-392

MINERAL RESOURCES

of the

B L U E L A K E

PROPOSED PRIMITIVE AREA

HUMBOLDT COUNTY, NEVADA

by

Reb E. Bennett
Geologist

U. S. Bureau of Land Management
Carson City, Nevada

An Evaluation of the Mineral Potential of the Area

November 8, 1973

NOTE

This report represents an evaluation of the mineral resources of the area described for the purposes stated, and should not be construed to be a mineral classification report or a validity determination of any lands or mining claims located within the area.

As none of the information in this report is considered to be privileged or confidential, this report may be treated as a public document.

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ABSTRACT

The proposed Blue Lake Primitive Area consists of the Blue Lake Section (about 22,000 acres) and Mahogany Mountain Section (about 7,000 acres), two areas situate in the Pine Forest Range, Humboldt County, Nevada. A field examination and other investigations were made in the autumn of 1973 in an attempt to ascertain what, if any, potential these two sections had for the occurrence of valuable mineral deposits. It is concluded that this potential is negligible; however, time and resources did not permit an exhaustive determination, and it is admitted that in certain areas knowledgeable subsurface exploration could possibly disclose the existence of ore deposits.

INTRODUCTION

The Bureau of Land Management, Winnemucca District, is proposing the establishment of a primitive area situate surrounding Blue Lake and Mahogany Mountain in the central and northern portion of the Pine Forest Range, northwestern Humboldt County, Nevada. These two areas, separated geographically by about 6 miles, would be collectively designated as the Blue Lake Primitive Area and encompass about 29,600 acres in total. (fig. 1)

To protect the primitive values within this area the Bureau desires to withdraw the lands from mineral entry. The purpose of this report is to present an opinion on the character of the lands with respect to their potential for the existence of valuable mineral resources, and to catalogue the presence of known mining locations.¹

Much of the proposed primitive area is unsurveyed and remote. Identification of the boundaries was accomplished by inspection of observed cultural and terrain features and their relationships as depicted on topographic maps. A few brass-cap section corners were found in the field and were utilized to facilitate identification of the area.

To facilitate discussion, the northern portion of the proposed primitive area will be referred to as the "Mahogany Mountain Section" while the southern portion of the area will be designated as the "Blue Lake Section".² (The terms "proposed primitive area" or "proposed Blue Lake Primitive Area" will refer to the area officially designated at the time of the field examination for consideration as the Blue Lake Primitive Area.)³

Prior to the commencement of field work all information available on the geology and mineralization, and exploration or mining activities in the area was obtained and reviewed. A low-altitude, fixed-wing aerial

- 1 It is understood that from a mineral resource standpoint it would be undesirable to include any land within the proposed primitive area containing economic mineralization or significant potential therefore.
- 2 The Blue Lake Section is shown on the USGS 15-minute Duffer Peak and Idaho Canyon quadrangles, 1965 editions. The Mahogany Mountain Section is shown on the USGS Denio 15-minute quadrangle, 1966 edition. All are at a scale of 1:62,500.
- 3 The Wilderness Act, P.L. 88-577, designates only "wilderness", "wild", and "canoe" areas for incorporation into the National Wilderness Preservation System, but it provides for inclusion of "primitive" areas also, if found suitable.

