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The Philippine mining industry : a
industry report

43270697

March 1961 - Metro Manila, Philippines

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THE PHILIPPINE MINING INDUSTRY

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This report was prepared by Mr. Jesus A. Rivera under the supervision of Dr. Thomas G. Aquino. Research assistance was provided by Mr. Carlo G. Sta. Maria.

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Among these mineral deposits, the Philippines is better known for its wide variety of minerals such as gold, copper, nickel and chromite. In fact, the country has consistently made it among the list of the top ten primary producers of gold, copper and chromite [1].

Table 1.1: Share of Philippine Mine Production to World Mine Production, 1987

Metal	Unit	Philippines Production	World Production	Rank	% of World Production
Gold	1000 kg	2,139	49,722	8	4.3%
Copper	1000 mt	217	8,459	10	2.6%
Chromite	100 mt	263	10,533	9	2.5%

Source: Bureau of Mines and Geosciences, World Bureau of Metal Statistics, 1987

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CHAPTER 1: Industry Structure

Major Mineral Products

The Philippines is blessed with abundant mineral resources. Among metallic minerals, the country has important reserves of gold, copper, nickel, cobalt and chromite. Among non-metallic minerals, sand and gravel, salt and silica sand comes to mind. Other mineral deposits abound, albeit at a lesser degree.

Among these minerals, though, the Philippines is better known for metallic minerals such as gold, copper, nickel and chromite. In fact, the country has consistently made it among the list of the top ten country producers of gold, copper and chromite [1].

Table 1.1: Share Philippine Mine Production to World Mine Production, 1986

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Chromite	000 Mt.	183	10,533	9	1.7%

Source: Bureau of Mines and Geosciences; World Bureau of Metal Statistics, 1987

Size of the Industry

The Phillipine mining and quarrying industry includes a broad range of firms engaged in the extraction, dressing and beneficiating of minerals--generally classified as metallic and non-metallic [2]. Mining also refers to underground and surface mines, quarries, wells and all supplemental activities needed to render the material marketable [3]. Mining firms are generally classified according to the type of mineral they extract.

In 1986, there were 165 large mining and quarrying establishments in the country--with only 20% of these falling under the following metallic-mineral subsectors: gold, copper, nickel and chromite. However, these four subsectors contributed 87.4% of the mining sector's output of P14.2 billion. Most of the mining sector's labor force of 52,321 were also employed in the four subsectors. Moreover, capital expenditures of these subsectors amounted to P570 million--68% of the mining sector's total capital expenditures (see Table 1.2).

Production and Exports

The Philippine mining sector grew at a remarkable pace in the seventies. In 1970, the value of mine production was registererd at P1,541 million (US\$ 260 million). Since then, production has risen to P10,782 million (US\$1,436 million) in 1980--reflecting an annual average growth of roughly 120% for the 10 year period.

In contrast, the eighties was a period of stagnation. After 1980--a boom year for most metals and minerals-- the value of mine production in US dollar terms has continously declined for

Table 1.2: Profile of Large Mining & Quarrying Establishments, 1986*
(Value in Million Pesos)

	Total	Gold	Copper	Nickel	Chroite	Others
Number of Establishments	165	13	8	3	9	132
I Share to Total	100.0%	7.9%	4.8%	1.8%	5.5%	80.0%
Number of Employees	52,321	11,414	23,384	3,897	2,375	11,251
I Share to Total	100.0%	21.8%	44.7%	7.4%	4.5%	21.5%
Capital Expenditures	838	178	314	57	21	268
I Share to Total	100.0%	21.2%	37.5%	6.8%	2.5%	32.0%
Value Added	6,918	1,754	4,230	(186)	196	974
I Share to Total	100.0%	25.4%	61.1%	-2.7%	2.8%	13.4%
Value of Output	14,193	3,063	8,691	301	346	1,792
I Share to Total	100.0%	21.6%	61.2%	2.1%	2.4%	12.6%

* Large establishments are those having an average total employment of 10 and over or with an average monthly sales of P1 million or more regardless of employment.

Source: HCSO Annual Survey of Establishments, 1986

the period 1981-1984. A slight recovery was experienced in 1985 only to fall again in the following year. It was only in the last two years that the Philippine mining sector got a much needed respite as the value of production finally showed an upward trend (see Table 1.3).

In 1988, mining production consisted of metallic minerals at US\$919 million (87.4%) and non-metallic minerals at US\$133 million (12.6%). Among the metallic minerals, gold and copper have the largest shares in terms of production value at 49.0% and 34.5% respectively. Gold is the most important mineral the country is producing at present. It gained the top spot from copper since 1985. In contrast, the importance of other metallic minerals, particularly nickel and chromite, have considerably declined in the eighties.

Much of this production performance is primarily due to the movements of world metal prices (i.e. world market conditions). During the first half of the eighties, metal prices in US\$ dollar terms were generally depressed, reflecting the sluggishness of metal markets overseas (see Table 1.4). The consumption of base metals in particular, by industrial countries were lower than expected. Coupled with the high capacity utilization rates and additional capacity from newly opened mines around the world led to excess supplies, increasing stocks and consequently, downward pressures on metal prices.

In 1986 onwards, a large improvement in metal consumption of industrial countries, among others--a totally unexpected development--led to the surge in metal prices especially for copper and nickel in 1987 and 1988.

Table 1.1a: Value of Mine Production
(In million Pesos)

Mineral	1970	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
Gold	130	1,180	2,785	7,642	2,651	3,907	4,773	6,088	8,395	9,290	10,970
Copper	1,113	3,690	4,409	3,782	3,446	4,047	4,970	5,630	5,461	6,141	7,727
Nickel	2	926	1,437	1,109	577	400	466	1,713	322	145	292
Chromite	64	291	291	271	229	254	355	427	329	275	319
Other Metallics	117	779	876	530	238	253	242	535	220	225	248
Metallics	1,426	6,366	9,799	8,335	7,142	8,860	18,806	14,392	14,727	16,077	19,555
Non Metallics (1)	115	829	983	1,373	1,723	1,976	1,946	1,954	2,397	2,407	2,823
Total	1,541	7,695	10,782	9,708	8,864	10,837	12,752	16,346	17,124	18,486	22,378

Table 1.1b: Value of Mine Production
(In million US\$)

Mineral	1970	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
Gold	22	160	371	334	310	352	286	327	412	452	515
Copper	188	500	587	479	404	364	298	303	268	299	363
Nickel		125	191	140	68	36	28	92	16	7	14
Chromite	11	39	39	34	27	23	21	23	16	13	15
Other Metallics	20	106	117	67	28	23	15	29	11	11	12
Metallics	241	930	1,305	1,055	836	798	648	773	722	782	919
Non Metallics (1)	19	112	131	174	202	178	117	105	118	117	133
Total	260	1,043	1,436	1,229	1,038	975	765	878	840	899	1,051
Exchange Rate (P:US\$)	5.92	7.38	7.51	7.90	8.54	11.11	16.68	18.61	20.39	20.57	21.29

Note: (1) Excludes Coal and Cement

Source: Bureau of Mines and Geosciences

Table 1.4: World Metal Prices

Metal	Unit	1980	1981	1982	1983	1984	1985	1986	1987	1988	Average 1981-1984	Average 1981-1988	Average 1981-1983	
		Gold	615	458	377	424	360	318	368	447	437	437	-2.3%	5.8%
Copper	US\$ per oz.	99.4	79.7	67.2	72.7	62.5	64.2	62.3	80.7	113.5	113.5	17.5%	17.5%	3.6%
Nickel	US cents/lb.	296.5	271.4	218.4	212.6	215.6	222.5	176.0	221.3	623.7	623.7	-10.1%	47.5%	20.1%

Growth Rates:

Gold	-25.5%	-17.7%	17.5%	-15.1%	-11.7%	15.7%	21.5%	-2.3%	-11.5%	5.8%	-2.8%
Copper	-19.8%	-15.7%	7.4%	-13.4%	2.7%	-3.0%	29.5%	40.6%	-10.1%	17.5%	3.6%
Nickel	-8.5%	-19.5%	-2.7%	1.4%	3.2%	-20.9%	25.7%	181.8%	-7.3%	47.5%	20.1%

† London Metal Exchange (LME) US equivalent prices

Source: Central Bank of the Philippines; Metals Week; Reuters

Table 1.5: Volume of Mine Production

Mineral (000 units)	Unit	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	Average 1980-1988
Gold	Kg.	16.64	20.02	23.58	25.95	26.07	25.73	33.06	35.43	32.60	35.30	32.60
Silver	Kg.	57.17	60.72	62.94	61.72	56.70	48.96	52.42	51.53	50.82	54.73	50.82
Copper	Mt.	298.30	304.50	302.33	292.09	271.40	233.36	222.19	217.02	214.10	224.77	214.10
Nickel	Mt.	33.29	47.11	29.25	19.63	13.90	13.60	28.16	12.74	8.51	12.33	12.33
Chrosite Ore & Conc.	Det	556.10	516.06	439.25	321.14	266.91	260.90	272.03	202.21	188.29	182.24	202.21
Growth Rates:												
Gold			20.31%	17.78%	10.05%	0.46%	-1.30%	28.49%	7.17%	-7.99%	8.28%	9.25%
Silver			6.21%	3.66%	-1.94%	-8.13%	-13.65%	7.07%	-1.70%	-1.39%	7.70%	-0.24%
Copper			2.08%	-0.71%	-3.39%	-7.08%	-14.02%	-4.79%	-2.33%	-1.34%	4.98%	-2.95%
Nickel			41.51%	-37.91%	-32.89%	-29.19%	-2.16%	107.06%	-54.76%	-33.20%	44.89%	0.37%
Chrosite Ore & Conc.			-7.20%	-14.88%	-26.89%	-16.89%	-2.25%	4.27%	-25.67%	-6.88%	-3.21%	-11.07%

Source: Bureau of Mines and Geosciences

High metal prices provides the most important incentive for mining companies to beef up their production. Since most metal prices were depressed during the first half of the eighties, the volume of production of metallic minerals declined sharply. Gold production was not affected because gold prices hovered at levels that had a comfortable spread over average production costs. Besides, there was the emerging small scale mines involved in panned gold which served as a boost to overall gold production.

The sectors that suffered the most were that of copper, nickel and chromite. Last year, it was only the copper sector which was able to take advantage of attractive copper prices. Production of nickel and chromite remained in the doldrums (see Table 1.5).

