

# THE MINERAL INDUSTRY OF PAPUA NEW GUINEA

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The mineral industry was the cornerstone of the country's economy in 1994, as it had been since 1972 when the world-class Panguna porphyry copper-gold deposit on Bougainville Island in North Solomons Province concluded its first full year of production. The country's gross domestic product (GDP) rose for the third successive year, growing at a rate of 3% in 1994. The minerals sector, however, including exploration programs, mining, and the associated construction and development undertakings, declined for the first time in 4 years.

Mining consisted of large, modern, mechanized operations, such as the Ok Tedi copper mine in Western Province and the Misima opencast and Porgera underground-open pit gold operations in Milne Bay and Enga Provinces, respectively, as well as panning and crude sluicing activity by individuals and small gold mining companies.

## Government Policies and Programs

The Government announced on December 8 that it was planning to divest all of its equity shares in the country's resource projects. Only a month earlier, the Government announced the reversal of its previous mineral resource policy by proposing to reduce a part of its holdings in the country's three largest resource undertakings—the Kutubu oil project, the Ok Tedi Mine, and the Porgera joint-venture operation.<sup>2</sup> Although the details were not finalized by yearend as to how and when the Government would sell off its interests in the various projects, the Government did explain that it would still acquire its legal entitlement of 30% in all new mining projects and 22.5% in all new petroleum projects by paying its share of sunk costs, but would then sell the equity holdings. Initial negotiations with the local landowners were to resolve the equity that they wanted and were able to pay for, with preference then given to selling to other Papua New Guineans prior to seeking new foreign investors.<sup>3</sup>

In addition, the Government's taking last year of an additional 15% equity in the Porgera Mine was to be abandoned because the Government had not paid its negotiated settlement price of almost \$139 million<sup>4</sup> and still did not have the funds to do so.<sup>5</sup>

## Environmental Issues

Mining-related environmental matters were legislated under several statutes, including the following, noting the year of original enactment: the Environmental Planning Act (EPA), 1978; the Environmental Contaminants Act, 1978; the Conservation Areas Act, 1978; the Water Resources Act, 1982; and the National Parks Act, 1982.

The EPA required a review of the potential environmental impact of all natural resource extraction and industrial- and human-development projects. If significant environmental or social impacts were foreseen, then an environmental plan, similar to a U.S. environmental impact statement, must be prepared describing any expected changes and the measures to be taken to minimize such changes. The environmental plan must be included as part of the feasibility study and include the details of all measures to be taken to safeguard the environment, including plans for rehabilitation.<sup>6</sup>

Under the EPA, the responsibility for monitoring the impact on the environment from mining activities lay with the Department of Environment and Conservation (DEC). Until 1993, the country's first two modern, world-class mining operations, the Panguna and Ok Tedi copper mines, were specifically excluded from the requirements of the Act because of their precedency. These mines were operated under contractual arrangements specifically developed for each of them in 1974 and 1976, respectively, and the Department of Mining and Petroleum, rather than the DEC, was responsible for their environmental monitoring. The Government transferred in midyear 1993 the environmental responsibility for the Ok Tedi Mine to the DEC. This left, at least theoretically because of its total closure since May 1989, the country's first large-scale mine at Panguna as the only one not legislated to be monitored for its impact on the environment by the DEC.

## Production

Three mines (Misima, Ok Tedi, and Porgera), one gas project (Hides), and two petroleum fields (Agogo and Iagifu-Hedinia) were in operation at the end of the year. These produced virtually all of the country's mineral production, excluding minor amounts of alluvial gold by individual panners and clays, sand and gravel, and stone for construction purposes. A fourth mine, the Panguna,

remained closed throughout the year owing to civil unrest by Bougainville Revolutionary Army militants. (See table 1.)

## Trade

Papua New Guinea has developed from a country dominated by subsistence agriculture and the export of the unrivaled cash crops of cocoa, coffee, and copra and palm oils in the early 1980's to one in which minerals and petroleum represent about 70% of the country's export revenues.<sup>7</sup> Papua New Guinea remained the sixth largest exporter of gold in the world in 1994, primarily shipping to the Perth, Western Australia, refinery and mint.