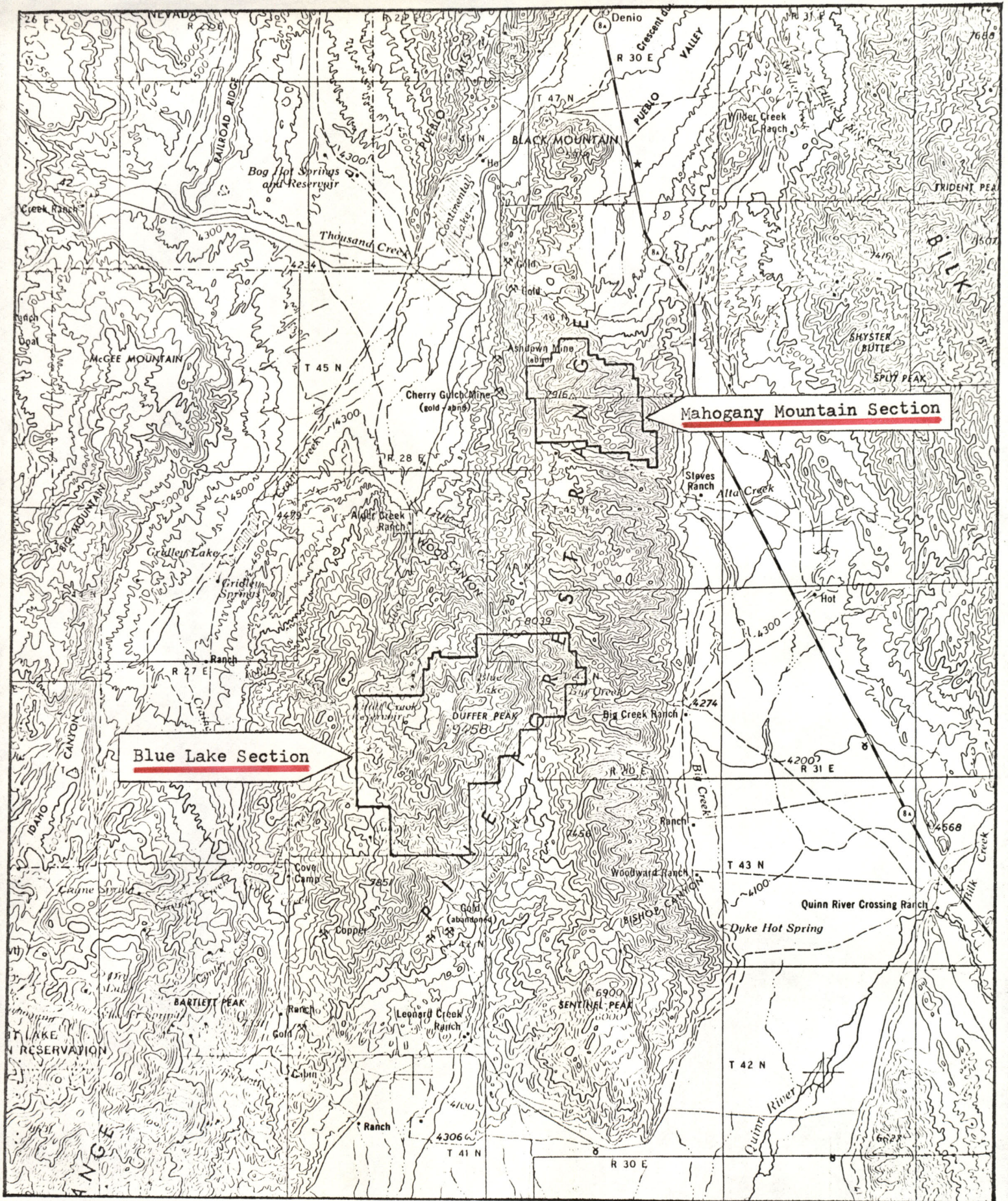


Figure 1. Index map of proposed Blue Lake Primitive Area, Humboldt County, Nevada. Map scale 1:250,000.

reconnaissance was made of the area for general orientation purposes; as an aid in identifying former and current minerals activity; and, for a gross evaluation of zones within the two areas and adjacent lands that would be favorable for the occurrence of economic mineralization. Actual on-the-ground fieldwork included reconnaissance geologic mapping to check and update a previously published geologic map of the area by Willden (1964). Aerial photos were used in the evaluation of the geology as well as an aid in locating prospects.

On-the-ground fieldwork was accomplished by vehicular and foot traverses of the proposed Blue Lake Primitive Area, including lands adjacent to the proposed primitive area, and centered around a search for 1) current prospect activity, and 2) physical evidence of valuable mineralization or the presence of hydrothermally altered areas or other discernable manifestations of mineralization. Special emphasis was placed on the examination of metamorphic terrain and contact zones. All known prospects were examined during the investigation.

The Blue Lake Section fieldwork was accomplished by the writer, assisted by Forest Littrell, Area Manager, Paradise-Denio Resource Area and his assistant, Peter Christensen, and John Rumps, Realty Specialist of the Winnemucca District Office. Robert Webb, Minerals Specialist in the Nevada State Office and Mr. Christensen assisted the writer in the Mahogany Mountain Section. Altogether the writer spent 14 days in the field; 9 days in the Blue Lake Section and 5 days in the Mahogany Mountain Section.

H. W. Mallery, Carson City District Senior Geologist, assisted in the initial planning of this investigation, provided technical advice and guidance, and made suggestions and comments in reviewing this report.

Access and Physical Features

Access to the eastern slope of the Pine Forest Range is provided by Nevada State Route 8A. An interconnecting network of graded and unimproved dirt roads provide access to other portions of the range.



Photo 1. Looking south from an elevation of approximately 7,400 feet in the Mahogany Mountain Section. Snow sprinkled peaks in the distance are in the central portion of the Blue Lake Section. The few roads in the photo evidence that much of the area is inaccessible to vehicular travel.



Photo 2. Typical road access in the northern portion of the Blue Lake Section. The smooth road in the photo belies the generally poor condition of most roads in the area. Note that the metamorphic rocks in the foreground form few outcrops compared to the granodioritic rocks in the middle distance and background.

Within the Blue Lake Section of the proposed primitive area avenues of access are few and consist of poorly maintained dirt roads and jeep trails. Much of the general area is inaccessible to vehicles, and only one road penetrates the Mahogany Mountain Section.

The town of Winnemucca is located about 80 air-line miles southeast of the proposed primitive area. The much smaller communities of Denio and Denio Junction lie 10 and 7 miles north of the area respectively.

The Pine Forest Range has a relief ranging between 3,000 and 5,000 feet along the steep eastern front of the mountain. Although not as physically imposing, the western front of the range is also steep and rugged. The highest point, Duffer Peak, situated in the center of the Blue Lake Section, has an elevation of 9,397 feet. Mahogany Mountain, elevation 7,934 feet, is the highest point in the Mahogany Mountain Section.

Leonard Creek and Alder Creek, two major perennial streams draining the Pine Forest Range, flow south and north respectively. Numerous other perennial streams and many springs and seeps are in the area. Moraine-dammed glacial lakes and man-made reservoirs are located at higher elevations along the flanks of Duffer Peak.

Aspen and mountain mahogany commonly form dense thickets in the Pine Forest Range. Aspen is concentrated around springs and seeps while mountain mahogany prefers drier slopes. These dense stands of trees provide excellent habitat for the many deer that live in the range. Locally, some pine trees are present. Typical desert vegetation--sagebrush, grasses, etc.--is found where water is not plentiful.

