

2005 Minerals Yearbook

TANZANIA

THE MINERAL INDUSTRY OF TANZANIA

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In recent years, the mineral industry of Tanzania has produced copper, gold, silver, and rolled steel products, and such industrial minerals as calcite, diamond and other gemstones, gypsum, phosphate rock, and salt. The country has also produced coal, natural gas, and such building materials as cement, gravel, limestone, pozzolanic materials, and sand. Deposits of cobalt, iron ore, nickel, and titanium are also known to occur in Tanzania.

In 2005, Tanzania's nominal gross domestic product (GDP) based on purchasing power parity amounted to \$27.1 billion; the per capita GDP was about \$700. The real GDP grew by 6.9% in 2005 compared with 6.7% in 2004. Manufacturing accounted for 9% of the GDP; construction, 4.8%; mining and quarrying, 3.5%; and electricity and water, 1.6% (Bank of Tanzania, 2006a, p. 29, 31; International Monetary Fund, 2006, p. 184; 2006§¹).

The value of output in the mining sector grew by nearly 16% in 2005 after rising by 15% in 2004. From 2000 to 2005, the value of output in the mining sector grew by an average of 16% per year because of substantial increases in gold production (table 1). During the same period, the value of output in the construction and electricity and water sectors rose by an average of 12% and 4% per year, respectively (Bank of Tanzania, 2006a, p. 31).

Trade

Tanzania's mineral exports have risen substantially since 2000. Most of the increase was attributable to gold exports, which increased in value to \$642 million in 2005 from \$629 million in 2004 and \$121 million in 2000. From 2000 to 2005, diamond exports declined to \$19.7 million from \$46 million. Exports of other minerals, which included copper, gemstones, and silver, increased to \$31.4 million in 2005 from \$18.5 million in 2000. The share of minerals in total exports was 45% in 2005 (Kafumu, 2005; Bank of Tanzania, 2006b, p. 20).

The Bank of Tanzania (2006b, p. 21) reported that imports of petroleum products increased in value to \$511 million in 2005 from \$432 million in 2004, and imports of fertilizers, to \$64.6 million from \$54.1 million. Petroleum products accounted for 19% of total imports, and fertilizers, 2%.

Commodity Review

Metals

Cobalt, Copper, and Nickel.—Kahama Mining Corp. Ltd. (KMC) (100% owned by Barrick Gold Corp. of Canada) produced copper as a coproduct at the Bulyanhulu gold mine. In April 2005, Barrick (50%) and Falconbridge Ltd. of Canada (50%) formed a joint venture for the exploration and development of the Kabanga nickel sulfide deposit in

northwestern Tanzania. In 2004, resources at Kabanga were estimated to be 26.4 million metric tons (Mt) at a grade of 2.6% nickel; Barrick and Falconbridge planned to complete field work for a new resource estimate in 2006. Falconbridge planned to spend \$50 million on exploration to update the resource model and bring the project to feasibility before making a decision on whether to proceed with development (Barrick Gold Corp., 2006a, p. 49).

Goldstream Mining NL of Australia explored for cobalt, copper, and nickel at the Mibango project near Lake Tanganyika and at the Luwumbu project near Lake Malawi in 2004. The company had joint-venture agreements with Lonmin plc of the United Kingdom for these projects. In April 2005, Goldstream announced that nickel laterite resources at Mibango were estimated to be 113.1 Mt at grades of 0.82% nickel and 0.05% cobalt. In July, Goldstream obtained a new property prospective for nickel near Nachingwa in southeastern Tanzania (Goldstream Mining NL, 2005, p. 10, 16).

In 2005, Albidon Ltd. of Australia and BHP Billiton Ltd. of Australia explored at the former company's Songea nickel-platinum project, which comprised five prospecting licenses in southwestern Tanzania. Further exploration was planned for 2006 (Albidon Ltd., 2006).

Gold.—Tanzania's gold production increased to 52,236 kilograms (kg) in 2005 from 48,178 kg (revised) in 2004. Tanzania became the third ranked gold producer in Africa in 2003. The Buhemba, the Bulyanhulu, the Geita, the Golden Pride, the North Mara, and the Tulawaka Mines had a combined capacity to produce about 61,000 kilograms per year (kg/yr) of gold. Tanzania's resources amounted to nearly 1,400 metric tons (t) of contained gold, of which about 840 t were reserves (tables 1, 2, and 3).

