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The Mineral Industry of Botswana

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In 2016, Botswana was the world's second-ranked producer of mined diamond by value and volume, accounting for 24% and 15% of global mined diamond production by value and volume, respectively. The country also accounted for 2% of the world's polished diamond production by value. Botswana's share of the world's soda ash production by volume was nearly 2%. In 2016, Botswana was not a globally significant consumer of minerals or mineral fuels (Even-Zohar, 2017; Bolen, 2018; Olson, 2018a, b).

Minerals in the National Economy

In 2016, the mining and quarrying sector accounted for 19.9% of Botswana's gross domestic product, and the manufacturing sector, 5.2%. The value of output in the mining and quarrying sector decreased by 3.7% in 2016 after decreasing by a revised 19.6% in 2015. Formal employment in the mining and quarrying sector was reported to be 23,661 workers in 2015 (the latest year for which data were available) compared with 23,783 in 2014; employment probably decreased in 2016 as copper and nickel mining operations were placed on care-and-maintenance status (Bank of Botswana, 2017, S.8, S.10–S.11; Kenalemang Charles, Senior Government Mining Engineer, Botswana Department of Mines, written commun., July 25, 2016).

In 2016, Botswana's exports were valued at $6.41 billion, of which diamond accounted for 86.2%; copper and nickel, 3.7%; and soda ash, 2.3%. Botswana's imports were valued at $6.15 billion in 2016, of which diamond (mostly rough diamond) accounted for 28.3%; fuels, 12.9%; metal and metal products, 4%; and salt, ores, and related products, 2.2% (Bank of Botswana, 2017, p. S.78–S.79, S.82–S.84, S.86).

Botswana's mining and quarrying sector is governed by the Mines and Minerals Act of 1999. The petroleum sector is governed by the Petroleum (Exploration and Production) Act of 1981. Botswana is a signatory to the Kimberley Process Certification Scheme, which is a certification system established to reduce the trade in conflict diamond. The cutting and polishing of diamond was regulated by the Diamond Cutting Act of 1979. The Government stopped issuing licenses for river sand mining in late 2015 because of safety issues and the increased flooding caused by river-bed degradation as a result of instream mining (Moses Tshetlhane, Chief Minerals Officer, Ministry of Mineral Resources, Green Technology, and Energy Security, oral commun., February 15, 2017).

Production

In 2016, Botswana's mined copper production increased by 36%; soda ash, by 15%; and gold, by 10%. Palladium and platinum production decreased by an estimated 92% each in 2016; cobalt, by 22%; smelter copper, by 18%; gemstones, by an estimated 17%; and mined and smelted nickel, by 15% each. Silver production was shut down in 2015. Cobalt, nickel, palladium, and platinum production decreased because of mine closures. Data on mineral production are in table 1 (Bank of Botswana, 2017, p. S.20–S.21).

Structure of the Mineral Industry

The Government maintained an equity position in the country's sole soda ash mine and a majority of the diamond mines; however, the mineral industry operated mainly on a free-market basis. Government-owned Bamangwato Concessions Ltd. (BCL) produced cobalt, copper, nickel, and platinum-group metals (PGMs). Cement, cobalt, copper, diamond, gold, nickel, PGMs, salt, and soda ash were produced by large-scale mines and plants. The mineral industry also consisted of many small-scale mines and artisanal operations that produced agate, aggregates, bricks, and dimension stone. Capacity, location, ownership, and production information were not readily available for these operations. Table 2 is a list of major mineral industry facilities.

Commodity Review

Metals

Cobalt, Copper, Nickel, Platinum-Group Metals, and Silver.—BCL mined copper and nickel at its Phoenix and Selebi-Phikwe Mines; the company smelted copper and nickel from its mining operations at Selebi-Phikwe. Smelted copper production decreased to 11,348 metric tons (t) in 2016 from 13,888 t in 2015, and smelted nickel production decreased to 14,273 t from 16,789 t. Cobalt production decreased to 248 t in 2016 from 316 t in 2015. PGMs also were produced at the Phoenix Mine. Palladium production decreased to an estimated 100 kilograms (kg) in 2016 from 1,200 kg in 2015, and platinum, to 20 kg from 250 kg (table 1).

In October 2016, the Government announced plans to liquidate BCL because of high costs and decreased copper prices on world markets. The remaining resources at Selebi-Phikwe were low-grade and at a depth of at least 2 kilometers. The Phoenix Mine was shut down in early 2016. MMC Norilsk Nickel of Russia was engaged in a legal dispute with the Government at yearend regarding BCL's reported failure to pay for its purchase of Norilsk's 85% share in the Phoenix Mine in October 2014 (Dludla, 2016; Cornish, 2017b; Chansonette Yun, Economic and Commercial Officer, U.S. Embassy Gaborone, oral commun., February 15, 2017).