The climate of the area is generally semi-arid. Normal precipitation ranges from 8-20 inches, most of which occurs in the winter months.¹ Temperatures average in the 90s during the summer and less than 20 degrees (F) in the winter. Summer temperatures in excess of 100 degrees F are not uncommon. Winter temperatures can be as low as -20 F or lower.²

1 Nev. Div. of Water Resources, 1973.

2 R. Willden, 1964.



Photo 3. Typical topography in the proposed Blue Lake primitive area. The terrain seen is underlain by granodiorite which forms the bulk of the Pine Forest Range. Note the absence of manifestations of man's intrusion into the area.



Photo 4. Blue Lake, elevation 8,000 feet. Good trout fishing and its remoteness make this area popular for camping and other outdoor activities.

It is reported that livestock grazing and recreational activities account for the bulk of land use in the proposed primitive area. Cattle--as many as 2,000--graze in and around the many meadows in the area. Recreational use of the land encompasses fishing, hunting, camping, and hiking.

GENERAL GEOLOGY

The proposed primitive area is underlain principally by granodioritic intrusive rocks. These rocks have assimilated or intruded older metamorphic rocks represented by fine-grained, clastic, eugeosynclinal lithologies. The metamorphic rocks are of possible Triassic and Jurassic age and crop out as roof pendants in the northern part of the Blue Lake Section. Other exposures occur in the southern portion of the same section. Both units--the granodiorite and metamorphics--occur in complex inter-relationships to each other, the detail of which is often obscured by overburden. Tertiary volcanics cap the intrusive rocks in the western part of the Blue Lake Section. A small felsite plug crops out in the southwest corner of the Blue Lake Section.

Granodiorite is the only rock present in the Mahogany Mountain Section. Other rock types--volcanics and metamorphics--are exposed within a quarter-mile west of the area boundary.

The Pine Forest Range is typical of those ranges within the geomorphic province referred to as the Basin and Range, and Basin-Range structures are responsible for most of the relief in the region. Specifically, the range is a tectonically uplifted block, bordered on the east by a major fault. Other structural adjustments, including tilting and warping, have contributed to the present configuration of the range. Mountain-type glaciation has further modified the shape of the higher elevations of the Range.

Metamorphic rocks

Metamorphosed eugeosynclinal rocks--the "western end-member assemblage" that begins with miogeosynclinal rocks of eastern Nevada and progresses



Photo 5. Typical metamorphic terrain in part of the Blue Lake Section of the proposed primitive area. Rocks shown consist of phyllite (metasiltstone). Elevation is approximately 8,000 feet.



Photo 6. Typical granodiorite terrain in the part of the Blue Lake Section of the proposed primitive area. Elevation of valley is approximately 8,000 feet.

through the "transitional facies" of central Nevada--are the oldest rocks exposed in the proposed Blue Lake Primitive Area. There are no metamorphic rocks exposed in the Mahogany Mountain Section. Willden (p.44, 1964) assigns these metamorphics an early to middle Mesozoic age, or about 136-225 million years old. The metamorphic units exposed in the Blue Lake Section are the largest exposures of metamorphic rocks known between the Blue Mountains in Oregon and the Taylorsville area in California, a linear distance of approximately 250 miles. These older rocks have been subjected to varying degrees of contact metamorphism in addition to regional metamorphism, and include metamorphosed equivalents of pelitic and quartzo-feldspathic sediments, and, more rarely, derivatives of calcareous sediments.

Regional metamorphism has produced quartzites, slates, phyllites, and low-grade schists. Metacarbonate rocks are rare but those present consist of medium-grained crystalline limestone. Quartzites and schists are present locally; however, slates and phyllites comprise the bulk of the unit.

Near intrusive contacts the metaclastic rocks include hornfelses, schists, and occasionally gneissic rocks. Hornfelsic rocks are commonly developed along the inner part of the contact metamorphic aureole formed adjacent to the granodioritic rocks. Rocks in the outer part of the aureole are schistose rather than hornfelsic. Porphyroblasts of andalusite are common in these schists and impart a knobby or spotted appearance to the rock. Gneissic rocks, composed mainly of quartz and feldspar, are present, albeit rarely, along the contact zone.

Occasional lenses and veins of quartz are present within the metamorphic unit. Most of the occurrences are small, averaging less than one foot in width and several tens of feet in length where exposed. Some of the larger quartz veins are genetically related to the granodioritic rocks and can readily be traced into the parent intrusive. Other quartz bodies, typically small lenses and veins, have formed at some distance from the intrusive, and bear no obvious relationship to the granodiorite.

Granodioritic Rocks

Intrusive rocks of granodioritic composition and batholithic dimensions crop out extensively in the Pine Forest Range. Variations in compositional and textural parameters suggests that more than one intrusive forms the core of the range. However, no attempt was made to map these separate intrusive bodies. Geologic inference has been used to date the granodiorite as Late Cretaceous to early Tertiary (Willden, p. 58, 1964), or about 50-120 million years old.

The granodiorite is composed of varying amounts of plagioclase, quartz, potassium feldspar, biotite, and accessory minerals. These rocks are typically fine- to medium-grained with occasional feldspar phenocrysts up to one inch in length. Genetically related to the intrusive are aplite dikes and simple pegmatites. These rock types are very commonly seen at or near the boundary of the batholith. Occasionally the aplite dikes penetrate the metamorphic rocks for a short distance. These dikes are never more than a few feet in width and consist essentially of a fine-grained mixture of potassium feldspar and quartz.

