



2008 Minerals Yearbook

BOTSWANA

THE MINERAL INDUSTRY OF BOTSWANA

By Harold R. Newman

Botswana's mineral resources include base metals, coal, diamond, salt, and soda ash. Mineral exploration and mining in Botswana are regulated by the Department of Geological Survey and the Department of Mines. Mineral exploration in Botswana is difficult. The geology of most of Botswana is poorly understood owing to extensive cover by recent sediments, and available information was based mainly on drilling and geophysical surveys.

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. It also administered those sections of the Mines and Minerals Act (CAP 01) that relate to mineral exploration (Department of Geological Survey, 2008).

The Department of Mines in partnership with stakeholders provides administrative services; develops policies, programs and legislation for mineral exploitation; and works to prevent occupational diseases and injuries related to mining and to minimize degradation of the environment. The Department of Mines was reviewing the Mines and Minerals Act to ensure that mining license holders make adequate financial provision to fulfill their environmental obligation to rehabilitate the mines at the end of mine life (Department of Mines, 2008).

Minerals in the National Economy

Botswana's mineral resources contributed significantly to Botswana's economic growth. In 2008, Botswana was a leading producer of diamond (by value) and the world's third ranked producer of diamond (in terms of volume) after the Democratic Republic of the Congo and Australia. Copper, gold, and soda ash production also had significant, though smaller, roles in the national economy.

Botswana accounted for about 10% of world diamond production (by volume) and 22% of world diamond reserves. The country's nickel production accounted for about 2% of world production (Kuck, 2009; Olson, 2009).

The worldwide financial crisis had a negative effect on Botswana's mining sector. In 2008, mining accounted for 35.8% of Botswana's real gross domestic product. Diamond production accounted for more than 70% of the value of the mining sector's output and about 75% of merchandise exports. Almost all the country's rough-diamond output was by Debswana Mining Co. (Pty) Ltd., which was a 50-50 joint partnership of the De Beers Group of South Africa and the Government of Botswana. Despite efforts by the Government to diversify the economy, production of gem-quality diamond continued to be the backbone of Botswana's economy (African Economic Outlook, 2008).

Three basic types of mining licenses were granted in Botswana: the reconnaissance permit, the prospecting license, and the mining lease. Mineral rights are the property of the State, irrespective of the ownership of the land on which they are found. Residents of communities in the areas of exploration

and mining development cannot claim ownership of mineral rights from existing mines in the country, and the Basarwa and the former residents of the Central Kalahari Game Reserve (CKGR) are no exception. The intent is to ensure that all the citizens have a common stake in and receive common benefits from mineral revenues (Government of Botswana, 2008).

Production

Tati Nickel Mining Co. (Pty.) Ltd. (a subsidiary of MMC Norilsk Nickel of Russia) produced 28,595 metric tons (t) of nickel, 23,146 t of copper, and 337 t of cobalt from its nickel/copper matte. Bamangwato Concessions Ltd. (BCL) of Botswana processed copper-nickel concentrate from its Selebi-Phikwe Mines. Also, BCL toll-smelted concentrate from Tati Nickel's Phoenix open pit mine. IAMGOLD Corp. produced 3,170 kilograms (kg) of gold in 2008 compared with 2,170 kg in 2007 (table 1).

In 2008, diamond production totaled about 32.6 million carats compared with 33.6 million carats in 2007. Production of semiprecious stones totaled about 50,000 kg. Debswana Mining was the major diamond producer. The semiprecious stones were mainly varieties of agate and carnelian, and production was not reported separately. Botswana Ash (Pty.) Ltd. produced salt and soda ash. In 2008, companies extracted clay, crushed stone, gravel, and sand. Production of these industrial materials depended on consumption by the construction industry. Coal production totaled 909,511 t in 2008 compared with 828,164 t in 2007 (Department of Mines, 2008).

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 privately owned free-market basis. In addition to these major operations, a number of medium- and small-scale mines produced agates, aggregates, clay, and dimension stone. Production information was not readily available for these operations. The country's major commodities and the companies that produced those commodities are listed in table 2.