In 2016, Alecto Minerals plc of the United Kingdom announced plans to purchase a 60% share in the Mowana Mine from African Copper plc of the United Kingdom. Alecto planned to reopen the mine and build a new processing plant that would increase production to about 22,000 metric tons per year (t/yr) of copper in concentrate; production levels were less than 10,000 t/yr when the mine was operated by African Copper. Resources at Mowana were estimated to be more than

1.6 million metric tons (Mt) of contained copper. Mining could restart by late 2017 (Cornish, 2017a; Modern Mining, 2017a).

In 2015, Cupric Canyon Capital LP (CCC) of the United States estimated that resources at Zone 5 of the Khoemacau copper-silver project (which was adjacent to the Boseto copper-silver mine) were more than 100 Mt at a grade of 1.95% copper and 20 grams per metric ton (g/t) silver. As of early 2016, CCC announced that it planned to start a new mine at Zone 5 by mid-2018. Initial planned production was 50,000 t/yr of copper and 43,500 kilograms per year (kg/yr) of silver in concentrate. The company planned to start an expansion to 80,000 t/yr of copper in late 2018 after mine startup. The opening of the mine subsequently was delayed until 2019 (James, 2016; Modern Mining, 2016; Piper, 2016a).

CCC planned to use the concentrator at the Boseto Mine to process ore from Khoemacau; capacity at the concentrator would be increased to 3.65 million metric tons per year (Mt/yr) from 3 Mt/yr. Discovery Metals Ltd. of Australia operated the Boseto Mine until the mine was placed on care-and-maintenance status in early 2015. Production shut down because of a high strip ratio and decreased copper prices on world markets (James, 2016; Modern Mining, 2016).

In late September 2016, MOD Resources Ltd. of Australia completed a scoping study on a new mine at the T3 copper-silver deposit. MOD could produce about 21,800 t/yr of copper and 20,700 kg/yr of silver during an estimated 10-year mine life at T3. The company planned to complete a prefeasibility study in early 2017 and a feasibility study in the first quarter of 2018. Depending on the results of the studies, MOD could start mining in 2019. Resources at T3 were estimated to be 28.4 Mt at grades of 1.24% copper and 15.7 g/t silver (Barradas, 2017; Modern Mining, 2017b).

Lead and Zinc.—In 2016, Mount Burgess Mining NL of Australia planned a drilling program at its Kihabe and Nxuu lead-silver-zinc deposits. The company hoped to increase identified resources at Kihabe and Nxuu, which were located in Ngamiland West near the border with Namibia. Nxuu was an oxide ore deposit and Kihabe was a deposit with about 50% each of oxide and sulfide ore (Piper, 2016c).

Industrial Minerals

Cement and Stone, Crushed.—Matsiloje Portland Cement Co. produced small amounts of cement from imported clinker. National cement consumption was between 620,000 and 650,000 t/yr, most of which was imported from South Africa. Most of the remainder was imported from Namibia and Zimbabwe. Portland Pretoria Cement Ltd. of South Africa operated a cement blending plant that used cement imported from South Africa and quarries near Francistown and Gaborone (Tuelo Botlhole, Sales and Distribution Manager, PPC Botswana (Pty) Ltd., oral commun., February 15, 2017).

Diamond.—The distribution arm of the De Beers Group of Companies of Luxembourg operated a sorting center in Gaborone from where it shipped its products worldwide. Government-owned Okavango Diamond Trading Co. was responsible for marketing the Government's portion of Debswana Diamond Co. (Pty) Ltd.'s production. Under the Government's agreement with De Beers, Okavango had the right to market between 10% and 15% of Debswana's production.

The value of Botswana's rough diamond production was estimated to be $3.11 billion in 2016, the majority of which was exported before any cutting and polishing. In 2016, total rough diamond exports were valued at $5.12 billion, of which $4.02 billion was reported to be from domestic production (domestic exports may include some reexports from other countries). In 2015, total rough diamond exports were valued at a revised $4.81 billion, of which $2.61 billion was reported to be from domestic production. Imports of rough diamond from countries that included Canada, Namibia, and South Africa were valued at $1.69 billion in 2016 compared with a revised $2.41 billion in 2015, the majority of which was exported before any cutting and polishing (Bank of Botswana, 2017, p. S.82–S.83; Even-Zohar, 2017).

