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Washoe Co.-general

Item 51

Mineral Resources Inventory and Analysis

of the

Long Valley Resource Area

Carson City District

Nevada and California

includes: Ft. Sage Mtn. Uranium
Stateline Peak

by

R. E. Bennett and H. W. Mallery

1973

INTRODUCTION

The Long Valley mineral resource inventory and analysis is the result of a review of the geology, an inventory of the mineral resources, and an evaluation thereof, by two geologists of the U. S. Bureau of Land Management headquartered at Carson City, Nevada.

As only a limited amount of time was available for field work, this review and inventory can in no way be considered comprehensive. As a result, its analysis and evaluation is (1) largely based on a cursory field reconnaissance (During which not even all known mineralized areas were investigated) by Bennett late in 1972, augmented by Mallery's general knowledge of the areas acquired during the preceding 10 year period, and (2) limited library research by both authors. Bennett was responsible for much of the descriptive portions of the Present Situation (URA-3) and Management Opportunities (URA-4). Mallery contributed much of the introductory text, and both writers are responsible for the analyses and evaluation wherever presented.

The Long Valley resource areas encompass slightly under 69,000 acres, or approximately 92 sections of land. The field investigations conducted and the format for this report are based upon procedures outlined in the Bureau of Land Management manual, as supplemented by amendments thereto. These instructions infer that this inventory and analysis shall be based primarily upon mineral resource inventories prepared over the years by geologists employed by BLM. However, no inventory is in existence for the lands situate in California.

Reference is made to the published literature insofar as is practicable. It goes without saying, however, that this study could not have been accomplished--and in fact would have very little value--without the considerable quantity of information and assistance provided over the years by numerous individuals and organizations. These contributions are hereby gratefully acknowledged, as is the cooperation and assistance of N. P. Stark, BLM's nonmetallic specialist in Nevada, in the evaluation of nonmetallic mineral commodities in these units.

The narrative portion is composed of two parts, the Present Situation and the Management Opportunities. Additionally, two sets of maps were prepared on plastic overlays in order to present some of this information graphically. They are referenced to both the existing Mineral Resource Inventory and to this narrative.

1. Mineral Status - depicts status of the mineral estate (ownership) of the units, regardless of surface ownership.

2. Mineral Resources - depicts "indicated mineral areas", "mineral resource areas", and "potential mineral extraction (mining) areas".

"Indicated mineral areas" are large areas, that based on geology, may contain mineral deposits, but the exact location of the deposits may not be known. Known areas of mining claims, without regard to geology, are also included. "Mineral resource areas" are located within indicated mineral areas and have a greater potential in terms of discovery of significant mineral deposits. "Potential mineral extraction areas" contain known mineral deposits that are in production, are being developed, or are capable of being developed under existing technology. Also included in this catagory are adjacent lands necessary for dump sites, mill or plant sites, and other activities associated with the necessary development of an ore deposit.

Any attempt to assess the mineral potential of an area is a difficult task at best. When time does not permit a thorough analysis, the problems involved become impressive. These factors must be kept in mind by anyone using this document and its related exhibits for contrary to popular impression, mineral resources are not finite in quantity, but change over time.

I. PRESENT SITUATION - MINERALS (URA-3)

The Long Valley resource area includes portions of northeastern Lassen and Plumas Counties, California.

Bonham, in Bonham and Papke, relates the basic mining history of the Long Valley resource area, as follows:

> "The oldest property in the district is the Antelope mine, located in sec. 31, T. 22 N., R. 18 E., at the south end of Petersen Mountain. Two claims were patented at this mine in 1887. Reportedly, some shipments of oxide copper ore containing gold and silver were made from this property prior to 1900, but no figures are available concerning this early-day production.
>
> "In 1954 uranium mineralization was found at the Buckhorn claims located on the west flank of Petersen Mountain on the California-Nevada border. A number of other claims were subsequently located in an 8-mile-long area along the west flank of the range. Shipments of uranium ore were made from the district in 1955 and 1956, principally from the Buckhorn claims. The total production from the Buckhorn property largely from the portion located in California has been in excess of 400 tons of uranium ore, with a grade exceeding 0.2 percent U_3O_8.
>
> "From 1957 to 1966 there has been no recorded production from the Stateline Peak district. Mining activity has been limited to assessment work and minor exploration."