Commodity Review

Metals

Copper.—Copper exploration projects continued to be active in 2008. African Copper plc had two projects underway. At the Mowana Mine (formerly the Dukwe Mine), construction of the processing plant was completed in 2008, and production of concentrates was started in mid-2008 at the open pit mine. Moolman Mining (Botswana) (a subsidiary of Aveng Ltd. of South Africa) was under contract for the open pit mining

operation. African Copper found that the inclusion of a dense media separation (DMS) plant into the crushing circuit would allow the cutoff grade to be reduced to 0.1% copper while still maintaining a mill feed that meets the design criteria for the concentrator. The improved recovery potential allowed the company to reengineer the open pit design based on the 0.1% copper cutoff. In addition to the material extracted during open pit mining, African Copper stated that the deposit had an additional 72.9 million metric tons (Mt) of estimated measured and indicated reserves that could be extracted using underground mining techniques. Copper oxide mineralization extends from the surface down to about 70 meters (m) (African Mining Magazine, 2008).

African Copper's other interest was the 3,800-square-kilometer (km²) Matsitama exploration concession, which is adjacent to the Mowana Mine. Work continued mainly on the Thakadu-Mutsuku corridor. The sampled area covered 2,000 km², and analysis identified eight anomalies that had geochemical similarities to the copper, gold, and iron oxide deposits of Australia. Activities during the last quarter of 2008 focused on mapping, prospecting, and soil sampling at 100-m line-spacing. The company indicated that the Thakadu-Mutsuku deposit could be its next mine to open in Botswana. Indicated resources were estimated to total 4.7 Mt grading 1.72% copper at a 0.25% copper cutoff, and inferred estimated reserves were 1 Mt grading 1.29% copper. African Copper also reported an estimated resource of 3.6 Mt grading 16 grams per metric ton (g/t) silver in the Thakadu-Mutsuku deposit (African Copper Ltd., 2008).

Hana Mining Ltd. of British Columbia, Canada, reported the discovery of new copper-silver mineralization at its Ghanzi project. The project consists of five license blocks covering 4,370 km² that contain widespread sediment-hosted copper-silver mineralization. Seven vertical percussion holes (HA-01-P to HA-07-P) were drilled on the limb of Zone 2 along a 400-m strike length. Six of the holes intersected mineralization and represented a new discovery in Zone 2. The new discovery is located more than 1,000 m from previously identified mineralization (Hana Mining Ltd., 2008).

Discovery Metals Ltd. of Australia's Boseto copper project comprised 14 prospecting licenses covering an area of more than 10,000 km² in northwest Botswana within the Kalahari Copper Belt, which is an underexplored extension of the Zambian Copper Belt. Discovery Metals completed its first and second phases of drilling in 2008. It confirmed substantial copper-silver mineralization at the Petra and the Zeta prospects. It also reported an increase in its estimated total mineral resource of 50.4 Mt grading 1.4% copper, which includes an estimated indicated mineral resource of 8.9 Mt grading 1.4% copper and 20 g/t silver at the Zeta project and an estimated inferred mineral resource of 41.5 Mt grading 1.3% copper at the Petra, the Plutus, and the Zeta prospects. All cutoff grades are 0.6% copper (Discovery Metals Ltd., 2008a).

Gold.—IAMGOLD Corp. operated the Mupane Mine, which was an open pit operation located about 30 kilometers (km) southwest of Francistown. IAMGOLD reported that its gold production from the Mupane Mine in 2008 was 3,170 kg and that the expected life of the mine had been extended

to 2012 after decreasing costs gave the company leeway to increase the mineral reserve estimate by 1,815 kg. The company was continuing to evaluate mining costs to determine whether it could develop additional reserves to extend the mine life beyond 2012. IAMGOLD continued exploring for additional ore deposits around Mupane to prolong the life span of its operations in Botswana. IAMGOLD stated that it planned to start mining the deposits at Signal Hill along with possible complementary mining deposits at Golden Eagle and Molomolo; all these deposits are adjacent to the Mupane Mine (Mmegi Online, 2008).

