

THE MINERAL INDUSTRY OF INDONESIA

By Pui-Kwan Tse

In 1998, Indonesia continued to endure its economic turmoil, which began in July 1997. In response to deteriorating financial crisis, the Government requested the assistance from the International Monetary Fund (IMF) on an economic reform program in October 1997. The agreement stabilization package between the Indonesian Government and IMF was revised in January, April, June, and July of 1998 in response to the deteriorating macroeconomic conditions. The program covered the entire range of economic challenges facing Indonesia, including fiscal and monetary policies, structural reform and deregulation, corporate debt, banking reform, and restoration of trade financing to promote exports.

In the past decade, the growth of the export sector had been a leading factor for Indonesian economic development. Between 1988 and 1997, the value of exports increased by nearly three-fold. With the decline in domestic demand, strong export performance was the essential for Indonesia's recovery. The depreciation of the rupiah should increase Indonesian export competitiveness with neighboring countries. Petroleum, natural gas, and minerals accounted for roughly 20% of Indonesian exports. In the past couple of years, the decline in the value of exports from the mining sector largely reflected the decline in prices of these commodities in the world market. With a strong demand in the world market, it could increase the market prices in these commodities and would boost the export revenue. About 50% of Indonesian exports was targeted to the East Asian countries; however, with continuing economic stagnation in Japan and East Asian countries, the outlook for strong demand in these countries is unlikely in the next couple years.

The depreciation of rupiah has affected the mining industry in different ways. The industrial minerals sector for construction materials has suffered most because the development of infrastructure declined dramatically. The consumption of building materials such as cement and aggregates has been reduced. However, exporting companies that depended on imported raw materials for reprocessing had difficulty purchasing raw materials because foreign banks refused to accept a letter of credit from Indonesian banks. Metal, machinery, and transportation equipment companies had reduced, according to the survey conducted by the Department of Industry and Trade, their employment and production significantly. About one-third of the companies temporarily shut down their operations. Indo-foreign joint-venture companies were not affected because their output was exported. Also, the operating costs in term of U.S. dollars for multinational companies in Indonesia were reduced.

The Government was planning to issue a new Mining Act in

early 1999 to replace the contract of work (COW) system that was adopted in 1967. The drafted new law will include a standard license covering both foreign and domestic companies. It will give the regional governments more autonomy in managing their mineral resources. Sixty-four percent of the revenues collected from royalties and rent will go to district governments, while the provincial and the central governments will receive 16% and 20%, respectively. Under the COW, revenue collections from oil and gas operations, as well as tax and royalties from mining companies were part of the state budget and were then distributed to provinces regarding their contribution to the state budget. Provincial administrations only received one-half of the land and building tax, while other taxes went to the central government (Metal Bulletin, 1998b).

In 1998, Indonesia faced a sharp drop in investment. The Government attempted to revive investors interests by passing a new law, granting tax holidays of up to 12 years to investors in 22 industries covering 81 types of production, including aluminum, copper, iron and steel, nickel manufacturing, mining equipment, and petroleum refining. The tax breaks were designed to assist Indonesian companies to compete with other countries and to attract investments in these industries. Many of these industries were heavily dependent on imports, which proved fatal when the rupiah collapsed. The standard exemption was 3 years for investments on Java or Bali, and 5 years in other parts of Indonesia. Additional 1-year tax breaks were given for projects employing more than 2,000 Indonesians and costing more than \$200 million exclusive of land and buildings. The Investment Coordinating Board would have the authority to approve foreign investments valued at \$100 million or less. As before, such investments required presidential approval (Financial Times, 1999a).

At yearend 1998, the Government received only 13 applications for the new eighth generation mineral COW that would be evaluated in 1999. In 1998, the Government approved 72 seventh generation COW, of which 34 were going to be implemented, while the other 38 were still being processed. The eighth generation COW will increase the Government mining royalty on the sales of mineral production to 5%. Under current contract, the Government receives 13.5% in royalties from coal production and 2.5% of net profits in royalties from copper and gold mining companies. Mining companies also pay an annual rent of about \$2 per hectare (ha) and various taxes. Under the eighth generation COW, Java and Bali are opened to foreign investors. Regulations and rules for operating in Java and Bali will be more restricted than other islands in Indonesia. Geologists believed that there are rich

gold and industrial mineral reserves in the southern Java and Bali.

Since 1996, the Government has issued deregulation packages that reduced the overall tariff rates, simplified the tariff structure, removed restrictions, and encouraged foreign and domestic private investment. Alcoholic beverages, automobiles, hand tools, rice, lube oil, and tractors were subjected to import restriction and special licensing requirement. Under the IMF reform program, there were a limited number of food commodities under the export restrictions and controls. The Government tried to ensure adequate domestic availability and stable prices of those commodities. Indonesia decided to withdraw its membership from the Association of Tin Producing Countries in August 1998. The decision was prompted by the effectiveness of the organization in support of tin prices.

