2013 Minerals Yearbook

PAPUA NEW GUINEA [ADVANCE RELEASE]

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The Mineral Industry of Papua New Guinea

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Papua New Guinea had a mining-intensive economy, and despite an overall decrease in the prices for the mineral commodities produced in Papua New Guinea in 2013, the country remained competitive by maintaining positive terms of trade. Copper, gold, nickel, and silver were the major mineral commodities produced in and exported from Papua New Guinea in 2013. It also had regionally significant reserves of natural gas. The Papua New Guinea Liquefied Natural Gas project (PNG LNG) was expected to supply liquefied natural gas (LNG) to companies in Asia, including Chinese Petroleum Corp. of Taiwan, Osaka Gas Co. Ltd., Tokyo Electric Power Co. of Japan, and Unipec Asia Co. Ltd. (a subsidiary of China Petroleum and Chemical Corp. of China). As construction on the PNG LNG project peaked and was coming to completion in 2013, expected earnings from exports and dividends were projected to be much higher than any previous year's revenues from mineral exports (Basu and others, 2014, p. 3).

Minerals in the National Economy

Papua New Guinea's economic growth slowed in 2013 compared with that of 2012 owing in part to winding down of construction at the PNG LNG project, decreases in international commodity prices, and decreases in the production of some of the country's mineral and agricultural commodities. The nominal value of sales increased in all sectors except the mineral and manufacturing sectors. During the 12 months ending in September 2013, the total value of sales in the country declined by 0.2%. Papua New Guinea's real gross domestic product (GDP) rate of growth was estimated to be 5.5% in 2013 compared with 8.1% in 2012 and 10.1% in 2011 (Bank of Papua New Guinea, 2014, p. 2; Australia Department of Foreign Affairs and Trade, 2014).

Government Policies and Programs

Laws that regulate the mining industry in Papua New Guinea include the Mining Safety Act of 1977, the Mining Act of 1992, the Oil and Gas Act of 1998, and the Mineral Resources Authority Act of 2005. The Mineral Resources Authority Act of 2005 established the Mineral Resources Authority (MRA) and defined the agency's powers and functions. Those functions include (a) promoting the development and exploitation of the country's mineral resources; (b) overseeing the administration and enforcement of the Mining Development Act of 1955, the Mining Act (Bougainville Copper Agreement) of 1967, the Mining Safety Act of 1977, the Mining Act of 1992, the Ok Tedi Agreement, and all other laws related to the development of Papua New Guinea's mineral resources; and (c) acting as the agent for the state for international mining agreements. The Geological Survey Division (GSD) is one of four divisions of the MRA. Core functions of the GSD include compiling of geoscience data and information aimed at encouraging mineral sector investment, conducting regional geoscience and geologic resource mapping, and archiving statutory reports submitted by mineral tenement holders (Government of Papua New Guinea, 2005, p. 10; Mineral Resources Authority of Papua New Guinea, 2013b).

In March 2013, the Government announced plans to restructure its role in the country's private and state-owned mining and petroleum projects and the commercialization of those assets. The restructuring was reportedly intended to provide more transparency and accountability for the management of mining and petroleum assets as well as to respond to the public debate about the ownership rights of the citizens of Papua New Guinea. A constitutional amendment was proposed that would create a new section to the Constitution confirming that hydrocarbons and minerals in their natural state are and always have been the property of the state as is stated in the Mining Act of 1992 and the Oil and Gas Act of 1998. The amendment would, among other things, require companies to carry out social mapping prior to exploration activity, allow the Government up to 50% equity in any mining project, and require mineral developers to process 70% of their output domestically through smelting and refining. Historically, royalties have gone directly to landowners and the Provincial governments rather than the National Government, and the National Government has retained back-in rights for 30% of mining projects and 22.5% of gas and oil projects (Papua New Guinea Chamber of Mines, 2013b, d; Business Advantage PNG, 2014).

In May 2013, the National Executive Council (Cabinet-level Government appointees) endorsed a plan for the formation of a new independent agency to act as the Petroleum and Energy Authority of Papua New Guinea, and the plan was approved by the Prime Minister. The decision would bring about a transition of responsibilities and abolishment of the Department of Petroleum and Energy. The proposed Petroleum and Energy Authority would consist of a Board of Directors that would govern the Authority's operations; a Petroleum Advisory Council and Energy Advisory Council to govern the regulatory and policy affairs of the petroleum and energy sectors, respectively, and the Office of the Managing Director to handle administrative and operational functions (Papua New Guinea Chamber of Mines, 2013c).