The pegmatites consist primarily of quartz, potassium feldspar, and contain minor amounts of muscovite. Individual feldspar crystals may reach three inches in maximum dimensions. Occasionally the pegmatites consisted entirely of potassium feldspar.

Progressing into the intrusive the aplite dikes decrease notably and pegmatites are absent. The interior of the batholith is very homogeneous; only granodiorite is seen over large areas.

Quartz veins and lenses are sporadically encountered throughout the intrusive. However, most of the quartz veins, and the largest in particular, are located near intrusive contacts. The largest veins noted are near the contact zone in the southern portion of the Blue Lake Section. These veins average 2-4 feet wide and the most persistent has a surface exposure of about 300 linear feet.



Photo 7. Granodioritic terrain in the Mahogany Mountain Section of the proposed primitive area. Elevation here is approximately 7,500 feet.

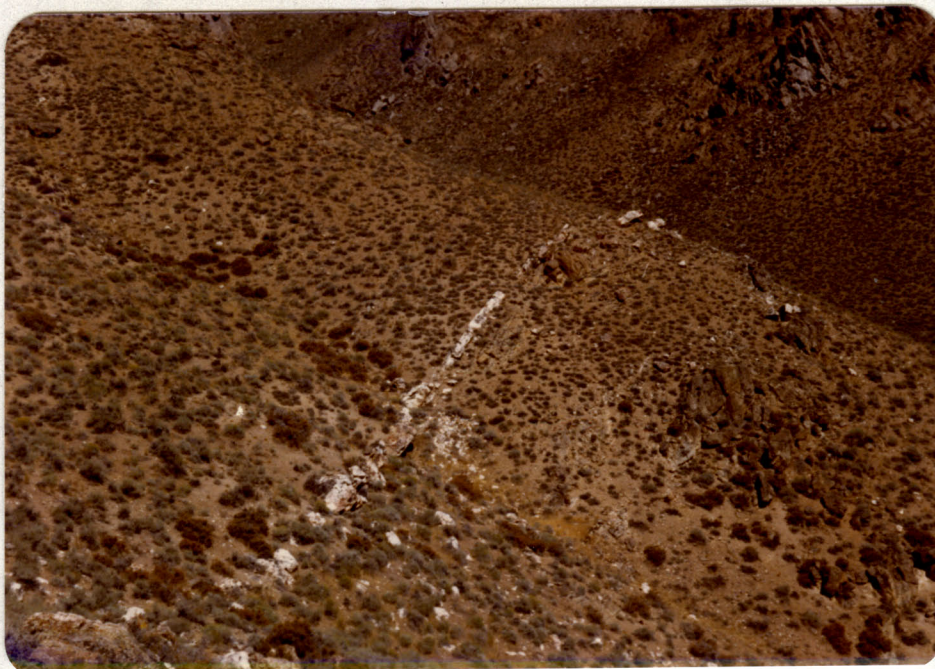


Photo 8. Quartz vein in granodioritic rocks of the southern portion of the Blue Lake Section of the proposed primitive area. Note lack of iron-staining or prospect workings.

Volcanic Rocks

Tertiary volcanic rocks are widespread along the margins of the Pine Forest Range. These rocks are remnants of what probably was once an extensive blanket of volcanics in the range and consist of a heterogeneous sequence of andesite, basalt, felsite, tuffs, and intercalated sediments.

Only a few hundred feet of these volcanics, a traprock--probably an olivine basalt--crop out in the Blue Lake Section and this unit rests directly on granodiorite. In the extreme southwestern part of the Blue Lake Section a small felsite--rhyolite--plug intrudes metamorphic rocks. There are no volcanic rocks known within the boundaries of the Mahogany Mountain portion of the proposed primitive area. However, several north-south trending volcanic dikes are exposed south of the Mahogany Mountain Section in Alta Canyon.

Glacial Deposits

Glacial deposits consisting of a jumbled mixture of boulder- to clay-sized material occur locally in the Blue Lake Section. They occur as several types of moraines. The best exposures are along the edges and at the ends of glaciated valleys. Blue Lake occupies a moraine-dammed cirque. Several hanging valleys also attest to the erosional power of past glacial action.

Alluvium

Recent alluvium includes stream deposits and some fine-grained sedimentary material in localized depressions that were probably once occupied by small lakes or ponds. Rock slides and talus or skree slopes are common throughout the area. A medium-sized rock slide, prominent because of the color contrast between the scar and the surrounding rock, is present immediately above Blue Lake.

MINERAL VALUES AND MINING CLAIMS

A number of foot traverses were made in the proposed primitive area in an attempt to determine if hydrothermally altered areas or other mani-

festations of mineralization occur therein. All known (mapped) prospects, and others not previously mapped, were examined; however, it is possible that all those actually in existence were not found because of a lack of visible (conspicuous) workings and constraints on time. Samples were taken from selected prospects as well as from other locations wherein rocks whose character indicated a favorable potential for mineralization were exposed. Major streams draining the area--Snow, Big, Alder, Chicken, Knott, and Leonard creeks--were panned and the concentrate visually checked for gold and other heavy minerals with negative results.

Minerals occurrences, prospects, and former mines on lands adjacent to the proposed primitive area were examined as part of the over-all mineral evaluation of the area to determine what relationships, if any, they might have to the possible occurrence of mineralization in the Mahogany Mountain and Blue Lake sections of the proposed primitive area.