In 1998, PT Indonesia Asahan Aluminum's smelter faced a power shortage that resulted in a 40% decline in its aluminum ingot output. The decline in water level in Lake Toba reduced the supply of hydroelectric power required by the smelter. The company purchased electricity from Indonesia's national grid in order to maintain production. Only one-half of 510 cells were in operation. The water level in Lake Toba remained low at yearend. In order to run the smelter at full capacity, the water level in Lake Toba must be at least 905 meters above sea level, a level set by local government officials. Nippon Asahan Aluminum Co. Ltd. of Japan received 60% of aluminum output from the smelter, in line with its shareholding of the smelter, and the Indonesian Government received the balance.

PT Smelting Co., a joint venture of PT Freeport Indonesia Co. (25%) and Japan's Mitsubishi Corp. (9.5%), Mitsubishi Materials Corp. (60.5%), and Nippon Mining & Metals Co. (5%), commissioned its copper smelter and refinery at Gresik, East Java, in late 1998. In 1991, the Indonesian Government granted Freeport an extension of its COW to mine copper in Irian Jaya under the condition for building a copper smelter in Indonesia and the \$626-million smelter began construction in July 1996. Mitsubishi Materials' continuous copper smelting and converting processes were employed. Three furnaces were linked by launders. The copper concentrate was smelted with fluxes, reverts, and pulverized coal to produce matte and slag. The slag was separated in the second furnace by specific gravity, before the metal was oxidized in the third furnace to produce blister copper for the anode furnace. The plant has the capacity to produce 200,000 metric tons per year (t/yr) of grade A cathode. PT Smelting planned to produce 150,000 metric tons (t) of refined copper in 1999, rising to 180,000 t in 2000, and reaching full capacity in 2001. The concentrate would be supplied by Freeport through a long-term contract. Byproduct sulfur dioxide gas was converted to sulfuric acid at the adjoining 600,000 t/yr acid plant and sold to a local fertilizer company, PT Petrokimia Gresik. Before the financial crisis, PT Smelting planned to sell 75% of its products locally and the rest would be exported to Asian countries. Because the demand of copper decline dramatically in Indonesia, the company expected to sell about 30% of its output locally.

PT Freeport had agreed to increase royalties on copper and gold production in return for the Government approval to

increase ore output at its mine in Grasberg, Irian Jaya, from 160,000 metric tons per day (t/d) to 300,000 t/d. Under the existing fifth generation COW, Freeport paid the Indonesian Government between 1.5% and 3.5% of its copper sales and 1% of its gold sales in royalties based on a formula indexed to world prices in both commodities. Under the new agreement, Freeport would pay between 3% and 7% of royalties on copper production and between 3% and 9% on gold production based on a formula indexed to world commodity prices. In 1998, Freeport paid 1.4 trillion rupiah in form of corporate income and other taxes to the Indonesian Government (Financial Times, 1999b).

A consortium of Duke Energy and Westcoast Energy paid a total of \$360 million to acquire a coal-fired power generating and transmission project in Irian Jaya, Indonesia from Freeport-McMoRan Copper & Gold Inc. of the United States and Rio Tinto Ltd. The group also brought Freeport's 30% holding in a power generating company, PT Puncakjaya Power. Freeport used the sale to repay debt and for other corporate purposes.

PT Newmont Nusa Tenggara, a joint venture between Newmont Gold Co. of the United States (45%), Japan's Sumitomo Corp. (35%), and PT Pukuauf Indah (20%), signed a fourth generation COW in December 1986 for exploring copper and gold in an area of 197,000 ha on the island of Sumbawa in the Nusa Tenggara Barat region. The Batu Hijau deposit was discovered in 1990, with estimated reserves at 5.9 million metric tons (Mt) of copper and 420 t of gold. Construction on the project began in May 1997 and was scheduled to be completed in the last quarter of 1999. When completed, the facilities will mine and process 120,000 t/d of ore, producing 245,000 t of copper and 18 t of gold per year. The total cost of the project was estimated at \$1.9 billion, with \$900 million being provided by the joint-venture partners and \$1 billion from export agencies, including U.S. Exports and Imports Bank (Financial Times, 1999c).

Aurora Gold Ltd. of Australia signed a sixth generation COW at the Toka Tindung deposit in northeast of Sulawesi. The deposit had a proven reserves of 4.9 Mt of ore grading at 4.01 grams per metric ton (g/t) gold and 12 g/t silver. The company planned to invest \$51 million to build a 1.2-million-metric-ton-per-year (Mt/yr) processing plant to produce 4.2 t of gold. Aurora Gold also discovered gold resources at Talawaan, 14 kilometers southwest from Toka Tindung. The deposit contained more than 400,000 t of ore, grading at 7.8 g/t gold and 10 g/t silver (Metal Bulletin, 1998a).

