5190.0006

(96) A + B

Item 18

Investigation of Lone Mountain-Weepah District

Esmeralda County, Nevada

Introduction:

Investigation of the mineral potential of portions of the Lone Mountain-Weepah mining district was undertaken as part of the work to be performed under Contract Number DE-A508-79NV10058, Department of Energy, titled "Potential Mineral Occurrences on Nevada Lands Being Investigated for Possible Use in Nuclear Waste Storage". Work consisted of a review of geologic literature pertaining to the area, compilation of information concerning individual mineral occurrences onto standard Nevada CRIB forms, investigation of land status and mineral claim activity, and reconnaissance field examinations of selected areas.

Location:

The area investigated is located on the flanks of Lone Mountain, a prominent topographic landmark which lies about nine miles west of the central Nevada town of Tonopah. The study area, the Lone Mountain-Weepah mining district, includes Lone Mountain itself, the Weepah Hills to the southwest, and portions of the General Thomas Hills to the southeast.

All of the Lone Mountain-Weepah area considered in this study is in Esmeralda County, Nevada, and is within the boundaries of the Lone Mountain and Silver Peak 1:62,500 scale and Gilbert SE and Paymaster Canyon 1:24,000 scale U.S.G.S. topographic quadrangle maps.

The Lone Mountain mining district, as now defined, includes Weepah in the Weepah Hills, General Thomas in the General Thomas Hills, Alpine on the west slope of Lone Mountain as well as all of the prospects along the east slope of Lone Mountain.

Mining History and Production

According to Thompson and West (1881, p. 518) Mexican miners made discoveries in the Lone Mountain district in 1863, and organized the district in 1864. The district was described as abandoned in 1866, then was re-opened in 1878 when some ore was shipped to Belleville for treatment. This early activity was probably on the east and southeast sides of Lone Mountain. Total production from this period is unknown. Discoveries were made at the Alpine Mine on the west side of Lone Mountain sometime shortly after 1900, and production was first reported in 1903. The Alpine property is credited with $209,000 production in silver and lead in 1903, and with declining amounts through 1908. Total production from the Alpine properties, including some in 1918, was approximately $275,000. Activity in the Weepah portion of the district dates from 1902 when gold discoveries were made. Little came of this first activity, or of the second flurry in 1908. The main period of production at Weepah followed discoveries made there in 1927. Between 1935 and 1939, the Weepah Nevada Mining Co. produced some $1,615,037 in gold from one property. Southeast of Weepah a small tonnage of barite was produced from the American Barite mine in the 1907-19 period.

In other parts of the district, mention is made of mining in the General Thomas Hills in 1904, and production was being reported from that area in 1910-1921.

With the exception of a few carloads of lead-zinc ore mined in the mid-1960's from the Gold Eagle mine south of Lone Mountain, there has been little recent production from the district. In 1978, the Nevada State Mine Inspector's Report showed only one active mine in the district, a one-man operation of the Blue Jay turquoise mine in the General Thomas Hills.

Total production from the Lone Mountain district is estimated to be approximately $3,500,000. Most of this was in gold, silver, lead and turquoise, with minor values in zinc, copper, and barite.

Land Status:

Most of the land within the Lone Mountain district is public land administered by the Bureau of Land Management. Fee land within the district consists of a few patented mining claims. The largest patented claim block consists of 18 claims surrounding the Alpine mine. Other patented claims are the Silver Top #2, the Alaska, the Sulfur Pure, and Alum Pure, and the Dipper claims.

Numerous unpatented mining claims cover large areas within the study area. The number of these claims, their distribution, and location can be used as somewhat of an indication of the current mining activity in the area.

The various claim blocks, patented and unpatented, are outlined on the map accompanying this report. The locations of the blocks have been plotted as accurately as possible from information obtained from the Esmeralda County Recorder's office. Some errors in location are known to exist, however, and exact locations can only be obtained from the location of marked boundaries in the field.