Production

Copper production decreased in 2013 by 3.0% compared with that of 2012 owing to the mining of lower grade ores at the Ok Tedi Mine, the country's only producing copper mine. Gold production decreased by 5.2% owing in part to decreased millhead grade and recovery rate at Simberi Island despite increased ore processing. Silver production in the country increased by 10.8%. The amount of cobalt and nickel in nickel hydroxide increased by about 115% each in 2013 owing to the continued ramping up of the Ramu Mine. Data on mineral production are in table 1.

Structure of the Mineral Industry

In 2013, several private international mining companies were majority owners or shareholders in producing metals operations in Papua New Guinea, including Newcrest Mining Ltd. of Australia's wholly owned Lihir Island Mine and Harmony Gold and Newcrest Mining's Hidden Valley Mine, from which the Government received a royalty of 2%. Barrick Gold Corp. of Canada operated and held a 95% interest in the Porgera Mine, and the Government held the remaining 5% share through the state-owned Mineral Resources Development Corp. New Guinea Gold Corp. of Canada was the operator of and held a 90% interest in the Sinivit Gold Mine, and Niugini Holdings Pty Ltd. of Papua New Guinea held the remaining 10% interest. In 2013, the Ok Tedi Mine was majority owned by the PNG Sustainable Development Program Ltd., which held a 70% share in the operation, and the Government held the remaining 30% until mid-October when it took full ownership of the operation. Profits from the mine would henceforth be directed towards national revenue as opposed to having been divided between the Western Province and the National Government. The Simberi Mine was wholly owned by St. Barbara Ltd. of Australia, and the Tolukuma Hill Mine was wholly owned by Petromin PNG Holdings (table 2).

Mineral Trade

According to the Bank of Papua New Guinea, the value of goods exported in 2013 was $5.3 billion. Of this amount, the value of mineral exports was $3.9 billion, or 73.5% of the total, which was a 4.7% decrease from that of 2012. The average price received for Papua New Guinea's gold exports decreased by 11.4% in 2013 compared with that of 2012. Papua New Guinea's leading export partner was Australia (which received 35.9% of Papua New Guinea's exports, by value), followed by Japan (11.7%), Germany (7.0%), and China (6.7%) (Bank of Papua New Guinea, 2014, p. 13).

The quantity of copper exports was about 92,900 metric tons (t), which was a 25.9% decrease compared with that of 2012. The decrease in copper exports was owing to extraction of lower grade ore at the Ok Tedi Mine, marginally lower prices for copper, and low water levels on the degradated Fly River, which resulted in decreased shipments. The total value of copper exports decreased by 26.4% to about $648 million in 2013 compared with that of 2012 (Bank of Papua New Guinea, 2014, p. 13).

The volume of crude oil exports was 8.3 million barrels (Mbbl), which was a decrease of 7.4% compared with the revised volume in 2012. The continued decrease in the volume of crude oil exports was owing to decreased extraction rates brought on by the decline in reserves at the Gobe Main, the Kutubu, the Moran, and the South East Gobe oilfields. The average export price of crude oil from Papua New Guinea increased by 2.5% compared with that of 2012. The increased price per barrel was attributed to lower production by member nations of the Organization of the Petroleum Exporting Countries associated with continued political tensions in some Middle East countries. The decrease in export volume, however, more than offset the increase in export price and the value of crude petroleum exports decreased by 4.9% compared with that of 2012 (Bank of Papua New Guinea, 2014, p. 13).

Commodity Review

Metals

Cobalt and Nickel.—The Ramu nickel and cobalt mine [a joint venture among MCC Ramu NiCo Ltd. (85%), Highlands Pacific Ltd. of Australia (8.6%), Mineral Resources Development Corp. (3.9%), and unnamed landowners (2.5%)], also known as the Kurumbukari and the Ramu River project, is located on the Kurumbukari Plateau near the Ramu River in Madang Province. The Metallurgical Corporation Ltd. of China (MCC) held a 61% interest in Ramu NiCo, and a number of other Chinese entities held the remaining 39%. Commissioning of the Ramu Mine took place in March 2012, and the mine was officially opened in December 2012.