Mispec Resources of Canada agreed to increase its interest in the existing joint venture with PT Hunamas Putra Interbuana. Mispec holds a 90% interest in the Jampang and an 85% interest in Jampang East and Pongkor in Java, with a total area of 20,530 ha. The property has an estimated resources of 8 Mt of ore grading 2.4 g/t gold. The company also identified possible copper, lead, and zinc resources within its concessions (Northern Miner, 1998b).

The Indonesian iron and steel sector has been hit hard by the country's economic crisis. Many steel plants operated at one-half capacity or less. Australian Broken Hill Proprietary Co. Ltd. (BHP) closed its four steel processing plants in Indonesia

and all its representative offices in Jakarta. Additional to BHP, several small producers also shut down their operation. Sales in the local market dropped dramatically. Two large locally owned producers, Kerimas Witiko and Tumbukmas Inti Mulia, were operating less than 50% of their output capacity. Producers that produced high-quality steel products, such as three Japanese-Indonesian joint ventures—PT Fumira, PT Sermani Steel, and Kalimantan Steel Co.—were better than other Indonesian companies because they were able to get credit guarantees from their Japanese banks in Indonesia.

Starting October 19, the Indonesian Government imposed dumping duties of 55% on silicomanganese, ferromanganese and manganese alloy from China for 4 months. The Government believed that it was necessary to issue the decree for temporary duties in order to protect the local steel sector while the investigation was going on.

Atapa Minerals of Canada discovered a new gold-silver zone in the Cikotok-Cikidang area at the southwestern of Java. Gold was hosted in a quartz vein. Gold values from channel samples varied between 0.50 g/t and 30.75 g/t, while silver ranged from 1.43 g/t to 8.02 g/t. Atapa could earn 67.5% and 63% interests in the adjoining Citotok and Cikidang licences by funding all exploration work. The remaining interests were held on a carried basis between a Indonesian company and state-owned Antam (Northern Miner, 1998b).

PT Tambang Timah, an Indonesian tin producer, intended to expand its interest into gold and coal resources in Indonesia. The company set up two subsidiaries to carry out the expansion projects. PT Timah Investasi Mineral would be in charge of gold and associated minerals exploration. PT Timah Batubara Utama would oversee the coal mining operation.

PT International Nickel Indonesia (PT INCO), Inco Limited of Canada (59.8%), Sumitomo Metal Shining Co. Ltd. of Japan (20.1%), and public shareholders (20.1%), operates in Indonesia under COW since 1968. The COW was modified in 1995 and extended through December 2025. PT INCO's operations are in central, south, and southeast Sulawesi. In 1998, its operations were being hampered by lack of hydroelectric power caused by low water levels. The company was unable to achieve its full capacity of 50,000 t of nickel matte. The completion of the expansion construction facilities in Soroako to increase its output by 50% of nickel matte was expected to be delayed until the second half of 1999. Because of additional costs, PT INCO was seeking additional funding of about \$200 million from its shareholders to complete the project (Mining Journal, 1998a).

Inco Limited and Dowa Mining Co. Ltd. of Japan announced the agreement of forming a joint venture to explore copper, gold, silver, and zinc in Indonesia. Inco through its subsidiaries Ingold Holdings Indonesia Inc. and Maluku Holding Inc. holds an 85% interest in the rights to about 100,000 ha of land, which has high potential for copper-lead-zinc sulfide deposits on Ambon, Haruku, Nusa Laut, and Saparua Islands. The remaining 15% is held by PT Aneka Tambang (ANTAM). Dowa can earn up to 49% of Maluku Holding Inc. by contributing exploration funding over a 3-year period (Inco Limited and Dowa Mining Co., Ltd. form joint ventures February 23, 1999 accessed February 23, 1999, at

URL http://biz.yahoo.com/prnews/990223/inco_dow_1.html).

ANTAM, owned 65% by the Indonesian Government and 35% by the public, which produced ferronickel, nickel ore, gold, and silver, faced serious problems at some of its mine sites. Because of a rumor that the company's security guard killed an illegal miner, hundreds of illegal miners at the Pongkor gold mine in Bogor went on a rampage in December and destroyed property (U.S. Embassy, Jakarta, Indonesia, 1999, Recent economic reports, accessed June 8, 1999, at URL <http://www.usembassyjakarta.org/econ/miningupd.html>). Pongkor gold mine has a long history of problems with illegal miners. The Indonesian association of mining professionals called for an increased community development program to solve this problem. ANTAM shut down one of its plants in Pomalaa, southeast Sulawesi, for maintenance in 1998. The other plant, which was built in 1995, continued operating without interruption. Each plant has an output capacity of 5,500 t/yr of ferronickel. Owing to partial shutdown of one plant, ANTAM produced about 8,450 t of ferronickel in 1998 (Mining Journal, 1998b).