Gold from the Porgera Mine continued to account for about 40% of all export revenues and 10% of the Government's income. Virtually all nonfuel mineral production was exported in the form of doré, bullion, and copper-gold-silver concentrates.

All petroleum production was exported from the marine export terminal in the Gulf of Papua and sold to refineries in Australia, Japan, and Southeast Asia.

## Structure of the Mineral Industry

Papua New Guinea is a mineral-rich country with a modern mining industry. Mining was the only large-scale industry in the country, directly accounting for more than 30% of the GDP, estimated at \$5.6 billion.<sup>8</sup> In addition to several large, world-class mining operations, there were numerous small-scale mining activities. The country has had a long history of mining, beginning in 1888 with the discovery of gold on what is now Misima Island, and was a world-class producer of copper and gold, ranking 10th in copper and 8th in gold, in 1994. (See table 2.)

## Commodity Review

### Metals

**Copper.**—Since the closure of Bougainville Copper Ltd.'s Panguna Mine on Bougainville Island in North Solomons Province in 1989, all of the country's copper production continued to be from the Ok Tedi Mine on Mount Fubilan in the Star Mountains of Western Province, 18 kilometers (km) east of the border with the Indonesian Province of Irian Jaya.

Virtually all the landowners living along the Ok Tedi and Upper, Middle, and Lower Fly Rivers were joined during the year in a lawsuit originally launched on May 5 by a Miripiki chief representing his clan of about 30 people. The original writ was filed in Australia's Victorian State Supreme Court on behalf of the Papua New Guineans by the Australian specialist law firm Slater and Gordon of Melbourne, Victoria. The lawsuit sought compensation for alleged environmental damage resulting from the dumping of tailings from the Ok Tedi Mine into the Fly River system via the Ok Tedi River.<sup>9</sup> The nearly \$3 billion suit was filed against BHP Minerals Holdings Pty. Ltd., the managing shareholder

of the Ok Tedi Mine that has its headquarters in Melbourne.<sup>10</sup>

May 15 marked the 10th anniversary of mining at Ok Tedi, a decade in which the operation became one of the world's leading producers and exporters of copper concentrate, accounting for more than 15% of Papua New Guinea's total merchandise exports, including all of its copper and about 15% of its gold.<sup>11</sup>

**Gold.**—Progress toward acquisition of the Special Mining Lease (SML) for the Lihir prospect on Lihir Island, 600 km northeast of the Papua New Guinea mainland in New Ireland Province, remained stalled throughout 1994 as it had in 1993. However, the Government announced at yearend that the long-awaited SML would be granted by February 28, 1995.<sup>12</sup> Development of the mine originally was due to commence in 1993, but internal wrangling within the previous Government administration over equity shares delayed issuance of the SML, which, in turn, held up the start of mine construction.

Although at yearend the Lihir joint-venture project remained owned 80% by Kennecott Explorations (Australia) Ltd. (KEA), a subsidiary of the British-owned RTZ Corp., and 20% by locally-based Niugini Mining Ltd. (NML), it was expected that the Government would acquire its full 30% authorized stake in the \$625 million project and then sell up to a 20% share to local landowners. KEA was expected to retain a 40% stake in Lihir, but make a 10% indirect interest available to Venezuelan Goldfields Inc. (Vengold), a Canadian junior mining company. NML was expected to raise its equity share in the project to 30%.<sup>13</sup> Development of the Lihir Mine was to be financed entirely by bank loans and a public float of Lihir Gold Ltd., the managing-holding company. Development was expected to take up to 28 months.<sup>14</sup>