Geita Gold Mining Ltd. (a subsidiary of AngloGold Ashanti Ltd. of South Africa) operated the Geita open pit gold mine. The Geita mine produced nearly 19,100 kg of gold in 2005 compared with about 21,500 kg of gold in 2004; the decrease in production was mostly attributable to lower ore grades. Cash costs increased to \$298 per troy ounce of gold in 2005 from \$250 per troy ounce of gold in 2004 because of lower production and higher contractor and diesel costs. In 2006, production at Geita was expected to decline to between 17,500 kg and 18,200 kg at a cash cost of between \$297 and \$309 per troy ounce of gold. By 2007, production was expected to increase to about 25,000 kg/yr because of the mining of highergrade ore from Nyankanga Cut 4 (AngloGold Ashanti Ltd., 2006, p. 42, 74-75; Moore, 2006).

AngloGold Ashanti's exploration activities at Geita were focused on Nyamulilima Hill in 2005. The company signed a joint-venture agreement with Draig Mineral Developments Limited to explore at Mkurumu. AngloGold Ashanti also had a joint-venture agreement with Tan Range Exploration Corp. of Canada for the Kigosi North property (AngloGold Ashanti Ltd., 2006, p. 82).

¹A reference that includes a section mark (§) is found in the Internet Reference Cited section.

KMC operated the Bulyanhulu underground gold mine. In 2005, the Bulyanhulu Mine produced nearly 9,700 kg of gold from nearly 1.05 Mt of ore compared with 10,900 kg of gold from 1.12 Mt of ore in 2004. Recovery rates from 2004 to 2005 remained relatively unchanged at more than 88%. Cash costs were \$358 per troy ounce of gold in 2005. The decline in production was attributable to lower ore grades and mechanical difficulties (Barrick Gold Corp., 2006a, p. 27, 48; 2006b, p. 88). KMC also produced copper and silver as coproducts. The majority of gold was recovered from copper concentrates; the remainder was from gold doré.

Barrick and its joint-venture partner Explorations Minières du Nord Ltée (MDN) of Canada started production at the Tulawaka open pit gold mine in 2005. Production at Tulawaka amounted to nearly 3,900 kg of gold from 322,000 t of ore. The recovery rate was nearly 96%. Cash costs were \$253 per troy ounce of gold (Barrick Gold Corp., 2006b, p. 88).

Barrick completed a prefeasibility study on mining the Buzwagi deposit (formerly known as Chocolate Reef) in 2005. The company reported that resources at Buzwagi amounted to 58 Mt at a grade of 1.7 grams per metric ton (g/t) gold, of which 39.2 Mt at a grade of 1.9 g/t gold was reserves. Barrick initiated a feasibility study on Buzwagi that was expected to be completed in 2006. Exploration was carried out at the Nyanzaga deposit, which is located northeast of Bulyanhulu, with joint-venture partner Sub-Sahara Resources NL of Australia. Barrick planned to conduct a drilling program at Nyanzaga in 2006 (African Mining, 2005a; Barrick Gold Corp., 2006a, p. 24, 49).

Resolute Mining Ltd. of Australia owned the Golden Pride open pit mine. In 2005, the Golden Pride Mine produced 4,723 kg of gold from 3.2 Mt of ore compared with 4,781 kg of gold from 2.88 Mt of ore in 2004. Gold recovery rates averaged more than 95% in 2005. Lower production was attributable to a decrease in ore grades. Resolute was studying the possibility of expanding the pit to include an additional 31 t of contained gold resources; the study was expected to be completed in the first quarter of 2006. These resources were previously considered to be subeconomic; higher gold prices could convert them to reserves depending on the outcome of the study (Resolute Mining Ltd., 2004; 2005a, b; 2006).

