GEOLOGY AND MINERALIZATION AT THE MILAGROS GOLD DEPOSIT, CENTRAL NEW MEXICO

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ABSTRACT: The Milagros deposit consists of native gold in a steeply dipping, lenticular quartz vein emplaced along a shear zone in Precambrian greenstone. Silver has been recovered, along with the gold, during intermittent operations. Emplacement of the vein occurred partly by replacement of greenstone and partly by infilling of brecciated, early-formed quartz. Copper carbonates, copper silicate, and traces of native copper occur in the vein, along with iron oxide staining, suggesting that copper-bearing sulfides may be present below the zone of oxidation. The primary mineralization is probably of Precambrian age.

Our preferred model for the genesis of this deposit involves hydrothermal leaching of gold, silver, and copper from sheared greenstone with deposition by ascending hydrothermal solutions.

INTRODUCTION

The Milagros gold deposit occurs in Precambrian greenstone near the west base of the Manzano Mountains, an eastward-tilted fault block in central New Mexico (Fig. 1) in Sec. 29, T. 8N., R. 5E. There is about 100 m of topographic relief near the deposit, where the elevation is approximately 6,300 ft (1,920 m). Elevations rise eastward to about 7,300 ft (2,225 m) near the crest of the Manzano Mountains.

The Milagros is the principal deposit in the Hell Canyon district (Mardirosian, 1977); this area has been included in the Tijeras Canyon district by Northrop (1959) and File and Northrop (1966). However, the main part of the Tijeras Canyon district is about 22 km (12 mi) north of the Milagros area.

Most of the recorded production from the Hell Canyon district is from the Milagros deposit and the adjacent Star claim, now held jointly with the Milagros. Reiche (1949, p. 1207) reported that the Milagros claim was patented in 1876 and that in the 1880's and early 1900's it produced 1,000 to 1,500 tons of ore that yielded $5 per ton in gold. He also noted that shortly after 1910, the adjacent Star shaft (Fig. 2) produced 9 carloads of ore that averaged $10 per ton in gold and 9 to 28 percent copper. During 1975 and early 1976, the Milagros deposit was operated as an open-pit mine, and the gold was recovered by leaching an open heap with cyanide solution (Chisholm, 1975). Canorex Development Limited, operator of the open pit, produced about 2,348 ounces of gold and 3,333 ounces of silver, having a total value of $338,604.00.

We are not aware of any detailed publications concerning the geology of this area. A report by Reiche (1949, p. 1206-1207) gives a general account of the Milagros claims and their history; his generalized map (1 inch = 1 mile) shows all of the rocks in the area to be a greenstone complex. The Myers and McKay (1970) map of the area at a scale of 1:24,000 appears to be similar to Reiche's map. Unpublished reports by G.P. Warner, A.M. Wuenisch, R.H. Demeter, H.A. Schmitt, and Henrichs Geoeexploration Company do not contain a detailed description of the geology.

Our report is based upon field work done for Canorex Development Limited in 1974 and later unspon-