

PROPERTY VISITSGIBRALTAR MINE - Placer Dome

[MI 93B007,010,012]

On September 7th, Bob Lane, Al Wilcox and I visited the Gibraltar Mine. Hosts included Gary Bysouth (Chief Geologist), Bill McCatan (Mine Manager), Gerry Gagner (Mine Engineer), and George Walker (SX-EW Plant). Gibraltar started production in 1972 with reserves estimated at 326 million tons grading 0.37% Cu and 0.016% MoS<sub>2</sub>. To the end of 1990, over 264 million tons of ore had been milled, and reserves were estimated at over 180 million tons grading 0.313% Cu, 0.0087% Mo and 0.0002 opt Au. The current mining rate is 140,000 tonnes/day; milling rate is 37,000 tonnes/day. Employees include approximately 360 staff and 60 contractors. Mining is in the 3rd stage in all three pits: Gibraltar East, Granite Lake, and Pollyanna. The Granite Lake pit was inactive at the time of our visit. Mine staff are examining a proposal to dewater the pit and push back the pit wall (est. 2 years). Current mining in the Pollyanna pit was from Bench 3725 (note: top bench = 4185; final (depth) bench = 3500). Cut-off grade from the Pollyanna pit is 0.146% Cu. Cut-off in the Gibraltar East pit is 0.186% Cu. Geologically, copper mineralization is not of a typical stockwork or disseminated 'porphyry' style; rather it is associated with shear zones hosting quartz-sericite-chlorite-Fe-carbonate altered zones in foliated quartz diorite. These shear zones are up to 35 metres thick (newly discovered Gibraltar North Zone may be more than 120 metres thick). In all deposits, a significant chalcocite blanket has been diagnostic. Garry Bysouth reflects back on early (and perhaps even now) exploration drilling where he believes true copper values were low due to much of the fine, sooty, chalcocite 'dust' being flushed out during drilling or lost during splitting. A distinct mineralization (and alteration) zoning has been worked out by Garry.

The highlight this year at Gibraltar is the newly discovered Gibraltar North zone which straddles the access road to the minesite. Some 22 holes totalling 19,000 ft. have outlined preliminary reserves of 30 to 40m tonnes grading 0.4% Cu (cf. average Gibraltar grade @ 0.3% Cu) with above average grades for gold and silver. This new discovery was based on a geologic model which required the drilling of some deep holes into an overburden covered area. The first 4 holes missed, but the 5th was a winner! Alteration in the new zone (and Gibraltar West) includes chlorite and garnet (red).

Good potential exists for the discovery of other Cu zones on the property (including underground, if the grade gets to be high enough). The real "blessing" at Gibraltar continues to be their solvent extraction - electrowinning plant which produces copper for 0.36 cents/lb. The initial capital cost of \$18 million was paid off in 3 years at an expected mine life (for SE-EW) of 8 years.

Operations at Gibraltar look healthy and should continue well into the next century (barring strikes, poor metal prices, etc).

BELL COPPER - Noranda Mines

[MI 93M001]

On September 18th, Bob Lane, Al Wilcox and I toured the Bell Copper Mine. We were joined by Nick Carter (Consultant) and three people with Corona (led by Mark Tindall). Our hosts were Ross McArthur (Mine Manager), and Maggie Dittrick (Mine Geologist). The mine is at a critical decision stage. With 150 ft. left to the present optimum bottom of the pit, the mine could face closure within the next year. Having realized this a few years ago, Noranda Exploration undertook an aggressive exploration program, both on the minesite and regionally. The results of a 60 diamond drill hole program in 1990 around the perimeter of the pit (especially the NW side) were quite positive. During 1991 a further 62 drill holes tested the perimeter of the pit. A geological reserve of 150 million tonnes of ore was indicated (15 - 20 yrs. mine life); however, in order to access it, the pit walls (i.e. waste rock) would have to be pushed back a further 400 to 500 ft. This process would take about 2 years. The mine is scheduled to close in about 1 <sup>3</sup>/<sub>4</sub> years, so Noranda is currently re-evaluating the economics of the entire situation at Bell Copper. Included in their deliberations are other inventories in the region, including Granisle (14 million tonnes @ 0.45% Cu, Morrison @ 0.45% Cu plus Au, Ag and Hearne Hill (100,000 tonnes @ 1.25 to 1.5% Cu).