The Ramu open pit mine was connected by a 135-kilometer (km) slurry pipeline to the Basamuk processing plant, which was located 75 km west of Madang. Parts of the slurry pipeline were buried, and the pipeline dropped about 680 meters in elevation from the mine to the processing plant. The design capacity of the mine was 5.7 million metric tons per year (Mt/yr) of ore, and the mine had a processing capacity of 4.3 Mt/yr of wet ore or 3.2 Mt/yr of dry ore, and an output capacity of 79,300 metric tons per year (t/yr) of nickel cobalt mixed hydroxides, or 33,000 t/yr of nickel metal and 3,300 t/yr of cobalt metal (Metallurgical Corporation of China Ltd., 2010, p. 23).

By March 2013, Ramu was operating at just over 30% of nameplate capacity and three shipments of mixed nickel cobalt hydroxide intermediate product containing 2,073 t of nickel and 187 t of cobalt were delivered. A third and final autoclave had yet to start load commissioning as the operation ramped up ore feed. In the fourth quarter of 2013, the mine, the Basamuk treatment plant, and the 135-km slurry pipeline to the treatment plant continued to ramp up to full production; all three autoclaves had been load commissioned; and the plant operated at about 50% of nameplate capacity. During the fourth quarter, the operation produced 4,720 t of nickel and 418 t of cobalt. Total production in 2013 included 11,369 t of nickel and 1,013 t of cobalt. The operation was expected to operate at about 70% of nameplate capacity in 2014 before reaching full production in 2015. When fully operational, the Ramu project was expected to account for about one-third of all China's nickel imports (Papua New Guinea Chamber of Mines, 2013a; Highlands Pacific Ltd., 2014, p. 5).

Highlands Pacific Ltd. reported assay results from reconnaissance exploration at its Sewa Bay tenements on Normanby Island that returned elevated nickel indicative of laterites with grades greater than 0.6% nickel. The presence of previously reported magnesite occurrences was also confirmed, which could potentially be used as a substitute for sodium hydroxide as a reagent for processing the ore (Asia Miner News, 2014c).

Copper.—The Ok Tedi Mine, which was also known as the Mt. Fubilan Mine, is located in a region of steep cliffs known as the Hindenberg Wall in Western Province approximately

16 km east of the border with Indonesia. In September 2013, Papua New Guinea's Parliament passed legislation for the Government takeover of the Ok Tedi Mine and rescinded former owner BHP Billiton of Australia's 12-year-old immunity deal related to environmental damage from tailings released into the Fly River system. The location and geology surrounding the mine contributed to the collapse of a tailings dam, which was part of the site's initial construction, following an earthquake in 1984. Since that time, from 20 to 60 Mt/yr of tailings from the operation have been released into the upper Ok Tedi River, which is a tributary of the Fly River, resulting in massive environmental destruction in the drainage basin. In exchange for legal immunity, BHP Billiton divested its controlling share in the mine to the PNG Sustainable Development Program charitable trust in 2001, but the company could face claims from landowners in light of the new legislation. The nationalization of the mine culminated a drawn out dispute with the Sustainable Development Program, which controlled its stake in the mine through its trust on behalf of the residents of the Province (Asia Miner News, 2014a).

In August, PanAust Ltd. of Australia entered into an agreement to buy the 80% share in the Frieda River copper and gold project by acquiring all the shares held by GlencoreXstrata plc of Switzerland. The remainder of the Frieda River project continued to be owned by Highlands Pacific. The most recent feasibility study for the Frieda River project envisioned a project with an open pit mining operation that would have an average production of 190,000 t/yr of copper and 9,000 kilograms per year (kg/yr) of gold during a 20-year mine life. PanAust, however, conducted a scoping study based on a smaller operation that would average 100,000 t/yr of copper and 5,000 kg/yr of gold during an 18-year mine life. PanAust agreed to pay GlencoreXstrata \$75 million in two installments, and GlencoreXstrata was to receive a 2% net smelter return royalty up to an aggregate of \$50 million. PanAust would also acquire a 7.5% share in Pacific Highlands and would have a 90-day option period for another 7.5% once the Frieda River acquisition was completed (Asia Miner News, 2014d).

