



2012 Minerals Yearbook

BOTSWANA

THE MINERAL INDUSTRY OF BOTSWANA

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Botswana's mineral resources were formed during several geologic periods and included base metals (copper and nickel), coal, diamond, salt, sand and gravel, semiprecious gemstones, and soda ash. The geology of most of the country is largely obscured by aeolian sands. Owing to these poorly exposed geologic settings, exploration techniques were based mainly on drilling and geophysics (MBendi Information Services (Pty) Ltd., 2012a).

All mineral rights in Botswana are vested in the state. The Ministry of Minerals, Energy and Water Resources (MMEWR) has the responsibility to ensure that the mineral resources of the country are explored and exploited in the most efficient, beneficial, and timely manner.

Mineral exploration and mining in Botswana are regulated by the Department of Geological Survey and the Department of Mines under the MMEWR. The Department of Geological Survey's role is to gather, collate, assess, and disseminate information related to the groundwater, rocks, and mineral resources of the country. The Department of Mines, in partnership with stakeholders, provides administrative services, sets policies, develops programs, and drafts legislation for mineral exploitation, and works to prevent occupational diseases and injuries related to mining and to minimize degradation of the environment (Ministry of Minerals, Energy and Water Resources, 2012).

Minerals in the National Economy

The country's mineral industry earnings contributed to the country's economy. Exploration and mining permits granted by the Government allow mineral resources to be explored for and exploited. The Government's main objective for the mineral sector is to maximize economic benefit from the sector while enabling private investors to earn competitive returns. In 2012, Botswana's real gross domestic product (GDP) was primarily owing to the output of the mining sector, which declined by 8%, although the output of the nonmining sectors increased by 9.7%. The Government continued in its efforts to reduce the country's economic dependence on the mining sector by encouraging growth in other sectors of the economy (African Economic Outlook, 2012).

Production

Bamangwato Concessions Ltd. (BCL) of Botswana processed copper-nickel concentrate from its Selebi-Phikwe Mines. Also, BCL toll-smelted concentrate from Tati Nickel Mining Co. (Pty) Ltd.'s Phoenix open pit mine. Mupane Gold Mining Pty Ltd. continued to produce gold from its Mupane Mine.

Botswana was a leading producer of diamond, and the production of gem-quality diamond continued to be the foundation of Botswana's economy. Diamond production

decreased, however, to about 20.2 million carats in 2012 from about 24 million carats in 2011. This decrease happened primarily because of a slope failure at the Jwaneng Mine (Israeli Diamond Industry, The, 2013).

Production of semiprecious stones was an estimated 35,000 kilograms. The semiprecious stones were mainly varieties of agate and carnelian, and production was not reported separately. Salt and soda ash production by Chlor-Alkali Holdings (Pty.) Ltd. decreased. Unexploited mineral resources included asbestos, chromium, feldspar, graphite, gypsum, iron, and manganese. These unexploited mineral resources were located mostly in remote areas and (or) beneath a thick sequence of Kalahari sands. Data on mineral production are in 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. The Government, Anglo American Corp. of South Africa Ltd. (AAC), Botswana RST Ltd., DeBeers Prospecting Botswana Ltd., and the Norilsk Nickel Group of Russia were significant partners in Botswana's mineral industry. DeBeers Centenary AG, which was an ACC-affiliated company, owned one-half of Debswana Diamond Co. (Pty) Ltd. AAC also had equity positions in Botswana RST Ltd., which was the Government's partner in the Selebi-Phikwe nickel-copper-cobalt mines, and the Moruple Colliery (Pty) Ltd. 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 was not readily available for these operations. Major commodities and the companies that produced those commodities are listed in table 2.

Mineral Trade

The Government exported about \$5 billion worth of diamond in 2012, which was a 19% increase compared with diamond exports in 2011. Diamond exports included rough and polished diamond that was sorted by the De Beers Group. Gross rough diamond imports increased to about \$2.1 billion, which was almost three times more than was imported in 2011. These increases were owing in part to De Beer's distribution arm, the Diamond Trading Co., moving to a new sorting center in Gaborone in 2012 from where it shipped its products worldwide (Hall, 2013).