Resolute explored at the Matinje and the Matinje West properties, which are located 30 kilometers (km) to the east of Golden Pride, and at Mwashimba. The company also explored at the Mkweni project, for which it had a joint-venture agreement with Sub-Sahara Resources. Resolute conducted exploration at the Nyakafuru project, which was a joint venture with Gallery Gold Ltd. of Australia, and at Kakumbi, which was a joint venture with African Eagle Resources plc of the United Kingdom (Resolute Mining Ltd., 2006).

Placer Dome Gold Inc. of Canada operated the North Mara open pit gold mine, which started production during the third quarter of 2002. The North Mara project encompassed the Gokona, the Nyabigena, and the Nyabirama pits. In 2005, Placer Dome produced 7,788 kg of gold from 2.98 Mt of ore compared with 6,485 kg of gold from 2.13 Mt of ore in 2004. Production increased because of the expansion of the ore treatment plant that was completed in the fourth quarter of 2004. Cash costs increased to \$303 per troy ounce of gold in 2005 from \$230 per

troy ounce of gold in 2004, and the recovery rate declined to 88.5% from 92%. In December 2005, Placer Dome's board of directors approved a bid by Barrick to purchase the company (Placer Dome Gold Inc., 2006, p. 3, 5).

In February 2003, the state-owned company Meremeta Ltd. started production at the open pit Buhemba Mine near Musoma. In 2005, Meremeta produced 2,075 kg of gold at a cash cost of \$384 per troy ounce of gold (Moore, 2006). Meremeta also held the Kilamongo and the Mwizi deposits, which are located south of Buhemba, and the Nyasanero deposit.

Gallery held the Buckreef/Rwamagaza and the Kitongo deposits. The company was engaged in a feasibility study of the Buckreef project. If the study were to yield favorable results, Gallery planned to start construction of open pit mines at Buckreef and Busolwa and an underground mine at Buckreef in the third quarter of 2006. Production was expected to start in mid-2007; the mines were expected to produce nearly 4,400 kg/yr of gold. Resources at Buckreef amounted to nearly 58 t of contained gold (Gallery Gold Ltd., 2005). In December 2005, Gallery's board of directors approved a bid by Iamgold Corp. of Canada to purchase the company.

In 2005, Shanta Gold Ltd. focused its exploration work at the Singida project in central Tanzania. The company relinquished 13 of the 24 prospecting licenses that it held in the Singida area. Shanta also explored for gold at the Katario and the Simba Nguru projects; exploration was terminated at the Ikungu and the Suguti projects in the Musoma greenstone belt because of a lack of substantial gold occurrences. Shanta planned to spend \$8 million on exploration at Singida in 2006. The company planned drilling to establish open pit resources at the Mgusu deposit before beginning the Singida exploration program. Resources at Mgusu were estimated to be 6.2 Mt at a grade of 3.7 g/t gold (Shanta Gold Ltd., 2006, p. 6-9).

Tan Range Exploration Corp. of the United States held 141 prospecting licenses in the Lake Victoria goldfield in 2005. The company engaged in exploration for gold at its Kibara, Luhala, and Shinyanga projects. Tan Range also had joint-venture agreements with MDN for the Biharamulu and the Tulawaka projects; MDN explored for gold at a property near the Tulawaka Mine in 2005. Barrick returned the Itetemia and the Katente properties to Tan Range in 2005 because of the incompatibility of their ores with the processing plant at the Bulyanhulu Mine (Tan Range Exploration Corp., 2005, p. 5, 8-9).

In 2005, Sub-Sahara Resources explored for gold at its Lake Victoria project with its joint-venture partner Currie Rose Resources of Canada. Randgold Resources Ltd. of the Channel Islands explored at its properties in the Mara and the Musoma greenstone belts. The company was granted an exploration permit for the Buhemba South property that surrounded the Buhemba Mine (African Mining, 2005a, b). African Eagle explored at Miyabi to increase resources. Midlands Minerals Corp. of Canada explored for gold at its Itilima property in the Lake Victoria goldfield. Lakota Resources Inc. of Canada explored at its Kunga, Simba, and Tanuk projects.

Gold was also produced by small-scale and artisanal miners. In December 2005, Mwananchi Gold Company Ltd. of Tanzania inaugurated the country's first gold refinery in Dar es Salaam.