Nickel.—Discovery Metals' Dikoloti nickel project comprised four licenses covering an area of 612 km² that surrounds the three nickel deposits of BCL Ltd. in the Selebi-Phikwe region of northeast Botswana. In 2008, the Dikoloti project had an estimated inferred resource of 4.1 Mt grading 0.7% nickel and 0.5% copper at a cutoff grade of 0.5% nickel. Outside of the immediate area of BCL's operating mines, little or no modern exploration had been conducted before the exploration activities of Discovery Metals. Geobiotics LLC's test work for Discovery Metals found that the Dikoloti mineralization was amenable to heap-leach bio-oxidation processing using the GEOLEACH™ process. More than 74% nickel extraction from the ore was achieved after 160 days, and 99% of the extracted nickel could be recovered as a nickel sulfide by the use of sodium sulfide precipitation (Discovery Metals Ltd., 2008b).

Tati Nickel was continuing with its 12-million-metric-ton-per-year (Mt/yr) DMS process. DMS is an ore-upgrading technology and is commonly used as a method of selectively separating 'heavy' particles from the host rock to increase the head grade of run-of-mine material. The DMS plant was expected to increase production to 22,000 Mt/yr from 14,500 Mt/yr of contained nickel and extend the mine life by 7 years to 2019. The Phoenix concentrator was undergoing an upgrade to increase the capacities of the filtration and thickening processes to 700,000 metric tons per year (t/yr) of concentrate from 400,000 t/yr (Infomine.com, 2008).

Albidon Ltd. of Australia announced that drill assays had confirmed thick nickel sulfides at the Sunnyside prospect, which is located in eastern Botswana. Drill hole intercepts indicated a large mineralized zone of 55 m of apparent thickness starting at 21 m from the surface. Sulfides were intersected in 8 drill holes, and mineralization remained open in several directions. The drill results were believed to be the most substantial nickel sulfide intersections in Botswana outside of the Selebi-Phikwe and the Tati nickel mining districts. The Sunnyside prospect forms part of an 8,705-km² tenement held by Albidon to the south of Selebi-Phikwe (Albidon Ltd., 2008a).

Albidon signed a joint-venture agreement with IAMGOLD under which Albidon could earn up to 80% interest in nickel exploration projects in the Maitengwe Greenstone Belt in eastern Botswana. The Maitengwe Greenstone Belt is one of a number of greenstone areas that make up large parts of Botswana, South Africa, and Zimbabwe. These greenstone belts contain the majority of nickel resources in southern Africa. An important feature of the Maitengwe Greenstone Belt is its location on a major regional structure that appears to localize substantial nickel mineralization at the Damba and the Hunter's

Road deposits to the east in Zimbabwe. Structures such as these are of fundamental importance in the formation of large nickel deposits (Albidon Ltd., 2008b).

Industrial Minerals

Cement.—The mineral industry in northern Botswana was expected to get another boost from the Matsiloje Portland Cement Plant when production is restarted at the cement plant. Matsiloje Portland had been closed for several years and required a complete refurbishment. The Department of Mines granted Matsiloje a license, and the plant was on target to start production of 65 metric tons per day (t/d) of cement by yearend 2008. Production was to be increased to 400 t/d in 2009 (Ganetsang, 2008).

Diamond.—Botswana is a participant in the Kimberley Process Certification Scheme, which is an association of the Governments of diamond producing and importing countries, commercial diamond firms, pan-industry associations, and nongovernmental organizations that have implemented a certification system for the international trade of rough diamond. The Kimberley Process is designed to prevent so-called “blood” or “conflict” diamond from being shipped through legitimate trading channels.

The Government and the De Beers Group formed a 50-50 joint venture to build a facility for the sorting and valuation of rough diamond. The venture was named the Diamond Trading Co. Botswana (DTC Botswana) and was intended to ensure that a portion of Botswana’s most important natural resource stays in the country longer and that value can be added by local companies. DTC Botswana would sort and value all rough diamond produced by De Beers-Botswana Mining Co. (Debswana) and perform local sales and marketing activities for rough diamond. In addition, the vast majority of De Beers’ global production would be aggregated in Botswana by DTC International by 2009 (IM International Mining, 2008).