The United States export trade with Botswana was valued at \$48 million and its import trade was valued at \$221 million in 2012. U.S. exports to Botswana included iron and steel products valued at \$50,000; drilling and oilfield equipment valued at \$19,000; and finished metal shapes valued at \$7,000. U.S. imports from Botswana included gem diamond

(uncut or unset) valued at \$185,300, sulfur and nonmetallic minerals valued at \$21,600, and finished metal shapes valued at \$6,000 (U.S. Census Bureau, 2012).

Commodity Review

Metals

Copper and Silver.—The Kalahari copper belt in Botswana, which stretches from Maun in northern Botswana to Ghanzi in western Botswana, was emerging as Africa's latest copper-silver mining province. Discovery Metals Ltd. of Australia moved from metals exploration to production of copper and silver concentrate in 2012. Hana Mining Ltd. of Canada was expected to be the second copper-silver miner to begin operations in the area, and MOD Resources Ltd. of Australia was expected to be the third. A fourth company was formed in 2012 when Hana Mining transferred 11 prospecting licenses, known as the Kuke property, to create New Hana Copper Mining Ltd. (Creamer, 2012).

Discovery Metals announced that it had started commissioning of its open pit Boseto Mine, which was expected to have an initial design capacity of about 36,000 metric tons per year (t/yr) of copper in concentrate and 33,000 kilograms per year (kg/yr) of silver in concentrate. The Boseto Mine was expected to become Botswana's leading copper mine, overtaking the Bamangwato Concession Ltd.'s Selebi-Phikwe Mines, which produced 25,000 t/yr of copper concentrate (Benza, 2012).

Discovery Metals announced that the estimated open pit mine reserves for its Plutus project had increased to 13.3 million metric tons (Mt) grading 1.3% copper and 13.4 grams per metric ton (g/t) silver. This was an increase compared with the 2010 estimated reserves of 11.3 Mt grading 1.3% copper and 13.7 g/t silver. The Plutus deposit remained open at depth, and a scoping study was planned to be completed in 2013 to assess the potential for an underground mine (Discovery Metals Ltd., 2012).

Hana Mining's Ghanzi copper-silver exploration project is located in the center of the Kalahari copper belt in northwestern Botswana. The Ghanzi 2,149-square-kilometer (km²) property contained sediment-hosted copper-silver mineralization with a strike length of 70 kilometers (km). The related geologic features were thought to extend for an estimated strike length of 600 km. A National Instrument (NI) 43-101-compliant preliminary economic assessment detailed a 10,000-metric-ton-per-day open pit mining and milling operation that was expected to produce 30,000 t/yr of copper concentrate and 25,000 kg/yr of silver during a 13-year mine life. Hana Mining announced that the Government had renewed the Ghanzi prospecting license for an additional 2-year period ending on December 31, 2014 (Hana Mining Ltd., 2012).

At yearend, Hana Mining announced that it had agreed to an \$82 million acquisition bid by Cupric Canyon Capital Co., a private equity firm of the United States, for 81.4% of the remaining shares of Hana Mining. Cupric Canyon already owned 18.6% of the shares. The southern African copper belt underwent more than \$10 billion in copper mine takeovers

between 2010 and 2012. The 800-km-long Kalahari Copperbelt extends from central Namibia into northwestern Botswana. It contains some of southern Africa's richest copper deposits (Mmegi, 2012).

Gold.—Galane Gold Ltd. of Australia announced that its subsidiary Mupane Gold Mining had acquired all outstanding shares of the Northern Lights Exploration Company Pty Ltd. (NLE), which held several prospecting licenses in the Tati Greenstone Belt that were adjacent to existing licenses held by Galane Gold. The combination of NLE's licenses and Galane's licenses gave Galane control of most of the prospective gold areas in the Tati Greenstone Belt. Galane's processing plant was located on the Greenstone Belt in the Mupane mining license area (Galane Gold Ltd., 2012).

Industrial Minerals

Diamond.—Botswana was a participant in the Kimberley Process Certification Scheme, which is an initiative of the Governments of diamond-producing and diamond-importing countries, commercial diamond firms, industry associations, and nongovernmental organizations that have implemented a certification system for the international trade of rough diamond. The Kimberley Process is designed to stem the flow of rough diamond that could be used by rebel movements to finance wars against legitimate Governments. The scheme requires that Governments certify that shipments of rough diamond are conflict-free. The Kimberley Process was endorsed by the United Nations General Assembly and the United Nations Security Council (Global Witness, 2012).

