



2014 Minerals Yearbook

PAPUA NEW GUINEA

THE MINERAL INDUSTRY OF PAPUA NEW GUINEA

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Papua New Guinea is located along the collision zone between the continental crust of the Australian Plate to the south and the oceanic crust of the Pacific Plate to the north. The country is a highly prospective region for a number of types of mineralization, including epithermal and porphyry-related high- and low-sulfidation systems, skarns, volcanogenic massive sulfides, exhalative manganese deposits, lateritic nickel-chromite-cobalt, and sea-floor massive sulfides. In 2014, Papua New Guinea produced a variety of metallic minerals, such as cobalt, copper, gold, nickel, and silver, as well as such mineral fuels as crude petroleum and natural gas. The Papua New Guinea liquefied natural gas (LNG) project, with an estimated construction cost of about \$19 billion, started production in early 2014 (table 1; Mineral Resources Authority, 2012, p. 1; Bank of Papua New Guinea, 2015a, p. 30).

Minerals in the National Economy

The rate of growth of Papua New Guinea's real gross domestic product (GDP) was estimated to be 8.4% in 2014 compared with 5.5% in 2013. The rate of growth of the nonmining GDP (all economic sectors except mining) was 1.4% in 2014 compared with 4.9% in 2013. The strong growth in the domestic economy in 2014 was attributed mainly to the starting of production and the exporting of commodities at the LNG plant, which was supported by improvement in international prices for most of Papua New Guinea's export commodities. The mineral sector accounted for 87.4% of the total foreign investment in Papua New Guinea in 2013 and 85.2% in 2014 (Bank of Papua New Guinea, 2015a, p. 2, 25; 2015b, p. 30, 31).

Government Policies and Programs

The Mineral Resources Authority (MRA) of Papua New Guinea, which was established through the enactment of the Mineral Resources Authority Act 2005 by Parliament, is the Government agency responsible for the development of mining in the country. Its responsibilities include ensuring that exploration and mining activities in Papua New Guinea are done within the regulatory and policy framework and that the benefits from these activities are being distributed fairly and transparently to all beneficiaries and stakeholders. The MRA also carries out earth-science research studies and processes field data to assist with and promote exploration, geologic research, and related activities in the mineral sector; and it coordinates the administration and management of all special projects, including ongoing development and support functions in the areas of project procurement, financial accounting, and management for projects with the European Union and the World Bank and other donor-funded projects. Laws that regulate the mining industry in Papua New Guinea include the Mining Act 1992, the Environment Act 2000, the Mineral Resource Authority Act 2005,

the Mining (Safety) Act & Regulations 2007, and the Gold Export License Requirements. In April 2014, a contract to carry out an aerial geophysical survey near the Papua New Guinea and Indonesia border was signed between the MRA and GPX Surveys Ltd. of Australia. The purpose of the contract was to enhance geoscientific knowledge of the area between the Frieda River and the Ok Tedi prospects. When completed, the new data sets were expected to increase mineral exploration activity in the area (Mineral Resources Authority, 2014, p. 1; 2015a, b).

Production

Copper production decreased by 29% in 2014 compared with that of 2013 owing to decreased production at the Ok Tedi Mine. Nickel production (nickel content) increased by 85%, and cobalt production increased by 111% owing to increased production at the Ramu Mine. Marketable natural gas production increased by 60% owing to increased output at the LNG plant gasfields. Liquefied natural gas production at the LNG plant was about 4 million metric tons (Mt). In 2014, production of crude petroleum, gold, and silver was maintained at levels similar to those of 2013 (table 1; Highlands Pacific Ltd., 2015, p. 9; Oil Search Ltd., 2015, p. 73; Ok Tedi Mining Ltd., 2015, p. 83).

Structure of the Mineral Industry

Most of the mining facilities in Papua New Guinea were joint ventures between the Government and private international mining companies. Some mines were wholly owned by foreign entities, such as the Lihir gold mine, which was 100% owned by Newcrest Mining Ltd. of Australia. The Ok Tedi Mine became a state-owned enterprise in 2013; Papua New Guinea held an 87.8% interest, and the remaining interest was owned by the Fly River Provincial government. Table 2 is a list of the major mineral facilities operating in 2014 (Newcrest Mining Ltd., 2015, p. 15; Ok Tedi Mining Ltd., 2015, p. 18).

