



2013 Minerals Yearbook

BOTSWANA

THE MINERAL INDUSTRY OF BOTSWANA

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In 2013, Botswana was the world's leading producer of diamond by value, accounting for 26% of the value of global mined diamond production. Botswana's share of the world's mined diamond production by volume was 18%, and soda ash production, 2%. The country also produced coal, cobalt, copper, gold, nickel, platinum-group metals (PGMs), salt, sand and gravel, semiprecious gemstones, and silver. Botswana was not a globally significant consumer of minerals or mineral fuels in 2013 (Dolley, 2014; Janse, 2014).

Minerals in the National Economy

In 2013, the mining and quarrying sector accounted for 22.4% of the gross domestic product and the manufacturing sector, 5.2%. Formal employment in the mining and quarrying sector was reported to be about 11,840 workers in 2012 (the latest year for which data were available) (Bank of Botswana, 2014, p. S.8, S.26–S.27).

In 2013, national exports were valued at \$7.69 billion, of which diamond accounted for about 82%; copper and nickel, 7.1%; and soda ash, 1.1%. National imports were valued at \$7.61 billion in 2013, of which diamond (mostly rough diamond) accounted for about 28%; fuels, 17.2%; metal and metal products, 4.7%; and salt, ores, and related products, 1.9% (Bank of Botswana, 2014, p. S.81–S.84, S.86).

Production

In 2013, Botswana's silver production increased by 161%; mined copper, by 43%; salt, by 34%; cobalt and mined nickel, by 27% each; smelted copper, by 21%; and diamond, by 13%. Platinum production decreased by 50%; palladium, by 49%; and gold, by 21% (table 1).

Structure of the Mineral Industry

The Government maintained an equity position in most of the major mining companies; however, the mineral industry operated mainly on a free-market basis. Cement, cobalt, copper, diamond, gold, nickel, PGMs, salt, silver, and soda ash were produced by large-scale mines. The mineral industry also consisted of a number of small-scale mines and artisanal operations that produced agate, aggregates, bricks, dimension stone, and gold. Capacity, location, ownership, and production information were not readily available for these operations. Major commodities and the companies that produced those commodities are listed in table 2.

Commodity Review

Metals

Copper and Silver.—Bamangwato Concessions Ltd. (BCL) mined copper at its Selebi-Phikwe copper and nickel mines; the company smelted copper from its mining operations and the Phoenix Mine. In 2013, smelted copper production increased to 21,300 metric tons (t) from 17,625 t in 2012. BCL signed an agreement with Botswana Metals Ltd. (BML) of Australia to explore for copper at the Airstrip and the Dieate projects (table 1; Paull, 2013).

Tati Nickel Mining Co. (Pty) Ltd. (TNMC) operated the Phoenix Mine. In 2013, TNMC's copper production at the Phoenix Mine decreased to 5,412 t from 10,292 t in 2012 because of lower ore grades (Murray, 2014).

In 2013, Discovery Metals Ltd. produced 18,274 t of copper in concentrate at the Boseto project compared with about 5,750 t in 2012 as the company had its first full year of mining. Silver output increased to 22,590 kilograms (kg) from 8,670 kg in 2012 (Discovery Metals Ltd., 2013a, p. 1; 2013b; 2014).

The Boseto Mine was expected to have an initial design capacity of about 36,000 metric tons per year (t/yr) of copper and 34,000 kilograms per year (kg/yr) of silver in concentrate. In the fourth quarter of 2013, Discovery Metals started to review the feasibility study on the Zeta underground mine, which could increase capacity at Boseto to 50,000 t/yr (Lanham, 2012; Discovery Metals Ltd., 2014).

African Copper plc of the United Kingdom (Zambia Copper Investments Ltd. of Bermuda, 84%) operated the Thakudu open pit mine and the Mowana processing plant. The company produced 9,496 t of copper in concentrate in fiscal year 2013 compared with 6,910 t in fiscal year 2012 (African Copper plc, 2013).