There has been, in essence, little mining activity in the Long Valley resource unit; the geology of which, however, is basically similar to that of the Nevada section in the Pyramid resource area.

Prior to the establishment of the county system of government, a number of "mining districts" were established in these resource areas to facilitate record keeping. The nomenclature "mining district" is presently archaic but because early mining history and data is referenced to individual "districts", they will be referenced to upon occasion in the following text. It should be clearly understood, however, the term "mining district", and its ofttimes vaguely described parameters, have no significance whatsoever in defining the presence or type of mineral resources or in their evaluation: The fact is that all persons concerned should avoid using the term insofar as practicable.

A number of areas exhibiting manifestations of the probable presence of valuable mineralization were noted by early explorers in the region. It was in these areas that prospecting was concentrated. Later on these became known as mining districts. None within the resource area, however, acquired the size and importance of the neighboring Comstock District in which Virginia City was established. Those that were named are summarized below:

Name	Year Developed	Period of Greatest Activity	Commodities Extracted	Recorded Production	Reference
Stateline Peak	1880's	late 1800's 1955-56	copper, gold silver, uranium	$700+	Bonham

Nonmetallic minerals occur widely across the resource area. None occur in "mining districts", per se (another good reason for eliminating this term in reference to mineral resources).

The only significant such deposit is summarized below:

Name	Year Developed	Period of Greatest Activity	Commodities Extracted	Recorded Production	Reference
Red Rock	1960's	1960's	pumicite	small	Bonham

The recorded value of mineral commodities extracted from the Long Valley resource area to date is approximately $700 in metallic minerals. Figures for uranium production have been withheld, but presumably the value exceeds several thousand dollars. The value of nonmetallic minerals probably exceeds that of metallic minerals, but recorded production is not known. The metallic minerals of economic value occur mainly in veins, replacement deposits, or as particles disseminated throughout pre-existing rock. Generally such deposits occur in volcanic rocks, metamorphosed sedimentary or volcanic rocks, or sedimentary rocks (including sands and gravels). That is, in just about all of the rock types occuring in the resource area with the exception of massive granites.

Frequently, the presence of metallic mineralization is manifested by development of suites of distinguishing minerals, or by geophysical or geochemical anomalies. These diagnostic features are normally not obvious, require the application of considerable experience and resources for their detection, and are not readily interpretable. Furthermore, in the Basin and Range province--which includes the resource area in its entirety--most, if not all, of the as yet undiscovered ore deposits are mantled (concealed) by either Tertiary volcanic rocks in mountainous areas or by unconsolidated sands and gravels in the valleys.

Nonmetallic rocks and minerals of economic value occur principally in Tertiary volcanic and sedimentary rocks. Many deposits of the various marketable commodities, however, closely resemble common, valueless rocks, and this situation creates real problems in their identification. Further, the ubiquitous overburden commonly conceals more than is revealed posing significant problems in the discovery and evaluation of this class of deposit.

It is estimated that approximately 90 percent of the Long Valley resource area has a potential for the occurrence of either metallic or nonmetallic deposits of either current economic value, or of economic value in the reasonably forseeable future.

As of December 1972 there were no prospects or operational mines active in the area.

For all practical purposes, therefore, as of late 1972 there were no significant mineral exploration programs underway within the Long Valley resource area. It should be remembered, however, that the late autumn is not the season of the year in which most prospecting is attempted. Had the field investigation been affected during the summer months in all likelihood much more activity would have been noted.

It may be anticipated that the level of metallic mineral exploration in the resource area will increase moderately with time, and that non-metallic mineral activities will increase greatly with time.

There is no significant potential for the occurrence of "leasing act" minerals in the resource area, and little or no exploration for such minerals is anticipated.