Since whatever is produced by Philippine mines are mostly exported (either directly or indirectly), exports follow the same trend as that of production. Thus, the value of mineral exports and its share to total exports showed a downtrend for the period 1980-1987. From a share to total exports of 21.3% in 1980, the sector only registered 8.5% in 1987 as shown in the table below.

Table 1.6: Share of Minerals to Total Exports
(US\$ millions, F.O.B.)

Year	Mineral Exports	Total Exports	% Share
1980	1,235	5,788	21.3
1981	1,025	5,722	17.9
1982	727	5,021	14.5
1983	550	5,005	13.2
1984	516	5,392	9.6
1985	594	4,629	12.8
1986	552	4,837	11.4
1987	482	5,692	8.5

Note: These data excludes gold delivered to the Central Bank

Source: Department of Economic Research, Central Bank

Economic Contribution

The adverse situation in which the mining sector found itself in during most part of the eighties is reflected in the sector's contribution to the national economy.

In 1980, large establishments in the sector employed a little over 69,000 workers--0.42% of the total labor force that were employed. This has shrank further in 1986 when only 52,320 workers were employed in these large establishments--down to a mere 0.25% of the total labor force employed in the country.

Moreover, the flourishing of small scale mining activities particularly in the gold rush areas in the countryside has to be considered. The attractiveness of gold prices in recent years has lured people to engage in gold panning activities. Employment in small scale mining is estimated at 200,000. Thus in terms of employment, small scale mining is a very important sector.

The inflation-adjusted value added contribution of the mining and quarrying sector is showing a downtrend. In 1980, the share of mining (gross value added at constant 1972 prices) to GDP was at 2.41%. This has continuously declined through the years, as it settled at 1.58% in 1988.

Foreign exchange earnings is the most important contribution of the sector to the national economy. However, if export earnings is taken as a proxy indicator for the foreign exchange earnings for the sector, then this too has been on the downtrend.

Chapter Notes

- [1] However, in 1986, the country lost its ranking among the world's top nickel producers due mainly to the closure of the Nonoc Nickel Refinery. It was only in gold, copper and chromite where it has retained its world ranking.
- [2] The study would concentrate on the metallic minerals subsector since these comprise a large share of total mining production besides being mainly export-oriented.
- [3] Philippine Standard Industrial Classification, 1977 (NEDA).

Chapter 2: Demand/Supply Analysis

Major Mineral Exports

In 1987, the Philippines exported metalliferous ores and metal scrap which amounted to US\$ 224 million. Metallic ores and concentrates comprise 98% of the total while the rest consisted of metal scrap.

Copper concentrates comprised almost half of the exports of metallic ores and concentrates in 1987 with a value of US\$ 109 million (see Table 2.1). However, this is a far cry from what the country has been exporting prior to 1984.

With the start of PASAR's operations in the middle of 1983, copper concentrate exports has dropped by more than 50% in the following year as shown in Table 2.2. A major part of the total production of copper concentrates were rechanneled from exports to PASAR for smelting and refining into copper cathodes.

On the other hand, gold from copper ores comprised 41% of the total exports of metallic ores and concentrates in 1987 at US\$ 90.5 million. But this too is a lean figure relative to those in the early eighties. PASAR recovers a by-product called dore metal (containing gold and silver) and sells them to the Central Bank for refining into gold and silver bullion.

Major Export Markets

Japan was the leading importer of gold and copper concentrates from the country in 1987. It was also the only market for the country's nickel ores, manganese ores and zinc concentrates. The USA, Brazil and Japan were the major markets of the country's chromium ores while Germany was the biggest market

Table 2.1: Export Structure, 1987
(US\$ 000 FOB)

Region/Country	Gold	Copper Concentrate	Chromia Ores Concentrate	Chromia Concentrate	Nickel Ores	Zinc Concentrate	Manganese Ores Concentrate	Iron Ore & Concentrate	Total	% Share to Total
Asia:										
Japan	62,180	92,459	1,244	112	10,714	357	2	57	187,125	85.20%
South Korea	4,361	6,650						233	11,244	5.12%
China	2,310	10,040	476						12,825	5.84%
Taiwan			157						157	0.07%
Indonesia				40					40	0.02%
America:										
USA			1,312						1,312	0.60%
Canada			739						739	0.34%
Brazil			1,132						1,132	0.52%
Chile			391						391	0.18%
Peru			252						252	0.11%
Europe:										
United Kingdom	1,341								1,341	0.61%
France	113								113	0.05%
Germany	150			1,074					1,224	0.56%
Sweden			884						884	0.40%
Netherlands			652						652	0.30%
Total	90,455	109,149	7,438	1,235	-10,714	357	2	290	219,639	100.00%
% Share to Total	41.16%	49.69%	3.39%	0.56%	-4.86%	0.16%	0.00%	0.13%	100.00%	

Source: Foreign Trade Statistics (450), 1987.

Table 2.2: Exports of Metalliferous Ore and Metal Scrap
(FOB value in US\$ millions)

Mineral	1960	1961	1962	1963	1964	1965	1966	1967	Average Growth		
									1981-1987	1987	
Copper Concentrates	545	429	312	249	115	84	90	109	21.1%	-17.3%	
Gold	239	215	169	154	104	100	140	90	-35.7%	-10.3%	
Chromite Ore	33	25	15	10	19	12	10	7	-30.0%	-13.0%	
Others	214	69	36	27	28	47	27	18	-33.3%	-21.0%	
Total	1,031	758	532	440	266	243	267	224	-16.1%	-18.3%	
Growth Rates:											
Copper Concentrates		-21.3%	-27.3%	-20.2%	-53.6%	-27.0%	7.1%	21.1%	-17.3%		
Gold		-10.0%	-21.4%	-8.9%	-32.5%	-3.8%	40.0%	-35.7%	-10.3%		
Chromite Ore		-24.2%	-40.0%	-33.3%	90.0%	-36.9%	-16.7%	-30.0%	-13.0%		
Others		-59.4%	-59.6%	-25.0%	3.7%	67.9%	-42.6%	-33.3%	-21.0%		
Total		-26.5%	-29.8%	-17.3%	-39.5%	-8.6%	9.9%	-16.1%	-18.3%		

Source: Foreign Trade Statistics (NSO)

for chromium concentrates.

Overall, Japan was the leading market for the country's exports of metallic ores and concentrates. It purchased US\$ 187 million or 85% of the total. South Korea and the People's Republic of China were a far second and third with a share of 6% and 5% respectively.

Mining Processes

Copper mining in the country utilizes open-pit mining operations which consists of drilling and blasting the rock. Then the ores are hauled out of the pit in large-capacity trucks. A couple of copper mining companies are also involved in underground operations using the block caving technique [1].

In underground operations, the ores are moved through underground passage ways to a centrally located shaft through which they are lifted to the surface. All these so far constitutes the mining stage.

The milling stage is where the copper-bearing minerals are separated from the ores. This is usually done by selective flotation. Initially, the ores are crushed into pieces, the size of peanuts. Thereafter, the crushed ores are finely grounded so that the individual mineral grains or particles are separated from the ore. Then, the mineral bearing particles in the powdered ore are removed by flotation.

This process works on the ability of certain minerals to cling to the air bubbles in water. Chemical reagents called frothers [2] are added to the solid-water mixture to condition the minerals to be separated. The air bubbles or froth that

accumulate on the top of the pulp is collected as concentrates-- which averages around 30% copper. Then, the copper concentrates undergoes smelting and refining to make copper cathodes like what is being done by PASAR [3].

Gold is also mined in the same way as copper--either by underground or open-pit operations. The slight difference lies in the milling stage. It employs an additional process called cyanidation in gold recovery. Silver is also mined from gold and copper ores. Consequently, it is recovered as a by/co-product of gold and copper.

Chromite mining is similar with that of the others. Its concentrates are recovered using the gravity concentration method. Nickel is mined and beneficiated (sizing and drying). Thereafter, they are shipped as ores since the country's only nickel refinery in Nonoc was shut down.

Cost Structure

Mining is a raw material intensive activity. In a lesser degree, it is also energy intensive depending on the type of mineral that is produced. What is very evident, though, is that mining and milling costs comprised the bulk of total production costs--about 50% of the total in 1985.

With regard to copper operations, 31% of the unit cost of production went to fuels and utilities. This is not surprising since most surface mines are highly mechanized using power shovels and dump trucks. Besides, the milling process of copper is known to be energy intensive. Raw materials and supplies comprised 26% of total production costs. This includes chemicals,

accumulate on the top of the pulp is collected and concentrated... which averages around 30% copper... under the existing and existing... is being done by PARKER (21)... gold is also mined in the same way as copper... underground or open-pit operations. The slight difference... the milling stage. It employs an additional process called... recovery silver is also mined from gold and... it is recovered as a by-product of... and copper... in... method. Nickel is mined and beneficiated (airing and drying)... thereafter, they are shipped as ores since the country's only... nickel refinery in Monoc was shut down... Cost Structure

Table 2.3: Unit Cost of Production of Selected Minerals, 1985

Mineral	Unit	Wages and Salaries	Materials & Supplies Purchased	Fuels & Utilities	Ad Valorem/Royalty Tax	Royalties to Claimowner	Depreciation and Depletion	Mine General Overhead	Other Operating Expenses	Total Unit Cost
Copper	P per lb.	0.57	4.32	5.07	0.47	0.04	2.12	0.54	3.22	16.35
Gold	P per oz.	722.64	1,722.71	795.48	111.12	28.32	842.37	404.74	520.82	5,148.20
Met. Chrosite Conc.	P per Dst.	322.88	368.69	323.89	43.49	0.00	246.97	177.59	1.56	1,435.07
Met. Chrosite Ore	P per Dst.	21.97	88.31	40.28	333.78	46.50	160.56	14.62	0.876	1,544.78
Refractory Ore	P per Dst.	184.09	331.06	147.20	103.74	0.00	79.81	179.44	12.76	1,042.10
Hickie	P per lb.	1.12	1.66	13.45	0.13	1.07	11.29	1.25	2.55	32.52
Share to total Unit Cost:										
Copper		3.5%	26.4%	31.0%	2.9%	0.2%	13.0%	3.3%	19.7%	100.0%
Gold		14.0%	33.5%	15.5%	2.2%	0.6%	16.4%	7.9%	10.1%	100.0%
Met. Chrosite Conc.		21.7%	24.8%	21.0%	2.9%	0.0%	16.6%	12.0%	0.1%	100.0%
Met. Chrosite Ore		1.4%	5.7%	2.6%	21.6%	3.0%	10.4%	0.9%	54.3%	100.0%
Refractory Ore		17.7%	31.0%	14.1%	10.4%	0.0%	7.6%	17.2%	1.2%	100.0%
Hickie		3.4%	5.1%	41.4%	0.4%	3.3%	34.7%	3.8%	7.8%	100.0%

