from NBMG OFR 83-9
See also 83-10 for
geochemical results.

(74)
Item 9

RAILROAD DISTRICT

3770 0009

The Railroad or Bullion district is located in the northern Pinon Range about 15 miles south-southeast of Carlin. The old mining camp of Bullion lies on the east side of the range at the entrance to the mine area. The mine area contains numerous adits, some of great extent, which occupy the steep upper slopes of the highest ridge (8,710') of the Pinon Range, known collectively as Bunker Hill and Ravens Nest. The adits occur in tight clusters on the north and west slopes of the peak.

The district was organized in 1869 a short time after the discovery of mineralized deposits at Mineral Hill located approximately 25 miles to the south. Smelters were in operation throughout the 70's and 80's at Bullion (Emmons, 1910), marking the beginning of a long and productive history of mining activity. Production figures are not complete, but an estimated 4.7 million dollars worth of Pb, Cu, Ag, Au and Zn were mined between 1869 and 1968 (Smith, 1976). Some production of barite has also occurred from the Pine Mountain Barite mine located on the west slope of Pine Mountain (Papke, in preparation).

The geology of the district was mapped at a scale of 1:12,000 by Ketner and Smith, 1963. The high peak area of Bunker Hill is underlain by generally massive to thickly bedded limestones, dolomites and minor quartzites and siltstones of the Silurian Lone Mountain Dolomite and the Devonian Devils Gate Limestone and Nevada Formation . Together the carbonates comprise a section about 2,300' thick. The main hosts for mineralization are the carbonates of the Nevada Formation and the Devils Gate Limestone. Older Paleozoic clastic rocks and dolomites are exposed within a narrow horst northeast of Bunker Hill. West of the district, the carbonate section is overlain by Mississippian argillites and quartzites. To the east they are unconformably overlain by Tertiary quartz latite tuffs and black vitrophyres (Ketner and Smith, 1963).

The sediments of the Railroad district are folded into a north-trending,

overturned anticline named the Pinon Range anticline. The axis is located just west of Bunker Hill. The central portion of the anticline is intruded by a stock and several dikes and is also the site of several high-angle reverse and normal faults. The most notable faults are the northeast-striking Bunker Hill Fault and the east-west-striking Bald Mountain Fault. Both faults have reverse movement, lie adjacent to mineralized areas and were later intruded by rhyolite porphyry dikes. The Bald Mountain Fault is post-intrusive as it truncates the north end of the stock, but other more minor faults in the district are likely related to deformation caused by the forcible intrusion of the stock. The faults and folds in the district do not seem to be the major control of ore deposition (Ketner and Smith, 1963).

The intrusive rocks in the district, as subdivided by Ketner and Smith, 1963, consist of two types; a medium crystalline granite which grades into quartz diorite and rhyolite porphyry. The outer shell of the stock is composed of the granite and the central core is intruded by a roughly circular body of rhyolite porphyry. The numerous dikes in the district also consist of rhyolite porphyry. Some of the intrusive dikes near the mineralized areas are sericitically altered.

Chemical analyses of the intrusive rocks from the district showed "more than average amounts" of Cu, W, Co, Ag, Pb, Sn or Mo in several different samples (Ketner and Smith, 1963). Minute crystals of pyrite, chalcopyrite, sphalerite, pyrrhotite, ruby silver and galena were observed in polished sections of the rhyolite porphyry core. Also samples of the Bunker Hill dike were found to contain more barite and sulfides than the main stock (Ketner and Smith, 1963). A biotite separate from a quartz monzonitic portion of the stock yielded a K-Ar age of 33 m. y. (Schilling, 1965).

The richest ore bodies in the district are replacement deposits located along the inersection of fractures or joints in the limestones and the rhyolite porphyry dikes. These deposits contain lead, silver and copper and usually form vertical

chimneys which have been mined to depths of 500' (Emmons, 1910). Thus far, a zone of secondary enrichment has not been reached. The entire deposit to this depth is oxidized. Ore minerals reported from the deposits are cerussite, horn silver, pyromorphite, malachite, azurite, chrysocholla, cuprite, pyrite, chalcopyrite, argentiferous galena, bornite, chalcocite, sphalerite, tetrahedrite, duftite (Pb Cu $(A_5\ O_4)$ (OH), and suprite (Emmons, 1910, Granger, 1957). The gangue minerals are quartz and calcite and everywhere the ore is stained by abundant iron and manganese oxides. The dumps from these deposits contain abundant gossans. Anomalous concentrations of Zn, Pb, Ag, Mo, Be, Y and La were found in mine dump samples collected from the central district (Ketner and Smith, 1963).