The company planned to purchase gold from small-scale and artisanal miners and to add value to Tanzania's gold exports (Kisembo, 2005).

Iron and Steel.—National production of rolled steel was 47,652 t in 2005 compared with 40,029 t in 2004 and 11,182 t in 2000. Aluminium Africa Ltd. (ALAF) produced nearly 45,000 t of cold-rolled steel, most of which was consumed in the company's galvanizing plant. The company also exported about 12,000 t to Uganda. Domestic demand for galvanized steel roofing sheets amounted to about 50,000 t in 2005; ALAF supplied nearly 27,000 t to the Tanzanian market and exported about 3,000 t to Angola, Burundi, Congo (Kinshasa), Rwanda, Uganda, and Zambia. MM Integrated Steel Mills Ltd. remelted scrap steel for use in its rolling mill; the company produced steel bars and pipes (Mabati News, 2005; Bank of Tanzania, 2006a, p. 38).

Platinum-Group Metals.—Goldstream Mining NL explored for platinum group metals (PGM) at the Mibango project near Lake Tanganyika and at the Luwumbu project near Lake Malawi. Goldstream's joint-venture partner Lonmin plc of the United Kingdom planned to spend \$2.4 million on exploration at Mibango in the 2005-06 field season; exploration was expected to focus on PGM-rich nickel sulfides. Lonmin also planned to spend \$850,000 at the Luwumbu project (Goldstream Mining NL, 2005, p. 6, 10, 15).

Sub-Sahara Resources and Canyon Resources Ltd. of Tanzania explored at the Western Areas Joint Venture project in 2005. Through this project, the companies would prospect for copper, nickel, PGM, and uranium on properties that covered 16,000 square kilometers in western Tanzania (African Mining, 2005a).

Silver.—Tanzania produced silver as a coproduct of gold mining and refining. Domestic output of silver decreased to 12,891 kg in 2005 from 13,216 kg in 2004 (table 1). The Bulyanhulu Mine produced concentrates that contained copper, gold, and silver; the recovery rate for silver was 65%. Contained silver resources at Bulyanhulu were estimated to be about 310 t, of which nearly 260 t was reserves (Barrick Gold Corp., 2006a, p. 129).

Coeur d'Alene Mines Corp. of the United States was awarded 10 prospecting licenses for gold and silver in the Lake Victoria goldfield in 2004; the company acquired the Sargurwa property, which is located to the northwest of its Geita 2 property. Preliminary exploration work started in 2005; the company planned to spend about \$800,000 on exploration in 2006 (Coeur d'Alene Mines Corp., 2006, p. 32).

Industrial Minerals

Cement.—In 2005, Tanzania's cement production increased to nearly 1.38 Mt from 1.28 Mt in 2004 and 833,000 t in 2000 because of demand from gold mine development, infrastructure works, and large construction projects. National cement capacity amounted to about 1.42 million metric tons per year (Mt/yr). Tanzania's three cement producers were Mbeya Cement Co. Ltd., Tanga Cement Co. Ltd., and Tanzanian Portland Cement Co. Ltd.; these companies used gypsum mined at Makanya in the Mwanga District as raw material (Bank of Tanzania, 2006a, p. 38).

Diamond.—In 2005, national diamond production declined to 219,600 carats from 303,920 carats and 354,400 carats in 2000. Diamond exports declined to \$19.7 million in 2005 from \$26 million in 2004. The Williamson Mine, which was operated by DeBeers Group, accounted for the majority of Tanzania's diamond production. Artisanal miners mined alluvial deposits near the Williamson Mine (Bank of Tanzania, 2006a, p. 41; 2006b, p. 20).

Diamond recovery at the Williamson Mine decreased to 190,384 carats in 2005 from 285,778 carats in 2004. The grade of ore processed declined to 5.6 carats per 100 metric tons in 2005 from 8.4 carats per 100 metric tons in 2004. In June 2005, DeBeers approved a prefeasibility study on building a new plant that would increase ore treatment capacity to 16 Mt/yr from about 4 Mt/yr. Diamond production was expected to increase to 1 million carats per year. DeBeers planned to complete the study by May 2006 at a cost of \$1.7 million. If the prefeasibility study were to yield favorable results, the company planned to finish a full feasibility study by the end of September 2006. Depending upon favorable results of the full feasibility study, DeBeers planned to complete the new plant by December 2008 (DeBeers Group, 2006, p. 73, 88). The entire output of the mine was exported to the United Kingdom.