Source: BMS

Table 2.4: Capital Expenditures of Large Mining & Quarrying Establishments, 1986
(Value in P 000)

Industry	Capital Expenditures					Total Capital Expenditures	Less: Sale of Fixed Assets	Gross Addition to Fixed Assets
	New Fixed Assets Purchased	Second Hand Fixed Assets Purchased	Alterations and Improvements	Work Done on Account	on Account			
Gold	170,783	605	1,340	4,934	177,682	3,640	174,042	
Copper	214,784	2,442	3,716	93,355	314,297	118,550	195,747	
Nickel	42,203	354	17	14,716	57,273	3	57,273	
Chromite	21,024			92	21,133		21,130	
Sub-total	408,794	3,401	5,073	113,117	570,385	122,193	448,192	
Total Mining	638,570	43,149	26,459	129,852	838,030	122,767	715,263	
Share to Total Expenditures:								
Gold	96.1%	0.3%	0.8%	2.8%	100.0%			
Copper	69.3%	0.8%	1.2%	29.7%	100.0%			
Nickel	73.7%	0.6%	0.0%	25.7%	100.0%			
Chromite	99.5%	0.0%	0.1%	0.4%	100.0%			
Sub-total	78.7%	0.6%	0.9%	19.8%	100.0%			
Total Mining	76.2%	5.1%	5.2%	15.5%	100.0%			

Source: Annual Survey of Establishments (NSO), 1986

2. Since mining machinery and equipment would have specialized applications in different mining activities, it was assumed that most of these are imported.

With these assumptions in mind, mining machinery and equipment (including spare parts) were disaggregated based on import statistics, the breakdown of which are as follows:

- (a) Machinery for sorting, screening, separating or washing earth, stone, ores, or other mineral substances in solid (including powder and paste) form.
- (b) Machinery for crushing or grinding earth, stone, ores, or other mineral substances in solid (including powder and paste) form.
- (c) Machinery for mixing or kneading earth, stone, ores, or other mineral substances in solid (including powder and paste) form.
- (d) Machinery for agglomerating or forming earth, stone, ores, or other mineral substances in solid (including powder and paste) form.
- (e) Parts of machinery and equipment from (a) to (d).

The value and volume of imported mining machinery, equipment and spareparts are shown in Table 2.5a and Table 2.5b respectively. In 1987, most of these imports came from the United States, Japan, Australia and Singapore (see Table 2.6).

Imports of mining machinery and equipment together with their corresponding spare parts have been on the downtrend during the eighties (see Table 2.5a). This is also indicative of the depressed situation the industry has encountered during the said period. Another factor which has dampened the purchases of imported mining machinery and equipment, among others, was the chronic devaluation of the exchange rate during the eighties--making the cost of these imported equipment very prohibitive.

Table 2.5a: Imports of Mining Machinery, Equipment & Parts (\$ 000 FOB)

	Code	1980	1981	1982	1983	1984	1985	1986	1987
Machinery and Equipment:									
Sorting, Screening, Separating	728.31-00	3,036	4,223	1,892	317	404	195	127	240
Grinders, Crushers	728.32-00	9,164	11,021	8,956	1,786	460	600	284	579
Mixing, Kneading	728.33-08	1,979	6,122	1,094	1,205	566	136	162	386
Molding, Agglomerating, Shaping	728.34-00	1,547	915	583	537	905	216	651	1,129
Total		15,725	22,281	12,524	3,846	2,335	1,148	1,224	2,334
Parts of Machinery & Equipment:									
Sorting, Screening, Separating	728.39-01	2,211	2,509	6,213	2,452	575	661	1,118	561
Grinders, Crushers	728.39-02	5,964	5,824	10,855	10,516	4,311	1,471	4,938	6,861
Mixing, Kneading	728.39-04	613	279	244	80	26	19	2,795	102
Molding, Agglomerating, Shaping	728.39-05	517	487	502	145	96	89	98	127
Total		9,305	9,099	17,814	13,192	5,008	2,239	8,950	7,650
Grand Total		25,030	31,380	30,338	17,038	7,343	3,387	10,174	9,984

Source: Foreign Trade Statistics (HSO)

Table 2.5b: Volume of Imports of Mining Machinery, Equipment & Parts

	Code	1980	1981	1982	1983	1984	1985	1986	1987
Machinery and Equipment (units):									
Sorting, Screening, Separating	728.31-00	177	207	214	58	36	40	26	177
Grinders, Crushers	728.32-00	217	150	424	175	379	307	43	184
Mixing, Kneading	728.33-08	16,465	294	86	86	54	30	52	101
Molding, Agglomerating, Shaping	728.34-00	60	14	24	43	44	90	44	29
Total		16,919	665	748	362	513	467	165	491
Parts of Machinery (kg.):									
Sorting, Screening, Separating	728.39-01	444,264	429,252	729,028	302,744	95,651	117,230	307,157	95,730
Grinders, Crushers	728.39-02	1,083,863	1,055,105	1,255,449	1,505,074	988,212	244,773	271,877	1,213,427
Mixing, Kneading	728.39-04	170,772	34,539	27,773	7,786	5,133	1,670	411,439	7,570
Molding, Agglomerating, Shaping	728.39-05	41,514	36,668	25,339	11,654	17,992	21,299	18,810	26,051
Total		1,740,413	1,555,564	2,037,589	1,827,258	1,106,988	384,972	1,009,283	1,342,778

Source: Foreign Trade Statistics (MSO)

Table 2.6: Import Structure of Mining Machinery, Equipment and Parts, 1970
(\$ 000 FOB)

Region/Country	Machinery				Spare Parts				% Share to Total	
	Sorting	Grinding	Mixing	Holding	Sorting	Grinding	Mixing	Holding		
	728.31-00	728.32-00	728.33-08	728.34-00	728.39-01	728.39-02	728.39-04	728.39-05		
America:										
U. S.	10.21	4.02	45.45	17.40	191.90	3,034.06	15.47	1.39	3,319.90	33.25%
Canada					0.73	176.62	0.00	0.00	177.35	1.78%
Euan								1.37	1.37	0.01%
Oceania:										
Australia	15.44	4.01	9.01		89.19	1,133.84			1,247.48	12.50%
New Zealand & W. Samoa					12.40				16.41	0.16%
Asia:										
South Korea	4.31		3.40			183.86			191.57	1.92%
Singapore	23.99		117.29		16.06	884.63			1,041.97	10.44%
Taiwan	26.86	171.58	30.40	29.88		6.24		0.79	265.75	2.66%
Hong Kong	2.33					12.84			15.17	0.15%
China						47.30			47.30	0.47%
Japan	157.06	85.56	143.38	616.10	224.87	676.55	21.28	81.15	2,005.95	20.09%
Malaysia		145.00							145.00	1.45%
Europe:										
Switzerland			0.80					2.33	3.13	0.03%
U K & North Ireland		60.05	3.35		9.49	268.09	22.81		363.82	3.64%
Sweden		10.15	19.39			28.37	42.27		100.18	1.00%
Belgium		46.75				281.10			327.85	3.28%
F R Germany		52.32	1.95	19.16	7.87	111.02		22.33	214.65	2.15%
Italy			11.11	446.40		8.53		17.29	483.33	4.84%
Finland						10.24			10.24	0.10%
Denmark						0.76			0.76	0.01%
Austria						2.71			2.71	0.03%
Middle East:										
Israel						1.70			1.70	0.02%
Total	240.20	579.44	385.53	1,128.94	561.04	6,859.93	101.86	126.63	9,983.57	100.00%
% Share to Total	2.41%	5.80%	3.86%	11.31%	5.62%	68.71%	1.02%	1.27%	100.00%	

Source: Foreign Trade Statistics (HSO), 1987

While purchases of machinery and equipment may be postponed for a later period, the maintenance of the current equipment in place cannot. Maintenance expenses for these equipment in place may even increase depending on their age. Thus, the lower decline in purchases of spare parts relative to that of mining machinery and equipment could be partly explained by this contention.

Chapter Notes

- [1] Large bulk of ore bodies are divided into rectangular blocks with a long vertical dimension. The blocks are undercut to induce caving under their own weight and the ore is usually drawn from them at the same rate so as to prevent dilution from waste rock on the margins of the ore body (Mikesell, 1979).
- [2] Frothers also reduce the wettability of certain minerals, enabling them to be attached to air bubbles so as to be floated (Mikesell, 1979).
- [3] The smelting and refining activities are however, classified under the manufacturing sector.
- [4] A breakdown of raw materials and supplies costs according to the cost items just mentioned is not available. Some ideas on the importance of these cost items can be gleaned from an earlier study.
A study by the German Development Institute (1980) shows a breakdown of raw materials and supplies cost (see Table 2.7). The cost of spare parts comprised 30% of raw materials cost. Also, about a third of raw materials cost are imported.
- [5] A breakdown of raw materials and supplies cost for primary gold operations is shown in Table 2.8. Cost of spare parts was a little less than half of the total while the cost of wood and timber was 22%.
- [6] This includes expenditures on land, buildings and minesite structures, machinery and equipment.

Table 2.7: Breakdown of Raw Materials & Supplies Cost (Copper), 1978
(in 000 Pesos)

ITEMS	Mining Costs		Milling Costs		General Overhead	TOTAL
	Local	Imported	Local	Imported		
Chemicals	0.29%	0.10%	0.97%	1.12%	0.28%	2.76%
Explosives	7.05%	0.09%	0.24%	0.10%	0.09%	7.58%
Spare parts	6.38%	13.06%	4.53%	1.28%	4.56%	29.81%
Containers & Packaging	0.00%	0.00%	0.01%	0.00%	0.00%	0.01%
Wood & Timber	1.14%	0.00%	0.00%	0.00%	0.12%	1.26%
Non-durable tools	0.05%	0.00%	0.03%	0.00%	0.10%	0.18%
Others	19.57%	2.44%	15.65%	15.13%	5.61%	58.39%
TOTAL	34.49%	15.70%	21.44%	17.63%	10.75%	100.00%

Source: German Development Institute (1980), BMGS

Table 2.8: Breakdown of Raw Materials & Supplies Cost (Primary Gold)
(in 000 Pesos)

ITEMS	Mining Costs		Milling Costs		General Overhead	TOTAL
	Local	Imported	Local	Imported		
Chemicals	0.00%	0.00%	2.83%	2.67%	0.43%	5.93%
Explosives	12.66%	0.00%	0.00%	0.00%	0.00%	12.66%
Spare parts	24.54%	0.21%	19.22%	0.13%	2.91%	47.01%
Containers & Packaging	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Wood & Timber	21.96%	0.00%	0.10%	0.00%	0.14%	22.19%
Non-durable tools	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Others	5.97%	0.26%	2.91%	0.20%	2.86%	12.21%
TOTAL	65.13%	0.48%	25.06%	3.00%	6.34%	100.00%

Source: German Development Institute (1980), BMGS



CHAPTER 3: Industry Issues and Government Policies

Small-Scale Mining

While the country's total gold production gets a healthy boost from panned gold production, this presents a number of problems.