The Misima open pit mine, 190 km east of the Papua New Guinea mainland on Misima Island, continued to operate at peak performance with high production rates and low operating costs. Gold production exceeded forecasts made early in the year, primarily due to higher-than-expected ore grades mined from the Kulumalia pit. The Kulumalia pit was developed early in the year as a source of soft ore to supplement harder ore mined at the main pit. The Kulumalia pit was essentially mined out by yearend, producing a total of 3.6 million metric tons (Mmt) of ore grading 1.56 grams per metric ton, about 25% higher than predicted. The Ewatinona pit, assessed at about 1.6 Mmt of soft, high-grade ore containing about 2,800 kilograms (kg) of gold, was being developed at yearend to replace the depleted Kulumalia pit.<sup>15</sup>

Australia's Ramsgate Resources Ltd., via its 62%-owned subsidiary Oakland Pty. Ltd., won in conjunction with the local landowner group Kare-Puga Development Corp. (KDC) the hardrock mining rights at Mount Kare, 18 km southwest of the Porgera Mine. Papua New Guinea's National Court confirmed early in the year that KDC held the title to the highly prospective Mount Kare hardrock gold prospect. The title had been relinquished more than a year earlier by CRA Minerals (PNG) Pty. Ltd. when CRA

transferred to KDC the SML for the Mount Kare alluvial-colluvial gold prospect it had previously held in Enga Province.<sup>16</sup> Oakland, under its agreement with KDC, had a 90% interest in the hardrock rights and 40% of the alluvial rights.<sup>17</sup>

Ramsgate entered into an agreement with Vengold that secured funding for the next stage of development at the Mount Kare project. Vengold was to spend \$5 million on development in return for the right to buy into Ramsgate's Oakland subsidiary. Ramsgate, in addition to its 62% interest, had an option over a further 35% owned by Menzies Gold NL. Under this agreement, Vengold would be able to progressively purchase up to a 71% equity in Oakland, with Ramsgate then holding 26%, and Menzies the remaining 3%.<sup>18</sup>

Gold production of 32,123 kg at the Porgera Mine, 130 km west of Mount Hagen and 600 km northwest of Port Moresby in Enga Province, was in line with forecasts made at the beginning of the year despite disruptions following a deadly explosion at the explosive facility and lower-than-predicted production from the underground East Zone that commenced early in the year.

The contractor-operated Dyno Wesfarmers Ltd.'s explosive manufacturing facility was destroyed August 2 by a blast that killed 11 people and severely interrupted operations at the mine site. Full production at the mine was not resumed until August 14.<sup>19</sup> The subsequent statutory Government inquiry concluded that the explosion was initiated in a pump used in the manufacturing process.

The Porgera deposit was mined by both underground and open pit mining methods. The high-grade section of the ore body was mined underground using long-hole stoping methods. Underground production was extended into two new zones during the year to maximize production. The East Zone was brought into production early in the year, but mining difficulties hindered production. Ore production in the West Zone commenced during the last quarter with ore grades as expected and mining conditions considered good.<sup>20</sup>

The staged expansion of the mine continued to offset declining ore grades and output benefited from the first full year of production since completion of the Stage 4A expansion in the final quarter of 1993.<sup>21</sup> Stage 4B of the expansion was approved in mid-November and was to include an additional semiautogenous grinding mill and a large ball mill, a 300-metric-ton-per-day (mt/d) oxygen plant, and increased flotation, leaching, and lime production capacities, as well as an increase in power production at the natural gas generating station adjacent to the Hides Gasfield in Southern Highlands Province and the process water storage capacity at the Waile Creek Dam.<sup>22</sup> Open pit production capacity, increased from 60,000 mt/d to 100,000 mt/d during 1994, was to be expanded further to 150,000 mt/d in late 1995 to meet projected throughput from the Stage 4B expansion that was expected to be completed early in 1996. Grinding plant capacity after completion of Stage 4B was to increase from the yearend 1994 rate of 10,000 mt/d to 17,700 mt/d.<sup>23</sup>

Union Mining NL, operator-manager with a 51% interest, and Macmin NL, 49%, were granted in the last quarter of 1994 a mining lease by the Department of Mining and Petroleum to develop the Wapolu Gold Project on Ferguson Island, 350 km east of Port Moresby in Milne Bay Province. Production was expected to commence from the Dagwalala and Didigayagaya pits in midyear 1995 at a rate of approximately 1,000 kg per year of gold.<sup>24</sup>