General Geology

The geology of the Long Valley resource area is basically the same as in the Pyramid resource area. Hence, a review of the Nevada section as presented in the Pyramid Mineral Resource Inventory and Analysis will suffice. In this regard, Bonham, in Bonham and Papke (op. cit.) writes:

> "Igneous, metamorphic, and sedimentary rocks, ranging in age from Permian(?) to Recent, crop out in the...area. The pre-Tertiary rocks, mostly of Mesozoic age, consist of metasedimentary and metavolcanic rocks intruded by granitic plutons.
>
> "The Tertiary rocks are predominantly of volcanic origin, consisting of complex, intertonguing piles and sheets of flow, pyroclastic, and intrusive rocks. Intercalated with the volcanic piles are lenses of sedimentary rocks.
>
> "Rocks of Quaternary age consist predominantly of alluvial and lacustrine sediments.
>
> "The structural geology of the area is complex and still little understood, in large part because of a lack of adequate detailed geologic mapping....The data presently available indicates that there have been two main deformational episodes, one of late Mesozoic age, and the other of Cenozoic age.
>
> "The Mesozoic deformation began in the Jurassic with the folding, faulting, and low-grade regional metamorphism of the Triassic and Jurassic volcanic and sedimentary rocks. Numerous granitic plutons were subsequently intruded into these rocks, principally in the Cretaceous, during the waning stages of the orogenic episode.
>
> "The Cenozoic deformation began in the Miocene and has continued into the Recent. Structural elements associated with this deformation include normal faulting and associated tilting, warping, wrench faulting, and related folding and volcanism."

The Long Valley resource area is underlain by rock types common to the northern Sierra Nevada range and thus are categorized as being Sierra Nevadian in character although they lie to the east of the front of the present day Sierra Nevada mountains and are within a geomorphic province

referred to as Basin and Range. This has the following significance: strip off the mantle of sands and gravels and remove the layers of volcanic units from this part of the Basin and Range province and the underlying rock types are basically identical to those observed in the higher elevations of the Sierras--old (Mesozoic) metamorphosed sedimentary and volcanic rocks and slightly younger (also Mesozoic) igneous rocks of granitic nature occurring in complex inter-relationships to each other. These older rock types are commonly referred to as the basement complex and have considerable significance in terms of the occurrence of metallic ore deposits. In contrast, the nonmetallic deposits are mainly restricted to the younger (Tertiary) volcanic units--which include intercalated sedimentary rocks--and the much younger (Quaternary) sands and gravels, etc.

The geology of the resource area is further complicated by the existence of both the Sierra Nevada range frontal fault systems, which trend generally northerly, and a deep seated northwest-trending shear zone known as the Walker Lane system. The end result of these major faults is manifested in large-scale dislocations of pre-existing rock units, and the creation of zones with which metallic ore deposits may be associated. An example of the extent of dislocation is demonstrated by the fact that north of Reno the basement complex achieves an elevation of about 7,000 feet above sea level, whereas across the Walker Lane structure a few miles farther to the northeast, as at the north end of Pyramid Lake, the basement complex is found at an elevation of 200 feet below sea level, a displacement of about 7,200 feet vertically within but a few miles lateral distance.

As to the significance of faulting to ore deposits, the Virginia City ores, as well as practically all of the other presently known metallic mineralization in the resource area is intimately and directly associated with fault zones.

There is little or no potential for the existence of petroleum products in the resource area although valleys such as Long Valley in California conceivably might contain limited quantities. N. P. Stark's (oral commun. 1972) comments in this regard is that any exploration in these units would be "highly speculative". He states he bases these conclusions on the fact that the sedimentary environment contains largely clastics and cherts, that both the rock units and other structures are mainly Pleistocene (early Quaternary) in age, and that if suitable traps had been created in all likelihood they have been broached.