In mid-2012, Hana Mining Ltd. of Canada completed a preliminary economic assessment of a new mine at the Ghanzi copper and silver project. The study yielded favorable results for a mine that would produce 30,100 t/yr of copper and 27,300 kg/yr of silver during an estimated life of at least 13 years. In March 2013, Cupric Canyon Capital LP (CCC) of the United States purchased Hana. CCC planned to complete a feasibility study on Ghanzi in 2014 (Murray, 2013).

Gold.—In 2013, Galane Gold Ltd. of Australia produced 1,206 kg of gold at the Mupane Mine compared with 1,522 kg in 2012. Mining was likely to cease at Mupane in 2014. Galane planned to mine 1 million metric tons (Mt) of ore at a grade of 1.71 grams per metric ton (g/t) from the nearby Golden Eagle deposit by the end of 2015 and 1 Mt at a grade of 2.6 g/t by 2018 from the new underground Tau Mine. The company also planned to produce gold by re-treating tailings (Murray, 2014).

Nickel and Platinum-Group Metals.—BCL mined nickel at its Selebi-Phikwe copper and nickel mines. The company

smelted nickel from its mining operations and the Phoenix Mine. In 2013, smelted nickel production decreased to 21,900 t from 24,000 t in 2012. BCL signed an agreement with BML to explore for nickel and copper at the Maibele North project (table 1; Paull, 2013).

In 2013, TNMC's nickel production at the Phoenix Mine decreased to 6,416 t from 12,215 t in 2012 because of lower ore grades. Palladium production also decreased to 1,337 kg in 2013 from 2,613 kg in 2012, and platinum production, to 218 kg from 435 kg (MMC Norilsk Nickel, 2014; Murray, 2014).

Industrial Minerals

Diamond.—In 2012, the distribution arm of De Beers Group moved its operations to a new sorting center in Gaborone from where it shipped its products worldwide. The Government of Botswana established a new diamond trading company named the Okavango Diamond Trading Co., which was wholly owned by the Government. Okavango was to be 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 12% of Debswana's production in 2013; its share would increase to 15% by 2016 (African Mining, 2013b).

Botswana's diamond trade increased as it became established as De Beers' new sorting center. The value of Botswana's rough diamond production was estimated to be \$3.75 billion in 2013, most of which was exported before any cutting and polishing. In 2013, rough diamond exports totaled \$5.52 billion, of which \$3.39 billion was reported to be from domestic production (domestic exports may include some reexports from other countries). In 2012, rough diamond exports totaled \$4.02 billion, of which \$3.06 billion was reported to be from domestic production. Imports of rough diamond from such countries as Canada, Namibia, and South Africa were valued at \$2.04 billion in 2013 compared with \$2.09 billion in 2012; most of the rough diamond imports were exported before any cutting and polishing was done (Bank of Botswana, 2014, p. S.82–S.83; Janse, 2014).

Debswana produced more than 22.7 million carats at the Damtshaa, the Jwaneng, the Letlhakane, and the Orapa Mines in 2013 compared with 20.2 million carats in 2012. In 2013, production at Orapa increased to 11.4 million carats from 11.1 million carats in 2012; at Jwaneng, to 10.4 million carats from 8.17 million carats; and at Damtshaa, to 260,000 carats from about 200,000 carats. Output at Letlhakane decreased to 682,000 carats in 2013 from about 760,000 carats in 2012. Increased production at Jwaneng was attributable to recovery from the collapse of a pit wall in mid-2012 (Janse, 2013; Murray, 2014).

Debswana's production for 2014 was expected to be more than 24 million carats, which included 12.8 million carats at Orapa. The Jwaneng Cut-8 project was likely to extend the life of the Jwaneng Mine to at least 2028 and allow an additional 95 million carats of diamond to be mined (Murray, 2013, 2014).