ANTAM's \$385-million expansion project in Pomalaa moved ahead smoothly in 1998. ANTAM awarded the bid to Mitsui for the construction of the nickel and powerplants. ANTAM had signed an initial agreement with an international ferronickel buyer to purchase 30% of the plant's output. The project was scheduled to be completed in 2001. The 13,000 t/yr capacity ferronickel plant will increase Indonesia's ferronickel production to 24,000 t/yr (Engineering and Mining Journal, 1998).

ANTAM and BHP Asia Pacific Nickel Pty. planned to form a joint venture at 25-75 equity to build a nickel and cobalt plant on Gag Island, Irian Jaya. After 13 years of commercial production, ANTAM would have the right to increase its joint-venture share to 45%. The design outputs for nickel and cobalt were 40,000 t/yr and 3,600 t/yr, respectively.

ANTAM and Ashton Malaysia Mining Corp. established an exploration company, PT Galuh Cempaka, at 20-80 share to explore gemstones in an area of 3,920 ha in south Kalimantan. The memorandum of understanding was signed in March 1995, and Ashton has invested \$11.3 million for exploration activities in that area.

PT Tambang Timah, owned 65% by the Indonesian Government and 35% by public shareholders, was scheduled for privatization in 1999. Timah had largely avoided the economic crisis that hit most of state-owned companies. Timah operates 33 mines in Bangka Island, South Sumatra, as well as 7 furnaces and 5 crystallizers to process tin ore. Timah tin production increased by 2% in 1998 compared with that of 1997. In 1998, Timah exported about 50% of its tin products to Australia. Timah decided to expand and diversify its mining business into other minerals. Timah's shares in PT Kutaraja Tembaga Raya, a joint venture with Phelps Dodge Australasia Corp. of the United States, increased from 25% to 45%. Raya is exploring copper and coal in Aceh, North Sumatra. Having a contract with a domestic company, Timah is exploring for gold and diamonds over 2.8 million ha in North Sumatra and 1.8 million ha in Kalimantan. Timah is negotiating with PT Kaltim Prima Coal Co. to purchase 25% shares of the coal

company. PT Koba Tin, another Indonesian tin producer, maintained its output level of 13,000 t of concentrates and 10,000 t of ingot.

Ashton Mining Ltd. (Ashton) of Australia announced that its subsidiary, PT Galuh Cempaka, received a COW from the Indonesian Government for an alluvial diamond project in South Kalimantan. PT Galuh Cempaka is a joint venture between Ashton (48%), Malaysia Mining Corp. (32%), and ANTAM (20%), to evaluate and mine deposits of gravel known to contain high-quality gem diamond. The COW area covers 260 million cubic meters. A trial-mining operation began in mid-1998 (Ashton Mining Ltd, 1998).

The Government extended the ban on urea export into 1999 that was supposed to expire at yearend 1998. Owing to the subsidies and state-controlled prices, the incentive of urea producers for exporting had been strong in the past. Since the fertilizer subsidies were removed on December 1, domestic market prices of urea increased by three-fold at yearend. In the past, Pupuk Sriwidjaja was the only approved importer. Since the deregulation of the urea price, the Government allowed any party to import fertilizer freely.

The Ministry of State Enterprises unveiled a plan for restructuring and privatizing six state-owned fertilizer companies—PT Asean-Aceh Fertilizer, Pupuk Gresik, Pupuk Kaltim, Pupuk Kujang, Pupuk Muda, and PT Pupuk Sriwidjawa—through merging and offering the new merged company to potential investors. The Government hoped that the sale of the combined assets of these companies would boost the sector and the economy.

Indonesia has electrical generating capacity of about 21 gigawatts, with 82% from thermal, 15% from hydro, and 3% from geothermal. In 1996, the Government endorsed the concept that electricity generated by the independent power producers be sold to the state-owned Perusahaan Listrik Negara (PLN), the sole buyer and seller in the power market, under long-term contractual power purchase agreements. In September 1998, faced with the growing demand for electricity and PLN unable to meet the demand, especially to supply power to many industrial users owing to a shortage of transmission and distribution lines, the Government allowed foreign companies to sell electricity directly to the end-users.