The potential for geothermal energy resources is measurably less than that for petroleum products. Basically, areas containing volcanic rocks are favorable; areas within volcanic terrane exhibiting manifestations of

hydrothermal alteration are more so; and, areas containing hot springs have, of course, an even greater potential. Less obvious areas are those containing concealed intrusive rocks wherein probably the greatest potential of all exists for the development of significant sources of geothermal energy. Such areas would not exhibit any indications whatsoever at the surface which a non-earth scientist would associate with geothermal energy.

Washoe Co. - general

NW-21-3
U, Au, Ag, Cu
pumice (pozzolan)

Mining District: STATELINE PEAK DISTRICT
(Uranium, Gold, Silver, Copper, Pumice)

T. 21-22-23 N., R. 17-18 E.
Plumas and Lassen Counties, California
USGS Chilcoot 15-min. quadrangle (1950), Loyalton 15-min. quadrangle (1955)

GENERAL BACKGROUND

The Stateline Peak area includes the western slope of Peterson Mountain and Long Valley. Most of the area is in California.

A large number of uranium claims have been located in the area, most of which are in California. Only one mine, the Buckhorn, located in the northwest slope of Peterson Mountain, has any record of production. Over 400 tons of uranium, exceeding 0.2 percent of U_3O_8, has been produced from this claim between 1955-1956.

The Antelope (Mars-Homestake) Mine in located in section 31, T. 22 N., R. 18 E., and the workings at this property straddle the Nevada-California State Line. Nominal gold and silver has been produced from the mine prior to 1890 and again between 1939-1941.

Pozzolan (an additative that imparts beneficial properties to cement, such as age and acid resistance) has been mined by open pit methods in section 25, T. 24 N., T. 17 E. Operations were suspended when the bridge connecting the plant on the west side of Long Valley Creek with the deposit on the east side of the creek was washed out.

GEOLOGY AND MINERALOGY

The core of Peterson Mountain is composed of granitic rocks of Cretaceous(?) age that intrude older metavolcanic rocks. Both the Hartford Hills Rhyolite and the Kate Peak Formation unconformably overlie some of the Mesozoic rocks. Plio-Pleistocene fluviatile and lacustrine sediments are locally unconformable on the older rocks.

Uranium mineralization occurs in ash-flow tuffs of the Hartford Hills Rhyolite, in Pliocene sedimentary rocks, and along fracture surfaces in the granitc rocks. In the ash-flow tuffs, uranium mineralization occurs in northeast-trending fracture zones up to 1 inch thick. Mineralization in the sedimentary rocks is confined to fracture zones, bedding planes, and arkosic sandstone lenses.

Uranium mineralization consists of gummite, autunite, and uranophane(?).

Bennett, Jan. 1973

The Antelope Mine is located on a northwest-trending quartz vein, averaging 5 feet thick, in Mesozoic metavolcanic rocks. Malachite, azurite, and pyrite are present on the mine dumps of this property. Bonham (1) reports that selected vein material contains small amounts of gold and between 2 and 10 percent copper.

The pozzolan deposit consists of rhyolitic ash beds.

POTENTIAL FOR DEVELOPMENT

With the exception of the Buckhorn claims, uranium mineralization in the other prospects in the area does not appear too promising. Undoubtedly some ore-grade material exists at these properties, but the limited extent of this material makes future development unlikely. However, considering the stragetic importance and projected future demands for uranium, a minor economic potential exists for the future production of uranium in the Stateline Peak area. Ore-grade material exists at the Buckhorn claims, but the reserves are not great. Should any production come from the area, it will probably come from this property first.

Past workings at many of uranium prospects consist simply of small prospect pits. Several of the uranium claims have been explored by shallow shafts and moderately large trenches and open pits. Future production, if any, would probably come from small open pits.

Although gold and silver has been produced from the Antelope Mine, copper mineralization is predominate. Inasmuch as the geology and mineralized structure are favorable, some potential exists for the discovery of economic mineralization. The old workings at the Antelope Mine consist of several shafts, adits, and numerous prospect pits. Future workings, if any, will probably be underground.

The pozzolan deposit will probably be exploited sometime in the future. Production at the pozzolan deposit will come from open pits.