Because of the difficulty of correlating courthouse records to mining claims--especially in unsurveyed areas--no record search was made for mining claims in the proposed primitive area. Many of the location notices found in the field have been rendered illegible by many years of exposure or were missing entirely. Those notices that were legible are listed in the appendix to this report.

Area Setting

The proposed primitive area is not within an established mining district. There are, however, four mining districts within the Pine Forest Range. No ore was being produced from any of these districts at the time of this investigation, and in the past none of these districts have ranked as important producers of ore. Willden (p. 121, 1964) indicates that total production from the Pine Forest Range is about \$482,000.

Mining Districts

The Warm Springs district, discovered in the late 1890s, is located in the northern end of the Pine Forest Range. The Ashdown mine is the most important mine in this district as well as the most important producer in the entire range. Both gold and silver have been produced from large quartz veins in granodioritic rock. Couch and Carpenter (p. 69, 1943) indicate a total production of \$371,000 from this district through 1940. An unknown amount of tungsten was produced from the district during World War II and again in 1956 (Willden, Table 21, 1964). The Warm Springs district is about six miles north of the Blue Lake Section and immediately west of the Mahogany Mountain Section.

The Adams or Homer Verne gold mine is located one mile north of the Blue Lake Section in the Pine Forest district. At this property gold values occur in quartz veins cutting hornfels, quartzites, schist, and slate. Development of the mine consisted of two adits and numerous prospect pits and trenches. Couch and Carpenter (p. 68, 1943) estimate gold production from the property to be about \$27,000 between 1935 and 1940.

The Leonard Creek district is located about 3 miles south of the Blue Lake Section. As a result of exploration in 1931 a considerable amount of auriferous gravels averaging 50 cents per cubic yard to a depth of 20 feet were discovered. However, only about \$5,000 in placer gold was recovered from this area through 1938 (Vanderberg, p. 29, 1938). Couch and Carpenter (p. 67, 1943) indicate a production of \$42,000 from the district in 1936, implying the gold was derived from lode occurrences. Since district boundaries are seldom rigidly fixed entities, it is possible that this ore was derived from mines in the Varyville district several miles to the southwest.

The Varyville district is located about 6 miles southwest of the proposed primitive area. The district was first prospected in the 1870s and Couch and Carpenter (p. 68, 1943) report that about \$37,000 in gold was produced through 1936. A small amount of copper has been shipped from this district.

Within the proposed Blue Lake Primitive Area are numerous mining claims containing prospect pits, trenches, and bulldozer cuts. None of the claims, however, exhibit any indications of occupancy or recent activity. Without exception prospect workings are overgrown with vegetation and recent claimposts are not in evidence. Information derived from location notices indicate that the commodities prospected for include gold, silver, tungsten, copper, uranium, molybdenum, and zirconium. It is doubtful that any of the prospects shipped ore in any quantities whatsoever.

Granite could be produced from the area for use as a decorative stone. However, it is extremely unlikely that any such operation would come to pass. Many other occurrences of this commodity are more readily accessible at other locations closer to potential markets and shipping facilities.

None of the quartz occurrences in the proposed Blue Lake Primitive Area are valuable now or would be valuable in the future for industrial or decorative purposes. Impurities present in these veins and lenses and their limited extent make the quartz unsuitable for use as a source of silica. The distances from potential markets is also prohibitive in considering the quartz as a source of decorative stone or silica.

There is no significant potential for the occurrence of "leasing act" minerals, including oil and gas, and no exploration for these commodities is anticipated.

Mineral Resource Inventory

A portion of two Indicated Mineral Resource Areas are shown on the Bureau's Mineral Resource Inventory (MRI) to include portions of the Mahogany Mountain and Blue Lake Sections. The Warm Springs Area (NW-2-2) includes a fringe of the north and west portion of the Mahogany Mountain Section while the Leonard Creek Area (NW-2-4) includes the southern and western portion of the Blue Lake Section.

The Indicated Mineral Resource Areas depicted, however, must be interpreted in light of several factors: 1) the inventory was largely compiled from an evaluation and interpretation of the literature by H. W. Mallery almost 10 years ago, and 2) it has not been updated to include current geologic knowledge nor has it been field checked in this specific area what-so-ever (personal communication, H. W. Mallery, 1973). Thus while the writer's examination to a large degree closely supports the interpretation presented in the Mineral Resources Inventory, this current investigation in essence supercedes and modifies the Mineral Resource Inventory to the degree indicated herein.

Exploration Programs

There is no known current exploration interest in the general area by any of the numerous mining companies engaged in such activities in Nevada. A few years ago, however, one of these companies spent a portion of the summer examining prospects and evaluating the mineral potential of the Pine Forest Range without apparently developing a further interest (personal communication, H. W. Mallery, 1973).

Sample Analysis

Stream sediments are representative of the weathering products of rocks undergoing erosion within the drainage basin. The panned concentrates of a stream sediment sample reflects the heavy mineral content of rocks or mineral deposits present upstream. The evaluation of panned concentrates therefore permits large areas to be rapidly tested for mineral probabilities and anomalous samples can be traced upstream to their source. All of the panned concentrates from the proposed Blue Lake Primitive Area were examined visually for gold, monazite, and zircon. No gold was seen in any of the samples and none were anomalous in other heavy minerals such as iron, titanium, platinum, etc.