The Indonesian coal sector is basically divided into three types. The state-owned coal mining coal company, PT Tambang Natubara Bukit Asam (PTBA), operates two mines—the Bukit Asam Mine in South Sumatra and the Ombilin Mine in West Sumatra. Private mining companies act as a contractor to PTBA through Coal Cooperation Agreements or operating on mining leases. Indonesia has coal resources of 36 billion metric tons, of which 5 billion tons are proven reserves. Coal quality ranges from lignite to metallurgical grade. Most Indonesian coals are low-ash and low-sulfur. Major coal deposits are in Sumatra (61%) and Kalimantan (38%).

In 1998, Indonesian coal output increased by 11% to 61 Mt. The Government set production targets of 65 Mt in 1999 and 85 Mt in 2002. About 67% of its total output was exported to Japan, Taiwan, the Republic of Korea, Spain, and the Hong Kong, in order. Domestic coal consumption is largely for use

in power generation and cement sector (International Coal Report, 1999).

PT Indominco Mandiri awarded Morrison Knudsen Corp. a 2-year contract extension to continue mine management services at its Bontang coal mine in East Kalimantan. The mine was designed to produce a combination of 3.8 Mt/yr of high-grade [6,700 kilocalories per kilogram (kcal/kg)], and low-grade [6,100 kcal/kg], coal. Mandiri exported about 2.5 Mt of high-grade coal mainly to Japan and Taiwan. Low-grade coal was sold to domestic consumers (Coal Age, 1999).

Murchison United released findings on its Ambor coal project with PT Singlurus Pratama at East Kalimantan. The 8,800-meter drilling program generated an indicated resource of 28 Mt of coal. Murchison must spend \$3.85 million on the prospect to earn a 50.1% interest. Ten potential seams at Argosari had been identified. Prefeasibility studies were underway (Mining Magazine, 1998).

Indonesia has 9.1 billion barrels oil resources, 4.9 billion barrels of proven reserves and 4.2 billion barrels of potential (Embassy of the United States—Jakarta, 1998). There are 22 oil basins, of which 22 have been fully explored. Most exploration activities are carried out in Western Indonesia under the production-sharing contracts. Oil resources located onshore and offshore in Central Sumatra and Kalimantan remain unexplored. The Government has urged companies to develop oil resources in remote areas.

The Directorate General of Oil and Gas, a subdivision of the Ministry of Mines and Energy, is responsible for all aspects of the petroleum industry. Pertamina, the state-owned company, is responsible for production of oil and gas. Under the Indonesian law and regulations, Pertamina is required to supply the nation with adequate petroleum products. A new oil and gas law that was drafted by a cross-ministerial team with input from oil institutions and the World Bank was submitted to the Indonesian parliament for review and approval. If approved, it will break up the monopoly power held by Pertamina on the processing and distribution of oil products. The five largest production-sharing contractors with Pertamina are Arco, Caltex, Conoco, Unocal, and YPF-Maxus.

Despite the depressed oil market caused by the Asian financial crisis, oil exploration activities remained stable in Indonesia. Companies such as Mobil, Unocal, and YPF-Maxus maintained active drilling in 1998. Caltex remained its position as number one crude oil and condensate producer, over 48% production share, followed by YPF-Maxus, Conoco, Unocal, Total, and Mobil.

According to Pertamina, oil companies operating in Indonesia spent \$5.3 billion for exploration and development activities in 1998, a 10% increase over that of 1997. Pertamina projected that contractors' investment on exploration would increase continuously as a number of new projects were being developed in the next several years. Reportly, Caltex invested an average of \$400 million per year in Indonesia to support its oil and gas operation. In 1998, Pertamina awarded a total of 22 oil contracts for oil and gas exploration and development in Irian Jaya, South Sulawesi, Timor Sea, North and South of Sumatra.

Indonesia joined the Organization of Petroleum Exporting

Countries (OPEC) in 1962. In March 1998, in line with other OPEC members, Indonesia agreed to reduce oil production by 70,000 barrels per day (bbl/d) to 1.31 million bbl/d, excluding condensate. In July, Indonesia supported the decision of fellow OPEC member to reduce an additional 30,000 bbl/d effective immediately. Pertamina instructed production-sharing contractors to comply with its quota level of 1.28 million barrels per day (Mbb/d). Production cuts affected ten oil companies—Arco, Caltex, Conoco, Exspan, Gulf Resources, Maxus, Santa Fe, Total, Unocal, and Vico. During January to November 1998, the average production was 1.406 Mbb/d for crude oil and 162,400 bbl/d for condensate.

More than 70% of Indonesia's natural gas output was processed into liquefied natural gas (LNG) and liquefied petroleum gas, while the remainder was used by power and petrochemical sectors. Indonesia is one of the major LNG exporters in the world. LNG remains the largest single earner in foreign exchange despite the Asian financial crisis. Japan, the Republic of Korea, and Taiwan are the key market countries for Indonesian LNG.