COMPANIES AND CLAIMANTS ACTIVE IN AREA

The following claimants have been identified in the Stateline Peak area:

1. BARBARA L, LOLA G Group
   George Baker, et.al.
   Reno
   (14 lode claims)

2. ----------
   Baker & Sins Mining Co.
   5350 S. Virginia, Reno
   (111+ lode claims)

3. BLACKJACK Group
   N.N. Stewart
   Box 702, Big Pine, CA
   (2 lode claims)

4. DAISY MAE
   W. F. Ash
   1202 Mark Twain, Reno

5. YELLOW JACKET Group
   George Baker
   Reno

6. REX Group
   J. C. Bastain
   6686 Oakmont Dr.
   Santa Rosa, Calif.
   (3 lode claims)

Bennett, Jan. 1973

7. BUCKHORN Group
Ted Delanga
1953 Hymen, Reno

8. DELTA
E. L. Carlson
1254 A St., Sparks

9. STEMO PLACER, SILVER DYKE
S. T. Esterholdt
Rt. B 1213-F
Shingle Springs
(15 placer claims)

10. ----------
Melvin L. Cook
PO Box 100, Doyle

11. AVENGER Group
Armand Girola
10 State St., Reno
(24 lode claims)

12. HANDRA Group
Handra Mining Co.
313 Irwin St.
San Rafael, Calif.
(21 lode claims)

13. HOPE GROUP
Lady Mining Co.
1730 Riley, Reno
(18 lode claims)

14. LASSEN-NITE Group
Glenn Mastelotto
6107 Vista Knolls
Paradise, Calif.
(42 lode claims)

15. SLIP Group
Donald Master
1307 12th, Sparks
(8 lode claims)

16. OLD CRONA Group
W. C. Knox
Milford, Calif.
(9 lode claims)

17. RYSON Group
Val Ryson, et.al.
100 Ralston, Reno
Jul. 1967
(33 placer claims)

18. OWENSVILLE Group
D. O. Roberts
3711 Almeada
Menlo Park, Calif.
(13 lode claims)

19. SHAMROCK Group
Shamrock Mining Co.
1014 Rice Rd., Ojai, Calif
(9 lode claims)

20. TWIN PEAKS Group
James S. Deal
(2 lode claims)

21. LINDA ANN
Willard McQuire

22. RAINBOW, BONANZA Group
William Wheatley
(6 lode claims)

23. JACKPOT Group
C. D. Brown

24. PROSPECT Group
W. L. Hammersmith
(4 lode claims)

25. SURPRISE Group
Ed T. Redma
(3 lode claims)

26. ----------
Harry Boswell
(9 lode claims)