Mineral Trade

According to the Central Bank of Papua New Guinea, the total value of goods exported from the country in 2014 was \$8.58 billion,¹ representing a 64% increase compared with that of 2013. The increase was mainly owing to the production and export of mineral commodities at the LNG project. The value of mineral exports from Papua New Guinea in 2014 was \$6.94 billion, or 81% of the total value of exports, which was an 84% increase compared with that of 2013. The increase in value was owing to an increase in the production and export of LNG, condensates, and naphtha, and an increase in gold and nickel exports. LNG exports totaled \$2.48 billion in 2014, which accounted for 29% of total exported goods. About 6.18 million barrels (Mbbl) of condensates, valued at

¹Where necessary, values have been converted from Papua New Guinean kina (PGK) to U.S. dollars (US\$) at an average rate of PGK2.55=US\$1.00 for 2014.

\$550 million, were exported. As a result of these increases in the value of exports, the country recorded a trade account surplus of \$5.05 billion in 2014 compared with a surplus of \$468 million in 2013 (Bank of Papua New Guinea, 2015a, p. 14, 15).

The value of exported gold increased to \$2.14 billion in 2014, or by 0.7% compared with that of 2013. Gold exports totaled 58,000 kilograms (kg), which was an increase of 5.5% compared with that of 2013. The increase in export volume was owing to increased production and shipments at the Hidden Valley, Porgera, and Tolukuma Mines and other licensed exporters, which more than offset lower production at the Lihir, Ok Tedi, and Simberi Mines. The average price of gold on the London Metal Exchange decreased by 10.4% in 2014 compared with that of 2013. The increase in Papua New Guinea's export volume was large enough to offset the decrease in the price of gold (Bank of Papua New Guinea, 2015a, p. 15).

According to the Central Bank of Papua New Guinea, copper exports totaled about 89,600 metric tons (t), which was a 3.6% decrease compared with that of 2013. The decrease in copper exports was owing mainly to decreased production and metal ore grades from the Ok Tedi Mine. The average price of copper exports from Papua New Guinea increased by 2.7% in 2014 compared with that of 2013. As a result, the total value of copper exports decreased to about \$591 million, or by 0.9% compared with that of 2013 (Bank of Papua New Guinea, 2015a, p. 15).

Nickel exports totaled about 20,900 t in 2014, which was a 31.4% increase compared with that of 2013. The increase in nickel exports was mainly owing to increased production from the Ramu nickel-cobalt mine. The average price of nickel exports from Papua New Guinea increased by 6.9% in 2014 compared with that of 2013. As a result, the total value of nickel exports increased to about \$289 million, or by 73.2% compared with that of 2013 (Bank of Papua New Guinea, 2015a, p. 15).

Cobalt exports totaled about 2,100 t in 2014, which was a 50% increase compared with that of 2013. The average price of cobalt exports from Papua New Guinea decreased by 42.2% in 2014 compared with that of 2013 owing to the weak demand from China. As a result, the total value of cobalt exports decreased to about \$44 million, or by 13.3% compared with that of 2013 (Bank of Papua New Guinea, 2015a, p. 15).

Crude oil exports totaled about 8.2 Mbbl in 2014, which was a decrease of 1.1% compared with that of 2013. The decrease in crude oil exports was owing to decreased extraction rates caused by the decline in reserves at the Kutubu, the Gobe Main, the South East Gobe, and the Moran oilfields. The average price of crude oil exports from Papua New Guinea increased by 3.9% in 2014 compared with that of 2013. The decrease in the price per barrel of crude oil was attributed to the depreciation of the Papua New Guinea kina against the U.S. dollar. The value of crude oil exports was about \$817 million in 2014, representing a 2.8% increase compared with that of 2013 (Bank of Papua New Guinea, 2015a, p. 15–16).

