



Mining Cost Models

Free Data for Mine Cost Estimates

Free 5,000 tpd Open Pit Cost Model

Other cost models, included in a Mining Cost Service: Open Pit, Underground, Placer, Milling & Heap Leach

5,000 Tonne per Day Open Pit Mine Model

[More Cost Models](#)

This mine is an open pit mine producing 5,000 tonnes ore and 5,000 tonnes waste per day. Rock characteristics for both ore and waste are typical of those of granite or porphyritic material. Operating conditions, wage scales, and unit prices are typical for western U.S. mining operations.

All costs listed are in 2012 US\$. The key design criteria, operating schedule, equipment, personnel, supply requirements and costs are listed below:

		Production	
Mine Type:		Surface Mine	
Stripping Ratio:		1:1	
Ore Production:		5,000 tonnes per day	
Waste Production:		5,000 tonnes per day	
Haul Distance - Ore	meters		1,532
Haul Distance - Waste	meters		1,310
Total Resource	tonnes		18,720,000
Hours per shift		10	
Shifts per day		2	
Days per year		312	
Bench height - Ore	meters		4.60
Bench height - Waste	meters		6.72
Powder factor - Ore	kg/mt		0.33
Powder factor - Waste	kg/mt		0.29

Equipment	Number	Size	
Hydraulic Shovels	1	3.4 cubic meter	
Front-end Loaders	1	3.8 cubic meter	
Rear-dump Trucks	6	41.0 metric ton	
Rotary Drills	2	20.00 cm	
Bulldozers	3	60 kW	
Graders	1	115 kW	
Water Tankers	1	9,500 liter	
Service/Tire Trucks	3	1,800 kg gw	
Bulk Trucks	1	450 kg/min	
Light Plants	4	8.9 kW	
Pumps	2	14.9 kW	
Pickup Trucks	5	680 kg	
Buildings			
Shop		sq.meters	583
Dry		sq.meters	244
Office		sq.meters	383
Warehouse		sq.meters	220
Anfo Storage Bin		cu.meters	28
Development			
Preproduction Stripping		tonnes	150,000
Haul Road Construction		meters	2,841
Hourly Personnel Requirements			
Drillers			2
Blasters			2
Excavator Operators			3
Truck Drivers			8
Equipment Operators			7
Utility Operators			3
Mechanics			6
Laborers/Maintenance			11

Total Hourly Personnel			42
Salaried Personnel Requirements			
Manager			1
Superintendent			0

Foreman	2
Engineer	1
Geologist	1
Supervisor	2
Technician	4
Accountant	0
Clerk	1
Personnel	0
Secretary	2
Security	1

Total Salaried Personnel	15

Primary Supply Requirements

Diesel Fuel	liter/day	4,751
Electricity	kWh/day	639
Powder	kg/day	3,100
Caps	#/day	33
Primers	#/day	29
Drill Bits	#/day	0.671
Det. Cord	m/day	368

Cost Summary

Operating Costs		
Supplies & Materials	\$/mt ore	\$1.05
Hourly Labor	\$/mt ore	2.96
Equipment Operation	\$/mt ore	1.67
Salaried Labor	\$/mt ore	0.97
Miscellaneous	\$/mt ore	0.67

Total Operating Costs		\$7.32

Capital Costs

Equipment Purchase	\$8,579,500
Haul Roads / Site Work	2,096,900
Pre-production Stripping	483,600
Buildings	1,744,400
Electrical System	132,700
Sustaining Capital	1,804,700
Working Capital	810,100

Engineering	2,412,800
Contingency	1,545,000

Total Capital Costs	\$19,609,700
Total per Daily Tonne Ore & Waste	\$1,961

Available Cost Models

Each of the models is developed from first principles based on typical mining criteria for rock densities, swell factors, drill penetration rates, etc. Industry-standard estimating methods are used for equipment selection, personnel allocation, and cost estimation. These models are invaluable for early order-of-magnitude estimates.

Surface mines: 36 Cost Models



production rates: 250 t/day to 80,000 t/day
stripping ratios 1:1 to 8:1

Underground mines: 48 Cost Models



production rates: 200 t/day to 45,000 t/day
access methods: adit or shaft
stopping methods: cut and fill, shrinkage, end slice, vertical crater retreat, sublevel longhole, room and pillar, sublevel caving, block caving

Placer operations: 32 Cost Models



production rates: 100 to 1,000 cubic yards per day
washing plants: mobile or stationary
stripping ratios: 1:1 to 8:1

Milling operations: 35 Cost Models



feed rates: 100 t/day to 80,000 t/day
flotation mills (1, 2, or 3 concentrate products)
carbon-in-pulp mills
agitation leach mills

Gold heap leach operations: 6 Cost Models



(/software/apex/)

leach rates: 5,000 to 20,000 t/day

run-of-mine or crush-screen-agglomerate operations

The models provide a great deal of important information about equipment, labor and supply requirements in addition to capital and operating costs. They include all labor, material, supply and equipment operation costs incurred at the mine site, including supervision, administration and on-site management. A more complete list of items included or excluded can be found in your Mining Cost Service Manual. The Manual also lists the wage and salary scales, supply prices, and other pertinent information used to construct the model.

Mining Cost Service

Price: 1 year subscription, single user, PDF only - US\$2,500

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