### *Mineral Fuels*

**Natural Gas.**—BP Petroleum withdrew from negotiations with Japan's Marubeni Corp. after failing to reach agreement on final terms for the sale of its natural gas exploration and production interests in Papua New Guinea. The pullout was considered a blow to the country's hopes of establishing a \$5 billion to \$10 billion liquefied natural gas (LNG) export project based on production from the Hides natural gasfield.<sup>25</sup> BP had been considering a joint venture with Exxon Inc. of the United States to construct an LNG plant using natural gas from the massive Hides Field.

**Petroleum.**—The Kutubu joint-venture petroleum project in Gulf and Southern Highlands Provinces of the Papuan Basin reached on October 14 the production milestone of 100 million barrels (bbl) produced since output started on June 21, 1992. Production levels averaged approximately 130,000 barrels per day (bbl/d) during 1994, a slight decline from that of 1993. The Kutubu joint-venture was producing from the Agogo Oilfield, discovered in 1989, and the Iagifu-Hedinia Oilfield, discovered in 1986.<sup>26</sup>

The Government signed in December an agreement for the construction by PNG Oil Refinery Pty. Ltd. of the planned \$190 million oil refinery on Motukea Island in Fairfax Harbour, near Port Moresby. The refinery was to be able to process 30,000 bbl/d of crude using conventional processing technology. Oil from the Kutubu Project was to be used as the main component, although other light crudes also would be able to be refined. The refinery, in addition to direct import substitution, would establish a valued-added industry of 12.5% and provide employment for 250, mainly local, people. PNG Oil Refinery, a consortium of several firms from Australia, Papua New Guinea, and the United States, allocated between 40% and 60% of the equity for Papua New Guinea institutions and landowners. Construction was slated to begin by mid-1995.<sup>27</sup>

The country's only refinery, the small topping Iagifu Ridge Refinery 200 meters above Lake Kutubu, obtained a variance to its license in the last quarter of the year, enabling it to sell its products within the country. Previously, it could only produce a small quantity of aviation and diesel fuels used in conjunction with the Kutubu project itself.<sup>28</sup>

### *Reserves*

Papua New Guinea, part of the largest of the islands of Oceania, also had the greatest share of Oceania's mineral

resources. However, only three major nonfuel mineral commodities (copper, gold, and silver) were produced. Although there was no immediate prospect of other major commodities being produced on a large scale, subeconomic resources of chromium, cobalt, and nickel were known. Mineral sands containing magnetite and titanomagnetite occurred at many locations around the coasts of Papua New Guinea. Minor quantities of platinum-group metals have been recovered from alluvial gold workings. Resources of bauxite were known on Manus Island in the Admiralty Islands and on New Ireland Island. In addition, lead, manganese, molybdenum, and zinc mineralization, as well as occurrences of industrial minerals, such as limestone, phosphate guano, and phosphate rock, were known.

Natural gas and petroleum potential was thought to be large, but proven reserves were only starting to be delineated. (See table 3.)

## Infrastructure

Essential elements of the transportation infrastructure included 19,200 km of roads, including 640 km paved; 10,960 km gravel, crushed stone, or stabilized-soil surface; and 7,600 km unimproved earth. The length of inland waterways totaled about 10,940 km and was of little importance to the transportation industry. There were 18 principal airports with permanent-surface runways out of an aggregate of 504 in the country. International shipping ports included Lae, Madang, Port Moresby, and Rabaul, although operations were terminated indefinitely at the latter because of volcanic eruptions in September. There were no railroads. Electric generating capacity was 400 megawatts.<sup>29</sup>

The vast majority of the in-place infrastructure in the country was concentrated in the Provincial capitals; therefore, the lack of infrastructure for most of the country remained a distinct hinderance for the minerals industry, including exploration, mine construction and development, and transportation of mined products.