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's production. Debswana operated four diamond mines in central Botswana (Jamasmie, 2012).

Lucara Diamond Corp. of Canada announced that its Karowe Mine project (formerly known as the AK6 project), which is located in north-central Botswana, had an estimated indicated resource of 51 Mt containing 8 million carats of diamond. Karowe had an estimated probable reserve of 36 Mt of ore containing 6 million carats of diamond to be mined from an open pit mine to a depth of 324 meters. Diamond recovery was expected to be an estimated 400,000 carats per year. At the planned mining rate, the Karowe Mine had an estimated mine life of 15 years (Barradas, 2012).

Lucara Diamond announced that its first diamond production of more than 5,300 carats was recovered from the North Lobe area of the Karowe Mine. The production had an average grade of 32 carats per 100 metric tons. Several large stones were recovered, including four stones larger than 10.8 carats. The three largest stones recovered were 25.8 carats, 16.5 carats, and 14.6 carats in size (Topf, 2012).

In 2012, Botswana Diamonds plc of the United Kingdom announced that it was continuing with its investigation of ground gravity and ground magnetic surveys on a number of identified anomalies. These anomalies outlined several drillable targets that Botswana Diamonds thought could hold

diamondiferous targets. The prospects that rated highest on the evaluation were selected for drilling. The work was expected to help establish the amount of additional revenue that could be generated by increasing the grade (MBendi Information Services (Pty) Ltd., 2012b).

Mineral Fuels and Related Materials

Coal.—Development of Hodges Resources Ltd. of Australia's coal mine at Morupule South was continuing in 2012. Botswana possessed large coal reserves in the eastern part of the country that had been estimated to be about 17 billion metric tons. The quality of the coal in these deposits was considered suitable for power generation. Calorific values were about 4,990,000 calories per kilogram from the Bottom Morupule Main seam and about 4,200,000 calories per kilogram from the Top Morupule Main seam. The Morupule Mine supplied coal to Botswana's only coal-fired powerplant (African Energy Journal, 2012).

Petroleum.—Ormil Energy Ltd. of Australia announced that it had been advised by the Government that its application for a petroleum exploration license had been approved. The license covers about 23,700 km² located in the Central and Ngamiland districts and was valid for a period of 4 years beginning on October 1, 2012 (MBendi Information Services (Pty) Ltd., 2012c).

Uranium.—A-Cap Resources Ltd. of Australia reported that its ongoing exploration at the Letlhakane uranium project had resulted in the deposit being estimated to be among the top 10 undeveloped uranium deposits in the world. A-Cap reported an estimated indicated resource of 143 Mt grading 284 parts per million uranium oxide (U₃O₈). The proposed Letlhakane project would involve the construction of Botswana's first uranium mine. The shallow-lying ore could be extracted using conventional open pit mining equipment. Necessary infrastructure for the mine project, including power, rail, road, and water, was already available at the site (African Mining, 2012).

Outlook

The diamond trade is expected to continue to help expand Botswana's economy, and the mineral industry as a whole is also expected to continue to be a key sector of the economy. International interest in exploration for diamond, base and precious metals, and uranium is expected to continue. The Government's mineral investment policies and the country's favorable mineral investment climate, low tax rates, and political stability are expected to continue to attract foreign mineral investment. Several international companies with active mineral exploration programs are expected to continue to operate in Botswana. Copper, gold, nickel, and soda ash production and processing are expected to continue to be positive factors to the country's economy. Additional coal resources are likely to be developed, along with uranium. The country's small domestic market, the cost of transportation to ports in South Africa, and the high incidence of HIV/AIDS will likely continue to limit the country's attractiveness to investments by foreign manufacturers.