Pertamina announced that Unocal discovered a significant oil and gasfield in the Kutai basin, off the coast of East Kalimantan. The West Seno field has the potential of producing 20,000 bbl/d of oil and 0.5 million cubic meters per day (Mm³/d) of natural gas. Unocal planned to develop the Seno field by 2001. Unocal also discovered oil at the adjacent Seno field containing between 210 and 750 million barrels of oil equivalent.

In July 1998, Pertamina signed a gas sales agreement with Sembawang Gas (Sembgas) of Singapore to supply natural gas from the West Natuna fields. Under the terms of the agreement, Sembgas will import 9.2 Mm³/d of natural gas over 22 years. Conoco, Premier Oil, and Gulf Resources are contractors of the West Natuna fields. The firms urged the Government to extend the production-sharing contract to cover the whole period of gas sales to Singapore in order to obtain a return on their investments in the fields. Their production-sharing contracts were scheduled to expire between the year of 2005 and 2018. The three companies had planned to invest \$1.5 billion to develop the gas plants and transportation facilities in the area. The Government granted their requests.

Mobil and Unocal announced that an additional oil and gas discovered in the deepwater Merah Besar area, off the coast of East Kalimantan. Oil and gas reserves were to be between 100 and 250 million barrels of oil equivalent. Mobil and Unocal each hold a 50% interest in the Makassar Strait production-sharing contract. Unocal agreed to sell a 30% interest in the Papak block, north of and adjacent to the Makassar Strait

production-sharing contract to Mobil.

Indonesia has nine major refineries, with a combined design capacity of 1 Mbb/d, which are owned and operated by Pertamina. The refineries are in East Kalimantan, Irian Jayam Java, and Sumatra. Most of the petroleum refined products are targeted for domestic consumption. In July 1998, the Government announced that oil refining, distribution, and market activities would be totally opened to the private sector in 2003.

References Cited

- Ashton Mining Ltd., 1998, Contract of work for Cempaka diamond alluvial project signed: Ashton Mining Ltd. media release, February 28, 1 p.
- Coal Age, 1999, Indonesia: Coal Age, v. 104, no. 5, p. 10.
- Engineering and Mining Journal, 1998, Indonesia: Engineering and Mining Journal, v. 199, no. 3, March, p. ww-25.
- Financial Times, 1999a, Indonesia offer tax holidays to investors: Financial Times, January 27, p. 6.
- 1999b, Indonesia raises Freeport royalties: Financial Times, February 15, p. 17.
- 1999c, Newmont puts brave face on Batu Hijau prospects: Financial Times, March 25, p. 28.
- International Coal Report, 1999, Taiwan shows biggest Indonesian growth: International Coal Report, issue 474, May 17, p. 12.
- Metal Bulletin, 1998a, Aurora Gold expects go-ahead for new Indonesian mine: Metal Bulletin, no. 8298, July 30, p. 9.
- 1998b, Indonesia plans new Mining Act: Metal Bulletin, no. 8334, December 10, p. 3.
- Mining Journal, 1998a, Inco's Indonesian plant hit by drought: Mining Journal [London], v. 331, no. 8501, October 9, p. 277.
- 1998b, Indonesian nickel shutdown: Mining Journal [London], v. 330, no. 8486, June 26, p. 491.
- Mining Magazine, 1998, More coal in Kalimantan: Mining Magazine, v. 178, no. 1, January, p. 69.
- Northern Miner, 1998a, Atapa uncovers new showing in Java: Northern Miner, June 15, p. 3.
- 1998b, Mispac tests targets at Jampang: Northern Miner, May 25, p. C1.
- U.S. Embassy, Jakarta, Indonesia, 1998, Petroleum Report, Indonesia: U.S. Embassy, Jakarta, Indonesia, October, 110 p.

Major Sources of Information

- Department of Mines and Energy
 Jl. Jend. Gatot Subroto Kav. 49
 Jakarta 12950, Indonesia
- Directorate of Mineral Resources and Geological
 Research and Development Center
 Jl. Diponegoro 57
 Bandung 40122, Indonesia
- Directorate General of Oil and Gas
 Jl. M.H. Tharmrin No. 1
 Jakarta Pusat, Indonesia

