

a 32 degree incline. This situation is due to the fact that exploitation programs did not widen the pit sufficiently, in an effort to lower costs and exploit higher grade minerals.

Codelco's new administration has requested studies of Bechtel Corp., Davy Mackee International Corp., and Fluor Daniel Inc., all U.S. companies, to develop an underground mine with a production capacity between 30,000 and 80,000 tpd of mineral.

However, during 1991 priority has been given to geological explorations in areas near Chuquicamata with positive results. The exploitation of these areas is being evaluated. These projects have a similar grade to the current main pit's grade; therefore, there is no clear advantage in accelerating exploitation.

Chuquicamata, like the rest of Codelco, is concerned about production costs. They have increased from 43 cents in 1985 to approximately 55 cents in 1991.

II.2.1.5 Salvador Division.

The Salvador Division of Codelco Chile is located in the III Region, in the mountain area opposite the port of Chañaral. It exploits the underground mine of Salvador, the open pit Quebrada M and the Potrerillos smelter and refinery located near the former Potrerillos Mine, about 50 kilometers from the present mine.

The deposit's proven reserves are 190 million tons of mineral with a 0.9% grade, which is enough for a useful life of approximately fifteen years. There are probable reserves of another 190 million tons surrounding the present mine, with grades of 0.6%.

Exploitation of these reserves would extend the mine's life for another fifteen years. Production is currently 91,000 tons of fine copper.

The low grades of the mineral currently being exploited are a source of concern to this Division which, when the copper price was low, faced the threat more than once of closing down or being privatized because of high costs.

The present administration has received the needed oxygen of better copper prices, which has enabled it to plan for the future with less pressure. The exploitation of the Quebrada M pit has also provided temporary relief, because it has allowed cost reductions.

Intensive mineral exploration is being carried out in the area to find a longer-term solution to the Division's problems. Copper and gold explorations are being carried out in the area between La Coipa and Salvador.

The Potrerillos smelter and refinery is offering the Division lucrative new business. At present there is a world scarcity of smelting capacity, which has raised treatment cost of concentrates to double the cost in the not too distant past. This has permitted the Potrerillos smelter to treat approximately 40,000 additional tons of fine copper with concentrates from other Codelco and Enami plants. There is a plan to expand Potrerillos - which must be approved by Codelco - which would increase capacity from 500 thousand tons of concentrate per year to 700 thousand.

Salvador has faced a decrease in ore grades, due to the significant dilution (contamination) of the mineral. The ore grade expected for the year was 0.9% and only 0.6% has been achieved which implies the same amount of work but lower production. In order to solve this problem, the rhythm of extraction was reduced to make it more selective.

Production costs in the Salvador Division have decreased from approximately one dollar per pound of copper to US¢ 72 at the end of 1990. This has been considered one of 1990's most positive aspects.

Open pit exploitation of Quebrada M since August, 1989 provides 20% of its own production. During 1990 Quebrada M was exploited at a rate of 8 thousand tpd with an average grade of 1.74% copper. This grade declined to 1.12% in 1991.

During 1990 Quebrada M was exploited at a rate of 8,000 tpd, with an average grade of 1.74% copper, which is estimated to have decreased to 1.12% in 1991. The underground mine is exploited at a rate of 26,000 tpd, totalling 34,000 tpd, with an average grade of 1.0% copper and 0.012% molybdenum.

With these achievements and the decision to proceed with the Inca Project, at a cost of US\$ 25 million, the Salvador Division is overcoming the risk of disappearing as a copper producer.

Directory XI.2 Equipment Inventory provides information on the equipment used in Salvador .