Commodity Review

Metals

Cobalt and Nickel.—The Ramu Mine (also known as the Kurumbukari, the Kurbukan, or the Ramu River Mine) was built

at a cost of \$2.1 billion and was commissioned progressively beginning in 2012. This nickel-cobalt mine, which is located near Madang on the north coast of Papua New Guinea, was one of the largest mining and processing projects to have been brought into production in Papua New Guinea during the past decade. At yearend 2014, production reached 72% of nameplate capacity. The Ramu open pit mine was connected by a 135-kilometer (km) slurry pipeline to the Basamuk processing plant, which is located 75 km east of the Provincial capital city of Madang in the Rai Coast District (Highlands Pacific Ltd., 2015, p. 8, 9).

In 1996, the Ramu nickel joint venture was established to prepare an economic feasibility study for the project. A special mining license for the project was granted in 2000, and, in 2005, the Metallurgical Corporation of China Ltd. (MCC) joined the joint venture and was responsible for financing and construction of the project. As of yearend 2014, the following entities owned an interest in the Ramu nickel-cobalt project—MCC Ramu NiCo Ltd. (85%), Highlands Pacific Ltd. of Australia (8.6%), and the Papua New Guinea Government and landowners (6.4%). Highlands announced that its share in Ramu would increase to 11.3% after an unspecified amount of internal project debt had been repaid from operating revenue, and it had an option to increase its interest to 20.6%. MCC held a 61% interest in MCC Ramu NiCo Ltd. and a number of other Chinese entities held the remaining 39%. MCC was responsible for the operation of the mine (Highlands Pacific Ltd., 2015, p. 9).

The Ramu Mine is a low-strip-ratio open pit mine. Face shovels and backhoe configured excavators were used to mine the 12-meter (m)-thick, on average, ore body and load the ore onto trucks for delivery to the washing plant and then to the beneficiation plant. Treatment would remove the chromite and create a slurry feed for overland pipeline transport to the Basamuk processing plant, which had the capacity to produce 78,000 metric tons per year (t/yr) of nickel-cobalt mixed hydroxides containing 31,150 t of nickel and 3,300 t of cobalt (Highlands Pacific Ltd., 2015, p. 9).

In 2014, a total of 6.0 Mt (wet) of ore was mined compared with 3.48 Mt in 2013. About 2.27 Mt (dry) of ore was processed in 2014 compared with 1.25 Mt in 2013. Production of mixed hydroxide precipitate (MHP) was 57,360 t in 2014 compared with 29,736 t in 2013. The MHP contained 20,987 t of nickel metal in 2014 compared with 11,369 t in 2013, and 2,134 t of cobalt metal in 2014 compared with 1,013 t in 2013. According to the company, the throughput was expected to increase to 83% of full capacity in 2015 and to reach full capacity in 2016. The nameplate capacity of the project was 8.5 million metric tons per year (Mt/yr) of mined ore (wet), 3.4 Mt/yr of processed ore (dry), and 78,000 t/yr of MHP (dry). The project had a planned mine life of more than 20 years and an expected production cost of about \$10,000 per metric ton of nickel at full capacity (Highlands Pacific Ltd., 2015, p. 9).

As of yearend 2014, the resources at the Kurumbukari Mine included 38 Mt of measured resources grading 0.9% nickel and 0.1% cobalt; 7 Mt of indicated resources grading 1.4% nickel and 0.1% cobalt; and 4 Mt of inferred resources grading 1.2% nickel and 0.1% cobalt. The resources at the Ramu West deposit included 17 Mt of indicated resources grading 0.8% nickel and

0.1% cobalt and 3 Mt of inferred resources grading 1.5% nickel and 0.2% cobalt. The resources at the Greater Ramu deposit included 60 Mt of inferred resources grading 1.0% nickel and 0.1% cobalt. The reserves at the Kurumbukari Mine included 33 Mt of proved reserves grading 0.9% nickel and 0.1% cobalt and 6 Mt of probable reserves grading 1.4% nickel and 0.1% cobalt. The reserves at the Ramu West deposit included 14 Mt of probable reserves grading 0.9% nickel and 0.1% cobalt. The total reserves at the Kurumbukari Mine were 39 Mt in 2014 compared with 42 Mt in 2013, reflecting depletion of the mined areas (Highlands Pacific Ltd., 2015, p. 13–14).