SELECTED REFERENCES

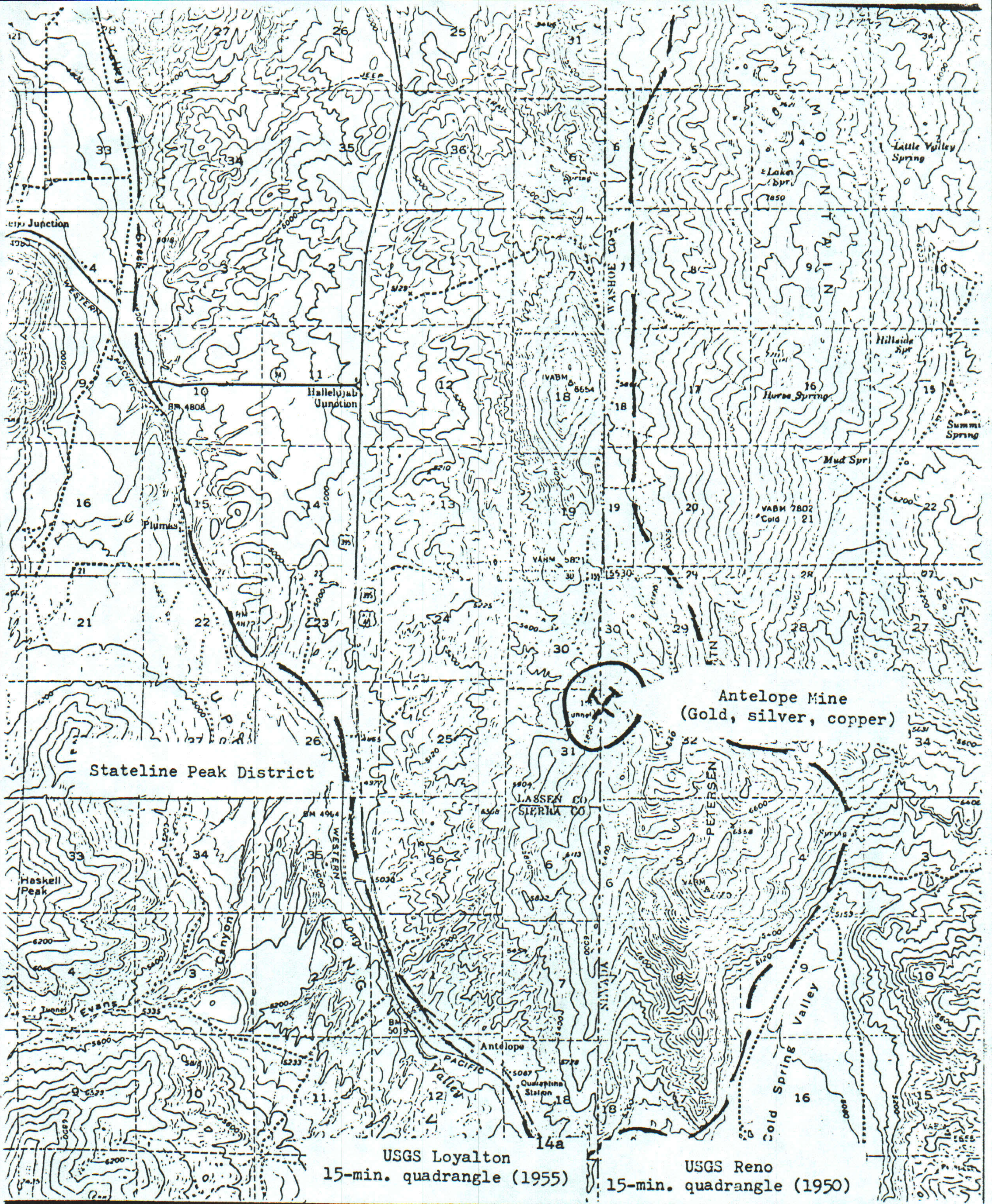
1. Bonham and Papke: Geology and Mineral Resources of Washoe and Storey Counties, Nevada; Nev. Bur. Mines Bull. 70, 1969.