Large portions of the BLM administered land in the district, including Lone Mountain itself and most of the eastern and southern Weepah Hills, are included within BLM Wilderness Study Areas. At the present time, these areas are subject to strict surface management regulations and the BLM will treat them as if they were wilderness areas until the final wilderness determinations are made. It is understood that vehicular travel along existing roads will not be restricted, but any activity which may detract from the wilderness character of the area would be subject to restraint.

General Geology:

In the Lone Mountain district, complexly folded and faulted sediments ranging in age from Precambrian through Orodovician have been intruded by granitic plutons of Cretaceous to Tertiary age. Lone Mountain itself is composed of a core of Cretaceous intrusive rock flanked to the east and west by folded Precambrian and Cambrian sediments. Younger intrusives (Tertiary) crop out in the foothills

northeast of Lone Mountain, and other intrusives of Cretaceous to Tertiary age outcrop along a roughly defined east-west zone extending from the General Thomas Hills westward through the northern Weepah Hills. These intrusives cut Precambrian sediments in the Weepah Hills, and complexly faulted Paleozoic rocks in the General Thomas Hills. Younger lamprophyre dikes cut the Lone Mountain and Weepah plutons, and aplite and pegmatite dikes can be seen near the Moly prospect and Dipper claims, southeast of Lone Mountain.

Most mineral occurrences in the district occur in metamorphosed sedimentary rocks within the contact aureoles of the various intrusive bodies. In the Alpine area, silver-lead mineralization occurs in replacement bodies along bedding shears in dolomite near contact with the Lone Mountain intrusive. In the belt extending from General Thomas Hills to Weepah, copper-lead-zinc mineralization occurs in shear zones in tactite bodies associated with the Weepah pluton and younger intrusives adjacent to it. At Weepah, gold mineralization occurs along a fault which cuts Precambrian sediments. To the east of Weepah prospecting has been done for copper, gold, and tungsten (?) in tactites related to the Weepah intrusive. Uranium is reported to occur in limonitic zones along fractures in the northern part of the Weepah pluton. Along the east side of Lone Mountain, silver, lead, zinc and some copper occur in small deposits associated with northwest-trending faults and porphyry dikes (Bonham and Garside, 1979, p. 133).

Specific Areas of Mineralization:

Within the Lone Mountain mining district, mineral occurrences are widespread and varied. For the purposes of this study, however, the occurrences have been grouped into four general geologic-geographic units: the western contact area of Lone Mountain, the eastern foothills of Lone Mountain, southern Lone Mountain, and the Weepah Hills. Each of these has slightly different mineral occurrences, and each has its own potential for future mineral discoveries.

Western Contact Area, Lone Mountain

Mining activity on the western slope of Lone Mountain was centered around the Alpine, northern Alpine, and Alpine Eagle properties. At these and nearby smaller occurrences, silver-lead ores were mined from small but high-grade replacement orebodies. According to Phariss (1974, p. 83), shipping ore from the district consisted mainly of vuggy, friable cerussite cemented by hemimorphite. Silver halides were probably the important pay mineral. The orebodies formed as the result of replacement of the Precambrian Reed Dolomite along a bedding plane shear zone which Phariss (1974) describes as a thrust fault. Local ore controls appear to have been intersections of northeast trending shears and northwest trending faults with gentle folds along the plane of the favorable bedding plane shear zone. All of the orebodies are within the aureol of contact metamorphism related to the Lone Mountain pluton.

Important guides to ore in the district have been silicified zones and bodies of white jasper which occur along structures within the favorable carbonate rocks. Phariss (1974) described this relationship in reference to the Alpine orebodies, and suggested two areas nearby where the presence of similar conditions could point to new, undiscovered ore. Other favorable areas could exist to the southeast in the band of Reed Dolomite which flanks Lone Mountain, or to the southwest where the favorable carbonates disappear under alluvial cover.