Botswana produced 32.6 million carats of rough diamond in 2008, which was a decrease of 3.5% from 2007, and sold 28.9 million carats in 2008, which was a decrease of 17% compared with 2007. The country’s diamond revenue was expected to be cut in half in 2009 and production was expected to decrease by 35%. Of the 16 diamond companies that held Botswana diamond cutting licenses, 15 were operating and the remaining plant was getting ready to begin diamond cutting (Antwerp World Diamond Center, 2008a).

DTC Botswana was scheduled to start providing the polishing plants for the country with rough diamond in 2008. By 2010, 15% to 20% of cuttable diamond production in Botswana would be processed by the polishing plants. It was estimated that no more than 30% of the rough diamond mined could be cut economically in Botswana. The Government stated that it would take time to train a sufficient number of diamond cutters to do quality local polishing (Antwerp World Diamond Center, 2008c).

Two of Debswana’s four mines, the Damtshaa and the Letihakane Mines in the north of the country, were to close at yearend 2008 for 12 months. This was in agreement with calls from worldwide diamond traders to cut rough diamond

production in the face of plummeting demand. This action was likely to affect the Government’s budget and the economy overall once short-term reserves are exhausted (Antwerp World Diamond Center, 2008b).

DiamondEx Ltd. of Australia announced that commissioning of its Lerala Mine processing plant was completed at the end of August 2008. The plant was operating at a rate of about 100 metric tons per hour; full production of 200 metric tons per hour was expected to begin in 2009. The cost of construction of the Lerala Mine was about \$24 million and the expected mine life was 10 years. The mine was expected to produce 300,000 carats per year from indicated reserves of 3.7 million carats. The average grade of the ore was expected to be 27.4 carats per hundred metric tons processed through DMS. The plant was designed with Pans to create a pre-concentrate of fine crushed ore, which is sent directly to the DMS; the remainder of the ore is sent to the tertiary crusher for reprocessing before it enters the DMS. The utilization of both Pans and the DMS in this fashion is unique. This practice reduces the capital cost of the plant by reducing the size of the DMS and it maximizes diamond recovery by minimizing loss (Mbendi Information Services (Pty) Ltd., 2008a).

Prefeasibility studies were being conducted at Debswana’s Jwaneng Mine to see if the open pit mine could be expanded or if the mine could be expanded to underground mining. This would be the first time that underground diamond mining would be undertaken in Botswana. As part of the study to mine underground, an exploratory shaft was to be sunk to a depth of 1,000 m about 1.5 km northwest of the open pit. New processing plants were planned for both the Jwaneng and the Orapa Mines. Jwaneng was the richest diamond mine in the world in terms of the value of its production (Hill, 2008a).

Numerous other companies were exploring for diamond in Botswana. Active exploration operations included Firestone Diamonds plc of the United Kingdom, which held diamond exploration rights to 17,000 km² in the Jwaneng and the Orapa areas and was the leading holder of diamond exploration rights in the area. Firestone was carrying out two parallel programs at its Tsabong project. The first was an intensive evaluation program on the known diamondiferous kimberlites. The second was an exploration program targeting new kimberlite discoveries. The Tsabong area contains 5 kimberlites that are larger than 50 hectares and 32 kimberlites that are between 20 and 50 hectares in size; it also includes the 180-hectare MK1 pipe, which Firestone indicated was one of the largest known diamondiferous kimberlites in the world (Mukumbira, 2008).

Tawana Resources NL of Australia reported that work on three shafts at its BK24 kimberlite project was started and would be ready for bulk sampling by the third quarter of 2008. Its partner, Botswana-based Nowak Investments, was doing the excavations to a depth of 30 m and building a DMS plant. When the shafts are completed, Nowak is expected to excavate and process 1,100 t/d of kimberlite, which could be increased by as much as 3,000 t/d, if warranted. Nowak could earn a 70% interest in the Orapa prospect by doing a bankable feasibility study on it (Hill, 2008b).