## Outlook

The terrorist activity that forced the closure of the Panguna Mine in May 1989, although contained, was still present. However, the security situation appeared to be improving and a resumption of mining at the property may be possible in the foreseeable future, although at considerable monetary expense.

Local dissidence and landowner unrest at some mining-prospecting sites, such as occurred previously at Mount Kare and was incipient at other sites, appeared to be escalating along with the already proliferous urban street crime.

These types of turmoil continued to make potential foreign investors anxious, thus slowing the initiation of new projects and affecting the tranquility at established projects. In

addition, the Government's recent propensity to increase somewhat imperiously its equity share in some projects also has reduced investor confidence in the country.

The Government of Papua New Guinea, however, seemed determined to improve the country's investment climate and was beginning to reestablish plans for sound mineral property development by trying to reduce exposure to risk to foreign investors.

<sup>1</sup>Text prepared May 1995.

<sup>2</sup>Mining Journal (London). V. 323, No. 8301, Nov. 11, 1994, pp. 337-338.

<sup>3</sup>\_\_\_\_\_. V. 323, No. 8305, Dec. 9, 1994, p. 417.

<sup>4</sup>Where necessary, the values have been converted from the Papua New Guinean kina (K) to U.S. dollars at the yearend rate of K0.86=US\$1.00.

<sup>5</sup>South-East Asia Mining Letter (Hong Kong). V. 6, No. 23, Dec. 16, 1994, p. 6.

<sup>6</sup>United Nations, New York: Mineral Resources Development and the Environment, 1992, pp. 30-31.

<sup>7</sup>Mining Journal (London). V. 324, No. 8319, Mar. 24, 1995, p. 219.

<sup>8</sup>Asian Journal of Mining (Richmond North, Australia). Sept. 1994, p. 17.

<sup>9</sup>South-East Asia Mining Letter (Hong Kong). V. 6, No. 17, Sept. 9, 1994, pp. 1-2.

<sup>10</sup>South Seas Digest (Sydney). V. 14, No. 14, Sept. 23, 1994, p. 3.

<sup>11</sup>South-East Asia Mining Letter (Hong Kong). V. 6, No. 11-12, June 24 1994, pp. 9-10.

<sup>12</sup>Mining Journal (London). V. 323, No. 8307, Dec. 23-30, 1994, p. 457.

<sup>13</sup>Work cited in footnote 3, p. 417.

<sup>14</sup>South-East Asia Mining Letter (Hong Kong). V. 6, No. 20, Oct. 31, 1994, p. 5.

<sup>15</sup>Placer Pacific Ltd. Annual Report 1994, p. 18.

<sup>16</sup>The Miner (Sydney). June 1994, p. 16.

<sup>17</sup>Mining Journal (London). V. 322, No. 8258, Jan. 14, 1994, p. 24.

<sup>18</sup>Asian Journal of Mining (Richmond North, Australia). Mar. 1994, p. VII.

<sup>19</sup>South-East Asia Mining Letter (Hong Kong). V. 6, No. 15-16, Aug. 26, 1994, p. 7.

<sup>20</sup>Placer Pacific Ltd. Annual Report 1994, p. 20.

<sup>21</sup>Mining Journal (London). V. 324, No. 8311, Jan. 27, 1995, p. 63.

<sup>22</sup>South-East Asia Mining Letter (Hong Kong). V. 6, No. 21-22, Nov. 25, 1994, pp. 2-3.

<sup>23</sup>South Seas Digest (Sydney). V. 14, No. 19, Dec. 2, 1994, p. 4.

<sup>24</sup>Asian Journal of Mining (Richmond North, Australia). Nov.-Dec. 1994, p. 10.

<sup>25</sup>Oil and Gas Journal (Tulsa, Oklahoma). V. 92, No. 36, Sept. 5, 1994, p. 46.

<sup>26</sup>Work cited in footnote 22, p. 10.

<sup>27</sup>South Seas Digest (Sydney). V. 14, No. 20, Dec. 16, 1994, p. 3.