Lucara Diamond Corp. of Canada operated the Karowe Mine, which produced diamond from the AK6 kimberlite project. Lucara mined about 441,000 carats at Karowe in 2013 compared with 303,100 carats in 2012 and 14,800 carats in

2011. Production was expected to be about 460,000 carats in 2014 (Janse, 2013, 2014; Ziminsky, 2014).

Mantle Diamonds Ltd. of the United Kingdom held the Lerala Mine, which was on care-and-maintenance status in 2013. Between February and July 2012, the company mined more than 73,000 carats of diamond at Lerala. In September 2013, Kimberley Diamonds Ltd. of Australia purchased Mantle. Kimberley planned to reopen Lerala in 2014 and to produce more than 400,000 carats per year during the estimated 7-year life of the mine. Reserves were estimated to be 20.6 Mt of ore that contained nearly 5.6 million carats (Kimberley Diamonds Ltd., 2013).

Gem Diamonds Ltd. of the United Kingdom started construction on the new Ghaghoo Mine in 2011; the company planned to start mining in 2013. The planned opening of the mine was delayed until August 2014 by heavy rains. Gem Diamonds planned to produce about 200,000 carats per year at Ghaghoo in the first phase of mining. Indicated resources at Ghaghoo were estimated to be about 15.5 million carats of contained diamond (Janse, 2013; Moodley, 2013; Murray, 2013).

Pangolin Diamonds Corp. of Canada explored for diamond at Tsabong North in southwestern Botswana in 2013. Botswana Diamonds plc of the United Kingdom explored for diamond near Gope. Firestone Diamonds plc's BK11 Mine remained on care-and-maintenance status in 2013 (Murray, 2013).

In 2013, Botswana had 25 diamond cutting and polishing companies that employed nearly 3,000 workers. National net exports of polished diamond were valued at \$700 million in 2013 compared with \$655 million in 2012. The growth of Botswana's diamond cutting and polishing industry was limited by high production costs, which were about \$60 per carat compared with between \$15 and \$20 per carat in India and \$25 per carat in China (Shor, 2013; Bank of Botswana, 2014, p. S.82–S.83).

Potash, Salt, and Soda Ash.—Botswana Ash (Pty.) Ltd. (BotAsh) had the capacity to produce 650,000 t/yr of salt and 300,000 t/yr of soda ash at Sua Pan. The company's soda ash production decreased to 227,913 t in 2013 from a revised 248,629 t in 2012. In December, BotAsh signed an agreement with Great Quest Metals Ltd. of Canada to evaluate the recovery of potash from the brines, BotAsh's mine effluent, and historical mine tailings (Great Quest Metals Ltd., 2013).

Mineral Fuels and Related Materials

Coal.—In 2013, production at the Morupule Mine increased to nearly 1.5 Mt of coal from 1.45 Mt in 2012 and 0.79 Mt in 2011. In 2012, Morupule Colliery (Pty) Ltd. completed an expansion of the mine's capacity to 3.2 million metric tons per year (Mt/yr) from 1 Mt/yr. The company's production was limited by fluctuating demand from Botswana Power Corp. Coal from Morupule was planned to be used in the new Morupule B power station. Morupule B, which had a planned capacity of 528 megawatts (MW), was expected to open in 2014 (Murray, 2013, 2014).

African Energy Resources Ltd. of Australia was engaged in an environmental impact assessment of a new mine at the Sese project, which had resources of 2.5 billion metric tons (Gt) of coal. The company completed feasibility studies with favorable

results on a new mine, a new 300-MW-capacity coal-fired power station, and railways for coal exports. African Energy planned to produce about 2 Mt/yr of coal for export and between 1.5 and 2 Mt/yr for consumption in the domestic power station. Mining could start at Sese in 2016 (Murray, 2013; Williams, 2013).

In 2013, African Energy acquired the Mmamantswe coal project, which had resources of 1.3 Gt, from Aviva Corp. Ltd. of Australia. The company planned to produce 2.5 Mt/yr of lower quality coal at Mmamantswe for consumption in a new domestic power station and 2.5 Mt/yr of higher quality coal for export. African Energy planned to start construction on the power station, which would have a capacity of between 300 and 400 MW, by the end of 2014 (Williams, 2013).