First, small-scale mining in the gold rush areas have caused damages to lives and properties as a result of using inadequate equipment besides ignoring prescribed safety measures. Illegal construction of mine tunnels, indiscriminate use of dynamite--which loosens the soil--and mercury in the treatment of ores have been reported but so far seems unabated.

Second, most of these panned gold from the gold rush areas leaves the country through the back door instead of going to the Central Bank--which is suppose to be the sole purchaser. Official estimates from the BMGS show the contribution of panned gold production to the country's total gold production (see Table 3.1). Panned gold production comprise roughly 24% of the total in 1987. However, this contribution seems to be understated if other independent estimates are considered [1].

Table 3.1: Gold Production (Kg.)

Producer	1983	1984	1985	1986	1987
Primary	10,665	9,222	9,529	9,835	9,667
Secondary	14,596	15,251	15,449	14,155	15,066
Panned Gold	136	1,254	8,085	11,440	7,866
Total	25,397	25,727	33,063	35,430	32,599

Note: The BMGS started to closely monitor panned gold production in 1983.

Source: BMGS

Lastly, small irritants exist between small-scale miners and big mining firms in terms of conflicts in mining claims. For example, the Apex Mining Corp. has barely mined a tenth of its mining claims in the Davao gold rush areas as small-scale miners have allegedly built their own tunnels indiscriminately.

Obviously, there seems to be an absence of a systematic approach to small scale mining activities in the country. Nevertheless, the country's solons have realized the gravity of this problem. There is a pending bill in the Senate which is supposed to offer remedies to all these problems regarding small-scale mining. Senate Bill No. 903, which is otherwise known as the "Small Scale Mining Act of 1988" is meant to rationalize small scale mining activities in the country.

Among the major provisions of the bill are the following:

1. The power of the DENR Secretary to declare and set aside small scale mining areas based on the recommendation of DENR regional executive directors, provided that these areas are not mining areas [2] and the minerals in these areas are technically and commercially suitable for mining activities [3].
2. In the event that an area that is set aside for small scale mining is covered by an existing mining claim, the claim owner is afforded certain rights and privileges in case of a disagreement between the claim owner and the small scale miners in the area.
3. Small scale miners licensed by the regional executive director shall organize themselves into cooperatives.

Cooperatives should have at least 25 licensed small scale miners. The DENR Secretary shall issue mining permits to these cooperatives.

4. Maximum size of the permit area per cooperative is 20 hectares while a tunnel should not be longer or deeper than 125 meters.
5. Gold produced by the small scale miners shall be sold only to the Central Bank or its duly authorized representative. The Central Bank shall also establish gold buying stations and assay laboratories in the gold rush areas to fully service the requirements of the small scale miners.

Payment of Deferred Taxes

In 1984, tax payments of distressed copper firms were suspended with the issuance of LOI No. 1416. The eligible companies included Atlas Consolidated, Marcopper, Maricalum and North Davao, among others. Two years after, P.D. No. 2027 was issued by former President Marcos. This decree ordered the waiver of the distressed copper firms' accumulated taxes suspended pursuant to LOI No. 1416.

The current administration does not want to recognize the validity of P.D. No. 2027, contending that it never took effect since it was not "self-executory."

Instead, the four copper firms will have to start paying their deferred taxes which were previously suspended in 1984. President Aquino lifted the tax suspension by virtue of Executive Order No. 340 when copper prices soared in the world market. Thus, the copper firms have to pay back taxes amounting to about

₱3 billion. The current issue on hand is the repayment terms for each of the copper firms involved. Repayment schemes are being studied at the moment in order to arrive at a compromise agreement.

Ecological Issue

Ecological issues have started to bother the industry. For example, Marcopper was closed down last April as its tailings disposal system was allegedly polluting Calancan Bay in Marinduque. Benguet and Philex faced similar charges of polluting rivers near their mining areas. Drumming up the issue has elicited proposals of higher tailings fees in Congress. Nothing concrete has been decided yet.

Just recently, The DENR filed charges against Lepanto due to the leakage of acid gas to three barangays in Mankayan, Benguet. The acid gas allegedly came from the mine firm's concentrate dryer which had been installed without any anti-pollution devices.

On the other hand, gold panners were cited as the culprits in mercury pollution. In the process of recovering the gold--by blowtorching the amalgam (gold plus mercury)--the poisonous fumes not only pollutes the air. As mercury condenses, it also settles in creeks and rivers when rain comes.

The National Pollution Control Commission and the National Environmental Protection Council are tasked to regulate activities that may affect the environment and the health of the public near industrial plants. So far, a solution still has to be found to strike a healthy balance between industrial progress in the mining sector and environmental concerns [4].

The New Mining Code

The recent positive events in the mining sector haven't gone unnoticed. Potential investors have been taking a second look at the local mining industry as others have already inked joint venture agreements with a number of local mining firms.

However, the entry of more foreign investments would depend on how the New Mining Code will finally take shape. The code, which comes in the form of the "Mineral Resource Development Act of 1988" is still being reviewed by the Cabinet Assistance System prior to its endorsement to Congress. Its enactment is expected by late this year. The proposed mining code allows foreign investors to own 100% equity in mining ventures that will be involved only in "service activities" such as prospecting and processing. However, if foreigners continue to the exploration stage, they are required to divest so as to adhere to the 60%-40% equity provision or enter into a financial and technical assistance agreement (FTAA) with the government through bidding or negotiation.

Activities subject to FTAA's cover prospecting, exploration and mining operations [5]. An FTAA may include one or a combination of several or all of these activities. However, a certificate of mining feasibility shall be secured before the contractor can proceed to mining operations. The minimum investment and area requirements for each activities are shown in Table 3.2 under an FTAA.

The governments share from mining operations is variable since it is determined through bidding or negotiation. The

government's share however, will not be less than 5% of gross revenues from such operations inclusive of excise tax.

Table 3.2: Minimum Investment and Area Requirements

Activity	Investment Requirement	Area Requirement
Prospecting	US\$1 million or Peso equivalent in direct costs; max. of 2 yrs.	onshore : < 40,000 has. offshore: <100,000 has.
Exploration	US\$1 million or Peso equivalent in direct costs; max. of 6 yrs.	onshore : < 20,000 has. offshore: < 50,000 has.
Mining Operations	US\$20 million or Peso equivalent; in direct costs; max. of 2 yrs.	---

Source: Mineral Resource Development Act of 1988 (Draft)

Chapter Notes

- [1] For example, alternative estimates by Consolidated Goldfields and the Brook Hunt Associates show that BMGS estimates were underestimated by 31% and 25% respectively in 1985. Although these estimates may be speculative, there is no doubt about the increasing contribution of panned gold production to the country's overall gold production.
- [2] Active mining areas are mining claims or areas under actual exploration, development, utilization or commercial production.
- [3] Priority areas will be those occupied and actively mined by small scale miners before August 1, 1987 such fact has been duly registered with the regional executive director.
- [4] SGV Study on Mining and Ore Dressing Sector (1989).
- [5] The following terms are defined as follows in the proposed Mineral Resources Development Act of 1988:

Prospecting - the cursory examination of lands for the purpose of finding indications of mineral resources and delineating areas called prospects that could possibly contain them.

Exploration - the systematic examination of lands supposed to contain mineral resources either by drilling; trenching; shaft sinking; tunneling; test pitting and other means; for the purpose of probing the extent of mineral resources and the feasibility of extracting them from the ground for profit.

Mine Operations - From minesite development up to the start of production of saleable mine product including run-of-mine ore.

Gold prices may see some support... relatively weak dollar... declining trend... expansion...

expansion... as relative prices have been shifting... in favor of gold...

Year	Gold Price (\$/oz)	Production (Million oz)
1973	155.87	15.88
1974	155.88	15.88
1975	155.88	15.88
1976	155.88	15.88
1977	155.88	15.88
1978	155.88	15.88
1979	155.88	15.88
1980	155.88	15.88
1981	155.88	15.88
1982	155.88	15.88
1983	155.88	15.88
1984	155.88	15.88
1985	155.88	15.88
1986	155.88	15.88
1987	155.88	15.88
1988	155.88	15.88
1989	155.88	15.88
1990	155.88	15.88
1991	155.88	15.88
1992	155.88	15.88
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2013	155.88	15.88
2014	155.88	15.88
2015	155.88	15.88
2016	155.88	15.88
2017	155.88	15.88
2018	155.88	15.88
2019	155.88	15.88
2020	155.88	15.88
2021	155.88	15.88
2022	155.88	15.88
2023	155.88	15.88
2024	155.88	15.88
2025	155.88	15.88
2026	155.88	15.88
2027	155.88	15.88
2028	155.88	15.88
2029	155.88	15.88
2030	155.88	15.88

Chapter 4: Prospects for the Industry

Metal Prices

Metal prices are affected by numerous factors, the relationship of which are of varying degrees. Moreover, the relationships of these factors are so complex. While a single factor may matter the most in explaining the movements of metal prices in a certain period, there is almost no assurance whatsoever, that the same factor will still be of import in another period.

Volatile movements have been the norm rather than the exception with metal prices, thus, making it difficult to anticipate in the future. Nevertheless, the future price trends for certain metals are discussed, after presenting the necessary caveat above.

Gold prices may get some support from higher inflation and a relatively weak dollar--due to the big US trade deficit--in the next two years. However, these may not be enough to arrest a declining trend in gold prices. Much of this is due to the emerging supply situation. World gold production has been expanding in recent years. as relative prices have been shifting in favor of gold.

It seems that the precious metal is getting to be not so precious after all. Increased exploration and mining activities overseas, coupled with the expected slowdown in the industrial growth of most industrial countries will soften gold prices a bit this year, and more so, in the coming years. Gold prices may settle at \$420 per oz. in 1989 and may hover around \$360 to \$380 per oz. in the medium term.