Nautilus Minerals Inc. of Canada reported that as of October 25, 2013, the Government of Papua New Guinea had not completed the purchase of its 30% interest in the Solwara 1 seafloor mining project in the Bismark Sea. An arbitrator appointed to resolve a dispute between the company and the State ruled in favor of the company on October 3 after which Nautilus issued a notice to Papua New Guinea's Government requiring it to make payments of about \$118 million by October 23. In March 2011, Nautilus entered into agreements with Papua New Guinea, and the Government exercised its option to acquire a 30% stake in the Solwara 1 project. In June 2012, however, both parties entered into a dispute following Government allegations that Nautilus had not met certain obligations. The arbitrator in the case ruled that the State was in breach of its agreement with Nautilus and would be held responsible for failing to acquire the agreed interest in the project. The ruling required the Government to comply with its obligation to complete the purchase in addition to making payments of 30% of all project expenditure incurred to date at the time of the ruling (Asia Miner News, 2014b).

According to a 2010 technical report, production for the Solwara 1 operation was planned to commence at a rate of 1.2 Mt/yr of dewatered ore. The operational plan would require tracked robots to excavate the massive sulfide material from the seafloor and a riser and lifting system to pump excavated material as slurry to a production support vessel (PSV) with dewatering facilities. The slurry would be dewatered at the surface and then transferred to cargo barges and delivered to the Port of Rabaul for stockpiling at an onshore facility. The ore would then be offloaded into bulk carriers for transportation to a conventional concentrator processing facility (Nautilus Minerals, Inc., 2010, p. 1–3, 9).

Environmental concerns regarding the Bismark Sea Project were significant. The project was deemed to be a Level 3 activity under Papua New Guinea's Environment Act of 2000. Level 3 activities were defined as those that may result in serious environmental harm. Nautilus conducted workshops and sponsored multidisciplinary study groups connected with the environmental impact assessment process to assist the company in engineering out potential hazards. The Solwara 1 deposit occurs in what is called the North Su volcanic center, which is a volcanic seamount where sulfide-rich chimneys actively vent hydrothermal fluids. Adverse effects to the seafloor, its hydrothermal chimneys, and associated vent fauna were identified as primary environmental issues. Other concerns involved possible effects on the entire water column, which contains a wide variety of animal species. There could be water-quality hazards from the effects of potential volcanic or seismic activity, desalination (to create potable water for the PSV) with resultant brine discharge, discharge of slurry waste water, prestripping and movement of surface sediment, noise, and equipment or infrastructure failures. Local concerns included whether benefits would reach people or Provincial governments directly affected by the project and the Government's capacity to regulate the project (Nautilus Minerals Inc., 2010, p. 27–29).

Gold.—In June, Newcrest Mining Ltd. initiated layoffs of at least 150 workers at the Lihir Island Mine. In the same month, the company announced it would write down the value of its mines by up to \$5.5 billion, more than \$3.7 billion of which would be an impairment on the Lihir Mine. The company then came under investigation by the Australian Securities and Investments Commission and the Australian Stock Exchange for allegedly providing market sensitive information to a small number of securities analysts prior to informing shareholders of the writedown. The investigation came about after it was noticed that analysts had downgraded Newcrest's target price just prior to the announcement of the writedown. In September, it was reported that three senior managers of Newcrest Mining would receive bonuses in excess of \$300,000 combined for their role in the purchase of the Lihir gold project despite the writedown. Shareholders were prepared to start a class action suit against Newcrest at yearend if it did not enter into confidential discussions with the shareholders regarding the conflicts of interest. The Lihir Mine was identified as the world's third largest producing gold mine in terms of resource estimates (measured, indicated, and inferred resources including reserves); Lihir is estimated to contain about 2,000 t of gold (Andres, 2013; Business Advantage PNG, 2013; King, 2013; Stringer and Hill, 2013).

Mineral Fuels

Natural Gas.—In 2013, the PNG LNG project was on track for its first deliveries of gas for export purposes and several commissioning procedures had been completed. On August 26, commissioning gas was introduced into the onshore and offshore pipeline from Oil Search's Kutubu field; on September 8, the commissioning gas arrived at the LNG plant near Port Moresby; on September 10, the flare at the LNG plant was lit; and on September 12, the first of seven power generators was started (Papua New Guinea Chamber of Mines, 2013d, p. 7).