Hodges Resources Ltd. of Canada completed a scoping study with favorable results on a new mine at the Morupule South project. In the first phase, production would be between 2 and 3 Mt/yr, all of which would be consumed in domestic and regional power stations. After 5 years, the mine would produce 5 Mt/yr in the second phase, of which 2 Mt/yr would be exported. Hodges planned to complete a feasibility study by early 2014. Resources at Morupule South were estimated to be 2.45 Gt (International Resource Journal, The, 2013; Murray, 2013).

Jindal BVI Ltd. of India was considering the development of a new mine at the Mmamabula project. The mine would produce 4.5 Mt/yr of coal that would be consumed in a new power station. The company could start production in 2016. Resources at Mmamabula were estimated to be 2.4 Gt (Murray, 2013; KPMG Global Mining Institute, 2014, p. 26).

Walkabout Resources Ltd. of Australia held the Takatokwane project, which had indicated resources of 748 Mt and inferred resources of 6.9 Gt. The company was considering the development of a new mine at Takatokwane that could produce as much as 5 Mt/yr. Higher quality coal would be exported and lower quality coal would be used in a domestic coal-to-liquids plant. Walkabout signed an agreement with Coalswana (Pty) Ltd., in which Coalswana would fund feasibility studies on the Takatokwane project in return for offtake rights on the mine's production (Murray, 2013; Australia's Paydirt, 2014).

A-Cap Resources Ltd. of Australia was engaged in a scoping study on a new mine at its Mea project, which had resources of 335 Mt. The company planned to complete the study in the first quarter of 2014. In May, A-Cap estimated that coal resources associated with the uranium deposits at Letlhakane were 107 Mt (A-Cap Resources Ltd., 2014, p. 6–7).

Natural Gas.—In 2013, Tlou Energy Ltd. of Australia estimated that resources of natural gas at its Lesedi coal bed methane (CBM) project were 65 billion cubic meters. Tlou planned a drilling program at Lesedi in early 2014. Magnum Gas & Power Ltd. of Australia drilled at two of the blocks in its Central CBM project in 2013; the company planned to drill at two other blocks in the Central CBM project in the first half of 2014. By mid-2015, Magnum hoped to start a feasibility study on the project. Origin Energy Ltd. of Australia and Sasol Ltd. of South Africa were also engaged in a joint venture to explore for CBM in 2013 (Barich, 2014).

Uranium.—In February 2013, A-Cap completed a scoping study on a new mine at the Letlhakane uranium project. The

study yielded favorable results for a mine that would produce about 1,360 t/yr of uranium oxide (U_3O_8) during an estimated 20-year life. Depending on the results of further studies, A-Cap could start production at Letlhakane by 2017. Resources were estimated to be nearly 160,000 t of contained U_3O_8 (African Mining, 2013a).

Outlook

Botswana's mining sector is likely to grow in the near future. Mined diamond production is expected to increase between 2014 and 2016; copper and silver production, between 2016 and 2018; and coal production, between 2014 and 2018. Uranium production could start in 2017. The production of cut and polished diamond also is likely to increase; growth could be constrained to specialty markets by high production costs. The growth in coal production could be constrained by limited rail capacity.

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TABLE 1
 BOTSWANA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity ²	2009	2010	2011	2012	2013	
Cement ^c	250,000	260,000	260,000	260,000	260,000	
Clay, brick ^c	170,000	170,000	170,000	170,000	170,000	
Coal, bituminous	737,798	988,240	787,729	1,454,724	1,495,653	
Cobalt, smelter output, Co content of matte ³	342	272	149	195	248	
Copper:						
Mine output, Cu content of ore milled ⁴	28,595	48,026	31,929	35,768	51,254	
Smelter output, matte, gross weight ³	NA ^r	NA ^r	NA ^r	NA ^r	NA	
Smelter output, Cu content of matte ³	24,382 ^r	22,823 ^r	16,105 ^r	17,625 ^r	21,300	
Diamond ⁵	thousand carats	17,734	22,019	22,903	20,550 ^r	23,190
Gemstones, semiprecious ^{c,6}	kilograms	72,000 ^{r,7}	75,000 ^r	80,000 ^r	85,000 ^r	90,000
Gold ⁸	do.	1,626	1,774	1,562 ^r	1,522 ^r	1,206
Nickel:						
Mine output, Ni content of ore milled ⁴	28,595	24,931 ^r	15,675	17,948	22,848	
Smelter output, matte, gross weight ³	54,000	53,000	53,000	52,000	52,000	
Smelter output, Ni content of matte ³	27,900 ^r	25,100 ^r	28,800 ^r	24,000 ^r	21,900	
Platinum-group metals:						
Palladium	kilograms	3,452	3,328	2,115	2,613	1,337
Platinum	do.	622	560	373	435	218
Salt ⁹		241,114	364,761	446,525	389,481 ^r	521,306
Silver	kilograms	--	--	--	8,670	22,597
Soda ash, natural		215,118	240,898	257,851 ^r	248,629 ^r	227,913