One thing going against the prices of base metals, particularly copper, is that the demand-supply gap--as indicated by lower inventories--may be corrected at the start of the second semester of 1989. Demand for the red metal may taper off due to the slower growth of industrial countries. This precludes that copper-intensive capital goods industries will also register lower growths in output. While on the supply side, large production units in major copper-producing countries are scheduled to come on-stream in the coming years. The threat of substitutes, however, is seen to have an effect yet in the long term. A slight reduction in copper prices may be expected this year. Also, the dampening effects of these negative factors will be felt strongly in 1990's when copper prices will be around \$0.60 to \$0.85 per pound.

Mineral Reserves

Positive or measured reserves [1] of metallic minerals as measured in 1986 are shown in the table below.

Table 4.1: Positive Reserves of Metallic Minerals, 1986

Mineral	Unit	Positive Reserves Metal Content
Primary Gold	Kg.	153,873
Secondary Gold	Kg.	1,040,162
Copper	Mt.	15,881,551
Nickel	Mt.	16,777,296
Lead	Mt.	149,436
Iron Ore	Mt.	461,852,517
Chromite:		
Metallurgical	Mt.	10,962,339
Refractory	Mt.	4,708,836
Chemical	Mt.	3,225,939

Note: Figures for iron ore and chromite are comparative tonnages for ores and not net metal contents.

Source: BMGS, SGV (1988)

Chapter 4: Prospects for the Industry

These reserves are more than adequate to meet production requirements in terms of net metal content. All tonnages can supply at least fifty years of output, except for primary gold which was estimated to last less than ten years [2].

However, reserves are classified as those minerals that are economically exploitable at current prices and with the available technology. Thus, the estimated reserves could have gone up after 1986 when metal prices started to inch upward.

Production Capacities

The copper industry has an operational milling capacity of 270,000 TPD of which 80% is being utilized. With the inclusion of non-operating copper mines, capacity utilization drops to about 60%.

Primary gold producers have a combined milling capacity of 10,000 TPD at full capacity utilization. Besides, there were no suspended operations in recent years.

The production capacity of the mothballed Nonoc nickel refinery is 34,000 Dmt. of nickel metal or 3,000,000 Dmt. of nickeliferous ore. The beneficiated ore producers contribute an additional 500,000 Dmt.

The production capacity for chromite producers can be estimated using the peak output through the years since industry participants come and go every year, with the exception of major producers with established milling capacities (see Table 4.2).

Table 4.2: Peak Output and Capacity Utilization Rates (Chromite)

Mineral	Peak Output/Year (000 Dmt.)	Capacity Utilization Rates (1988)
Metallurgical conc.	140.00 (1981)	30.5%
Metallurgical ore	43.70 (1986)	52.7%
Chemical grade ores	21.03 (1988)	100.0%
Refractory ores	400.00 (1977)	24.0%

Source: BMGS

Production/Exports

In the course of estimating future trends in mining production, the following pointers were considered:

- a) There is a limited flexibility in varying total mining output. Expanding mine output in the short run beyond rated capacity is constrained by the time required to develop other mining areas and to adjust the mill to variations in the ore grade. On the other hand, production cutbacks can be resorted to. However, temporary shutdowns (with the intention of reopening the mine in a year or two) rarely occurs [3].
- b) The short term effect of prices is not that significant. However, the effect of expected metal prices, among others, would matter more in terms of investments in new or additional mining capacity in the medium term.
- c) Additional mine capacity will be insignificant in the medium term. Except for the gold sector, where one new mine is starting to operate commercially and is expected to contribute around 700 kg. of gold per annum, no major additions to capacity is expected in the said period. While two copper mines are planning to expand capacity, this will

require a lead time of three to five years. Thus, they are not expected to increase production in the near future.

In view of the above, the expected growth in mining production in the medium term appears to be modest (see Table 4.3).

Table 4.3: Medium Term Trend for Mining Production
(000 units)

Mineral	Unit	1989	1993	Average Growth 1989-1993
Gold	Kg.	37.07	40.92	3.0%
Copper	Mt.	232.64	248.16	2.0%
Nickel	Mt.	12.45	13.00	1.0%
Chromite	Dmt.	184.06	191.54	1.0%

Note: Copper, gold and nickel - metal content

It was also assumed that mineral exports will basically follow the same trends as that of production. Thus expected growth of mineral exports will also be modest (see Table 4.4).

Table 4.4: Medium Term Trend for Mineral Exports
(000 units)

Mineral	Unit	1989	1993	Average Growth 1989-1993
Gold from copper ores	oz.	282.45	317.90	3.0%
Copper conc.	Dmt.	459.34	497.20	2.0%
Nickel ores	Dmt.	493.95	514.00	1.0%
Chromite ores & concentrates	Dmt.	165.13	171.84	1.0%

Investment Prospects

With the sluggish metal prices expected in the medium term horizon, it will be increasingly difficult to justify new or

additional investments in capacity. Moreover, a constraining factor which seems to be inhibiting foreign investments in the country is the non-enactment of the New Mineral Development Code.

This does not preclude, though, the absence of investments in the industry. Investments in order to further improve operating efficiency will always be resorted to. Foreign companies that have the means of offering new-technology--which allows for cost savings or increased efficiency--and the knowledge or experience in negotiating satisfactory mining agreements besides operating in other host countries will have a distinct advantage in the country [4].

Prospects for Machinery, Equipment and Spare Parts

Given the prospects for the mining industry, the purchases of imported machinery and equipment in the medium term will grow moderately. Moreover, much of these purchases will be in the form of replacement demand due to obsolete machinery and equipment..

On the other hand, demand for spareparts is expected to improve in the coming years in lieu of any major expansion and equipment upgrading programs in the industry.

Lastly, there is a good possibility that there will be shifting in the country sources of machinery, equipment and spare parts. In a large degree, this would depend on the type of technology that is adopted by a number of joint venture firms with foreign equity participation.

CABLE ADD : Vulcan Manila
TELEX : ITT 42253 "Vulcan PH"
FAX : 762080
CONTACT : Alfredo C. Ramos
POSITION : President

Chapter Notes

- [1] Positive reserves are computed from dimensions revealed in outcrops, trenches, workings or drill holes, and whose grades are computed with sufficient accuracy from the results of the detailed sampling. Sites for inspection, sampling and measurement are spaced so closely that the geological character is so well defined that size, shape, depth and the mineral content of the resources are well established (SGV, 1988).
- [2] Ibid.
- [3] This is especially true for copper mines.
- [4] A number of Australian mining companies have already entered into joint venture agreements with some local companies particularly in the gold sector.

APPENDIX A

List of Philippine Mining Companies

Product : GOLD

COMPANY : Abcar Paragon Mining Corporation
 ADDRESS : 7th fl, Alfaro St., Champaca Bldg Salcedo Village, Makati
 PHONE : 8151071 (4)
 CABLE_ADD : None
 TELEX : None
 FAX : 815-1064
 CONTACT_1 : Ernesto Caringal
 POSITION : President
 CONTACT_2 : Omar Dizon
 POSITION : Purchasing Manager
 ACTIVITY : Mining
 PRODUCTS : Gold
 SUBSIDIARIES/AFFILIATES : None
 MINESITE : Parakale, Camarines Norte (OP & UG)
 GROSS REVENUE 1987 : N.A.
 TOTAL ASSET 1987 : N.A.
 OWNERSHIP : N.A.

COMPANY : Kenmare Resources PLC
 ADDRESS : PNOC-EDC Meritt Road, Fort Bonifacio, Makati
 PHONE : 8160416 8158961
 CABLE_ADD : None
 TELEX : 22646 Kenmare PH
 FAX : 815-2747
 CONTACT_1 : Antonio V. del Rosario
 POSITION : President
 CONTACT_2 : Omel Celenk
 POSITION : Materials and Project Manager
 ACTIVITY : Exploration
 PRODUCTS : Gold
 SUBSIDIARIES/AFFILIATES : Kenmare Minerals
 MINESITE : Southeast Negros; Legaspi, Albay, Bicol; Tongonan,
 Leyte
 GROSS REVENUE 1987 : N.A.
 TOTAL ASSET 1987 : N.A.
 OWNERSHIP : N.A.

COMPANY : Vulcan Industrial and Mining Corporation
 ADDRESS : 8th fl. Quad Alpha Centrum, 125 Pioneer St.,
 Mandaluyong
 PHONE : 782061 771633
 CABLE_ADD : Vulcan Manila
 TELEX : ITT 42251 "Vulcan PM"
 FAX : 782060
 CONTACT_1 : Alfredo C. Ramos
 POSITION : President

CONTACT_2 : Pacifico T. Minas
POSITION : Materials Manager
ACTIVITY : Mining
PRODUCTS : Gold
SUBSIDIARIES/AFFILIATES : N.A.
MINESITE : San Vicente, Palawan (OP)
GROSS REVENUE 1987 : N.A.
TOTAL ASSET 1987 : N.A.
OWNERSHIP : Public

COMPANY : Alpha Resources Development Corporation
ADDRESS : 14 th fl., Metro Bank Building, Gil Puyat, Makati
PHONE : 8108661 8158114
CABLE ADD : N.A.
TELEX : N.A.
FAX : 810-7509
CONTACT 1 : Henry Fernandez
POSITION : President
CONTACT 2 : N.A.
POSITION : N.A.
ACTIVITY : Exploration
PRODUCTS : Gold
SUBSIDIARIES : N.A.
MINESITE : N.A.
GROSS REVENUE 1987: N.A.
TOTAL ASSET 1987: N.A.
OWNERSHIP : N.A.

COMPANY : Banahaw Mining and Development Corporation
ADDRESS : 4th fl., Hong Kong Building, Ortigas Complex, Pasig
PHONE : 6730856
CABLE ADD : None
TELEX : 62386 BANAHAW PN
FAX : 6735633
CONTACT 1 : Douglas Villanueva
POSITION : President
CONTACT 2 : Jaime Lucena
POSITION : Purchasing manager
ACTIVITY : Mining
PRODUCTS : Gold
SUBSIDIARIES : N.A.
MINESITE : Buan, Wasian, Agusan del Sur (UG)
GROSS REVENUE 1987 : Still in
TOTAL ASSET 1987 : development - no figures
OWNERSHIP : N.A.