InterOil Corp. of Australia formed a joint venture with Total S.A. of France for the Elk and Antelope gasfields in Gulf Province. InterOil agreed to sell Total a 61.3% share in the fields in addition to a right to negotiate a farm-in to all InterOil exploration licenses in Papua New Guinea. Total would fund three appraisal wells, carry out certification of gas reserves in 2015, and be responsible for construction and operation of the integrated LNG project (Papua New Guinea Chamber of Mines, 2013d, p. 13).

In August, Oil Search Ltd. submitted an oilfield development license application to the Department of Petroleum and Energy for its Mananda 5 and Mananda 6 oil discoveries in the highlands, and drilling started on the Mananda 7 appraisal well. The company was continuing with studies for potential development of the P'nyang gasfield including technical work and social mapping. Oil Search's joint-venture partner, Esso PNG P'nyang Ltd., undertook resource definition, engineering, and environmental and social impact studies with the aim of submitting a development license application in early 2015 (Papua New Guinea Chamber of Mines, 2013d, p. 12)

Outlook

According to the World Bank, the year-over-year real GDP rate of growth in Papua New Guinea is expected to increase 10% in 2014 and 20% in 2015 owing to the startup of the gas developments in Papua New Guinea as income from the PNG LNG is directed towards the nation's economy. After a decade of strong economic growth, Papua New Guinea faces a slowdown in the nonmineral sector as construction winds down at the PNG LNG project, which will have an effect across sectors that contributed to the project's development. The coming economic growth spurt from the PNG LNG revenues is expected to be modest in the medium term, however, and the country's economic stability will be increasingly tied to uncertainty about mineral commodity prices and investment. Risks associated with the commodity boom have been considered in terms of the potential for unproductive use of natural resource revenue inflows if, for example, the Government increases its own consumption at the expense of public investment. There is potential for decreased external competitiveness that could negatively affect trade as real currency appreciation could reduce profitability from trade relative to domestic sectors. If the tradable sector were to remain the primary source of productivity within the economy to the point that a diminished tradable sector would decrease overall productivity permanently, long-term economic growth prospects would be decreased rather than increased, a set of circumstances defined in economics as Dutch disease (International Monetary Fund, 2013; Basu and others, 2014, p. 3–4; World Bank, The, 2014).

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TABLE 1
PAPUA NEW GUINEA: PRODUCTION OF MINERAL COMMODITIES[1]

Commodity[2]		2009	2010	2011	2012	2013
Copper, mine output, Cu content	metric tons	166,700	159,821	130,473	125,348	121,600
Gas, natural, marketed	million cubic meters	113	113	113	100	100
Gold, mine output, Au content	kilograms	63,600	58,983	62,200	59,100 r	56,035
Nickel cobalt hydroxide:						
Gross weight	metric tons	--	--	--	13,777	29,763
Co content	do.	--	--	--	469	1,013
Ni content	do.	--	--	--	5,283	11,369
Petroleum, crude	thousand 42-gallon barrels	12,806	11,100	11,000	10,000	8,500
Silver, mine output, Ag content	kilograms	50,000	74,000	90,700	81,300	90,100

[r]Revised. -- Zero.
[1]Table includes data available through December 5, 2014.
[2]In addition to the commodities listed, cement, and construction materials (common clays, sand and gravel, and stone) are produced, but available information is inadequate to make a reliable estimate of output.