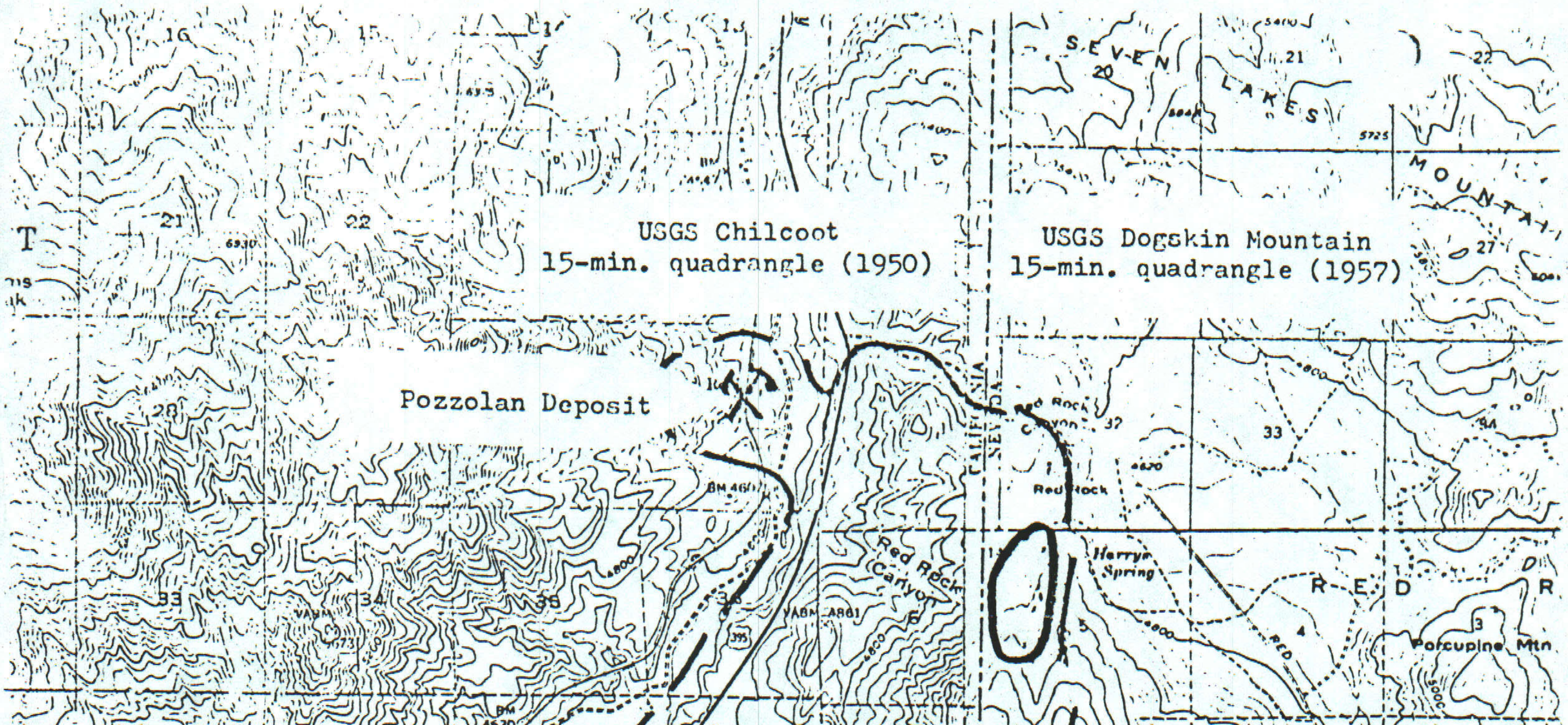
2. US AEC: Reports of Uranium Investigations, 1955 (unpublished).

FIELD EXAMINATION

Bennett, Nov. 1972

Bennett, Jan. 1973


Antelope Mine
(Gold, silver, copper)
Stateline Peak District
USGS Loyalton
15-min. quadrangle (1955)
USGS Reno
15-min. quadrangle (1950)
Hallelujah Junction
Little Valley Spring
Hillside Spr
Horse Spring
Mud Spr
Haskell Peak
Plumas
Antelope
Cold Spring Valley
PETERSEN
WASHOE CO
LASSEN CO
SIERRA CO
NEVADA
WESTERN PACIFIC
MOUNTAIN



USGS Chilcoot
15-min. quadrangle (1950)
USGS Dogskin Mountain
15-min. quadrangle (1957)
Pozzolan Deposit
Buckhorn Mine
(Uranium)
SEVEN LAKES MOUNTAIN
RED ROCK VALLEY
Red Rock Canyon
Red Rock
Harry Spring
Porcupine Mtn
Augusti Spring
Chokecherry Spring
Tunnel Spring
PETERSEN
CALIFORNIA
NEVADA
WESTERN

Washoe Co. - ground

NW-21-2
U

Mining District: FORT SAGE MOUNTAIN URANIUM PROSPECTS, SEVEN LAKES MOUNTAIN AREA
(Uranium)

T. 23-24-25 N., R. 18-19 E.
Washoe County, Nevada
USGS Dogskin Mountain 15-min. quadrangle (1957)

GENERAL BACKGROUND

Numerous uranium prospects are located in area NW-21-2. To facilitate discussion, the area has been divided into two smaller geographic areas; each of which will be considered separately.