Mineral Fuels and Related Minerals

Coal.—Aviva Corp. Ltd. of Australia announced that it had an estimated resource of 1.3 billion metric tons (Gt) of coal at the Mmamantswe project, which was more than double the amount it proposed seeking when it was granted its prospecting license in 2007. The resource estimate was based on a 3,500-m drilling program. Of the 32 holes drilled, 23 holes intersected coal. The volume was larger than targeted because the thickness of the carbonaceous sequence persisted further to the west than anticipated. Test work indicated that the coal content of the carbonaceous sequence also persisted to the west. The resource estimate affirmed that the Mmamantswe project was a low strip-ratio open pit thermal coal deposit that had the potential to produce 6 Mt/yr. The project is located on the border with South Africa and adjacent to key infrastructure, including highway, railway, and high-voltage transmission lines. Aviva was also investigating the merit of constructing a 1,500-megawatt power station (Louthean, 2008).

Coal reserves in the eastern part of Botswana were estimated to be 17 Gt. In this region, the Karoo Basin was attracting the attention of companies interested in selling energy to the Southern Africa region which has a shortage of electricity. The Coal Investment Corp. (CIC) of Canada was proposing to develop its multibillion-dollar Mmamabula energy project on the edge of this basin; the project would include a coal mine and a powerplant. Coal on the basin's edge is relatively shallow and accessible. The deeper seams of the basin contain rich coalbed methane (CBM) which is also known as coal seam gas. The seams are being evaluated to determine if the resource is of sufficient scale potential to host significant CBM ventures (Van der Merwe, 2008).

Zulu Energy Corp. of the United States spudded its first CBM exploration well on the Pandamatenga licenses in northeastern Botswana in 2008. The well identified as 2008-01 was expected to reach a depth of between 600 and 800 m through the Kalahari Sands and the Stormberg lavas. Zulu Energy had identified six sites on which it planned to carry out drill core desorption tests for 18 stratigraphic exploration drill holes to determine the location of the gas. The Pandamatenga licenses cover about 890,000 hectares in an extension of the mid-Zambezi Basin. Zulu Energy considered that the area had a strong potential for CBM hosted in the Lower Ecca Group of the Permian age Karoo Supergroup (Izundu, 2008).

Zulu Energy announced that it had spudded two additional wells (2008-02 and 2008-04) under its CBM exploration program, which brought to three the number of wells underway in 2008. The 2008-02 well was expected to be drilled to a depth of 1,200 m; the 2008-04 well was expected to be drilled to a depth of 900 m to the coal-bearing Lower Ecca Group. The company announced that it had identified three additional sites and expected to begin drilling by yearend 2008 (Mbendi Information Services (Pty) Ltd., 2008b).

Natural Gas.—Zulu Energy announced that it had unexpectedly hit natural gas while drilling for CBM. The surprise discovery occurred during exploratory drilling by Nyati Resources Botswana (Pty) Ltd., which was a wholly owned subsidiary of Zulu Energy. Nyati Resources announced that, as

a precautionary measure, the well was temporarily shut until the required safety equipment was mobilized and installed at the drilling location. The company announced that a drilling specialist had been hired to plan and execute reentry operations. The gas was encountered in sandstones of the Upper Karoo Group, beneath the Kalahari sand and the Stormberg lava (Tradingmarkets.com, 2008).

Uranium.—A-Cap Resources Ltd. of Australia announced that the initial inferred mineral resource at its Kraken and Mokobaesi prospects in northeastern Botswana contained an estimated 9,000 t of uranium oxide. The prospects were part of the larger Letlhakane project, which had an inferred resource of 13,600 t of uranium oxide. A-Cap was proceeding with plans to complete the development of the Letlhakane Mine and start production by 2011. A-Cap expected its feasibility study to be completed in 2009, after which the company would seek approval of a mining license from the Government. An environmental impact assessment was initiated at yearend 2008. A-Cap announced that it had discovered new uranium deposits near Serule in the Central District, where the company had another prospecting license that covered 4,500 km² (Benza, 2008).

Impact Minerals Ltd. announced it had been granted uranium exploration licenses for an area covering more than 20,000 km² in eastern Botswana. The licenses covered about 350 km of the strike extension of rocks that host deposits and prospects near the town of Serule and along strike with the Mokobaesi deposit of A-Cap resources and the Foley prospect, which was discovered by African Energy Resources Ltd. Preliminary interpretation of airborne radiometric data identified a large number of radiometric anomalies that will be investigated with ground prospecting activities. Field work was planned to start in mid-year 2008 (Mining Top News, 2008).