Debswana produced nearly 20.5 million carats at the Damtshaa, the Jwaneng, the Letlhakane, and the Orapa Mines in 2016, which was nearly unchanged from 2015. In 2016, production at Orapa decreased to 7.93 million carats from 9.88 million carats in 2015. Production at Jwaneng increased to 12 million carats in 2016 from 9.76 million carats in 2015, and at Letlhakane, to 595,000 carats from 506,000 carats. The Damtshaa Mine, which produced 221,000 carats in 2015, was on care-and-maintenance status in 2016. Decreased production at Orapa was mostly attributable to reduced volumes of ore processed. Damtshaa could reopen in late 2017 or early 2018 (Anglo American plc, 2017, p. 191; Debswana Diamond Co. (Pty) Ltd., 2017; Moses Tshetlhane, Chief Minerals Officer, Ministry of Mineral Resources, Green Technology, and Energy Security, oral commun., February 15, 2017).

In the first quarter of 2015, Debswana started construction of the Letlhakane Mine Tailings Resource Treatment project. The project was expected to have a capacity of as much as 800,000 carats per year and to extend the life of the Letlhakane Mine by at least 20 years. Debswana planned to complete the project by the end of the third quarter of 2017 (Debswana Diamond Co. (Pty) Ltd., 2017).

Lucara Diamond Corp. of Canada operated the Karowe Mine, which produced diamond from the AK6 kimberlite. In 2016, Lucara mined about 354,000 carats at Karowe compared with about 366,000 carats in 2015. The company planned to produce between 290,000 and 310,000 carats at Karowe in 2017. Lucara planned to start a prefeasibility study on an underground mine that could extend the life of Karowe by as much as 10 years. The company also engaged in bulk sampling at the BK02 kimberlite and drilling at the AK11 kimberlite in 2016. Drilling was planned at the AK13 and AK14 kimberlites in the first quarter of 2017 (Piper, 2017; Lucara Diamond Corp., undated).

Gem Diamonds Ltd. of the British Virgin Islands started production at the new underground Ghaghoo Mine in 2014; the company produced 40,976 carats in 2016 compared with 91,499 carats in 2015. In 2016, production decreased because of lower ore grades and decreased prices for smaller diamonds on world markets (Gem Diamonds Ltd., 2017).

In September 2013, Kimberley Diamonds Ltd. of Australia purchased the Lerala Mine, which was on care-and-maintenance status, from Mantle Diamonds Ltd. of the United Kingdom.

Kimberley reopened Lerala in early 2016 for a 4-month period before shutting down again. The company planned to restart operations in the near future (Moses Tshetlhane, Chief Minerals Officer, Ministry of Mineral Resources, Green Technology, and Energy Security, oral commun., February 15, 2017).

National net exports of polished diamond were valued at $365 million in 2016 compared with $355 million in 2015. As of yearend, Botswana had 20 companies that cut and polished diamond. In 2016, the Overseas Private Investment Corp. of the United States agreed to guarantee a loan of $125 million from Barclays Bank of Botswana to capitalize local diamond cutting and polishing companies (African Mining, 2017; Bank of Botswana, 2017, p. S.82–S.83).

Potash, Salt, and Soda Ash.—Botswana Ash (Pty.) Ltd. (BotAsh) had a capacity of 650,000 t/yr of salt and 300,000 t/yr of soda ash at Sua Pan. The company's soda ash production increased to 280,457 t in 2016 from 243,369 t in 2015, and salt production decreased to 399,837 t from 404,295 t. BotAsh was engaged in expanding its salt production and was considering the possibility of producing potash at Sua Pan (Bank of Botswana, 2017, p. S.21; Chansonette Yun, Economic and Commercial Officer, U.S. Embassy Gaborone, oral commun., February 15, 2017).

Mineral Fuels and Related Materials

Coal.—In 2016, production at the Morupule Mine decreased to 1.87 Mt of coal from 2.07 Mt in 2015. Coal from the Morupule Mine was used at the Morupule B power station. Decreased production may be attributable to the closure of BCL, which was a substantial consumer of power until October. Morupule B supplied between 450 and 500 megawatts (MW) of capacity; diesel power stations, about 160 MW; and imports, about 50 MW. Expansion of the Morupule Mine was expected to be completed by 2019 to supply Morupule B after the power station's expansion was completed (Bank of Botswana, 2017, p. S.21; Moses Tshetlhane, Chief Minerals Officer, Ministry of Mineral Resources, Green Technology, and Energy Security, oral commun., February 15, 2017).