Product : GOLD, SILVER

COMPANY : Apex Mining Company Incorporated
ADDRESS : 11th Fl. Strata 200, Emerald Avenue, Pasig
PHONE : 6736534
CABLE_ADD : APEXMIN MANILA

TELEX : 43176 APEXMIN PM
FAX : NONE
CONTACT_1 : Vicente G. Puyat
POSITION : President
CONTACT_2 : Hermigildo L. Montemayor
POSITION : Materials Control Manager
ACTIVITY : Mining and milling
PRODUCTS : Gold, silver
SUBSIDIARIES/AFFILIATES : N.A.
MINESITE : Masara, Maco, Davao del Norte (UG)
GROSS REVENUE 1987 : 417610 (000 Pesos)
TOTAL ASSET 1987 : 429108 (000 Pesos)
OWNERSHIP : Public

COMPANY : Atok Big-Wedge Mining Company Incorporated
ADDRESS : 16th fl., Aurora Towers Inc., Malvar St., Cubao, QC
PHONE : 9212701 loc 272
CABLE_ADD : JAMARA MANILA
TELEX : ITT 42019 AMADING PM RCA 27331 JAA PH
FAX : NONE
CONTACT_1 : Ramon H. Felipe
POSITION : President
CONTACT_2 : George Fores
POSITION : Purchasing Manager
ACTIVITY : Mining
PRODUCTS : Gold, Silver
SUBSIDIARIES/AFFILIATES : None
MINESITE : Gumatdang, Itogon Benguet
GROSS REVENUE 1987 : 33447 (000 Pesos)
TOTAL ASSET 1987 : 51487 (000 Pesos)
OWNERSHIP : Public

COMPANY : Itogon-Suyoc Mines Incorporated
ADDRESS : RM 308 Makati Stock Exchange Bldg., Ayala, Makati
PHONE : 8190171 - 3
CABLE_ADD : ISMINE
TELEX : None
FAX : NONE
CONTACT_1 : Dennis Belmonte
POSITION : President
CONTACT_2 : Abner S. Franco
POSITION : Purchasing Manager
ACTIVITY : Mining and milling
PRODUCTS : Gold, Silver
SUBSIDIARIES/AFFILIATES : None
MINESITE : Sangilo, Itogon, Benguet Suyoc, Mankayan, Benguet
GROSS REVENUE 1987 : 108543 (000 Pesos)
TOTAL ASSET 1987 : 69754 (000 Pesos)
OWNERSHIP : Public

COMPANY : Manila Mining Corporation
ADDRESS : 20th fl. BA-Lepanto Bldg. 8747 Paseo de Roxas, Makati

PHONE : 859447 8193786
CABLE_ADD : COBRE MANILA
TELEX : RCA 722255 ITT 7425124 ETPI 64204
FAX : 810-5583
CONTACT_1 : Arsenio Gonzales
POSITION : President
CONTACT_2 : Almario S. Enrique
POSITION : Purchasing Manager
ACTIVITY : Mining
PRODUCTS : Gold, Silver
SUBSIDIARIES/AFFILIATES : None
MINESITE : Bo. Tinabingan Placer, Surigao del Norte (OP)
GROSS REVENUE 1987 : 75668 (000 Pesos)
TOTAL ASSET 1987 : 128598 (000 Pesos)
OWNERSHIP : Public

COMPANY : Surigao Consolidated Mining Company Incorporated
ADDRESS : 11th fl. Strata 200 Bldg., Emerald Avenue, Pasig
PHONE : 6731401 6735052
CABLE_ADD : None
TELEX : 43176 Apexmin PM
FAX : NONE
CONTACT_1 : Walter Brown
POSITION : President
CONTACT_2 : Angelito T. Tecson
POSITION : Materials Control
ACTIVITY : Mining
PRODUCTS : Gold, Silver
SUBSIDIARIES/AFFILIATES : Icon Minerals, Golden Arrow, Marina Mines
MINESITE : Siana, Mainit, Surigao del Norte (OP)
GROSS REVENUE 1987 : 368135 (000 Pesos)
TOTAL ASSET 1987 : 304675 (000 Pesos)
OWNERSHIP : Public

Product : GOLD, COPPER

COMPANY : North Davao Mining Corporation
ADDRESS : 104 Gamboa, NDMC Bldg., Legaspi Village, Makati
PHONE : 8170736 8170526
CABLE_ADD : NORTH DAVAO
TELEX : 45852 AUCU PM
FAX : 817-6331
CONTACT_1 : Amor Estebanlar
POSITION : President
CONTACT_2 : Dominic Barbieto
POSITION : Purchasing Manager
ACTIVITY : Mining
PRODUCTS : Gold, Copper
SUBSIDIARIES/AFFILIATES : None
MINESITE : Maco, Davao del Norte (OP)
GROSS REVENUE 1987 : 533796 (000 Pesos)
TOTAL ASSET 1987 : 2929206 (000 Pesos)

OWNERSHIP : N.A.

Product : GOLD, SILVER, COPPER

COMPANY : Marcopper Mining Corporation
ADDRESS : 6th fl Madrigal Bldg., 6793 Ayala Avenue, Makati
PHONE : 8102081
CABLE_ADD : MARCOPPER MANILA
TELEX : 22140 MOM PH(RCA) 63627 MARCOP PH(Eastern),
FAX : 817-0190
CONTACT_1 : John E. Dodge
POSITION : President
CONTACT_2 : Francisco G. Talampas
POSITION : Purchasing Manager
ACTIVITY : Mining and milling
PRODUCTS : Gold, silver, copper
SUBSIDIARIES/AFFILIATES : None
MINESITE : Sta. Cruz, Marinduque; Tapian (OP); Tapian Leach (Le)
GROSS REVENUE 1987 : 789138 (000 Pesos)
TOTAL ASSET 1987 : 1248912 (000 Pesos)
OWNERSHIP : Public

COMPANY : Philex Mining Corporation
ADDRESS : Philex Bldg., cor. Brixton & Fairlane Sts., Pasig
PHONE : 6731971-78
CABLE_ADD : PHILEXMINE MANILA PHILEXMINE PASIG
TELEX : 43141 ITT ,Philex PM
FAX : 721-6398
CONTACT_1 : Henry A. Brimo
POSITION : President
CONTACT_2 : Ermelo R. Escalante
POSITION : Assistant Vice President - Purchasing
ACTIVITY : Copper, gold and silver mining
PRODUCTS : Gold, Silver, Copper
SUBSIDIARIES/AFFILIATES : CityTrust Banking Corporation,
Firestone Tire & Rubber Corp, Armco Marsteel Corporation
MINESITE : Padcal, Tuba, Benguet (UG)
GROSS REVENUE 1987 : 2262527 (000 Pesos)
TOTAL ASSET 1987 : 2645999 (000 Pesos)
OWNERSHIP : Public

COMPANY : Maricalum Mining Corporation
ADDRESS : 2283 Pasong Tamo Extension, Makati
PHONE : 864011 878625
CABLE_ADD : None
TELEX : 74245154
FAX : NONE
CONTACT_1 : Jose C. Vitug
POSITION : Officer-in-Charge
CONTACT_2 : Nazario Cordoba
POSITION : Purchasing Manager
ACTIVITY : Mining and milling
PRODUCTS : Gold, silver, copper

SUBSIDIARIES : None
MINESITE : San Jose, Sipalay, Negros Occidental
GROSS REVENUE 1987: N.A.
TOTAL ASSET 1987 : N.A.
OWNERSHIP: N.A.

COMPANY : Lepanto Consolidated Mining Corporation
ADDRESS : 21st flr., BA-Lepanto Building, 8747 Paseo de Roxas,
Makati
PHONE : 8159447
CABLE ADD : COBRE MANILA
TELEX : 7222255 (RCA) 7425124 (ITT) 64204 (Eastern) 14893
(Capwire),
FAX : 810-5583
CONTACT 1 : Ramon A. Recto
POSITION : President
CONTACT 2 : Juan R. Ravalo
POSITION : Asst. Vice-Pres. and Purchasing Manager
ACTIVITY : Mining and milling
PRODUCTS : Gold, silver, copper
SUBSIDIARIES : Diamond Drilling Corporation of the Philippines,
Lepanto Investment and Development Corporation
Shipside, Inc.
MINESITE : Mankayan, Benguet (UG)
GROSS REVENUE 1987: 1267583 (000 Pesos)
TOTAL ASSET 1987 : 1550515 (000 Pesos)
OWNERSHIP: Public

COMPANY : Dizon Copper Silver Mines Inc.
ADDRESS : 214 State Condominium, Ortigas Ave., Greenhills
San Juan, M. M.
PHONE : 7213961 - 3
CABLE ADD : None
TELEX : None
FAX : 721-5954
CONTACT 1 : Jovencio D. Dizon
POSITION : President
CONTACT 2 : Veronica Dacanay
POSITION : Purchasing Manager
ACTIVITY : Mining and milling
PRODUCTS : Gold, silver, copper
SUBSIDIARIES : N.A.
MINESITE : Barrio Aglao, San Marcelino, Zambales
GROSS REVENUE 1987: 105643 (000 Pesos)
TOTAL ASSET 1987 : 74420 (000 Pesos)
OWNERSHIP: Public

Product : GOLD, COPPER, CHROMITE

COMPANY : Lodestar Mining Corporation
ADDRESS : Valgosons Realty Bldg., Pasong Tamo, Makati
PHONE : 8176869
CABLE_ADD : LODEMINE MANILA
TELEX : None

FAX : 817-6869
CONTACT_1 : Delfin N. Gonzalez
POSITION : President
CONTACT_2 : Leo Gusto
POSITION : Materials Control
ACTIVITY : Exploration
PRODUCTS : Gold, Copper, Chromite
SUBSIDIARIES/AFFILIATES : None
MINESITE : Aroroy, Masbate; Sakong, Puerto Princessa, Palawan,
Negros Occidental & Nueva Ecija
GROSS REVENUE 1987 : N.A.
TOTAL ASSET 1987 : N.A.
OWNERSHIP : N.A.

Product : GOLD, CHROMITE, NICKEL

COMPANY : Camarines Minerals
ADDRESS : Marsman Bldg., Gil Puyat, Makati
PHONE : 872031 889731
CABLE_ADD : None
TELEX : 72222060 MSN PH
FAX : 815-4082
CONTACT_1 : Luciano Salazar
POSITION : President
CONTACT_2 : Octavio Lasay
POSITION : Materials Manager
ACTIVITY : Mining
PRODUCTS : Gold, Chromite, Nickel
SUBSIDIARIES/AFFILIATES : None
MINESITE : Paracale, Camarines Norte; Jose Panganiban,
Camarines Norte; Manikane Island, Guiuan,
Eastern Samar
GROSS REVENUE 1987 : N.A.
TOTAL ASSET 1987 : N.A.
OWNERSHIP : N.A.

Product : GOLD, SILVER, COPPER, PYRITE CONC.