Selected samples from prospects indicating manifestations of mineralization were fire-assayed for gold and silver. Assay results are recorded under the appropriate prospect in the appendix to this report. None of the assay results indicate the presence of valuable mineralization. Inasmuch as no prospects suggested a potential for the occurrence of mineral commodities other than gold and silver, no samples were assayed for other metals.

Mahogany Mountain Section

No valuable mineral deposits were found within the Mahogany Mountain Section of the proposed primitive area, and it is unlikely that any such deposits exist. Several claims, staked in 1955, exist in the southwestern part of the area. These claims have been located on isolated pods of quartz in granodioritic rocks. Examination of these claims by the writer indicated to him that they do not warrant further prospecting. The lack of visible prospecting efforts suggests that the claims have apparently been abandoned for years.

Several other discontinuous quartz veins or lenses were found within the Mahogany Mountain Section. There is no evidence of prospecting or location notices at any of these outcrops. The sterile appearance of the veins and the lack of visible mineralization indicates to the writer that prospecting would not be rewarding.

Mr. Vernon Cannon¹ was interviewed on the possibility of mineralization in the Mahogany Mountain Section. Mr. Cannon stated that he had prospected the entire area in past years and knew of no area within the proposed boundary that would warrant any prospecting attempts. In Mr. Cannon's opinion the only mineralized area lies north of Thacker Canyon, less than a mile or so outside the northwest boundary of the area. Investigation revealed no zones of alteration or any other manifestations of hydrothermal activity that might signify the presence of mineralization. In short, the writer's examination supports Mr. Cannon's opinion that the subject area contains no exploitable mineral deposits.

1 Mr. Vernon Cannon represented himself as a miner-pro prospector, owner of the Ashdown mine, and resident of the area for over 20 years. He voiced no objection from a minerals standpoint to establishment of the primitive area within the boundaries as proposed.

Other mining claims are located in Thacker Canyon and Alta Creek Canyon. These claims are just outside the area boundaries. The mining locations in Thacker Canyon indicate that the claims were staked in 1955 and 1956. No valuable mineralization was found on any of these claims and the lack of any fresh prospecting activity suggests that the claims have been abandoned. The two claims in Alta Creek Canyon were located in 1973. The claimant, Mr. Lee Nelson, Denio, stated that they were located for gold and nickel. However, evidence of mineralization that might suggest economic potential is not present on either claim. No evidence of prospecting is present on the two claims either.

Blue Lake Section

Commercial or potentially commercial mineral deposits were not found within the Blue Lake Section of the proposed primitive area. There are no known claims in the central portion of the section. Some claims exist in the northern portion, but the southern portion is heavily staked with mining claims. All of the claims in the Blue Lake Section are confined to metamorphic rocks or its contact zones with the granitic rocks, which are the most favorable sites for the occurrence of ore deposits in the area. None of the claims, however, evidence current occupancy and all appear to be inactive. In fact, extensive growth of vegetation on many of the prospect workings suggests that most of the claims have not been worked for years and may be abandoned.

Northern Blue Lake Section

This area encompasses the exposures of metamorphic rocks and the contact zone in the northern portion of the Blue Lake Section around Big Creek. Claims in this area have been located on veins and the contact zone. The majority of the veins are clear to white quartz and with the exception of minor iron oxide staining are barren of visible mineralization. Other veins consist of silicified limonitic material containing occasional quartz stringers. Assays of selected samples indicate negligible precious metal values.

The contact zone was examined for the occurrence of contact metamorphic ore deposits, principally tungsten mineralization. However, as the host rocks are unreactive and relatively unfavorable for such deposits, none were found. One crystalline limestone unit crops out near the contact but no tactite was seen and no evidence of valuable mineralization is present.

Central Blue Lake Section

The only veins found in the central portion of the Blue Lake Section are composed of quartz. These veins are small, discontinuous, and none were found that exhibited valuable mineralization. No manifestations of hydrothermal alteration are present in the area. None of the pegmatites examined offer any economic possibilities either as they are too narrow.

Southern Blue Lake Section

Considerable prospecting has centered around the metamorphic rocks and contact zone in the vicinity of Snow Creek, referred to here as within the Southern Blue Lake Section. Several claims were located in the early 1940s and others are undoubtedly older. Claims have been located up to the late 1960s in the area.

Manifestations of mineralization are present in this area to a greater degree than in any other portion of the proposed primitive area. Quartz veins commonly exhibit iron staining and some contain pyrite, molybdenite, chalcopyrite, and secondary copper minerals and other sulfide minerals that were so finely disseminated that they could not be identified with a hand lens. Assays of the most promising veins indicated, however, that there is no ore grade material present in the surface outcroppings or on mine dumps.

A colorful but meager surface showing of chrysocolla, a copper-bearing mineral, has been the object of prospecting immediately adjacent to the extreme southwest corner of the area. The collar to one drill hole



Photo 9. Essentially flat-lying quartz vein in granodioritic rocks of the southern Blue Lake Section. Note the minor iron oxide staining and the generally blocky, conspicuous appearance of the vein.



Photo 10. Small prospect working typical of those observed within the proposed Blue Lake Primitive Area. Note the sharp delineation between the unaltered wall rock and the shear zone, which has been excavated to a limited degree.

was found in the field at this prospect, the purpose of which was apparently to determine the extent of mineralization at depth. The result of the drilling, however, is not known.