Outlook

International interest in exploration for diamond and base and precious metals and uranium is expected to continue. The country's favorable geologic environment, mineral investment climate, low tax rates, and political stability are expected to continue to make Botswana an attractive country for foreign mineral investment. Revenues from diamond operations that were affected by the international financial crisis are expected to recover in the near future. The several international companies with active exploration programs for mineral resources are expected to continue to operate in Botswana. Copper, gold, nickel, and soda ash production and processing are expected to continue to be notable factors in the country's economy.

Given the country's extensive coal resources and projected regional power demand, Botswana is expected to continue to develop and support CBM resources. Additional coal-fueled electricity-generating plants could be constructed to supply power to the Southern African power pool.

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TABLE 1
BOTSWANA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

| Commodity ² | 2004 | 2005 | 2006 | 2007 | 2008 ^e | |
|--|-----------------------|---------------------|---------------------|---------------------|----------------------|---------------------|
| Clay ^e | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | |
| Coal, bituminous | 913,087 | 984,876 | 962,427 | 828,164 | 909,511 ³ | |
| Cobalt, smelter output, Co content of matte ^{4,5} | 223 | 326 | 303 | 242 | 337 ³ | |
| Copper: | | | | | | |
| Mine output, Cu content of ore milled | 29,460 | 31,300 ^e | 24,255 | 21,500 ^e | 22,000 | |
| Smelter output, matte, gross weight ⁴ | 54,448 | 68,637 | 64,368 | 53,947 | 48,000 | |
| Smelter output, Cu content of matte ^{4,5} | 21,195 | 26,704 | 24,255 | 19,996 | 23,146 ³ | |
| Diamond ⁶ | thousand carats | 31,125 | 31,890 | 34,293 | 33,639 | 32,595 ³ |
| Gemstones, semiprecious ⁶ | kilograms | 99,000 | 165,000 | 65,000 | 48,000 ^e | 50,000 |
| Gold ⁸ | do. | 161 | 2,709 | 3,020 | 2,722 | 3,176 ³ |
| Nickel: | | | | | | |
| Mine output, Ni content of ore milled | 35,163 | 39,305 | 38,000 ^e | 27,600 ^e | 28,940 ³ | |
| Smelter output, matte, gross weight ⁴ | 54,448 | 68,637 | 64,368 | 53,947 | 54,000 | |
| Smelter output, Ni content of matte ⁵ | 22,292 | 28,212 | 26,762 | 22,844 | 24,000 | |
| Salt ⁹ | 208,319 | 243,945 | 151,595 | 165,710 | 170,994 ³ | |
| Sand and gravel ¹⁰ | thousand cubic meters | 2,330 | 1,906 | 4,812 | 2,866 | 3,000 |
| Soda ash, natural | 263,358 | 279,085 | 255,677 | 279,625 | 263,566 ³ | |
| Stone, crushed | thousand cubic meters | 1,219 | 1,100 | 1,134 | 1,200 ^e | 1,200 |

^eEstimated; estimated data are rounded to no more than three significant digits. do. Ditto.

¹Table includes data available through August 1, 2009.

²In addition to commodities listed, palladium, platinum, and silver were produced, and exported in the nickel-copper-cobalt matte; copper and nickel cathodes also were produced at a pilot plant, but information is inadequate to make reliable estimates of output.

³Reported figure.

⁴Smelter product was granulated nickel-copper-cobalt matte.

⁵Included some product from direct smelting of ore; that is, ore not reported as milled.

⁶Assumed to contain about 70% gem and near gem.

⁷Principally agate. Reported as sales.

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

⁹Byproduct of natural soda ash production.

¹⁰Includes clay (for brick and tile).

TABLE 2
BOTSWANA: STRUCTURE OF THE MINERAL INDUSTRY IN 2008

(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. |
| 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). |
| Do. | | Masa Precious Stones (Pty.) Ltd. | Bobonong, east of Selebi-Phikwe | 4,000. |
| Salt | | Botswana Ash (Pty.) Ltd. (Government, 50%, and Anglo American plc, 50%) | Sua Pan, 450 kilometers north of Gaborone | 650,000. |
| Soda ash | | do. | do. | 300,000. |

^cEstimated.

¹For brick and tiles.