<sup>28</sup>\_\_\_\_\_. V. 14, No. 17, Nov. 4, 1994, p. 3.

<sup>29</sup>U.S. Central Intelligence Agency, Washington, DC: The World Factbook 1994, pp. 308-309.

## Major Sources of Information

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TABLE 1  
PAPUA NEW GUINEA: PRODUCTION OF MINERAL COMMODITIES 1/ 2/

Commodity 3/		1990	1991	1992	1993	1994 e/	Annual capacity e/ (Jan. 1, 1995)
Copper, mine output, Cu content	metric tons	170,000	204,000	193,000	204,000	206,000	250,000
Gold, mine output, Au content	kilograms	31,900	60,800	71,200	60,600	59,300	71,200
Petroleum, crude	thousand 42-gallon barrels	--	--	19,400	46,400 r/	43,900	50,000
Silver, mine output, Ag content	kilograms	115,000	125,000	95,500	96,100	75,700	125,000

e/ Estimated. r/ Revised.

1/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines to three significant digits.

2/ Table includes data through May 5, 1995.

3/ In addition to the commodities listed, crude construction materials (common clays, sand and gravel, and stone) are produced, but output is not reported quantitatively, and available general information is inadequate to make reliable estimates.

TABLE 2  
PAPUA NEW GUINEA: STRUCTURE OF THE MINERAL INDUSTRY FOR 1994

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity e/
Copper	thousand tons	Ok Tedi Mining Ltd., operator. [BHP Minerals Holdings Pty. Ltd., managing shareholder, 52%; Mineral Resources Development Co. (State of Papua New Guinea), 30%; and Metall Mining Corp. of Canada, 18%]	Ok Tedi Mine, Mount Fubilan, Western Province	145
Do.	do.	Bougainville Copper Ltd., operator and manager. [CRA Ltd., 53.6%; public shareholders, 27.3%; and Mineral Resources Development Co. (State of Papua New Guinea), 19.1%]	Panguna Mine, Bougainville Island, North Solomons Province 1/	180
Gold		Lihir Joint Venture, operator and manager. [Kennecott Explorations (Australia) Ltd., 80%; Niugini Mining Ltd., 20%]	Lihir project, Lihir Island, New Ireland Province 2/	18
Do.		Misima Mines Pty. Ltd., operator and manager. [Placer Niugini Pty. Ltd., 80%; and Mineral Resources Development Co. (State of Papua New Guinea), 20%]	Misima Mine, Misima Island, Milne Bay Province	6
Do.		Oakland Pty. Ltd., operator and manager, 90%, and Kare-Puga Development Corp. (local landowner group), 10%	Mount Kare deposit, 18 kilometers southwest of the Porgera Mine, Southern Highland Province	5
Do.		Ok Tedi Mining Ltd., operator. [BHP Minerals Holdings Pty. Ltd., managing shareholder, 52%; Mineral Resources Development Co. (State of Papua New Guinea), 30%; and Metall Mining Corp. of Canada, 18%]	Ok Tedi Mine, Mount Fubilan, Western Province	15
Do.		Bougainville Copper Ltd., operator and manager. [CRA Ltd., 53.6%; public shareholders, 27.3%; and Mineral Resources Development Co. (State of Papua New Guinea), 19.1%]	Panguna Mine, Bougainville Island, North Solomons Province 1/	10
Do.		Placer (PNG) Pty. Ltd., manager, 25%; Highland Gold Properties Pty. Ltd., 25%; RGC (Papua New Guinea) Pty. Ltd., 25%; and Mineral Resources Development Co. (State of Papua New Guinea), 25%	Porgera Mine, 130 kilometers west of Mount Hagen, Enga Province	30
Silver		Misima Mines Pty. Ltd., operator and manager. [Placer Niugini Pty. Ltd., 80%; and Mineral Resources Development Co. (State of Papua New Guinea), 20%]	Misima Mine, Misima Island, Milne Bay Province	100
Do.		Ok Tedi Mining Ltd., operator. [BHP Minerals Holdings Pty. Ltd., managing shareholder, 52%; Mineral Resources Development Co. (State of Papua New Guinea), 30%; and Metall Mining Corp., 18%]	Ok Tedi Mine, Mount Fubilan, Western Province	30
Do.		Placer (PNG) Pty. Ltd., manager, 25%; Highland Gold Properties Pty. Ltd., 25%; RGC (Papua New Guinea) Pty. Ltd., 25%; and Mineral Resources Development Co. (State of Papua New Guinea), 25%	Porgera Mine, 130 kilometers west of Mount Hagen, Enga Province	5
Natural gas	thousand cubic meters per day	BP Petroleum Development Ltd., operator and manager, 92.5%, and Oil Search Ltd., 7.5%	Hides Gasfield, Southern Highlands Province	425
Petroleum	thousand 42-gallon barrels per day	Chevron Niugini Pty. Ltd., operator and manager, 19.375%; BP Petroleum Development, 19.375%; Ampol Exploration Ltd., 16.46%; BHP Petroleum (PNG) Inc., 9.69%; Oil Search Ltd., 7.76%; Merlin Pacific Petroleum Co., 4.84%; and Petroleum Resources Kutubu Pty. Ltd. (State of Papua New Guinea), 22.5%	Kutubu Project (Agogo and Iagifu-Hedinia Oilfields), Gulf and Southern Highlands Provinces	140
Do.	do.	Barracuda Pty. Ltd., operator and manager, 20%. Southern Highlands Petroleum, 50%; Oil Search Ltd., 20%; Nomenco PNG Oil Co., 7%; and Mountains West Exploration Inc., 3%	South East Gobe Oilfield, Gulf Province	40