African Energy Resources Ltd. of the United Kingdom and First Quantum Minerals of Canada were engaged in the development of a new mine and coal-fired power station at the Sese project, which had estimated resources of 2.5 billion metric tons. The initial planned capacity of the mine was 1.5 Mt/yr of thermal coal, and the power station, 300 MW. The companies planned to start operations at the power station no later than in 2019. In 2016, the company was planning to update its mining study to include a power station with an increased capacity of 450 MW (Cornish, 2014; van Wyngaardt, 2016).

In March 2014, African Energy completed a prefeasibility study on a new mine at the Mmamabula West project. The company planned to complete a feasibility study by the end of 2016. Depending on the results of the study, the new mine at Mmamabula West could produce 3 Mt/yr of thermal coal during an estimated 20-year life. In 2016, African Energy was modifying its environmental impact assessment of Mmamabula West to include power stations with a total capacity of 600 MW. As of yearend, the feasibility study had not been completed (Dickinson, 2015; Piper, 2016b).

African Energy signed a joint development agreement for the power station at Mmamabula West in March 2016. The company was considering the export of power to South Africa. The Government of South Africa planned to source as much as 3,500 MW from neighboring countries (Piper, 2016b).

In 2016, the Government approved Shumba Energy Ltd.'s environmental and social impact assessment for the proposed Mabesekwa Mine and power station in northeastern Botswana. The power station was expected to have four units with a capacity of 150 MW each. Shumba planned to obtain financing for the project by the end of 2017 and to start supplying power by the second half of 2020 (Kotze, 2016).

Uranium.—In September 2016, the Government granted A-Cap Resources Ltd. of Australia a mining license at its Letlhakane uranium project. The company planned to complete its prefeasibility study on a new mine in 2017. Depending on the results of prefeasibility and feasibility studies, A-Cap could start construction at Letlhakane in 2018 and mining in 2020. Planned production was nearly 1,400 t/yr of uranium oxide (U_3O_8); the estimated life of the mine was 18 years. Resources were estimated to be 822 Mt at a grade of 0.02% U_3O_8 (A-Cap Resources Ltd., 2016).

Outlook

Mined diamond production is expected to increase because of the reopening of the Damtshaa Mine and the startup of the Letlhakane Mine Tailings Resource Treatment project. The diamond cutting and polishing industry is likely to be constrained by high production costs. Copper mining is expected to restart in 2017 and silver mining, in 2019. Uranium mining was planned to start in 2020.

Coal production could decrease in 2017 because of the closure of BCL and increase subsequently starting in 2019 because of the expansion of the Morupule Mine. Plans to build new coal mines and power stations to export power could be constrained by power surpluses in South Africa; the power deficits that afflicted that country in recent years were eliminated. In 2016, South Africa had a power surplus because of weak demand, the startup of the first module of the coal-fired Medupi power station, and Government-owned utility Eskom's repairs to other power stations that restored them to their rated capacity (Geoffrey Schadrack, Economics Officer, U.S. Embassy Pretoria, oral commun., February 9, 2017). Further challenges to the development of coal projects included the Government's pledge to reduce greenhouse gas emissions.

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TABLE 1
BOTSWANA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons, gross weight, unless otherwise specified)

Commodity[2]		2012	2013	2014	2015	2016
METALS						
Cobalt, mine production, matte, Co content[3]		195	248	196	316	248
Copper:						
Mine, Cu content		35,768	51,254	38,000	9,126	12,415
Smelter, primary[3]		17,625	21,300	14,628	13,888	11,348
Gold, mine, Au content	kilograms	1,522	1,205	958	756	833
Nickel:						
Mine, Ni content[e]		17,900 [r]	22,800 [r]	15,000 [r]	16,800 [r]	14,300
Smelter, matte[3]		17,948	22,848	14,958	16,789	14,273
Platinum-group metals, mine, elemental content:						
Palladium	kilograms	2,613	1,742 [r]	1,120	1,200 [e]	100 [e]
Platinum	do.	435	280	190	250 [r, e]	20 [e]
Silver, mine production, Ag content[4]	do.	8,670	22,597	22,328	2,801	--
INDUSTRIAL MINERALS						
Cement, hydraulic[e, 5]		15,000 [r]	15,000 [r]	15,000 [r]	15,000 [r]	15,000
Clay and shale, brick[e, 5]		170,000	170,000	170,000	170,000	170,000
Diamond, gem and industrial[6]	thousand carats	20,592 [r]	23,148 [r]	24,677	20,824	20,954
Gemstones, semi-precious stones[e, 7]	kilograms	85,000	90,000	90,000	77,000 [r]	64,000
Salt[8]		389,481	521,306	515,311	404,295	399,837
Soda ash, natural		248,629	227,913	268,529	243,369	280,457
MINERAL FUELS AND RELATED MATERIALS						
Coal, bituminous		1,454,724	1,495,653	1,711,555	2,065,778 [r]	1,873,547

[e]Estimated. [r]Revised. do. Ditto. -- Zero.