TABLE 1
INDONESIA: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity	1994	1995	1996	1997	1998
METALS					
Aluminum:					
Bauxite, gross weight thousand tons	1,342	899	842 r/	809 r/	1,055
Metal, primary	221,900	220,000 e/	225,000 e/	216,150	133,000 e/
Chromite sand, dry basis e/	2,500	10,000	13,300	2,156 4/	2,000
Copper, mine output, Cu content	322,190	443,618	507,484	529,121	647,994
Gold, mine output, Au content 2/ kilograms	47,877 r/	64,031 r/	83,564 r/	86,927 r/	87,000 e/
Iron and steel:					
Iron sand, dry basis	361,511 r/	366,111 r/	425,101 r/	516,403 r/	560,524
Metal:					
Ferroalloys, ferronickel	28,725	53,675	48,260 r/	49,990 r/	42,260
Steel, crude thousand tons	3,220	3,500 e/	4,100 r/	3,800 r/	3,500 e/
Manganese: e/					
Ore	2,695 r/	634 r/	34 r/	889 r/	600 e/
Ferromanganese	10,000	14,000	14,000	15,000	13,000
Nickel:					
Mine output, Ni content 3/	81,100	88,183	90,000 e/	67,900 r/	77,600
Metallurgical products:					
Matte, Ni content	45,989 r/	46,067 r/	39,500 r/	32,012 r/	35,697
Ferronickel, Ni content	5,745	10,735	9,653 r/	9,999	8,452
Silver, mine output, Ag content kilograms	102,834 r/	275,568 r/	255,403 r/	219,392 r/	348,987
Tin:					
Mine output, Sn content	41,897 r/	46,058 r/	52,304 r/	55,175 r/	53,959
Metal	31,100	38,628	39,000 e/	52,658 r/	53,401
INDUSTRIAL MINERALS					
Cement, hydraulic e/ thousand tons	21,907	23,129	25,000	26,000	25,000
Clays:					
Bentonite	14,409	26,057	26,000 e/	653,823 r/	840
Fireclay e/ thousand tons	1,950	2,000	2,000	2,000	1,800
Kaolin powder	53,236	14,373	15,000 e/	1,956 r/	10,036
Diamond: e/					
Industrial stones thousand carats	22	22	22	23	22
Gem do.	6	7	7	7	6
Total do.	28	29	29	30	28
Feldspar	40,483	49,415	50,000 e/	24,399 r/	53,068
Gypsum	1,286	1,327	1,400 e/	-- r/	406
Iodine kilograms	89,098	76,824	75,000 e/	83,000 r/	66,000
Nitrogen, N content of ammonia e/ thousand tons	2,800	2,850	2,875	2,880	2,800
Phosphate rock e/	7,000	7,500	7,500	533 r/ 4/	752
Salt, all types e/ thousand tons	650	670	670	680	660
Stone:					
Dolomite	4,386	4,056	4,000	13,411 r/	17,785
Granite thousand tons	5,113 r/	5,386 r/	4,827 r/	6,138 r/	4,801
Limestone do.	20,814	13,143	15,000 e/	6,329 r/	6,575
Marble square meters	15,286	10,446	12,000 e/	13,000 e/	8,357
Quartz sand and silica stone	588,429	278,925	300,000 e/	636,468 r/	293,100
Sulfur, elemental e/	3,500	3,500	3,500	3,500	3,400
Zeolite e/	70	70	75	75	70
MINERAL FUELS AND RELATED MATERIALS					
Coal, bituminous thousand tons	32,174 r/	39,936 r/	50,332 r/	55,982 r/	61,146
Gas, natural:					
Gross million cubic feet	2,940,000	2,900,000 e/	2,950,000	3,166,034 r/	2,641,447
Marketed e/ do.	1,700,000	1,700,000	1,700,000	1,800,000	1,600,000
Petroleum, crude including condensate thousand 42-gallon barrels	588,000	580,000 e/	575,000	539,752 r/	534,892

e/ Estimated. r/ Revised.

1/ Table includes data available through August 15, 1999.

2/ Includes Au content of copper ore and output by Government-controlled foreign contractors' operations. Gold output by operators of so-called people's mines and illegal small-scale mines is not available, but may be as much as 20 metric tons per year.

3/ Includes a small amount of cobalt that is not recovered separately.

4/ Reported figure.