Copper.—Ok Tedi Mining Ltd. (OTML) was a state-owned company that operated the Ok Tedi Mine (also known as the Mt. Fubilan Mine), which is located within Mt. Fubilan in a region of steep cliffs known as the Hindenburg Wall in the rainforest of Papua New Guinea's Western Province approximately 16 km east of the border with Indonesia. The deposit was mined as a large open pit with a 23-Mt/yr flotation processing plant. Copper concentrate was transported 156 km south to the Kiunga port facilities, which are located on the Fly River; there, the concentrate was dried, stored, and then shipped by barge down the Fly River to Port Moresby to a silo and storage vessel, prior to export to overseas customers (Ok Tedi Mining Ltd., 2015, p. 26).

In 2014, 15.9 Mt of ore was mined at the Ok Tedi Mine and 52.1 Mt of waste rock was moved. More than 16.8 Mt of ore was processed, resulting in 308,387 t of concentrate containing 75,901 t of copper, 7,497 kg of gold, and 18,504 kg of silver. The sales of copper, gold, and silver concentrate totaled \$956 million. In 2013, the company mined 62.8 Mt of ore and waste rock. More than 19.6 Mt of ore was processed, resulting in 415,713 t of concentrate containing 105,523 t of copper, 11,346 kg of gold, and 29,875 kg of silver. The sales of copper, gold, and silver concentrate totaled \$1.18 billion. The decrease in mine production in 2014 compared with that of 2013 was largely owing to the inability to access higher grade ore, partially owing to heavy rains and minor landslides. Lower grade ore was mined from stockpile material before development work was completed to restore full access to the pit. The production at the processing plant decreased owing to a major failure of a semiautogenous grinding (SAG) mill shell and major outages of the primary crusher. Despite the production decrease, the company recorded a net profit of \$135 million in 2014 compared with \$17 million in 2013 (Ok Tedi Mining Ltd., 2014, p. 26; 2015, p. 26, 81–83).

A total of 381,075 t of copper concentrates was exported in 2014 compared with 394,622 t in 2013. In 2014, the exported concentrates contained 93,760 t of copper, 9,078 kg of gold, and 21,778 kg of silver; in 2013, the exported concentrates contained 100,212 t of copper, 10,950 kg of gold, and 28,907 kg of silver. The concentrate was stored and dispatched from the silo ship *MV Kumul Arrow* to OTML's customers. In 2014, Japan received 54.3% of OTML's total exported concentrates; the Philippines, 15.8%; Germany, 13.6%; the Republic of Korea, 9.1%; India, 5.2%; and Indonesia, 2% (Ok Tedi Mining Ltd., 2015, p. 27, 81).

At yearend 2014, OTML's resources were estimated to be 911 Mt, including measured resources of 332 Mt grading

0.52% copper and 0.58 gram per metric ton (g/t) gold, indicated resources of 485 Mt grading 0.39% copper and 0.47 g/t gold, and inferred resources of 94 Mt grading 0.40% copper and 0.54 g/t gold. At yearend 2013, OTML's resources were estimated to be 871 Mt, including measured resources of 344 Mt grading 0.52% copper and 0.58 g/t gold, indicated resources of 417 Mt grading 0.39% copper and 0.51 g/t gold, and inferred resources of 110 Mt grading 0.41% copper and 0.57 g/t gold. The change from 2013 was largely owing to revised pit optimization modeling and block model changes (Ok Tedi Mining Ltd., 2015, p. 34–35).

OTML's proven and probable ore reserves increased by 33% to 287 Mt in 2014 from 215 Mt in 2013. The 2014 proven reserves were 187 Mt grading 0.55% copper and 0.63 g/t gold, and the probable reserves were 100 Mt grading 0.52% copper and 0.66 g/t gold. The primary cause of the increase in reserves was a revised pit design of the East Wall Cut Back Stage 2, which allowed access to deeper ore that was identified from the 2014 drilling program. This increase also was attributed to changes in mill processing, metal prices, net smelter return assumptions, and minor ore reserve block modeling changes. Depletion from mining in 2014 was 14.5 Mt (Ok Tedi Mining Ltd., 2015, p. 34–35).