I. Fort Sage Mountain Uranium Prospects

Several uranium prospects are located in sections 6 and 8, T. 24 N., R. 18 E., on the south slope of State Line Peak in the Fort Sage Mountains. These prospects were not examined by the writers; AEC records indicate there apparently has been no production.

GEOLOGICAL AND TECHNICAL DATA

At a uranium prospect in section 6, autunite reportedly occurs at coatings on pebbles and in small pockets in sandstone. Two samples assayed by the AEC contained 0.04 and 0.05 percent equivalent U_3O_8. In section 8, torbernite, autunite, and carnotite(?) are present in a fault zone in metamorphic rocks. No samples were analyzed, but reportedly a high thorium content was recorded (2).

POTENTIAL FOR DEVELOPMENT

The uranium prospects in the Fort Sage Mountains are indicated to be economically submarginal. A minor amount of ore-grade material may be present at these properties, but when compared with other, more favorable areas in the planning unit, it is unlikely that any production will come from the Fort Sage Uranium Prospects in the future.

Past activities in the area have been confined to the excavation of prospect pits.

Bennett, Jan. 1973

COMPANIES AND CLAIMANTS ACTIVE IN AREA

1. DONALD Group
   S. P. Miller
   2491 W. 133 Ave.
   San Leandro, Calif.
   (2 lode claims)

2. BLACK HAWK Group
   H. E. Lupton
   Herlong, Calif.
   (9 lode claims)

II. Seven Lakes Mountain

Seven Lakes Mountain is located south of Fort Sage Mountain and north of Petersen Mountain. Several uranium prospects are located in sections 16, 19, 26, 27, 30, and 31, T. 24 N., R. 18 E. The properties were originally located during the uranium "boom" of the 1950's, but there has been no apparent production from any of the prospects. The area was not examined by the writers.

GEOLOGICAL AND TECHNICAL DATA

The oldest rocks exposed on Seven Lakes Mountain are ash-flow tuffs of the Hartford Hills Rhyolite. These rocks are overlain by volcanic rocks and associated sediments of the Pyramid Sequence.

Uranium mineralization occurs in fault zones and carbonaceous lenses in Tertiary ash-flow tuffs of the Hartford Hills Rhyolite. Autunite(?) and other unidentified uranium minerals have been reported, and assayed samples collected from several properties by the AEC averaged less than 0.10 percent equivalent U_3O_8 (2).

POTENTIAL FOR DEVELOPMENT

Some ore-grade uranium mineralization is reported to be present in a few prospects on Seven Lake Mountain. As the price of uranium rises, the area will again be of interest to prospectors. However, unless more promising ore bodies are discovered or a serious depletion in uranium stockpiles exists, the potential for production from the present properties seems slight.

Past mining operations consist of numerous prospect pits. Future workings, if any, would consist of open-pit or underground workings, or a combination of both.

COMPANIES AND CLAIMANTS ACTIVE IN AREA

The following list identifies some of the claimants in the Seven Lakes Mountain area:

Bennett, Jan. 1973

1. INDEPENDENCE Group
   Paul Langslet
   882 Main, Susanville, CA
   (12 lode claims)

2. NORMA J Group
   Paul Langslet
   (9 lode claims)

3. CRESENT Group
   Robert McPherson
   Star Rt. 2, Box 75
   Susanville, Calif.

4. BUCKEYE Group
   W. Howard Davis
   (8 lode claims)

SELECTED REFERENCES

1. Bonham and Papke: Geology and Mineral Resources of Washoe and Storey Counties, Nevada; Nev. Bur. Mines Bull. 70, 1969. (Includes Geologic Map of Resource Area)

2. US AEC: Reports of Uranium Investigations, 1955 (unpublished).

FIELD EXAMINATION

Not examined.

Bennett, Jan. 1973