TABLE 2
INDONESIA: STRUCTURE OF THE MINERAL INDUSTRY IN 1998

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Locations of main facilities	Annual capacity	
Aluminum:				
Bauxite	PT Aneka Tambang (Government, 100%)	Kijang, Bintan Island, Riau	1,300	
Metal	PT Indonesia Asahan Aluminum (Nippon Asahan Aluminum Co. Ltd. of Japan, 59%; Government, 41%)	Kual Tanjung, North Sumatra	225	
Cement	PT Indocement	Citeureup, West Java	8,000	
Do.	PT Semen Cibinong	Narogong, East Java	1,400	
Do.	PT Semen Gresik	Gresik, East Java	1,500	
Do.	PT Semen Padang	Indarung, West Java	2,200	
Coal	PT Adaro Indonesia (New Hope Corp, 50%; PT Asminco Bara Utama, 40%; Mission Energy, 10%)	Paringin and Tutupan, South Kalimantan	20,000	
Do.	PT Bukit Baiduri Enterprise (PT Gajah Tunggal Gal Mulia, 90%, others, 10%)	Samarinda, East Kalimantan	3,000	
Do.	PT Kaltim Prima Coal Co. (BP Coal Indonesia Ltd., 50%; Rio Tinto Ltd., 50%)	do.	16,000	
Do.	PT Arutmin Indonesia (BHP Ltd., 80%; Bakrie Group, 20%)	Banjamasin, South Kalimantan	5,000	
Copper, in concentrate	PT Freeport Indonesia Co. (Freeport-McMoRan Copper and Gold Inc. of the United States, 81.28%; Government, 9.36%; others, 9.36%)	Ertsberg and Grasberg, Irian Jaya	550	
Gold	metric tons	Aurora Gold Ltd. (100%)	Balikpapan, Central Kalimantan	60
Do.	PT Freeport Indonesia Co. (Freeport-McMoRan Copper and Gold Inc. of the United States, 81.28%; Government, 9.36%; others, 9.36%)	Ertsberg and Grasberg, Irian Jaya	55	
Do.	PT Kelian Equatorial Mining (Rio Tinto Ltd, 90%; PT Harita Jaya Raya of Indonesia, 10%)	Sangatta, East Kalimantan	15	
Do.	PT Newmont Minahasa Raya (Newmont Mining Corp., 80%; PT Tanjung Serapung, 20%)	Manado, North Sulawesi	15	
Do.	PT Prima Lirang Mining (Billiton BV of the Netherlands, 90%; PT Prima Maluku Indah of Indonesia, 10%)	Lerokis, Wetar Island	3	
Petroleum, crude	Atlantic Richfield Indonesia, Inc. (subsidiary of Arco of the United States)	Arjuna and Arimbi, offshore, West Java	170	
thousand barrels per day	Do.	Maxus Southeast Asia Ltd. (subsidiary of Maxus Energy of the United States)	Cinta and Rama, offshore, Southeast Sumatra	95
Do.	Pertamina (Government, 100%)	Jatibarang, West Java, and Bunyu, offshore East Kalimantan	80	
Do.	PT Caltex Pacific Indonesia (Texaco Inc., 50%; Chevron 50%, both of the United States)	Minas, Duri, and Bangko, central Sumatra	700	
Do.	Total Indonesia (subsidiary of Compagnie Francaise des Petroles of France)	Handi and Bakapai onshore and offshore East Kalimantan	180	
Gas:				
Natural	Mobil Oil Indonesia, Inc. (subsidiary of Mobil Corp. of the United States)	Arun, Aceh in North Sumatra	1,700	
million cubic feet per day	Do.	Roy M. Huffington (subsidiary of HUFFCO of the United States)	Badak, East Kalimantan	1,000
Liquefied	PT Arun LNG Co. Ltd. (Government, 55%; Mobil Oil, 30%; the Japan Indonesia LNG Co., 15%)	Balang Lancang, Aceh in North Sumatra	10,000	
Do.	PT Badak LNG Co. Ltd. (Government, 55%; HUFFCO Group, 30%; the Japan Indonesia LNG Co., 15%)	Bontang, East Kalimantan	7,900	
Nickel:				
In ore	PT Aneka Tambang (Government, 100%)	Pomalaa, South Sulawesi and on Gebe Island, Moluccas	34	
In matte	PT International Nickel Indonesia (Inco Ltd. of Canada, 59%; Sumitomo Metal Mining Co. Ltd. of Japan, 20%; others, 21%)	Soroako, North Sulawesi	45	
Nitrogen	PT Aseah-Aech Fertilizer (Government, 60%; other members of Association of Southeast Asian Nations, 40%)	Lhokseumawe, North Sumatra	506	
Do.	PT Pupuk Iskandar Muda (Government, 100%)	do.	506	
Do.	PT Pupuk Kalimantan Timur (Government, 100%)	Bontang, East Kalimantan	1,012	
Do.	PT Pupuk Sriwijawa (Government, 100%)	Palembang, South Sumatra	1,438	
Steel, crude	PT Krakatau Steel (Government, 100%)	Cilegon, West Java	2,400	

TABLE 2--Continued
INDONESIA: STRUCTURE OF THE MINERAL INDUSTRY IN 1998

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Locations of main facilities	Annual capacity
Tin:			
In ore	PT Koba Tin (Westralian Sands Ltd., 75%; PT Tambang Timah TBK, 25%)	Koba, Bangka Island	6
Do.	PT Tambang Timah (Government, 100%)	Onshore and offshore islands of Bangka, Belitung, and Singkep	45
Metal, refined	Peleburan Timah Indonesia (Government, 100%)	Mentok, Bangka Island	42