e/ Estimated.

1/ Closed since May 1989 because of civil unrest.

2/ Waiting for Special Mining Lease to be issued by the Government, enabling development of project to proceed.

TABLE 3  
PAPUA NEW GUINEA: RESERVES OF MAJOR MINERAL COMMODITIES, BY DEPOSIT, FOR 1994

Commodity, deposit, and location	Reserves e/
<b>Copper:</b>	
Nena (Frieda River), West Sepik Province	32 million tons ore grading 2.3% copper.
Ok Tedi, Western Province	510 million tons ore grading 0.69% copper.
Panguna, North Solomons Province	710 million tons ore grading 0.4% copper.
Wafi, Morobe Province	19 million tons ore grading 1.4% copper.
<b>Gold:</b>	
Lihir, New Ireland Province	188 million tons ore grading 3.6 grams gold per ton.
Misima, Milne Bay Province	35.7 million tons ore grading 1.21 grams gold per ton.
Mount Kare, Enga Province	3 million cubic meters alluvium grading 5 grams gold per cubic meter.
Nena (Frieda River), West Sepik Province	32 million tons ore grading 0.58 gram gold per ton.
Ok Tedi, Western Province	510 million tons ore grading 0.63 gram gold per ton.
Panguna, North Solomons Province	710 million tons ore grading 0.49 gram gold per ton.
Porgera, Enga Province	65.4 million tons ore grading 4.6 grams gold per ton.
Tolukuma, Central Province	700,000 tons ore grading 13.3 grams gold per ton.
Wafi, Morobe Province	19 million tons ore grading 1.9 grams gold per ton.
Wapulu, Milne Bay Province	2 million tons ore grading 2.4 grams per ton.
<b>Petroleum:</b>	
Hides Gasfield, Southern Highlands Province	6 trillion cubic meters recoverable natural gas.
Kutubu Project (Agogo and Iagifu/Hedinia Oilfields), Gulf and Southern Highlands Provinces	275 million barrels recoverable petroleum.
<b>Silver:</b>	
Misima, Milne Bay Province	35.7 million tons ore grading 11.0 grams silver per ton.
Panguna, North Solomons Province	530 million tons ore grading 1.18 grams silver per ton.
Porgera, Enga Province	585 tons recoverable silver.
Tolukuma, Central Province	700,000 tons ore grading 37 grams silver per ton.

e/ Estimated.