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TABLE 1
BOTSWANA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity ²		2008	2009	2010	2011	2012
Coal, bituminous		909,511	737,798	988,240	787,729 ^r	1,454,724
Cobalt, smelter output, Co content of matte ³		337	342	272	149 ^r	195
Copper:						
Mine output, Cu content of ore milled ⁴		28,800	28,595	48,026 ^r	31,929 ^r	35,768
Smelter output, matte, gross weight ³		48,000 ^e	38,000	22,823 ^r	16,105 ^r	17,625
Smelter output, Cu content of matte ³		23,146	13,600	7,170	7,200	7,200 ^e
Diamond ⁵	thousand carats	32,595	17,734	22,019	22,903 ^r	20,478
Gemstones, semiprecious ^{e, 6}	kilograms	50,000	30,000	30,000	30,000	35,000
Gold ⁷	do.	3,176	1,626	1,774	1,800 ^e	1,800 ^e
Nickel:						
Mine output, Ni content of ore milled ⁴		28,940	28,595	23,053	15,675 ^r	17,948
Smelter output, matte, gross weight ³		54,000	54,000	53,000	53,000	52,000
Smelter output, Ni content of matte ³		24,000	29,616 ⁸	29,000	29,000	27,000
Platinum-group metals:						
Palladium	kilograms	3,359	3,452	3,328	2,115	2,613
Platinum	do.	715	622	560	373	435
Salt ⁹		170,994	241,114	364,761	446,525 ^r	289,481
Soda ash, natural		263,566	215,118	240,898	230,000 ^e	225,000

^eEstimated; estimated data are rounded to more than three significant digits. ^rRevised. do. Ditto.

¹Table includes data available through August 31, 2013.

²In addition to commodities listed, silver was produced and exported in the nickel-copper-cobalt matte. Copper and nickel cathodes, dimension stone, and sand and gravel also were produced at a pilot plant, but information was inadequate to estimate output.

³Smelter product was granulated nickel-copper-cobalt matte.

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

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

⁶Principally agate. Reported as sales.

⁷Reported as bullion; historically included silver estimated to be about 2%. Includes artisanal production.

⁸Reported figure.

⁹Byproduct of natural soda ash production.

TABLE 2
BOTSWANA: STRUCTURE OF THE MINERAL INDUSTRY IN 2012

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Clay ¹		Lobatse Clay Works (Pty.) Ltd. (Botswana Development Corp. and Interkiln Corp. joint venture)	Lobatse, 70 kilometers south-southwest of Gaborone	50,000. ^c
Do.		Makoro Brick and Tile (Pty.) Ltd.	Makoro, 10 kilometers south of Palapye	20,000. ^c
Coal		Morupule Colliery (Pty) Ltd. (Anglo American Corp. of South Africa Ltd. and related firms, 93.3%)	Morupule, 270 kilometers northwest of Gaborone	1,000,000.
Diamond	thousand carats	Debswana Diamond Co. (Pty.) Ltd. (Government, 50%, and De Beers Centenary AG, 50%)	Jwaneng Mine, 115 kilometers west of Gaborone	12,000.
Do.	do.	do.	Orapa Mine, 375 kilometers north of Gaborone	13,000.
Do.	do.	do.	Lethakane Mine, 350 kilometers north of Gaborone	1,000.
Do.	do.	do.	Damtshaa Mine, 220 kilometers west of Francistown	670.
Do.	do.	Tswapong Mining Co. (Pty.) Ltd. (De Beers Prospecting Botswana Ltd., 85%, and Government, 15%)	Tswapong Mine, 275 kilometers northeast of Gaborone	3.
Gemstones, semiprecious	kilograms	Agate Botswana (Pty.) Ltd.	Processing plant at Pilane, 45 kilometers north of Gaborone	60,000.
Do.		Masa Precious Stones (Pty.) Ltd.	Bobonong, east of Selebi-Phikwe	4,000.
Gold	do.	IAMGOLD Corp.	Mupane Mine, near Francistown	3,100.
Nickel-copper-cobalt		Bamangwato Concessions Ltd. (BCL), (Government, 15%, and Botswana RST Ltd., 85%, of which LionOre Mining International Ltd., 12.65%)	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. (LionOre Mining International Ltd., 85%, and Government, 15%)	Phoenix and Selkirk Mines, 23 kilometers east of Francistown	3,600,000 ore matte content (of which 15,000 nickel, 9,000 copper, 100 cobalt, 960 kilograms palladium, 145 kilograms platinum).
Salt		Botswana Ash (Pty.) Ltd. (BotAsh) (Government, 50%, and Anglo American plc, 50%)	Sua Pan, 450 kilometers north of Gaborone	650,000.
Soda ash		do.	do.	300,000.

^cEstimated. Do., do. Ditto.

¹For brick and tiles.