The Frieda River copper-gold project is located 70 km south of the Sepik River on the border of the Provinces of Sanduan and East Sepik. The project was composed of four deposits—the Horse-Ivaal-Trukai (HIT), the Koki, and the Ekwai copper-gold porphyry deposits, and the Nena epithermal high-sulfidation copper-gold deposit. At yearend 2014, the mineral resources at the HIT deposit included measured resources of 780 Mt grading 0.51% copper, 0.28% gold, and 0.79 g/t silver; indicated resources of 410 Mt grading 0.44% copper, 0.2% gold, and 0.72 g/t silver; and inferred resources of 920 Mt grading 0.4% copper, 0.2% gold, and 0.7 g/t silver. The total mineral resources of the four deposits were estimated to contain 13 Mt of copper, 622,070 kg of gold, and 1,524 t of silver, positioning the Frieda River project as the largest undeveloped copper-gold project in Papua New Guinea and 1 of the top 10 undeveloped open pit copper mines in the world. The Frieda River project had 3 times the in-ground copper and gold content of all the copper and gold extracted in the past 25 years from the Ok Tedi copper mine, more than 2.5 times the 5.3 Mt of contained copper at the Panguna deposit in Bougainville, and more than the estimated 9 Mt of copper and 600 t of gold contained in Newcrest-Harmony's proposed underground Wafi Golpu project. The life-of-mine mill feed was estimated to be approximately 600 Mt, with an average processing rate of 30 Mt/yr during a 20-year mine life. The average annual production was expected to be 125,000 t of copper and 6,221 kg of gold in concentrate (Highlands Pacific Ltd., 2015, p. 6–7, 12).

In August 2014, PanAust Ltd. (PanAust) of Australia completed the purchase of an 80% interest in the Frieda River project, which was owned by Glencore plc of Switzerland, for an initial consideration of \$25 million. Highlands Pacific Ltd. held a 20% interest in the project, and the Papua New Guinea Government had the right to acquire up to a 30% interest. If the Government exercised its right to its full extent, Highlands' holding would be reduced to 15% and PanAust's, to 55% (Highlands Pacific Ltd., 2015, p. 7).

Gold.—Newcrest Mining Ltd. (Newcrest) of Australia operated the Lihir gold mine and the Hidden Valley gold mine. The Lihir operation, which is located on the island of Niolam and is 900 km northeast of Port Moresby in the Province of New Ireland, was 100% owned by Newcrest. Production for the year ended June 2014 was 22,434 kg of gold. At yearend 2014, the Lihir mineral resources were estimated to be 790 Mt grading 2.3 g/t gold and containing 1,835 t of gold, and the Lihir mineral reserves were estimated to be 380 Mt grading 2.4 g/t gold and containing 902 t of gold (Newcrest Mining Ltd., 2015, p. 14–15, 25).

The Hidden Valley operation, which is located approximately 90 km southwest of Lae in the Province of Morobe, was owned by Newcrest (50%) and Harmony Gold Mining Co. Ltd. of South Africa (50%). Hidden Valley consisted of three major deposits—the Hamata, the Hidden Valley, and the Kaveroi deposits. Production for the fiscal year that ended on June 30, 2014, was 6,600 kg of gold compared with 5,500 kg for the fiscal year that ended on June 30, 2013. At yearend 2014, the Hidden Valley mineral resources were estimated to be 83,979 kg of gold and 1,524 t of silver, of which the mineral reserves were estimated to be 46,655 kg of gold and 871 t of silver (Morobe Mining Joint Ventures, 2013; Newcrest Mining Ltd., 2015, p. 17).

The Wafi Golpu gold and copper deposits are located in the Province of Morobe approximately 65 km southwest of the port city of Lae. The Wafi Golpu project consisted of the Golpu and the Nambonga copper-gold porphyry deposits, the Wafi epithermal gold deposit, and other substantial exploration targets. At yearend 2014, the Golpu porphyry deposit had estimated mineral resources of 1,000 Mt containing 622 t of gold and 9 Mt of copper. The reserve estimate was 386 t of gold and 5.4 Mt of copper. The mineral resources for the Wafi epithermal deposit were estimated to be 224 t of gold; the mineral resources for the Nambonga porphyry deposit were estimated to be 31 t of gold and 86,000 t of copper. The Wafi Golpu project was owned by the Wafi Golpu Joint Venture, which was jointly owned by Newcrest (50%) and Harmony Gold (50%). The optimized Golpu prefeasibility study proposed a small, low-capital-cost operation for the first stage of development. The capital cost to build Stage 1 was estimated to be \$2.3 billion, with production to begin in 2020 (Morobe Mining Joint Ventures, 2014).

