Proceedings Chapter

Geology of the Raul-Condestable iron oxide-copper-gold deposit, central coast of Peru

DE HALLER, Antoine, ZUÑIGA ALVARADO, Julio, FONTBOTÉ, Lluis

Abstract

The Raul-Condestable deposit, located at around 90 km south from Lima, has a cumulated production of >25 Mt with 1.7% Cu, 0.295 g/t Au, and 0.1940 Oz/t Ag. The ore consists in a chalcopyrite-pyrite-pyrrhotite-magnetite assemblage. Magnetite is often massive. A broad correlation exists between Cu, Ag, and Au grades. Associated minor elements include Co, Mo, Zn, and Pb. The country rock consists in a Lower Cretaceous shallow water volcano-sedimentary sequence, crosscut by Middle to Upper Cretaceous intrusions of the Peruvian Coastal Batholith. Previous workers interpreted the deposit as a volcanogenic massive sulfide, whereas others favored a skarn type mineralization. New field and laboratory evidences indicate that the Raul-Condestable deposit can be attributed to the iron oxide-Cu-Au class. Mineralization is predated by andesite-dacite porphyritic dikes and sills followed by a small granodiorite stock which is cut by dolerite dikes in originally subvertical fractures that grossly follow the NNW Andean trend. Most of the ore replaces porous (tuffs, volcanic breccias) or chemically reactive (limestone) beds and was [...]

Reference

DE HALLER, Antoine, ZUÑIGA ALVARADO, Julio, FONTBOTÉ, Lluis. Geology of the Raul-Condestable iron oxide-copper-gold deposit, central coast of Peru. In: *GSA Annual Meeting*. 2001.

Paper No. 53-0

GEOLOGY OF THE RAUL-CONDESTABLE IRON OXIDE-COPPER-GOLD DEPOSIT, CENTRAL COAST OF PERU

DE HALLER, Antoine, Mineralogy Department, University of Geneva, rue des Mara�chers 13, Gen�ve 4, CH-1211, Switzerland, Antoine.dehaller@terre.unige.ch, ZU�IGA ALVARADO, Julio, Geology department, C�a. Minera Condestable S.A, Calle Manuel Roaud y Paz Sold�n 364, San Isidro, Lima, 27, Peru, and FONTBOT�, Llu�s, Mineralogy Department, Univ of Geneva, Rue des Mara�chers 13, Gen�ve 4, 1211, Switzerland

The Raul-Condestable deposit, located at around 90 km south from Lima, has a cumulated production of >25 Mt with 1.7% Cu, 0.295 g/t Au, and 0.1940 Oz/t Ag. The ore consists in a chalcopyrite-pyrite-pyrrhotite-magnetite assemblage. Magnetite is often massive. A broad correlation exists between Cu, Ag, and Au grades. Associated minor elements include Co, Mo, Zn, and Pb. The country rock consists in a Lower Cretaceous shallow water volcano-sedimentary sequence, crosscut by Middle to Upper Cretaceous intrusions of the Peruvian Coastal Batholith. Previous workers interpreted the deposit as a volcanogenic massive sulfide, whereas others favored a skarn type mineralization. New field and laboratory evidences indicate that the Raul-Condestable deposit can be attributed to the iron oxide-Cu-Au class.

Mineralization is predated by andesite-dacite porphyritic dikes and sills followed by a small granodiorite stock which is cut by dolerite dikes in originally subvertical fractures that grossly follow the NNW Andean trend. Most of the ore replaces porous (tuffs, volcanic breccias) or chemically reactive (limestone) beds and was generated by hydrothermal fluids flowing laterally from NE and NW trending veins.

Alteration and ore assemblages display the following sequence: 1) albite and scapolite (marialite); 2) Ca-amphiboles; 3) hematite-magnetite-(�quartz-feldspar-sericite-chlorite), with widespread pseudomorphic replacement of hematite by magnetite; 4) main sulfide stage with chalcopyrite-pyrite-pyrrhotite-(�molybdenite-sphalerite-galena-quartz-chlorite-sericite); 5) late minor carbonate-sulfide stage with calcite-pyrite-sphalerite-galena-marcasite-bravoite-chalcopyrite. Whole rock geochemistry on andesite-dacite porphyry samples shows that stage 1 is accompanied by Na-metasomatism (up to 8% NaO) and moderate MgO enrichment. Unlike in other iron oxide-Cu-Au deposits (e.g. Candelaria, Salobo), no strong K-metasomatism is recognized. Very saline fluid inclusions with halite and sylvite crystals occur in stages 3 and 4 quartz. Late stage calcite still display salinities up to 38 wt % NaCl eq., with most values around 13 wt % NaCl eq. Presence of vapor inclusions suggest boiling in this last stage. NE dextral wrench faults and subsequent tilting of 30-40° to the SW postdate mineralization.

GSA Annual Meeting, November 5-8, 2001
General Information for this Meeting

Session No. 53
Economic Geology I: Fe-oxide(-Cu-Au) Deposits, Fe-Sulfides in Black Shales, Taconite Ores, Geochronology
Hynes Convention Center: 112
8:00 AM-11:30 AM, Tuesday, November 6, 2001