In January 2004, El Hillal Minerals Ltd. of Tanzania started pilot mining at Mwadui near the Williamson Mine. From February to December 2005, the company produced 12,875 carats of diamond at a value of \$2.87 million (East African, 2006).

Tan Range Exploration Corp. discovered 11 kimberlites on its properties in 2005 that included the Igunga project south of the Williamson Mine and the Nzega project southeast of the Buzwagi gold deposit. The company also explored for diamond at the Mwadui project near the Williamson Mine (Tan Range Exploration Corp., 2005, p. 5). Midlands Minerals Corp. of Canada explored for diamond at its Itilima property in the Lake Victoria goldfield.

Gemstones.—Tanzania produced a variety of gemstones that included amethyst, aquamarine, cordierite, emerald, garnet, ruby, sapphire, spinel, tanzanite, and tourmaline. In 2005, the total production of gemstones was nearly 1,940,000 kg compared with 1,610,000 kg in 2004 and 150,000 kg in 2000.

Merelani, which is near Arusha, was the world's only source of tanzanite. In Blocks B and D of the Merelani deposit, artisanal and small-scale miners accounted for most of the country's tanzanite production. Tanzanite Africa Ltd. operated a larger-scale mine in the Block D Extension. Kilimanjaro Mines Ltd. mined tanzanite in Block A. Tanzanite prices increased sharply in 2004 and 2005 because of decreases in production. The increasing depths of tanzanite mines led to higher production costs and a need for greater investment in equipment. Lower grades of tanzanite exacerbated these problems. By mid-2005, production shut down at 180 of the 430 plots in Blocks B and D because of a lack of funds (Kondo, 2005).

TanzaniteOne Ltd. of South Africa held the rights to mine for tanzanite in Block C; the company cut high-quality tanzanite at its lapidaries in South Africa and Tanzania. In 2005, TanzaniteOne produced 280 kg of rough tanzanite. Ore grades were 55 carats per metric ton in 2005 compared with 49 carats per metric ton in 2004; the volume of ore processed

also increased. TanzaniteOne started exploration for tanzanite at greater depths on Block C and on adjacent properties in 2005. Resources in Block C were estimated to be between 12,600 kg and 16,600 kg of tanzanite contained in between 950,000 t and 1.26 Mt of ore. In August 2005, TanzaniteOne approved Color Jewels Inc., K.L. Tambi & Co., Rare Multicolor Gems Inc., STS Jewels Inc., Tanzanite International, and Tanzanite Company as sightholders, which are preferred customers (TanzaniteOne Ltd., 2004; 2006, p. 9-11, 22).

India performed about 80% of the world's cutting and polishing of tanzanite. In July 2003, the Tanzanian Government proposed a ban on the export of all rough tanzanite by 2005. This proposal was designed to encourage the growth of the Tanzanian lapidary industry. At the end of 2005, the Government had not taken action on the proposed ban (TanzaniteOne Ltd., 2004; Ihucha, 2006).

Tsavorite, which is a green grossular garnet that obtains its color from trace amounts of chromium and vanadium, was mined from alluvial and primary deposits at Lemshuko. Mechanized mining operations were under development in late 2005. Rhodolite garnet was produced from mines located a few km south of Lemshuko and in the Umba Valley. Almandine garnet was also produced in the Umba Valley; large-scale mining operations were reportedly planned for the near future (Austin and others, 2005; Henricus, 2005).