Mineral Fuels

Natural Gas.—The LNG project, which is located in the Hela, Southern Highlands, Western, Gulf, and Central Provinces of Papua New Guinea, was an integrated gas production and processing facility built at a cost of \$19 billion. Natural gas was sourced from the Angore, Hides, and Juha fields as well as associated gas from the currently operating oilfields of Agogo, Gobe, Kutubu, and Moran. The natural gas from the fields was first processed at the Hides gas conditioning plant and then supplied to the LNG plant through a 700-km-long pipeline. The project had a capacity of 6.9 Mt/yr of LNG and an expected operational life of 30 years. Condensate (a low-density mixture of hydrocarbon liquids recovered through the gas liquefaction process) was also stored and offloaded at the

LNG plant. The LNG plant facilities consisted of two LNG process trains, two 160,000 cubic meters LNG storage tanks, and a loading terminal for LNG tankers with a capacity of up to 220,000 cubic meters (ExxonMobil PNG Ltd., 2015a, b, d).

The project was operated by ExxonMobil PNG Ltd. (EMPNG), which was a subsidiary of Exxon Mobil Corp. of the United States. At yearend 2014, EMPNG held 33.2% interest in the project. Other interest holders included Oil Search Ltd. of Australia, 29%; National Petroleum Co. of Papua New Guinea (Papua New Guinea Government), 16.8%; Santos Ltd. of Australia, 13.5%; JX Nippon Oil and Gas Exploration of Japan, 4.7%; and Mineral Resources Development Co. (Papua New Guinea landowners), 2.8% (Oil Search Ltd., 2015, p. 18).

The Papua New Guinea LNG project started LNG production in April and ramped up to full operational capacity 3 months later. The plant delivered its first cargo of LNG in May. In 2014, EMPNG produced about 4 Mt of LNG and delivered 55 tankers filled with LNG to customers in Asia, including the Chinese Petroleum Corp. of Taiwan, Osaka Gas Co. Ltd. of Japan, Tokyo Electric Power Co. Inc. of Japan, and Unipeac Asia Co. (a subsidiary of China Petroleum and Chemical Corp.). These four customers had long-term sales agreements with EMPNG to purchase more than 95% of the project's annual LNG output during the next 20 years (Exxon Mobil Corp., 2015, p. 2, 38; ExxonMobil PNG Ltd., 2015c, p. 1; Oil Search Ltd., 2015, p. 16).

Outlook

According to the Bank of Papua New Guinea, Papua New Guinea's GDP is expected to increase by 15.5% in 2015, driven by a full year of production and the export of LNG and supported by a recovery in the nonmining sectors. Total nonmining GDP is expected to increase by 4.0% in 2015 (compared with 1.4% in 2014) owing to anticipated improvement in the construction sector and increased production of key cash crops (Bank of Papua New Guinea, 2015a, p. 24–25).

Natural gas production is expected to increase owing to the increasing gas exploration and expansion activities aimed at securing a supply of natural gas for processing at the LNG plant. Nickel and cobalt production is expected to increase in the short term as the Ramu Mine ramps up to full production capacity during the next 2 years. Copper and gold production will remain at the same level or decrease slightly owing to the lower grades of ore and unfavorable market conditions. The long-term outlook for the mining sector is positive considering the mineral potential identified at the Wafi Golpu gold and copper deposits and the Frieda River copper and gold deposits.