TABLE 2
PAPUA NEW GUINEA: STRUCTURE OF THE MINERAL INDUSTRY IN 2013

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities[1]	Annual capacity[e]
Cement	thousand metric tons	Papua New Guinea-Halla Cement Pty. Ltd. (Halla Cement Corp., 50%, and Government, 50%)	Lae, Morobe Province	200
Cobalt	do.	MCC Ramu NiCo, Ltd., 85%; Highlands Pacific Ltd., 8.56%; Mineral Resources Development Corp., 3.94%	Open pit mine facility, Basamuk beneficiation plant, Madang Province	3
Copper	do.	Ok Tedi Mining Ltd. (Government, 100%)	Ok Tedi open cut, Western Province, 20 km northwest of Tabubil and 390 km southwest of Wewak	170
Gold		Newcrest Mining Ltd., operator, 100%	Lihir open cut, Lihir Island, New Ireland Province, 700 km northeast of Port Moresby	26
Do.		St. Barbara Ltd., 100%	Simberi Island open cut, New Ireland Province	3
Do.		Newcrest Mining Ltd., 50%, and Harmony Gold Mining Co. Ltd., 50%	Hidden Valley open cut, Morobe Province, 90 km southwest of Lae	8
Do.		Ok Tedi Mining Ltd. (Government, 100%)	Ok Tedi open cut, Western Province, 20 km northwest of Tabubil and 390 km southwest of Wewak	17
Do.		Porgera Joint Venture (Barrick Gold Corp., 95%, and Mineral Resources Development Corp., 5%)	Porgera open cut and underground mines, Enga Province, 620 km northwest of Port Moresby	22
Do.		New Guinea Gold Corp., 90%; Niugini Holdings Pty Ltd., 10%; Government, 100%	Sinivit open pit, East New Britain Province, about 50 km south southwest of Rabaul	1
Do.		Petromin PNG Holdings, 100%	Tolukuma Hill open pit, 100 km north of Port Moresby	216

See footnotes at end of table.

TABLE 2—Continued
PAPUA NEW GUINEA: STRUCTURE OF THE MINERAL INDUSTRY IN 2013

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities[1]	Annual capacity[e]
Nickel	thousand metric tons	MCC Ramu NiCo, Ltd., 85%; Highlands Pacific Ltd., 8.56%; Mineral Resources Development Corp., 3.94%	Open pit mine facility, Basamuk beneficiation plant, Madang Province	32
Petroleum, crude	thousand 42-gallon barrels	Petroleum development license 2: Chevron Niugini Ltd. (operator and manager), 19.37%; Oil Search (Kutubu) Ltd., 27.14%; Orogen Minerals Ltd., 25.44%; Exxon Mobil Corp., 14.52%; Petroleum Resources (Kutubu) Ltd., 6.75%; Merlin Petroleum Co., 6.78% Petroleum development license 5: Exxon Mobil Corp. (operator and manager), 47.5%, and Oil Search Ltd., 52.50%	Central Moran oilfield, Southern Highlands Province (includes Agogo and Iaqufi-Hedinia fields). Onshore Papuan Basin, petroleum development licenses 2 and 5	20
Do.	do.	Chevron Niugini Ltd. (operator and manager), 19.37%; Oil Search Ltd., 27.14%; Orogen Minerals Ltd., 30.19%; Exxon Mobil Corp., 14.52%; Merlin Petroleum Co., 6.78%; Petroleum Resources Ltd. (Gobe), 2.0%	Gobe Main oilfield, Southern Highlands Province. Onshore Papuan Basin, petroleum development license 4	11
Do.	do.	Chevron Niugini Ltd. (operator and manager), 19.37%; Oil Search Ltd., 27.14%; Orogen Minerals Ltd., 25.44%; Exxon Mobil Corp., 14.52%; Petroleum Resources (Kutubu) Ltd., 6.75%; Merlin Petroleum Co., 6.78%	Kutubu oilfield, Southern Highlands Province. Onshore Papuan Basin, petroleum development license 2	16
Do.	do.	Santos Ltd. (operator and manager), 15.5%; Southern Highlands Petroleum Ltd., 39.14%; Orogen Minerals Ltd., 20.5%; Oil Search Ltd., 15.50%; Cue PNG Oil Co. Ltd., 5.42%; Petroleum Resources (Gobe) Ltd., 2.0%; Mountains West Exploration, Inc., 1.94%	South East Gobe oilfield, Gulf and Southern Highlands Provinces. Onshore Papuan Basin, petroleum development licenses 3 and 4	11
Silver		Porgera Joint Venture (Barrick Gold Corp., 95%, and Mineral Resources Development Corp., 5%)	Porgera open cut and underground mines, Enga Province, 620 km northwest of Port Moresby	4
Do.		Newcrest Mining Ltd., 50%, and Harmony Gold Mining Co. Ltd., 50%	Hidden Valley open cut, Morobe Province, 90 km southwest of Lae	124
Do.		Ok Tedi Mining Ltd. (Government, 100%)	Ok Tedi open cut, Western Province, 20 km northwest of Tabulio and 390 km southwest of Wewak	30

[e]Estimated. Do., do. Ditto.
[1]Abbreviations used for units of measure in this table include the following: km, kilometer.