Although no gold was found in panned concentrates from Snow Creek, the geologic environment favors this area as the source of the placer gold in the Leonard Creek district south of the proposed primitive area. The occurrence of placer gold in this district does not indicate a rich source occurring in the proposed primitive area, but rather natural concentration of relatively non-economic mineralization upstream.

SUPPLEMENTAL DATA

Maps

Four maps (two sets each of the Mahogany Mountain and Blue Lake sections) were prepared to accompany the text of this report. These maps were derived from available USGS topographic map sheets and enlarged to a scale of 2 inches equals 1 mile. One set of maps depicts basic geology and structure, and delineates traverses taken during the field examination of the proposed Blue Lake Primitive Area. The second set of maps identifies the location of mining claims or prospects found in the field, and illustrates graphically a ranking by the writer of portions of the proposed Primitive Area in terms of its minerals potential.

Mining Claims

Included in the appendix is a catalogue of mining claims and prospects found in the field with appropriate comments on each location. When possible, the last known claimants have also been identified. The listing has been keyed numerically to the set of maps identifying the location of mining claims and prospects in the proposed Blue Lake Primitive Area.

CONCLUSIONS

The Pine Forest Range has been extensively prospected since the late 1800s. However, little, if any, ore has been produced from the lands within the boundaries of the proposed Blue Lake Primitive Area. The

conclusions that follow are based on this writer's field examination and an evaluation of the present geologic knowledge of the subject lands, and are believed to accurately portray the minerals potential of the proposed Blue Lake Primitive Area at this time.

Mahogany Mountain Section

There are no known mineral deposits in the Mahogany Mountain Section of the proposed primitive area. Geologically this area is essentially unfavorable for the occurrence of ore deposits, and it is considered unlikely that such deposits exist. From a mineral resource standpoint it appears that this section may be withdrawn from minerals entry without reservation.

Blue Lake Section

Northern Blue Lake Section

Manifestations of mineralization in the northern Blue Lake Section are few. None of the outcrops or prospects examined contain economic mineralization. The potential for future minerals production from this area is considered by this writer to be remote.

Central Blue Lake Section

No ore deposits or manifestations of significant mineralization were found in the granodioritic rocks of the central Blue Lake Section of the proposed primitive area, and it is, in the writer's judgement, concluded that the possibility for such occurrences is unlikely.

Southern Blue Lake Section

Examination of surface outcrops and prospects in the southern portion of the Blue Lake Section revealed no occurrences of mineralization that would, in the writer's judgement, warrant further prospecting. Furthermore, it would be expected that previous prospecting of this area would have lead to the discovery of ore if such deposits existed. The possibility of blind ore bodies in and adjacent to the contact zone cannot

be entirely discounted. However, full determination of this potential would require the application of exploration techniques far beyond the scope of this investigation. Surface indications do, however, suggest that such possibilities are slight.

It is concluded that the Blue Lake Section of the proposed primitive area can be withdrawn from minerals entry without materially jeopardizing future mineral resources.

R E Bennett

Reviewed and accepted as technically adequate:

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APPENDIX

CATALOGUE OF MINING CLAIMS

Blue Lake Section

<u>PROSPECT</u>	<u>CLAIMANT(S)</u>	<u>COMMENTS</u>
1	Unknown	Rock monumentation of claim. No workings on claim. No veins, structures, or mineralization noted within claim boundaries. Country rock is metasiltstone.
2	Unknown	Shallow prospects pit on 1 foot wide, 3 foot long quartz lens. Some iron oxide staining on the quartz. No sulfide minerals observed.
3	LODE CLAIM NO. 1 (Sundown Mine) Domingo & Frank Obirta Pete & John Yrueta J. Doming Mairguga Doratio Lasa Domingo Bernardo Loc: Nov. 1, 1955	Shallow, partially caved pit in metasiltstone. Pit appears to have been dug on crystalline limestone lens that was completely removed by the excavation. Crystalline limestone on dump contains epidote and quartz stringers. No valuable mineralization noted.
4	Unknown	Badly slumped prospect trench. Iron stained quartz float in the vicinity. Dump contains sugary quartzose rock with abundant disseminated pyrite. Assay of select dump material: Au= trace, Ag= 0.44 oz. (RB73-2)
5	Unknown	Two prospect pits and a trench. Excavations did not penetrate alluvium. Silicified, limonitic float appears to have been the object of the prospecting. Country rock is quartzite and metasiltstone. Assay of float material: Au= trace, Ag=1.22 oz. (RB73-3)
6	Unknown	Old prospect pit in metasiltstone and quartzite. Pit did not penetrate alluvium. No veins or mineralization noted.
7	Unknown	Prospect pit on 3-inch wide fault zone. Also exposed in the pit is a silicified, limonitic vein. Country rock is metasiltstone. No mineralization or hydrothermal alteration of fault zone or wall rock. Assay of silicified vein material: Au= none, Ag= 0.36 oz. (RB73-17)
8	Unknown	Claim located on small quartz lens. Minor iron oxide staining. No sulfide minerals seen. No workings on claim.

