

## MILL CITY (CENTRAL) MINING DISTRICT

## LOCATION

The Mill City mining district is located in the Eugene Mountains in northern Pershing County on the Humboldt County border. The mines on the north end of the range are in both Humboldt and Pershing counties and are accessible via poorly maintained dirt roads that lead south from the Pronto railroad siding. The mines on the south end of the range, in Pershing County, are accessible via a narrow but paved mine access road that leads into the old camp of Tungsten from Mill City.

## HISTORY

Historically, all of the Eugene Mountains were included in the Central mining district which was organized in 1862. The first work in this district was by L. Vary in 1856 who discovered the Fifty Six copper mine at the southern tip of the range. This is the first known mineral discovery in the area now included in Pershing County. In the 1860's work was done at the Golden Age and other mines on the northern edge of the range. Most of the activity at these mines had ceased by 1876 but some bullion production was reported from the Blackbird mine in 1908, and the Fifty Six mine produced some copper ore in 1917. Total recorded production for the district, 1871-1899, is only \$14,648. Tungsten was discovered in the southern portion of the district in 1914 and, beginning in 1917, tungsten has been the major metal produced from this district. The tungsten mining area is on the southern tip of the range, close to the old town of Mill City and the tungsten mines are commonly referred to as being in the Mill City mining district. Total recorded production of the Mill City district, 1917 through 1958, is about 2 million units of  $WO_3$ .

## GEOLOGIC SETTING

The Eugene Mountains are largely composed of a thick section of Triassic age shales, quartzites, and limestones. In mid-Mesozoic time, regional westwardly-directed folding and thrusting folded and locally overturned the sedimentary section. During late Cretaceous and early Tertiary time, the Triassic rocks were intruded by a number of small stocks and dikes. These intrusive rocks are mainly granodiorite in composition although the larger bodies vary to quartz monzonite and all are commonly cut by pegmatite and aplite dikes. Near the intrusive contacts, the sedimentary rocks are locally metamorphosed to hornfels, marble, and tectite.

## ORE DEPOSITS

## Old Central District Occurrences

With the exception of the Fifty Six copper mine, all of the pre-1900 vintage mines in the Eugene range are very similar in structure and

mineralization. Most of the mines were developed on prominent veins of milk-white ("bull") quartz which occupy northeast-trending shear zones in hornfels and granodiorite. All of the occurrences appear to be either directly related to a hornfels-granodiorite contact or are near a contact and, at several properties, the veins follow the contact itself. The veins and surrounding wallrocks are commonly stained with hematite and green arsenate minerals. Sulfides are sparse and are restricted to mainly pyrite and arsenopyrite with local concentrations of galena, sphalerite, and tetrahedrite. Wallrocks are commonly kaolinized and silicified near the vein boundaries. The Fifty Six copper mine was developed on a wide shear in granodiorite which has been kaolinized and mineralized with pyrite and copper sulfides. The outcrop of the deposit is stained green from thick fracture coatings of chrysacolla and other secondary copper minerals. At the time of our examination (September 1984, April 1985) the only activity on these deposits consisted of mining of some dumps at the Golden Age mine and some construction activity at the Republican Mine.

#### Mill City District

The major ore deposits in the Mill City portion of the Eugene range are the tungsten mines located south of Pole Canyon along the southeast edge of the mountain front. These tungsten (scheelite) deposits occur in thin but persistent limestone beds in the lower part of the middle Triassic Raspberry Formation that have been altered to tactite. The main production has come from a few distinct beds and the scheelite-bearing tactite bodies within these beds have formed near the points of contact of the beds with the Springer granodiorite stock. In the area of the mines, the limestone beds dip steeply and the tactite replacement bodies have the form of narrow, near-vertical lenses of tactite in marbelized limestone. Scheelite is present in the ores as disseminations and fracture coatings in the tactite bodies and as irregular blebs and crystal masses in quartz veins which cut both granodiorite and tactite. The mineralized zones also contain small amounts of molybdenite, chalcopyrite, rare bismuthinite, and up to several percent pyrite. The most important scheelite ore bodies are localized in those areas displaying intense silication and silicification. The Springer stock, the probable source for the tungsten mineralization, has been dated at  $78.4 \pm 2.9$  my.

The major tungsten production from the district originated from the Stank, Humboldt, and Springer mines on the west side of the Springer stock, and from the Sutton One and Sutton Two mines on the east side of the Springer stock. All of these deposits were operated by one company as the Nevada-Massachusetts property up until 1958 when tungsten mining ceased due to poor market conditions. In the early 1970's the mines were acquired by General Electric Co. and, following extensive exploration, tungsten mining operations were resumed in 1982 with announced reserves sufficient for 13 to 15 years of operations. Mining ceased after only a few months, and at this time (1985) the mines are on standby.

#### GEOCHEMICAL RELATIONSHIPS

Geochemical data from the quartz vein deposits in the Old Central portion of the Eugene range shows virtually every property to have very high arsenic values. Most have silver, antimony, copper, lead, and zinc,

present, and all samples showed detectable gold. Several of the properties also reported anomalous cadmium. The samples taken from the tactite tungsten properties in the Mill City portion of the range showed a quite different suite of elements present. In addition to tungsten and molybdenum, samples from these properties were generally high in manganese, and bismuth but were low in arsenic and antimony and contained no detectable gold.

#### SELECTED REFERENCES

- Johnson, M.G. (1977) Geology and Mineral Deposits of Pershing County, Nevada: NBMG Bull. 89.
- Kerr, P.F. (1934) Geology of Tungsten Deposits near Mill City, Nevada: NBMG Bull. 21.
- Lincoln, F.C. (1923) Mining Districts and Metal Resources of Nevada: Nevada Newsletter Publishing Co.
- Stager, H.K. (in prep) Tungsten Deposits of Nevada: NBMG Bull.
- Thompson, T.A., and West, A.A. (1881) History of Nevada: Howell-North, 1958 reprint.



