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Item #25
76SAN ANTONIO DISTRICT

LOCATION

The San Antonio district covers the northwest portion of the San Antonio Mountains east of Big Smoky Valley about 25 miles north of Tonopah. The district includes the old camp of Cimarron in Township 6 North, Range 42 East on the north end of the range and the Liberty camp in the northwest portion of Township 5 North, Range 42 East along the west side of the mountains. At present, access to the district is difficult. Cimarron camp can be reached by very poor roads from the east but dune sand in Smoky Valley and restrictions by Arco security guards at the Hall Mine prevent access to any of the mines or prospects on the west side of the range.

HISTORY

Springs at the site of the San Antonio stage stop in Smoky Valley north of the San Antonio district were visited by John Fremont in 1845 (Hall, 1981), and Kral (1951) relates that diggings south of Liberty were worked by Mexicans in 1854. Thompson and West (1881), however, give the discovery date of the district as 1863. They also credit the discovery to Mexicans. The early discoveries were all in the vicinity of the Liberty Mine, on the west side of the district. In 1865 a 10-stamp mill was built at San Antonio station to treat ores from the district; it ran for only a short time and was replaced by a 4-stamp which also ran only a short time (Kral, 1951). Production of \$116,301 is credited to the district for 1867-88 (Couch and Carpenter, 1943), and Kral (1951) credits the Liberty Mine with \$500,000 between 1910 and 1912. Beginning in about the mid-1930's exploration in the district has been concentrated at the Hall property, about one mile north of the Liberty area on the west edge of the district. Copper-molybdenum mineralization there attracted the attention of several large mining companies for its low-grade, open-pit potential. U.S. Vanadium Corporation worked the area in 1935-38, and Freeport Sulfur Company held the property in 1940. In 1942, as part of its strategic metals investigations, the U.S. Bureau of Mines studied the deposit. In 1957, the Anaconda Company acquired the ground and began a long period of exploration and study of the porphyry molybdenum deposit. In 1981 Anaconda, then a subsidiary of Atlantic Richfield Co., placed the Hall Mine in production. The \$200 million molybdenum mine and mill began production with an estimated mine life of 20 years on a 40 million ton orebody. In 1983, drastic reductions in the price of molybdenum caused the mine to be closed. The mine remains closed, the plant is still in place but Arco hopes to sell and it is doubtful that the mine will reopen.

GEOLOGIC SETTING

The oldest rocks in the San Antonio district consist of dark gray to black volcanic siltstone and some interbedded greenstone of the Permian Pablo Formation. At the Hall Mine, quartzite and quartz-mica schist of possible Triassic or Jurassic age are intruded by a Cretaceous quartz monzonite stock. Tertiary volcanic rocks, consisting of rhyolitic welded ash-flow tuffs, dacite flows, and basalt flows cover most of the San Antonio Mountains north and east of Liberty camp. Rhyolite and andesite dikes are common in the district and are generally altered. Andesite dikes intrude Tertiary welded tuffs at

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Cimarron camp and are inferred to be associated with the precious metal mineralization there (Kleinhampl and Ziony, 1984).

ORE DEPOSITS

Ore deposits in the San Antone district consist of precious-metal deposits in breccia zones in the Cimarron area and base-metal silver and gold veins and porphyry copper-molybdenum deposits in the Liberty area.

At the Cimarron Mine, in the eastern part of Cimarron camp, a shaft and several adits were driven on a N25°W, 65°SW shear zone in bleached, argillized rhyolite. Brecciated vein material from the shear zone contains fine crystals of black sulfides, possibly silver. This area has been recently drilled; drilling was confined to an arcuate vein system which follows the western and northern margins of a rhyolite plug.

At the San Antonio Mine, about three quarters of a mile west of the Cimarron Mine, major workings follow a N70°W, 45°SW fissure vein along a fault in rhyolite. The vein is several feet wide and is composed almost entirely of brecciated rhyolite, bleached white, stained with iron oxides and cemented with silica. In places the breccia is open and appears merely glued together, in others, the space is completely filled with silica matrix. Jarosite and fine-grained pyrite are present within the breccia.

In the Liberty area, silver was recovered from oxidized veins containing cerargyrite, embolite, native silver, and argentite which cut rocks of the Permian Pablo Formation (Kleinhampl and Ziony, 1984). At Liberty, veins are reported to strike northwest and range in width from about 2 to 12 feet.

The porphyry molybdenum deposit at the Hall property is related to a quartz monzonite stock which locally intrudes quartz-mica schist, sericitic quartzite, and limestone. Ore minerals, which include molybdenite, pyrite, and minor chalcopyrite are disseminated chiefly in a massively developed irregular zone of quartz veins, a stockworks, that envelops the marginal zone of the pluton and some of the bordering country rocks. An irregular, hydrothermally altered halo around the deposit is sericitized, silicified, and argillized, and a limestone unit is massively silicified. The deposit has a maximum lateral dimension of 4000 feet and extends to at least 2000 in depth (Kleinhampl and Ziony, 1984). Prior to the beginning of open-pit mining, Anaconda outlined at least 5-10 million tons of material containing 0.25% to 0.35% MoS₂ per ton.

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