KENNEDY DISTRICT

LOCATION

The Kennedy mining district is located at the southern end of the East Range, mainly in T28N,R37 and 38E. The district includes mines and prospects in the vicinity of the old camp of Kennedy on the east side of the range as well as those in the vicinity of Rileyville (Henrietta Mine) in French Boy Canyon. Also included are manganese and copper prospects in the central part of T29N, R37E, and copper-molybdenum mineralization on the north flank of Granite Peak.

HISTORY

The Kennedy district was discovered in 1891 by Charles E. Kennedy. During the period of 1893-94 prospectors located numerous claims on a series of north- and northwest-trending narrow quartz veins in the vicinity of the Imperial and Gold Note mines in Kennedy Canyon on the east side of the mountain range (Vanderburg, 1936; Johnson, 1977, p. 64). These early workings were in the shallow oxidized zone, and the ores contained free-milling gold. Little work was apparently done in the sulfide zone before 1900. The mines were operated intermittently until 1950, but most of the development and production was between 1893 and 1905. After 1900, most of the mining was done by lessees (Johnson, 1977, p. 64). About $300,000 of gold and silver was reportedly produced, mainly between 1894 and 1905 (Muller and others, 1951).

The Henrietta Mine, in French Boy Canyon on the west side of the range, was reportedly discovered in the 1870's, and abandoned after minor prospecting in the oxide zone. The sulfide zone was explored after the mine was relocated in 1912. The oxidized zone was worked mainly for its gold and silver values; leaad, silver, and zinc values increased in the sulfide zone. The mine was operated intermittently until 1950, but production has been small (Johnson, 1977, p. 64).

In the late 1970's and early 1980's, an exploration program was carried out on copper-molybdenum porphyry-type mineralization located on the north flank of Granite Mountain in the central part of the district. The majority of the geologic mapping, geochemical and geophysical surveys, and diamond drilling was carried out by William A. Bowes, Inc. (Juhas, 1982; Bowes and others, 1982). The property was inactive in the fall of 1984, probably because of the low interest in copper-molybdenum exploration at this time.

GEOLOGIC SETTING

Granite Mountain in the central part of the mining district consists of Triassic granite on the southern flank of the mountain, and an Oligocne intrusive complex (gabbro-diorite-monzonite-quartz monzonite) comprises the northern flank (Juhas, 1982). These plutons intrude Pennsylvanian-Permian siliceous and volcanic marine eugeosynclinal rocks of the Havallah sequence and Triassic rocks (volcanic flows, tuffs, and tuffaceous sedimentary rocks) of the Koipato Group (Johnson, 1977, p. 64;

Whitebread and Sorensen, 1980). A small sliver of carbonate rocks of the Triassic Natchez Pass Formation overlies the Koipato at the eastern edge of the district (Johnson, 1977, p. 65).

Juhas (1980) reports that emplacement of the Oligocene diorite, monzonite, syenite and quartz monzonite was accompanied by pervasive potassium metasomatism and weak propylitic alteration. A major granitic body, which was intruded next, was accompanied by sericite-quartz-pyrite alteration. This was followed by a sequence of intermediate to felsic porphyritic dike rocks; associated with this event is potassic and propylitic alteration and associated chalcopyrite-molybdenite mineralization. The final igneous activity was the emplacement of diabase dikes and a rhyolite porphyry pluton. Juhas (1980) relates extensive pyrite-sericite-clay alteration and precious-base metal vein mineralization in the surrounding rocks to the rhyolite porphyry pluton.

ORE DEPOSITS

The mineralized area in the Kennedy district occurs in and around an Oligocene stock of monzogranite to granodiorite compositon. Copper and molybdenum concentrations occur within the intrusive rocks, and, accordingly to Bowes and others (1982), lead, zinc, silver, and locally gold deposits are zonally arranged around the intrusive complex.

In the mid 1970's, W. A. Bowes, Inc. found anomalous copper values in soils over a broad area of granodioritic rocks on the north flank of Granite Mountain. Diamond drilling in the area has outlined overlapping zones of molybdenum and copper in the subsurface. Molybdenite and chalcopyrite reportedly first occur at about 100 feet below the surface. The zones rich in chalcopyrite and molybdenite are about 460 m wide, but occurrences of molybdenite and chalcopyrite in drill core extend over a much larger area (Bowes and others, 1980, p. 433). The whole mineralized area is characterized by potassium metasomatism over a distance of about 1.8 km in one direction. Propylitic alteration is also associated with the copper-molybdenum mineralization and the mineralizing event is believed to be associated with intermediate to felsic porphyry dikes (Juhas, 1980).