In addition to Alpine type silver lead occurrences, prospecting targets for disseminated gold could be present in the district. There are trace amounts of gold present in the Alpine ores (Phariss, 1974, p. 86). Silicification and the presence of jasper, important ore guides common to almost all disseminated gold prospects in Nevada, are present. The Wyman Formation, present in the area and underlying the Reed Dolomite, contains thinbedded siltstone and argillite with interbedded limestone and dolomite. The Reed itself contains silty lenses. Thinbedded, silty rocks are the host rocks for many of the fine-grained gold occurrences in Nevada. The presence of trace amounts of gold associated with

zones in carbonate rock could define prospecting targets in the underlying thinbedded silty rocks. Folding and faulting in the Precambrian rocks is much more complex than presented by Phariss, and structural complications could detract from or eliminate altogether favorable prospecting targets. However, mineralization could exist in rocks now covered by alluvium to the southwest of the Alpine property, or at other structurally controlled locations along the western flank of Lone Mountain.

Eastern Foothills, Lone Mountain

This area is well described by Bonham and Garside (1979, p. 132-133), and the detailed description need not be repeated here. Of most interest in this area is the Moly Prospect molybdenite occurrence which lies just south of the area mapped by Bonham and Garside. The molybdenite occurrence is in altered rocks on the north edge of a quartz monzonite intrusive. Other areas of alteration within this same intrusive were seen on the Dipper claims to the south of the molybdenite occurrence. Areas of aplite and pegmatite diking and some copper mineralization were seen within the Dipper claim area. The alteration noted may coincide with a magnetic low which appears to embay the north side of an east-west trending magnetic high. U.S.G.S. open file map 79-1456 shows this feature.

This area of altered intrusive rocks should be prospected for porphyry type copper-molybdenum mineralization. The entire east-west trending zone, extending west across the southern end of Lone Mountain and the northern edge of the Weepah Hills can be included within this area of favorability.

Southern Lone Mountain:

This area covers the small basin between Lone Mountain to the north and the Weepah Hills to the south. No mining activity was noted here, but large patches of K-feldspar alteration with associated iron staining are present in outcrops of intrusive rocks. This area lies west of the Moly Prospect, and is along the

the east-west magnetic high described in the previous section on Eastern Lone Mountain. Although there are no obvious indications of economic mineralization associated with alteration in this area, the presence of alteration in itself is important. The alteration is along the southern margin of the Lone Mountain intrusive, and may be related to younger intrusive activity such as the small diorite bodies which outcrop on the north edge of the basin or the Moly Prospect granite which outcrops to the east.

Old location notices on posts prove that the iron-stained outcrops have received attention in the past. A large block of claims has recently been staked immediately south of the altered outcrops, on the southern edge of the small basin. These claims, the Itsa group, are reported to have been staked to cover an area of anomalous radioactivity detected during an airborne radiometric survey.

The presence of alteration in intrusive outcrops, coupled with evidence of multiple stages of intrusive activity all which coincide with the east-west magnetic trend make this area attractive for future mineral exploration. The recent staking of uranium claims shows the area is receiving exploration attention at this time.

Weepah Hills:

In dollar value, the Weepah Hills have provided the largest production within the Lone Mountain district. Most of this amount, of course, was provided by the Weepah Nevada Mining Co. gold mine at Weepah. Much smaller but still significant production came from the Gold Eagle mine east of Weepah.

The Weepah gold deposit occurs in a shear zone cutting Precambrian siltstones and carbonates (Wyman Formation) which crop out in a northeast-trending belt along the southeast contact of the Weepah pluton (Sonderman, 1971). In the vicinity of the old gold operation, there may be potential for development of additional

reserves of low grade gold ore. A California-based company now holds the Weepah deposit and claims surrounding it and is reported to be evaluating the area. To the east of Weepah, small copper-gold occurrences were mined from tactite pods which formed along the contact between the Cambrian Campito Formation and the Weepah stock. Some tungsten (scheelite) has been reported from this area also. About two miles southeast of these deposits, barite has been mined from small deposits in the Harkless and Polenta Formations (Albers & Stewart, p. 60). Along the north side of the Weepah stock, numerous small pendants of Wyman Formation outcrop within the predominantly granitic terrain. Small, old, prospects in this area explore gold-bearing quartz veins which cut the metamorphic rocks. Recent claim staking in this area (Ape claims) is reported to have been done to cover areas of radioactivity detected during a reconnaissance, airborn radiometric survey. The radioactivity is reported to be associated with iron oxide filled shear zones in the Weepah pluton.