COMPANY : Atlas Consolidated Mining Corporation
ADDRESS : 3rd fl. Soriano Bldg. 8776 Paseo de Roxas, Makati
PHONE : 8190251 - 9
CABLE_ADD : COPPER PM
TELEX : 45642
FAX : 815-4604
CONTACT_1 : Juan de Ibazeta
POSITION : President
CONTACT_2 : Dominador C. Uy
POSITION : Senior Vice President (Purchasing)
ACTIVITY : Mining and Milling
PRODUCTS : Gold, silver, copper, pyrite conc.
SUBSIDIARIES/AFFILIATES : None
MINESITE : Toledo, Cebu (UG); Aroroy, Masbate (OP); Colorado,
IXL-Balete, Dabu-Panique, Masbate (OP); Berong,
Quezon & Tagbita, Palawan (OP)

GROSS REVENUE 1987 : 3724256 (000 Pesos)
TOTAL ASSET 1987 : 8039643 (000 Pesos)
OWNERSHIP : Public

Product : GOLD, SILVER, COPPER, CHROMITE

COMPANY : Benguet Corporation
ADDRESS : Benguet Center, 12 San Miguel Ave., Mandaluyong
PHONE : 7216801 - 35
CABLE_ADD : BENGUETCORP MANILA
TELEX : 63651BCI Pn (Eastern) 42079 Benguet PM ITT, Fax No.
721-1291
FAX : NONE
CONTACT_1 : Delfin Lazaro
POSITION : President
CONTACT_2 : Veronica Dacanay
POSITION : Group Manager Procurement
ACTIVITY : Mining, exploration, beneficiation, marketing of
minerals
PRODUCTS : Gold, Silver, Copper, Chromite
SUBSIDIARIES/AFFILIATES : Benguet Management Corporation 100%;
Arrow Freight Corporation 100%; Itogon Suyoc Mines 54%
MINESITE : Benguet Gold-Balatok Itogon, Benguet; Dizon Copper
Gold-San Marcelino Zambales (OP); Masinloc Chromite-
Coto Masinloc, Zambales; Benguet Paracele Gold-Jose
Panganiban, Camarines Norte
GROSS REVENUE 1987 : 3403587 (000 Pesos)
TOTAL ASSET 1987 : 3487396 (000 Pesos)
OWNERSHIP : Public

Product : GOLD, SILVER, COPPER, SULFUR

COMPANY : Benguet Exploration Incorporated
ADDRESS : 2nd fl. Sterlinglife. Condmn., Dela Rosa, Makati
PHONE : 8191911 8154309
CABLE_ADD : N.A.
TELEX : 62111 BEI PN
FAX : 817-8553
CONTACT_1 : Joaquin Rodriguez
POSITION : President
CONTACT_2 : Generoso Alcasabas
POSITION : Purchasing Manager
ACTIVITY : Mining
PRODUCTS : Gold, Silver, copper, sulfur
SUBSIDIARIES/AFFILIATES : Sterling Life Insurance Corporation
100%; Falcon Minerals Incorporated 67%
MINESITE : Camp 6, Kennon Rd. Tuba, Benguet (UG); Omibex Heap
Leaching, Makawiwi, Li, Itogon, Benguet (OP);
Makawiwi, Li, Itogon, Benguet (OP); Pinut-an, San
Ricardo Panaon Island, South Leyte (UG); Singalat,
Palayan City, Nueva Ecija (OP); Thanksgiving (UG)
GROSS REVENUE 1987 : 122542 (000 Pesos)
TOTAL ASSET 1987 : 185174 (000 Pesos)

OWNERSHIP : Public

Product : CHROMITE

COMPANY : Acoje Mining Company Incorporated
ADDRESS : 6th fl. Quad Alpha Centrum, 125 Pioneer St., Mand.
PHONE : 773669 796468
CABLE_ADD : None
TELEX : 42414 ACOJE PM
FAX : NONE
CONTACT_1 : Modesto B. Bermudez
POSITION : President
CONTACT_2 : Eduardo G. Dacanay
POSITION : Purchasing Manager
ACTIVITY : Mining
PRODUCTS : Chromite (metallurgical & lumpy ore)
SUBSIDIARIES/AFFILIATES : None
MINESITE : Candalaria, Sta. Cruz, Zambales (OP/UG); Dinagat
Island, Surigao del Norte (OP)
GROSS REVENUE 1987 : N.A.
TOTAL ASSET 1987 : N.A.
OWNERSHIP : N.A.

COMPANY : Alamag Processing Corporation (Rio Chico Mng. Corp.)
ADDRESS : 2nd fl. EBC Bldg. Greenhills San Juan, MM
PHONE : 7216011-21 L245
CABLE_ADD : BAYER PHIL MANILA
TELEX : RCA 27458 BAY PH 66070 PN BAYER
FAX : 721-9101
CONTACT_1 : Helmut Von Hagen
POSITION : President
CONTACT_2 : Perry Sibiangco
POSITION : Purchasing Manager
ACTIVITY : Mining
PRODUCTS : Chromite (Chemical grade)
SUBSIDIARIES/AFFILIATES : None
MINESITE : Alamag, Llorente Eastern Samar (OP)
GROSS REVENUE 1987 : 28239 (000 Pesos)
TOTAL ASSET 1987 : 43408 (000 Pesos)
OWNERSHIP : N.A.

COMPANY : Homonhon (Annandale) Mining Resources Co., Inc.
ADDRESS : 1143 Perez St., Paco, Manila
PHONE : 591374/586760
CABLE_ADD : None
TELEX : ITT 40405 ICS 540
FAX : NONE
CONTACT_1 : Daniel Sison
POSITION : President
CONTACT_2 : Roger Mangaliman
POSITION : Purchasing
ACTIVITY : Mining

PRODUCTS : Chromite (Refractory)
SUBSIDIARIES/AFFILIATES : N.A.
MINESITE : Mt. Masinloc Chromite Mines, Zambales
GROSS REVENUE 1987 : N.A.
TOTAL ASSET 1987 : N.A.
OWNERSHIP : N.A.

COMPANY : Malayan Wood Products
ADDRESS : Universal Motors Building, Pasong Tamo Ext., Makati
PHONE : 885591
CABLE ADD : NONE
TELEX : NONE
FAX : NONE
CONTACT 1 : Eric L. Lee
POSITION : Exec. Vice-President
CONTACT 2 : N.A.
POSITION : N.A.
ACTIVITY : Mining
PRODUCTS : Chromite
SUBSIDIARIES : N.A.
MINESITE : N.A.
GROSS REVENUE 1987 : 18579 (000 Pesos)
TOTAL ASSET 1987 : 13086 (000 Pesos)
OWNERSHIP : N.A.

COMPANY : Caschrome Incorporated
ADDRESS : 18 Lincoln Street, West Greenhills, Mandaluyong
PHONE : 7224589 - 90
CABLE ADD : NONE
TELEX : NONE
FAX : NONE
CONTACT 1 : Ramon C. Atayde
POSITION : President
CONTACT 2 : N.A.
POSITION : N.A.
ACTIVITY : Mining - No operation
PRODUCTS : Chromite
SUBSIDIARIES : N.A.
MINESITE : N.A.
GROSS REVENUE 1987 : 18870 (000 Pesos)
TOTAL ASSET 1987 : 25289 (000 Pesos)
OWNERSHIP : N.A.

Product : NICKEL

COMPANY : Hinatuan Mining Corporation
ADDRESS : 4th fl. Singapore Airlines Bldg., Dela Costa, Makati
PHONE : 8174460
CABLE_ADD : HIMIC MANILA
TELEX : HINMC 23685
FAX : NONE

CONTACT_1 : Salvador Zamora
POSITION : President.
CONTACT_2 : Benjamin Buenaventura
POSITION : Purchasing Manager
ACTIVITY : Mining
PRODUCTS : Nickel
SUBSIDIARIES/AFFILIATES : None
MINESITE : Hinatuan Island, Surigao del Norte (OP)
GROSS REVENUE 1987 : 51804 (000 Pesos)
TOTAL ASSET 1987 : 89197 (000 Pesos)
OWNERSHIP : N.A.

COMPANY : Rio Tuba Nickel Mining Corporation
ADDRESS : 2nd fl. Solid Mills Bldg Dela Rosa , Makati
PHONE : 874824 871006-9
CABLE_ADD : RIONICKEL MANILA
TELEX : RCA 722-2587
FAX : 817-9996
CONTACT_1 : Manuel Zamora
POSITION : President
CONTACT_2 : Zenaida Hernandez
POSITION : Purchasing Manager
ACTIVITY : Mining
PRODUCTS : Nickel
SUBSIDIARIES/AFFILIATES : None
MINESITE : Bo. Rio Tuba, Bataraza, Palawan (OP)
GROSS REVENUE 1987 : N.A.
TOTAL ASSET 1987 : N.A.
OWNERSHIP : N.A.

COMPANY : Taganito Mining Corporation
ADDRESS : 4th fl., Solid Mills Building, Dela Rosa St., Makati
PHONE : 864679 - 88
CABLE_ADD : NONE
TELEX : NONE
FAX : NONE
CONTACT 1 : Renato R. Reyes
POSITION : President
CONTACT 2 : Anecto Torrefranca
POSITION : Purchasing manager
ACTIVITY : Mining
PRODUCTS : Nickel (Beneficiated ore)
SUBSIDIARIES : Rio Tuba Nickel Mining Corporation, Hinatuan
Mining
MINESITE : Taganito, Claber, Surigao del Norte (OP)
GROSS REVENUE 1987 : N.A.
TOTAL ASSET 1987 : N.A.
OWNERSHIP : N.A.

Product : COAL

COMPANY : Almendras Mining Corporation
ADDRESS : 9 E.Rodriguez St., Pasay City

PHONE : 5218141/5212641
CABLE_ADD : NONE
TELEX : NONE
FAX : NONE
CONTACT_1 : Adelaida Rodriguez
POSITION : Executive Vice President
CONTACT_2 : N.A.
POSITION : N.A.
ACTIVITY : Mining
PRODUCTS : Coal
SUBSIDIARIES/AFFILIATES : N.A.
MINESITE : Dapdap & Taganilan, Compostela & Licos Togonon
Danao City, Cebu
GROSS REVENUE 1987 : N.A.
TOTAL ASSET 1987 : N.A.
OWNERSHIP : N.A.