[1]Includes data available through January 19, 2018. All data are reported unless otherwise noted. Estimated data are rounded to no more than three significant digits.

[2]In addition to the commodities listed, dimension stone and sand and gravel may have been produced in Botswana, but available information was inadequate to make reliable estimates of output.

[3]Reported content of pelletized nickel-copper matte.

[4]Silver also was produced in gold bullion and nickel-copper-cobalt matte, but available information was inadequate to make reliable estimates of output.

[5]Based on production capacity.

[6]Assumed to contain about 70% gem and near gem quality.

[7]Mostly agate.

[8]From natural soda ash production.

TABLE 2
BOTSWANA: STRUCTURE OF THE MINERAL INDUSTRY IN 2016

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Cement		Matsiloje Portland Cement Co.	Plant at Matsiloje, 45 kilometers southeast of Francistown	36,000.
Clay[1]		Makoro Brick and Tile (Pty.) Ltd.	Makoro, 10 kilometers south of Palapye	100,000.[e]
Do.		Lobatse Clay Works (Pty.) Ltd. (Botswana Development Corp. and Interkiln Corp. joint venture)	Lobatse, 70 kilometers south-southwest of Gaborone	70,000.[e]
Coal		Morupule Colliery (Pty.) Ltd. [Debswana Diamond Co. (Pty.) Ltd., 100%]	Morupule Mine, 14 kilometers west of Palapye	3,200,000.
Diamond	thousand carats	Debswana Diamond Co. (Pty.) Ltd. (Government, 50%, and De Beers Centenary AG, 50%)	Jwaneng Mine near Jwaneng	30,000.
Do.	do.	do.	Orapa Mine near Orapa	20,000.
Do.	do.	do.	Letlhakane Mine near Letlhakane	1,000.
Do.	do.	do.	Damtshaa Mine, 220 kilometers west of Francistown[2]	670.
Do.	do.	Lucara Diamond Corp.	Karowe Mine in Boteti Sub-District	460.[e]
Do.	do.	Kimberley Diamonds Ltd.	Lerala Mine near Lerala[2]	400.
Do.	do.	Gem Diamonds Ltd.	Ghaghoo Mine	210.
Gemstones, semiprecious	kilograms	Agate Botswana (Pty.) Ltd.	Processing plant at Pilane, 45 kilometers north of Gaborone	70,000.[e]
Do.	do.	Masa Semi-Precious Stones (Pty.) Ltd.	Bobonong, east of Selebi-Phikwe	20,000.[e]
Gold	do.	Galane Gold Ltd.	Mupane Mine, 30 kilometers southeast of Francistown	2,000.
Nickel-copper-cobalt		BCL Ltd. (Government, 100%)	Selebi-Phikwe Mines, 350 kilometers northeast of Gaborone[2]	Matte content: 30,000 nickel: 25,000 copper: 400 cobalt.
Do.		Tati Nickel Mining Co. (Pty.) Ltd. (BCL Ltd., 100%)	Phoenix and Selkirk Mines, 23 kilometers east of Francistown[2]	Matte content: 21,000 nickel; 12,500 copper; 800 cobalt; 4,400 kilograms palladium; 700 kilograms palladium.
Do.		Cupric Canyon Capital LP (CCC)	Boseto Mine[2]	36,000 copper.
Do.		African Copper plc (Zambia Copper Investments Ltd., 84%)	Thakudu Mine[2]	10,000[e] copper.
Salt		Botswana Ash (Pty.) Ltd. (BotAsh) (Government, 50%, and Chlor Alkali Holdings, 50%)	Sua Pan, 450 kilometers north of Gaborone	650,000.
Silver	kilograms	Cupric Canyon Capital LP (CCC)	Boseto Mine[2]	34,000.
Soda ash		Botswana Ash (Pty.) Ltd. (BotAsh)	Sua Pan	300,000.
Stone, crushed		Portland Pretoria Cement Ltd. (PPC)		NA.

[e]Estimated. Do., do. Ditto. NA Not available.
[1]For brick and tiles.
[2]Not operating at the end of 2016.