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TABLE 1
PAPUA NEW GUINEA: PRODUCTION OF MINERAL COMMODITIES¹

Commodity ²		2010	2011	2012	2013	2014
Copper, mine output, Cu content	metric tons	159,821	130,473	125,348	105,524 ^r	75,907
Gas, natural, liquefied	million metric tons	--	--	--	--	4
Gas, natural, marketed	million cubic meters	113	113	100	100	160 ^c
Gold, mine output, Au content	kilograms	58,983	62,200	59,100	54,092 ^r	52,858
Nickel cobalt hydroxide:						
Gross weight	metric tons	--	--	13,777	29,763	57,360
Co content	do.	--	--	469	1,013	2,134
Ni content	do.	--	--	5,283	11,369 ^r	20,987
Petroleum, crude	thousand 42-gallon barrels	11,100	11,000	10,000	10,900 ^r	11,000
Silver, mine output, Ag content	kilograms	74,000	90,700	81,300	82,702 ^r	84,302

^aEstimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. ^rRevised. do. Ditto. -- Zero.

¹Table includes data available through October 9, 2015.

²In addition to the commodities listed, cement, and construction materials (common clays, sand and gravel, and stone) were produced, but available information was inadequate to make reliable estimates of output.

TABLE 2
PAPUA NEW GUINEA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities ¹	Annual capacity ^c
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%; PNG Government and landowners, 6.44%	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., 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 (Niugini) Ltd., 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%	Sinivit open pit, East New Britain Province, about 50 km south southwest of Rabaul	1
Do.		Petromin PNG Holdings (Government, 100%)	Tolukuma Hill open pit, 100 km north of Port Moresby	2
Liquefied natural gas	million metric tons	ExxonMobil PNG Ltd. (Operator), 33.2%; Oil Search Ltd., 29%; National Petroleum Co. of Papua New Guinea (PNG Government); 16.8%; Santos Ltd., 13.5%; JX Nippon Oil and Gas Exploration, 4.7%; Mineral Resources Development Co. (landowners), 2.8%	Southern Highlands, Hela, Western, Gulf, and Central Provinces	7
Natural gas	million cubic meters	Oil Search Ltd., 100%	Hides GTE, Southern Highlands Province, 80 km northwest of Kutubu	160
Nickel	thousand metric tons	MCC Ramu NiCo, Ltd., 85%; Highlands Pacific Ltd., 8.56%; PNG Government and landowners, 6.44%	Open pit mine facility, Basamuk beneficiation plant, Madang Province	32
Petroleum, crude	million 42-gallon barrels	Oil Search Ltd. (operator and manager for license 2), 49.51%; Exxon Mobil Corp. (operator and manager for license 5), 26.82%; Eda Oil Ltd., 11.28%; Merlin Petroleum Co., 8.31%; Petroleum Resources Kutubu Ltd., 2.97%; Petroleum Resources Moran Ltd., 1.10%; Petroleum Resources North West Moran Ltd., 0.02%	Central Moran oilfield, Southern Highlands Province (includes Agogo and Iaqui-Hedinia fields). Onshore Papuan Basin, petroleum development licenses 2 and 5	2
Do.	thousand 42-gallon barrels	Merlin Petroleum Co., 73.48%; Exxon Mobil Corp., 14.52%; Oil Search Ltd. (operator), 10%; Petroleum Resources (Gobe) Ltd., 2.0%	Gobe Main oilfield, Southern Highlands Province. Onshore Papuan Basin, petroleum development license 4	50
Do.	million 42-gallon barrels	Oil Search Ltd., 60.05% (operator and manager); Merlin Petroleum Co., 18.69%; Exxon Mobil Corp., 14.52%; Petroleum Resources (Kutubu) Ltd., 6.75%	Kutubu oilfield, Southern Highlands Province. Onshore Papuan Basin, petroleum development license 2	4
Do.	thousand 42-gallon barrels	Oil Search Ltd., 36.36%; Southern Highlands Petroleum Ltd., 40.15%; Santos (operator), 15.92%; Cue PNG Oil Co Ltd., 5.57%; Petroleum Resources (Gobe) Ltd., 2.0%	South East Gobe oilfield, Gulf and Southern Highlands Provinces. Onshore Papuan Basin	200
Silver		Porgera Joint Venture [Barrick (Niugini) Ltd., 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 Tabubil and 390 km southwest of Wewak	30

^cEstimated. Do., do. Ditto.

¹Abbreviations used for units of measure in this table include the following: km, kilometer.