

## NIGHTINGALE DISTRICT

## LOCATION

The Nightingale district encompasses the southern portion of the Nightingale Range, the northern portion of the Truckee Range, and the southern portion of the Sawtooth Range. Most of the district, including the main producing mines, is located in Pershing County, but two small tungsten mines and several prospects are located within adjacent Washoe County.

## HISTORY

According to Bonham (1969) the Nightingale district has been essentially a producer of tungsten ores although occurrences of uranium, gold, silver, molybdenum, and copper as well as several different types of industrial minerals are present in the district.

The tungsten deposits of the Nightingale Mine, the principal producer in the district, were discovered in 1917 and a small amount of tungsten ore was produced in 1917-1918. There was little development in the district until 1929 when the Gold-Silver-Tungsten Co. purchased the Nightingale Mine. This company built a mill on the property and operated intermittently through 1939. The mines of the district were extensively worked during World War II (1942-1946) and the Korean War (1952-1955) when ore was shipped to the Toulon mill. The district has been idle since 1956. During the 1970's, considerable tungsten exploration was done in the area of the old mines but no additional deposits of any minable size were found. The district was inactive at the time of our examination.

## GEOLOGIC SETTING

The Nightingale district is underlain by Triassic and Jurassic shales and limestones that have been intruded by Cretaceous granodiorite. All of the known metallic deposits in the district are related to the granodiorite and associated intrusive rocks. Tertiary lavas and pyroclastic rocks and younger basalt flows cover parts of the southern part of the Nightingale district. The tungsten deposits are in tactites at and near the contact of granodiorite and limestone. The contact is irregular in detail although generally concordant with bedding in the sedimentary rocks (Johnson, 1977).

## ORE DEPOSITS

Most of the mining activity in the Nightingale district has centered around the Nightingale tungsten mine on the east side of the Nightingale Range. This deposit is the largest of several that occur along a generally north-trending contact zone that lies along the eastern flank of the range. At the Nightingale Mine, scheelite occurs in tactite along a limestone-granodiorite contact zone. The tactite is mostly quartz, epidote, and garnet, with substantial amounts of calcite, pyroxene, and



minor amounts of tremolite, pyrrhotite, molybdenite, chalcopyrite, arsenopyrite, pyrite, and scheelite (Johnson, 1977). According to Smith and Guild (1942), the richest specimens of scheelite are associated with coarse quartz and euhedral epidote crystals. Lenses containing imperfectly-formed scheelite crystals an inch across have been found at the mine. The average grade of the Nightingale Mine was, however, less than 0.5%  $WO_3$  (Smith and Guild, 1942). At the Red Hammer prospect, north of the Nightingale Mine, ilsemanite coatings were seen on a coarsely-crystalline tactite formed in small pendants in granodiorite.

Other tungsten deposits in the district include the M.G.L. Mine on the west side of the range in Pershing County and the Crosby Mine on the south end of the range in Washoe County. The Crosby deposit mineralogy is somewhat unique for a tactite, argentiferous cosalite, a lead-bismuth sulfosalt occurs in late-stage quartz veins which cut the tactite body (Bonham, 1969).

Sulfide-bearing quartz veins have been explored in the Black Warrior Peak area of Washoe County and a pegmatite occurrence has been prospected in the Stone House Canyon area of Pershing County, on the northern edge of the district. The Black Warrior Peak veins contain small amounts of sulfides, chiefly pyrite, galena, sphalerite, tetrahedrite, and some stibnite. The Stone House pegmatite contains streaks of black tourmaline as well as fine-grained sulfides.

Uranium occurrences have been prospected at several locations within the Nightingale district. At the Four Jacks area, in the northern part of the district and of the western slope of the Nightingale Range, small pods of uranophane, autunite, and possibly uraninite occur along shear zones in shales and siltstones of the Jurassic-Triassic Auld Lang Syne Group. To the south, in the extreme southern portion of the Nightingale Mountains in Washoe County, several uranium occurrences are present in Tertiary volcanic and sedimentary rocks of the Hartford Hill Rhyolite and Chloropagus Formation (Bonham, 1969).

#### GEOCHEMICAL RELATIONSHIPS

Ore samples taken from the tactite tungsten deposits within the district showed considerable variability in geochemistry. All were high in manganese, reflecting manganese content of garnet from the deposits, and all had tungsten present. They were all generally low in antimony, arsenic, and base metals although one sample from a shear zone at the Crosby Mine was very high in arsenic. This sample was also high in boron and contained 0.7 ppm gold. Bismuth content of the skarns was quite variable, ranging from over 1000 ppm at the Nightingale deposits to not detected at deposits at Jaybird. Some tin was detected in samples from both the Nightingale and M.G.L. mines. Silver was found to be present in several of the tactites, and gold was detected in small amounts in samples from the Nightingale, Crosby, and M.G.L. mines. Anomalous molybdenum was found in samples from the Alpine Mine and the Crosby Mine.

Samples from the vein deposits in the Washoe County part of the district were uniformly anomalous in antimony and contained variable but high silver values. Gold was detected in four of the five samples taken in this area.



## SELECTED REFERENCES

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