<u>PROSPECT</u>	<u>CLAIMANT(S)</u>	<u>COMMENTS</u>
9	B & D NO. 1 J. Stephrn George E. Hougland P. O. Box 790 Winnemucca, Nev. Loc: June 6, 1955	Claimants contend scheelite, uranium, and other metals. Claim located along contact zone. No workings on claim. Small crystalline limestone unit occurs within boundaries of claim. No tactite developed or valuable mineralization seen.
10	George L. McCulley Alturas, Calif. Loc: May 16, 1941	Discontinuous bull quartz vein in granodiorite. No mineralization seen. An apparent attempt was made to drive an adit and cut the vein at depth. The adit was never completed. This claim appears to be located just outside the proposed primitive area boundaries.
11	SKYVIEW COPPER DYKE C. W. Reicheit Mary Dyke Harold Dyke Adel, Oregon Loc: May 14, 1958	Showing of chrysocolla in fracture zone in felsite. No primary sulfides seen. Four prospect pits and one trench observed. Inclined drill hole apparently intersects structure at depth. No information on the results of drilling. Claim extends into proposed primitive area, however, the mineralized zone does not.
12	Unknown	Several prospect pits and trenches that do not penetrate overburden. Iron stained quartz float is in the area and apparently was the object of interest. No sulfide minerals present in any of the quartz float
13	MONTE CRISTO NO. 1 Leo Weihnunster Bea Weihnunster Don Weihnunster Bob Weihnunster Loc: June 15, 1941	Badly caved prospect pit in metasiltstone. No mineralization or structures seen in prospect pit. Some quartz stringers occur in dump material.
14	George L. McCulley Alturas, Calif.	Old prospect pit in metasiltstone. Quartz float in the vicinity. Pit does not penetrate colluvium. No mineralization observed.
15	George L. McCulley Alturas, Calif.	Prospect pits in overburden. Minor quartz float in the area. No mineralization observed.
16	Unknown	Claim located on 2-3 foot wide quartz vein in granodiorite. Vein can be traced for about 100 feet. Some iron oxide staining in the vein, but no sulfide minerals seen. Vein appears barren of valuable mineralization.

<u>PROSPECT</u>	<u>CLAIMANT(S)</u>	<u>COMMENTS</u>
17	Unknown	Shallow prospect pit less than 1 foot deep. No mineralization present and pit does not penetrate overburden.
18	Unknown	Bulldozer cut exposing contact between granodiorite and meta-siltstone. Some brecciation and silicification at the contact. No mineralization observed.
19	Unknown	Two shallow prospect pits exploring iron oxide stained quartz veins less than 6 inches wide. Old bulldozer cut exposes intrusive contact. No mineralization present.
20	Unknown	Silicified breccia zone 2-4 feet wide exposed for about 180 feet. Very fine-grained sulfide mineral (pyrite?) disseminated throughout the vein. Chip sample across vein assayed: Au= none, Ag= 0.20 oz. (RB73-14)
21	SOLAR #2 Lester Horn P. O. Box 672 Canyonville, Oregon	Claimant contends gold, silver, and copper. Small prospect pit exposes intrusive contact. Nothing of economic interest seen on claim.
22	Unknown	Discovery claimpost situate on overburden. No workings on claim.
23	Unknown	Quartz vein in granodiorite. Vein is about 2 feet wide and can be traced for 100 feet. Scalping has exposed one end of the vein where it pinches out into granodiorite. Aside from iron staining and scattered molybdenite crystals in the quartz, no other mineralization was seen.
24	Unknown	Old prospect pit explored breccia zone developed between felsite plug(?) and metamorphic rocks. No metallics or anything of economic interest seen. (This prospect is outside the proposed primitive area.)
25	UP & UP NO 4 F. Dunnington Loc: Oct. 9, 1950	Claim located in metamorphic rocks containing large crystals of hornblende. No workings seen on the claim. Nothing of economic interest present.
26	STYBO CLAIMS Ray Clark Madena Clark Denise Clark Suzanne Clark P. O. Box 144 Lovelock, Nev Loc: April 1970	Claims appear to be a relocation of older claims. Judging from the size of the dump some production occurred from this mine, probably 20 years or so ago. Antimony was apparently the commodity of interest (E. F. Lawrence, p. 80, 1963). An adit and

PROSPECTSCLAIMANT(S)COMMENTS

26 (con't.)

numerous prospect pits explore several different shear zones. (None of the claims appear to be in the proposed primitive area.)

Mahogany Mountain Section

27	JOHNSON NO. 2 Carl B. Johnson Loc: Jan. 3, 1956	Claims in granodiorite. Two old prospect trenches in overburden. Nothing of economic interest seen. (Claims are outside proposed primitive area.)
28	SPAR DYKE CLAIMS Thurnam Aldern Earl Peterson 1707 1st Ave Walnut Creek, Calif. Loc: May 9, 1955	Claims located on granodiorite. No workings present. Nothing observed that would warrant further investigation. (Claims appear to be outside the proposed primitive area.)
29	GOLDEN FLEECE NO. 1 William Roney Lee Nelson Denio, Nev. Loc: Apr. 17, 1973	Claim located on fine-grained (felsite?) dike in granodiorite. Claimant contends dike runs 3-4 pounds of nickel per ton. No workings on claim and nothing of economic interest seen. (Claim is outside proposed primitive area.)
30	GOLDEN FLEECE	Claim in granodiorite. No veins, structures or mineralization observed. No workings on claim. (The claim is outside the proposed primitive area.)
31	ALTA CLAIMS Ronald C. Begg William Wright John Day, Oregon Loc: May 25, 1956	Claims located on isolated pods of quartz in granodiorite. No workings on the claims. No valuable mineralization present.