^cEstimated; estimated data are rounded to more than three significant digits. ^rRevised. do. Ditto. NA Not available. -- Zero.

¹Table includes data available through December 19, 2014.

²Silver was produced and exported in the nickel, copper, and cobalt matte. Dimension stone and sand and gravel also were produced, but information was inadequate to estimate output.

³Smelter product was granulated nickel, copper, and cobalt matte.

⁴Includes some product from direct smelting ore; that is, ore not reported as milled.

⁵Assumed to contain about 70% gem and near gem.

⁶Principally agate.

⁷Reported figure.

⁸Reported as bullion; historically included silver estimated to be about 2%.

⁹Byproduct of natural soda ash production.

TABLE 2
BOTSWANA: STRUCTURE OF THE MINERAL INDUSTRY IN 2013

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Cement		Portland Pretoria Cement Botswana (Pty) Ltd.	Plant at Gaborone	400,000.
Do.		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. ^c
Do.		Lobatse Clay Works (Pty.) Ltd. (Botswana Development Corp. and Interkiln Corp. joint venture)	Lobatse, 70 kilometers south-southwest of Gaborone	70,000. ^c
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	12,000.
Do.	do.	do.	Orapa Mine near Orapa	13,000.
Do.	do.	do.	Letlhakane Mine near Letlhakane	1,000.
Do.	do.	do.	Damtshee Mine, 220 kilometers west of Francistown	670.
Do.	do.	Lucara Diamond Corp.	Karowe Mine in Boteti Sub-District	460. ^c
Do.	do.	Kimberley Diamonds Ltd.	Lerala Mine near Lerala ²	400.
Gemstones, semiprecious	kilograms	Agate Botswana (Pty.) Ltd.	Processing plant at Pilane, 45 kilometers north of Gaborone	70,000. ^c
Do.	do.	Masa Semi-Precious Stones (Pty.) Ltd.	Bobonong, east of Selebi-Phikwe	20,000. ^c
Gold	do.	Galane Gold Ltd.	Mupane Mine, 30 kilometers southeast of Francistown	2,000.
Nickel, copper, and cobalt		Bamangwato Concessions Ltd. (BCL), (Government, 94%, and OJSC MMC Norilsk Nickel, 6%)	Selebi-Phikwe Mines, 350 kilometers northeast of Gaborone	3,000,000 ore matte content (of which 30,000 nickel, 25,000 copper, 400 cobalt).
Do.		Tati Nickel Mining Co. (Pty.) Ltd. (OJSC MMC Norilsk Nickel, 85%, and Government, 15%)	Phoenix and Selkirk Mines, 23 kilometers east of Francistown	5,000,000 ore matte content (of which 21,000 nickel, 12,500 copper, 800 cobalt, 4,400 kilograms palladium, 700 kilograms platinum).
Do.		Discovery Metals Ltd.	Boesto Mine	36,000 copper.
Do.		African Copper plc (Zambia Copper Investments Ltd., 84%)	Thakudu Mine	10,000 ^c 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	Discovery Metals Ltd.	Boesto Mine	34,000.
Soda ash		Botswana Ash (Pty.) Ltd. (BotAsh)	Sua Pan	300,000.

^cEstimated. Do., do. Ditto.

¹For brick and tiles.

²Not operating at the end of 2013.