The location of the replacement deposits is marked by irregular zones of iron-rich gossan within bleached and **marbe**lized limestones. Marbelization of the limestone wallrock is a characteristic alteration observed throughout the entire district.

Tactite bodies developed locally and were mined primarily for copper (mainly chalcopyrite, bornite, chalcocite). They also contain galena, sphalerite and resultant oxidation products. Some of the ore mined from these deposits carried 3.8% copper and good valves in silver (Granger, et al, 1957). The largest tactite bodies lie along the granite limestone contact but similar deposits are found southwest of Bunker Hill near the Grey Eagle mine where only one small intrusive dike crops out (Smith and Ketner, 1978). However, a magnetic anomaly centered at Lee Canyon just west of the Grey Eagle Mine is interpreted to overlie a "large igneous body at shallow depth" (Smith and Ketner, 1976).

The tactites near the Grey Eagle mine are vein shaped occurrences which strike east-west and contain scheelite, in addition to copper. Their narrow, vertical form is suggestive that the deposits follow fissures or fractures in the limestone host rocks.

Although there is no recorded production of tungsten from the district, narrow (2-3' wide) scheelite-bearing tactites are exposed within the Davis Tunnel 3,000' beyond the portal. (Stager, in press). The tactite assayed 0.3 to 4.3% WO_3. The occurrence of scheelite in the district may be more common than previously thought. Dense, iron-stained tactite from dumps near the Grey Eagle and Standing Elk mines (sample 173 and 1533) contain some disseminated scheelite in addition to copper, lead and iron sulfide minerals.

Gold-bearing quartz veins crosscut the granite stock at the Delmas mine. However, the grade of the vein ore was too low to work profitably in the early years of mining.

Fluorite reportedly occurs in the ore at the Standing Elk mine (Papke, 1979). Although none was observed at this locality, a minor amount of fluorite was noted in a sample of turqoise-bearing clay gouge collected near the Bald Mountain Chief mine (sample 1683).

Near the Sun mine in the SE/4 of section 33, T31N, R53E, several small discontinuous replacement deposits of hematite occur in limestone near the granite contact (Shawe, 1962). Also, molybdenite occurs in core retrived from the rhyolite porphyry. The molybdenum content reportedly increases with depth (Smith, 1976).

Many of the mines in the central district are patented. The old workings are generally inactive but the mineralized areas on Bunker Hill have been the site of extensive exploratory drilling in the last few years.

Selected References:

Beal, L. H. (1963) Investigation of Titanium occurrences in Nevada: NBM Report 3, p. 15.

Emmons, W. H. (1910) A reconnaissance of some mining camps in Elko, Lander and Eureka Counties, Nevada: USGS Bull. 408, p. 89.

Flynn, D. B. (1957) Geology of a part of the Dixie Flats quadrangle, Elko County

Nevada: M.A. thesis, UCLA.

Granger, A. E., et al (1957) Geology and mineral resources of Elko County, Nevada: NBM Bull 54, p. 126.

Ketner, K.B., and Smith, J.F. Jr. (1963) Geology of the Railroad mining district, Elko County, Nevada: USGS Bull. 1162-B, p. B1-B27.

Papke, K. G. (1979) Fluorspar in Nevada: NBMG Bull. 93, p. 69.

Papke, K. G., Barite deposits in Nevada: NBMG Bull., in preparation.

Schilling, J. H.(1965) Isotopic age determinations of Nevada rocks: NBM Report 10, p. 31.

Shawe, F. R., et al (1962) Iron ore deposits of Nevada: NBM Bull 53, pt.c., p. 121.

Smith, J.F. and Ketner, K. B. (1972) Generalized geologic map of the Carlin, Dixie Flats Pine Valley, and Robinson Mountain quadrangles, Elko and Eureka Counties, Nevada : USGS Misc. Field studies, Map MF-481.

Smith, J.F. Jr. and Ketner, K.B. (1976) Stratigraphy of post-Paleozoic rocks and summary of resources in the Carlin-Pinon Range area, Nevada: USGS PP 887-B, p. B44.

Smith, J.F. Jr., and Ketner, K. B. (1978) Geologic map of the Carlin-Pinon Range area, Elko and Eureka Counties, Nevada: USGS Map I-1028.

Smith, R. M. (1976) Mineral resources of Elko County, Nevada: USGS OFR 1976-56, p. 135.

Stager, H., in press, Tungsten deposits of Nevada: NBMG Bull.

Whitehill, H.R. (1873) Biennial report of State mineralogist, State of Nevada for 1871-1872, Carson City, Nevada, p. 28.