Vein deposits in the vicinity of the old camp of Kennedy on the east side of the East Range occur in Oligocene intrusive rock, in Mesozoic Koipato Group volcanic rocks, and in sedimentary and volcanic rocks of the Paleozoic Havallah sequence. These veins are a network of intersecting quartz pyrite veins which contain minor calcite and galena, sphalerite, chalcopyrite, arsenopyrite, pyrite, tetrahedrite, pyrrhotite (Muller and others, 1951), chalcocite, some argentite, and gold (Wallace, 1974). Tourmaline is present in some veins and as a wallrock alteration mineral; specular hematite is reported from the Borlasca Mine. Supergene minerals recognized include malachite, azurite, chrysocolla, chalcocite, covellite, and cuprite. Argentite in the ore replaces galena, and may be supergene (Wallace, 1974, p. 66-70). The veins exhibit open-space and crustiform textures. The trend of the veins is northwest to west-northwest (Wallace, 1977, pl. 3), and the veins generally dip southwest.

The wallrocks of those veins that cut the Oligocene intrusive rocks and Havallah sequence rocks are altered in the vicinity of the veins. Alteration minerals include biotite, tourmaline quartz, and minor calcite and potassium feldspar. Veins along the southern edge of the district are localized in shear zones in Koipato Group rocks. The Gold Note and

Borlaasca Mines are along the main vein in this area. Wallrocks here contain specular hematite, wollastonite, epidote, calcite, and andradite garnet (Wallace, 1977, p. 63-64). The oxidized zone, ranging in depth to 50 or 125 feet down dip from the surface, contained 0.75 oz of gold and 12.0 oz of silver per ton (Klopstock, 1913). The secondary sulfide zone varies from 50 to 75 feet in depth below the oxidized zone and contains some copper, lead, and zinc with high-grade gold-silver values. The primary sulfide zone averages 65 feet in depth below the secondary sulfide zone and contains 0.52 oz gold and 10.0 oz silver with traces and occasional enrichments of lead, zinc, and copper (Johnson, 1977, p. 65).

The Henrietta Mine, located in French Boy Canyon on the west side of the East Range, is developed along a quartz-sulfide vein that varies from a few inches to 4 feet in thickness in a thrust(?) fault in greenstone and schist of the Havallah sequence. In the upper part of the fault zone, the vein has been completely oxidized and the ore minerals are earthy oxides and carbonates of lead and zinc. In the lower levels, below 400 feet(?) from the surface down the dip of the vein, sulfides predominate over oxidized material - principally galena, sphalerite, and pyrite, with minor chalcopyrite as narrow bands or ribbons generally on the foot and hanging walls of the fault, occasionally at a few places within the vein. At depth, the banded structure of the vein is less apparent; quartz and sulfides appear to be in more or less intimate mixture (Johnson, 1977, p. 65).

Approximately 3.5 km northwest of the Henrietta Mine, north of French Boy Canyon at the front of the range (S33,T29N,R37E) is a hill locally known as Jasperoid Peak. This area, a reported gold exploration target (Bowes and others, 1982, fig. 2), consists of jasperoid and jasperoid breccia developed in the Havallah sequence (Whitebread and Sorensen, 1980).

In the vicinity of Jasperoid Peak, in S/2, S34,T29N,R37E are copper prospects at several old shafts, adits, and pits which reportedly expose massive sulfide mineralization (Whitebread and Sorensen, 1980; Hallof, 1982, p. 378). These reported occurrences could be volcanogenic exhalative massive sulfide mineralization like that at the Big Mike Mine in the northern Tobin Range (Tobin and Sonoma Range mining area).

Whitebread and Sorensen (1980) show numerous manganese prospects located to the northeast of French Boy Canyon in S/2,T29N,R37E. These manganese occurrences are not described elsewhere, but based on their presence in oceanic eugeosynclinal rocks of the Havallah sequence, they are most probably syngenetic volcanogenic exhalative deposits like those elsewhere in Pershing and Humboldt Counties.

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