

Case 20

New World Mining

The World Bank is evaluating a proposed hard rock mining venture in a depressed region of a developing country. The development would provide badly needed jobs and earn scarce hard currency. Thus, the country wants the project very badly. World Bank financing may be the only source since the country has already incurred substantial debts. The Bank's board has decreed that financing will only be provided if the project is self-supporting, with no subsidy from the country's hard-pressed economy.

The country's currency is unstable, and the mineral is priced in dollars on the world market, so the entire project is being analyzed in U.S. dollars. The discussion that follows summarizes the data collection phase. Your assignment is to recommend whether or not the project should be funded.

World Bank financing, if offered, will be at 8.5% with a level repayment schedule. No payments will be required until the end of the sixth year, and then they will continue for 30 years. As production will start earlier, the World Bank is requiring that 60% of the "initial profits" be deposited in reserve accounts. When prices are high, more deposits will be made into these accounts. Then when mineral prices drop, these accounts will be used to "make" the payments.

The deposit is a mixture of hard rock minerals, but the most important one is used for specialty steels. When demand is high, prices rise; conversely, when demand is low, prices fall. These swings cause variations of over 50% from the average price. Because this project will support a number of new communities, only minor adjustments of its production level

are possible when prices fall. This deposit is not large enough to change the worldwide price/demand relationship. For the initial analysis assume that prices and production are stable at their average level.

The country's economists have agreed with the suggestion of using a stable long-term average price, but they are recommending that this include an allowance for long-term increases. They are suggesting that the annual rate be 3%. The data was gathered during a 15-year period when the overall inflation rate for U.S. dollars was 3.5%. The current inflation rate is relatively close to this long-term inflation rate.

The financing for the project will be released in three segments. The first is expected to cover geological sampling, the detailed design effort, and construction of initial camp facilities. The second segment covers the purchase of equipment and the bulk of the construction effort. The third segment includes \$15 million for working capital and funding for the last phase of construction.

First-Segment Activities

Exploratory sampling provided rough estimates for the quality and size of the deposit. The detailed development plan requires more sampling. This can proceed in conjunction with development of the basic infrastructure for the site (engineering design is already done). The major items with their associated costs (in millions, as are all stated costs) are summarized in Table 20-1. These expenses and activities will span a year after the go decision.

Table 20-1 First Segment Costs

<u>Cost (\$M)</u>	<u>Item</u>
\$6.5	Initial harbor and road development
\$1.4	Geological sampling
\$2.1	Camp development
\$1.8	Engineering and planning for mine development

Second-Segment Activities

Ordering and construction of the bulk-handling equipment will take two years. This includes more infrastructure—roads, harbor, and supporting communities. These costs are summarized in Table 20-2 along with replacement costs and intervals. These initial construction costs, like the other construction costs, are estimated in year-of-expenditure dollars. The replacement costs will inflate at about the general 3.5% rate.

Table 20-2 Second-Segment Costs

<u>Cost (\$M)</u>	<u>Item</u>
\$35	Bulk-handling conveyors, etc.
\$18	Every 5 years for replacement
\$55	Infrastructure development
\$16	Every 10 years for replacement

Third-Segment Activities

There is \$10 million worth of construction to be completed during the first year. Production will be at half of the full rate, and it will cost 25% more than “normal.” This construction will add more bulk-handling equipment with similar maintenance and replacement needs. At full production, which starts in the second year, the deposits will last nearly 50 years.

Energy costs are expected to keep pace with inflation. Labor costs are expected to grow about 1% faster as living conditions and expectations are raised. At full production with current prices, annual sales of \$165 million are expected initially. Past experience with other mines suggests that this will fall about 1% annually because the richest areas of the deposit are developed first. The annual costs for mine operation and infrastructure are shown in Table 20-3.

Table 20-3 Annual Costs for Mine and Infrastructure

<u>Cost (\$M)</u>	<u>Item</u>
\$12	Energy costs
\$49	Labor costs

Options

1. How far off does each estimate have to be to change the recommendation? For example, the World Bank expects that there will be substantial pressure to increase the pay rates more rapidly than the 1% differential over inflation that was analyzed.
2. Use simulation to study the impact of price fluctuations. Is the initial reserve fund adequate, and what guidelines do you recommend for making deposits and withdrawals from the reserve fund? Note that initial expenditures on the mine will be made only at a time when prices are reasonably good and likely to remain so.