COMPANY : Almendras Mining Corporation/ Edmann Dev. Corp.
ADDRESS : 44 Escario St., Cebu City, Cebu
PHONE : 72601
CABLE_ADD : NONE
TELEX : NONE
FAX : NONE
CONTACT_1 : Angeles S. Uy
POSITION : President
CONTACT_2 : N.A.
POSITION : N.A.
ACTIVITY : Mining
PRODUCTS : Coal
SUBSIDIARIES/AFFILIATES : N.A.
MINESITE : Cahumayhumayan & Lantawan, Danao City, Cebu
GROSS REVENUE 1987 : N.A.
TOTAL ASSET 1987 : N.A.
OWNERSHIP : N.A.

COMPANY : Argonaut Mineral Exploration
ADDRESS : 7th fl. Ortigas Bldg. Pasig, MM
PHONE : 780921/7212707
CABLE_ADD : NONE
TELEX : NONE
FAX : NONE
CONTACT_1 : Ernesto Caringal
POSITION : Vice President (Operations)
CONTACT_2 : N.A.
POSITION : N.A.
ACTIVITY : Mining
PRODUCTS : Coal
SUBSIDIARIES/AFFILIATES : N.A.
MINESITE : Alpaco, Naga, Cebu
GROSS REVENUE 1987 : N.A.
TOTAL ASSET 1987 : N.A.
OWNERSHIP : N.A.

COMPANY : Cebu Alpaco Mining Incorporated
ADDRESS : 26 Happy Valley 1st St., Rama Ave. Cebu City
PHONE : N.A.
CABLE_ADD : NONE
TELEX : NONE
FAX : NONE
CONTACT_1 : Alexander Yap
POSITION : President
CONTACT_2 : N.A.
POSITION : N.A.
ACTIVITY : Mining
PRODUCTS : Coal
SUBSIDIARIES/AFFILIATES : N.A.
MINESITE : Alpaco, Lanas & Iutac, Naga, Cebu
GROSS REVENUE 1987 : N.A.
TOTAL ASSET 1987 : N.A.
OWNERSHIP : N.A.

COMPANY : Cebu Coal Mines Incorporated
ADDRESS : Rm 9 304 State Condominium I, Salcedo St., Makati
PHONE : 8183721
CABLE_ADD : NONE
TELEX : NONE
FAX : NONE
CONTACT_1 : Arsenio Santos
POSITION : President
CONTACT_2 : N.A.
POSITION : N.A.
ACTIVITY : Mining
PRODUCTS : Coal
SUBSIDIARIES/AFFILIATES : N.A.
MINESITE : Asturias, Danao City, Talisay, Pardo, Cebu City
GROSS REVENUE 1987 : N.A.
TOTAL ASSET 1987 : N.A.
OWNERSHIP : N.A.

COMPANY : D.G. Sanchez Coal Mines Incorporated
ADDRESS : 24 Fulton St., Lahug, Cebu City
PHONE : 92123
CABLE_ADD : NONE
TELEX : NONE
FAX : NONE
CONTACT_1 : Dominador Sanchez
POSITION : President
CONTACT_2 : N.A.
POSITION : N.A.
ACTIVITY : Mining
PRODUCTS : Coal
SUBSIDIARIES/AFFILIATES : N.A.
MINESITE : Luca, Balamban, Cebu
GROSS REVENUE 1987 : N.A.
TOTAL ASSET 1987 : N.A.

OWNERSHIP : N.A.

COMPANY : E B Aznar Mining Corporation
ADDRESS : 23 Pelaez St., Cebu City
PHONE : 77586/74968
CABLE_ADD : NONE
TELEX : NONE
FAX : NONE
CONTACT_1 : Emmanuel Aznar
POSITION : President
CONTACT_2 : N.A.
POSITION : N.A.
ACTIVITY : Mining
PRODUCTS : Coal
SUBSIDIARIES/AFFILIATES : N.A.
MINESITE : Mantija & Camansi, Danao City, Cebu
GROSS REVENUE 1987 : N.A.
TOTAL ASSET 1987 : N.A.
OWNERSHIP : N.A.

COMPANY : F F Cruz and Company
ADDRESS : 800 Edsa Ave., Quezon City
PHONE : 9215241 (3789)
CABLE_ADD : FEFCRUZ MANILA
TELEX : 72227877 FFC PH
FAX : 921-1223
CONTACT_1 : Felipe F. Cruz
POSITION : President
CONTACT_2 : Eric A. Cruz
POSITION : Purchasing Manager
ACTIVITY : Mining
PRODUCTS : Coal
SUBSIDIARIES/AFFILIATES : N.A.
MINESITE : Bulalacao, Oriental Mindoro
GROSS REVENUE 1987 : 498055 (000 Pesos)
TOTAL ASSET 1987 : 9120 (000 Pesos)
OWNERSHIP : N.A.

COMPANY : Fortune Coal Development Corporation
ADDRESS : 218 MJ Cuenco Ave., Cebu City
PHONE : NONE
CABLE_ADD : NONE
TELEX : NONE
FAX : NONE
CONTACT_1 : Cesar R. Pasag
POSITION : President
CONTACT_2 : N.A.
POSITION : N.A.
ACTIVITY : Coal exploration, marketing & distribution
PRODUCTS : Coal
SUBSIDIARIES/AFFILIATES : N.A.

MINESITE : Alpaco & Uling Naga, Cebu
GROSS REVENUE 1987 : N.A.
TOTAL ASSET 1987 : N.A.
OWNERSHIP : N.A.

COMPANY : Hercules Coal Mining and Development Corporation
ADDRESS : Rm 2 Mendezona Bldg., F Ramos St., Cebu City
PHONE : NONE
CABLE_ADD : NONE
TELEX : NONE
FAX : NONE
CONTACT_1 : Luis O. Mendezona
POSITION : President
CONTACT_2 : N.A.
POSITION : N.A.
ACTIVITY : Mining
PRODUCTS : Coal
SUBSIDIARIES/AFFILIATES : N.A.
MINESITE : Pawikan, Cataingan, Masbate
GROSS REVENUE 1987 : 23668 (000 Pesos)
TOTAL ASSET 1987 : 15198 (000 Pesos)
OWNERSHIP : N.A.

COMPANY : Il Rey'c Coal Mining Exploration Corporation
ADDRESS : Beatriz Compound, Danao City, Cebu
PHONE : 472
CABLE_ADD : NONE
TELEX : NONE
FAX : NONE
CONTACT_1 : Conrado Batoon
POSITION : President
CONTACT_2 : N.A.
POSITION : N.A.
ACTIVITY : Mining
PRODUCTS : Coal
SUBSIDIARIES/AFFILIATES : N.A.
MINESITE : Cahumayhumayan & Lantawan, Danao City, Cebu
GROSS REVENUE 1987 : N.A.
TOTAL ASSET 1987 : N.A.
OWNERSHIP : N.A.

COMPANY : JD Almendras Agro-industrial & Development Corp.
ADDRESS : Paradise Village, Banilad, Cebu City
PHONE : 77009
CABLE_ADD : NONE
TELEX : NONE
FAX : NONE
CONTACT_1 : Josefino Almendras
POSITION : President
CONTACT_2 : N.A.
POSITION : N.A.

ACTIVITY : Mining
PRODUCTS : Coal
SUBSIDIARIES/AFFILIATES : N.A.
MINESITE : Capillahan & Cahumayhumayan, Danao Ci
GROSS REVENUE 1987 : 13564 (000 Pesos)
TOTAL ASSET 1987 : 21321 (000 Pesos)
OWNERSHIP : N.A.

COMPANY : Luvimin Cebu Mining Corporation
ADDRESS : 56 V. Gullas St., Cebu City
PHONE : NONE
CABLE_ADD : NONE
TELEX : NONE
FAX : NONE
CONTACT_1 : Antonio V. Garcia
POSITION : President
CONTACT_2 : N.A.
POSITION : N.A.
ACTIVITY : Coal Mining
PRODUCTS : Coal
SUBSIDIARIES/AFFILIATES : N.A.
MINESITE : Calagasan, Balaas, Bayabas, Argao, C
GROSS REVENUE 1987 : 51627 (000 Pesos)
TOTAL ASSET 1987 : 28341 (000 Pesos)
OWNERSHIP : N.A.

COMPANY : Manguerra Mining & Development
ADDRESS : Andres Abellana St., Cebu City
PHONE : 71580
CABLE_ADD : NONE
TELEX : NONE
FAX : NONE
CONTACT_1 : Mariano Manguerra
POSITION : President
CONTACT_2 : N.A.
POSITION : N.A.
ACTIVITY : Mining
PRODUCTS : Coal
SUBSIDIARIES/AFFILIATES : N.A.
MINESITE : Mantalongon, Dalaguete, Cebu
GROSS REVENUE 1987 : N.A.
TOTAL ASSET 1987 : N.A.
OWNERSHIP : N.A.

COMPANY : Pilipino Cathay Mining Corporation
ADDRESS : Suite 201 ITC Bldg.337 Gil Puyat, Mai
PHONE : 898665 884575
CABLE_ADD : NONE
TELEX : NONE
FAX : NONE
CONTACT_1 : Amador Borloza

POSITION : President
CONTACT_2 : N.A.
POSITION : N.A.
ACTIVITY : Mining
PRODUCTS : Coal
SUBSIDIARIES/AFFILIATES : N.A.
MINESITE : Bordeous, Polillo Island, Quezon
GROSS REVENUE 1987 : 5135 (000 Pesos)
TOTAL ASSET 1987 : 19768 (000 Pesos)
OWNERSHIP : N.A.

COMPANY : Pnoc-Coal Corporation
ADDRESS : Merritt Rd., Fort Bonifacio, Makati
PHONE : 8158961 859061
CABLE_ADD : PHILNOCO ATTN: EC
TELEX : 722666 EDC PH
FAX : 815-2747
CONTACT_1 : Manuel Estrella
POSITION : President
CONTACT_2 : Carlos Cruz
POSITION : Purchasing Manager
ACTIVITY : Mining and trading
PRODUCTS : Coal
SUBSIDIARIES/AFFILIATES : None
MINESITE : Bislig, Surigao del Sur Uling, Naga,
GROSS REVENUE 1987 : 633596 (000 Pesos)
TOTAL ASSET 1987 : 1092334 (000 Pesos)
OWNERSHIP : N.A.

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12. Sycip, Gorres, Velayo and Co., "Mining and Ore Dressing, Final Report, Long-Term Sectoral Plan, 1988-2000," Board of Investments, Philippines, January 1989.

COMPANY : Filipino Cathay Mining Corporation
ADDRESS : Suite 201 ITC Bldg. 337 Gil Puyat, Manila
PHONE : 898865 884873
CABLE_ADD : NONE
TELEX : NONE
FAX : NONE
CONTACT_1 : Amador Berlossa

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