West of the Weepah Hills, a pediment flanks the western slope of the range. Examination of this area revealed outcrops of garnet tactite and aplitic rocks. A pebble dike and a small but interesting gossan also outcrops within this area. Very little prospecting appears to have been done in the pediment, and it may have exploration potential.

East of the Weepah pluton outcrop, in the eastern Weepah Hills, extensive areas of garnet tactite occur in outcrops of Cambrian carbonate rocks. Along the northern part of this area, toward Lone Mountain, many small prospects explore showings of copper, lead, zinc, silver mineralization in lenses and pods within the tactite. One of these, the Alaska, appears to have had sizeable underground workings but production figures are not known. At the Gold Eagle mine to the south, fairly large bodies of lead-zinc-silver replacement ore were mined from deposits associated with a small quartz monzonite intrusive. In this entire area, individual deposits have been small, but the total outcrop of tactite and scatter of

mineralization is quite extensive. There could be potential for the discovery of additional replacement orebodies, and there could also be potential for the discovery of large disseminated orebodies in this part of the district. On to the south, in the southern Weepah Hills, there are several claim groups reportedly staked on barite occurrences. There may be potential for barite production from this district in the future.

Summary and Conclusions:

Mining activity in the Lone Mountain dates back to the early 1860's and has been more or less continuous to the present time. Major production has been in gold, but copper, lead, zinc, silver, turquoise and barite have also been produced from the district. Recent activity indicates that there may also be uranium potential. Current known activity in the district includes drilling at the Alpine Eagle, evaluation work at Weepah, uranium exploration in the northern Weepah Hills, and turquoise mining at the Blue Jay property. Many exploration firms are active in this part of central Nevada, however, and the Lone Mountain district is no doubt under scrutiny by many of them.

In the Lone Mountain district, evidence indicates several periods of intrusive activity. Large areas of silicated rocks occur in contact zones and areas of K-feldspar alteration and sericitization occur within some intrusive outcrops.

Mineralization, while not intense, is widespread and varied. There are areas of structural and lithologic favorability within the district. Studies of mineral zoning and alteration coupled with detailed geologic mapping could outline several favorable prospecting areas within the Lone Mountain district.

Selected Bibliography:

Albers, J. P., and Stewart, J. H. (1972) Geology and Mineral Deposits of Esmeralda Co., Nevada, NBMG Bulletin 78.

Ball, Sydney H. (1907) Geologic Reconnaissance in Southwestern Nevada and Eastern California, U.S.G.S. Bulletin 308.

Bonham, H. F. and Garside, L. J. (1979) Geology of the Tonopah, Lone Mountain, Klondike, and Northern Mud Lake Quadrangles, Nevada, NBMG Bulletin 92.

Couch, B. F., and Carpenter, J. A. (1943) Nevada's Metal and Mineral Production (1859-1940 inclusive), Univ. Nev. Bulletin, VXXXVII, No. 4.

Lincoln, Francis Church (1923) Mining Districts and Mineral Resources of Nevada, Nevada Newsletter Publishing Co.

Morrissey, F. R. (1968) Turquoise Deposits of Nevada, NBMG Report 17.

Phariss, E. I. (1974) Geology and Ore Deposits of the Alpine Mining District, Esmeralda Co., Nevada, Univ. of Nevada M.S. Thesis.

Sonderman, F. J. (1971) The Geology of the Weepah Mining District, Esmeralda Co., Nevada, Univ. of Nevada Thesis.

Spurr, J. E. (1906) Ore Deposits of the Silver Peak Quadrangle, Nevada, U.S.G.S. Prof. Paper 55.

U.S.G.S. Open File Report 79-1456 (1979) Aeromagnetic Map of the Lone Mountain Area, Nevada.