Ruby production increased at the Losongonoi Mines, which are located southeast of Arusha; foreign and local investors started large-scale mining there for the first time. In the Umba Valley, the production of ruby, sapphire, and other gemstones declined because of the depth of the mines and the lack of modern mining equipment. The production of ruby, sapphire, and other gemstones declined in the Tunduru District in the Ruvuma Region because of the depletion of alluvial deposits. Mechanized ruby and sapphire mining was carried out by Tansta Mining Co. and World Gem Supplies Ltd. in the Songea District in the Ruvuma Region; artisanal miners also worked at these deposits. Ruby was also produced at the Longido Mine in the Monduli District and at the Naende Mines in the Rukwa Region (Austin and others, 2005).

Artisanal and small-scale miners produced alexandrite and emerald sporadically at the Manghola and the Manyara deposits in the Manyara District. The Manghola deposit was alluvial. In January 2005, the Government issued 10 mining licenses for Manghola. By mid-2005, Paradiso Minerals (T) Ltd. was setting up a mechanized mining operation. Production was inhibited by the remoteness of the deposits. Alexandrite was also produced in the Tunduru District, and emerald, in the Sumbawanga District (Kondo, 2005).

Aquamarine was mined at Kalunga in the Nkasi District; moonstone, in the Dodoma and Morogoro Regions; spinel, in the Mahenge Region in south-central Tanzania and at in the Tunduru District; and tourmaline, at the Manghola deposit and in the Umba Valley.

Mineral Fuels

Coal.—The Kiriwa coalfield produced a small amount of bituminous coal, most of which was consumed at a powerplant

near the mine. Bituminous coal deposits in the Ruhuhu coalfield included the Ketewaka, the Mbalawala, the Mbuyura, and the Mchuchuma; other bituminous coalfields included the Gahula and the Njuga.

The state-owned National Development Corp. (NDC) formed a joint venture with Grinaker-LTA and Siemens Ltd. to develop the Mchuchuma coal deposit, which had estimated resources of 585 Mt. NDC planned to build a surface mine with a capacity of 1.5 Mt/yr and a coal-fired powerplant with a capacity of 400 megawatts (MW). The cost for the project was estimated to be \$600 million; development depended upon Government approval of the project verification documents submitted in March 2004. The Government had not approved the documents at the end of 2005. In 2005, the state-owned utility Tanzania Electric Supply Company Ltd. (TANESCO) decided to postpone competitive bidding on the development of the new power station because of the availability of natural gas from Songo Songo Island (Mwamunyange, 2006).

Natural Gas.—In July 2004, EastCoast Energy Corp. started the production of natural gas from Songo Songo Island. In 2005, the company increased production to 408 million cubic meters of natural gas from 119 million cubic meters in 2004. The Ubungo power station in Dar es Salaam consumed 292 million cubic meters of Songo Songo's production, and the Wazo Hill cement plant operated by TPCC, 45 million cubic meters. Industrial consumers that included ALAF and Kioo Ltd. accounted for 22 million cubic meters. Reserves were estimated to be 16 billion cubic meters at the end of 2005 (EastCoast Energy Corp., 2006, p. 2-3, 7).

TANESCO planned to build new gas-fired powerplants to meet increased demand for natural gas. Demand was expected to increase by 440 million cubic meters per year by 2008 and 890 million cubic meters per year by 2010. By the end of May 2006, a study on increasing the capacity of EastCoast's gas-processing plant to more than 1.2 billion cubic meters per year from 720 million cubic meters per year was expected to be completed. Production would be limited by the capacity of the pipeline to about 1.1 billion cubic meters per year. EastCoast also planned to drill at least one well on the Songo Songo West property in 2006 or 2007 and to make a decision on whether to drill a well on the Nyuni A property by September 2006 (EastCoast Energy, 2006, p. 3, 5, 16).

In December 2005, Artumas Group Inc. of Canada received an environmental impact assessment certificate from the Government for development of the Mtwara energy project. This project involved the development of natural gas resources in Mnazi Bay, which is located in southeastern Tanzania. Artumas planned to complete a gas-processing plant with a capacity of about 100 million cubic feet per year and a 27-km pipeline in the second quarter of 2006 and a 12-MW powerplant at Mtwara in the third quarter of 2006. In the second half of 2006, the company planned to begin the expansion of the Mtwara plant to 24 MW and to upgrade the local power transmission and distribution system. Mnazi Bay had estimated reserves of 31 billion cubic meters (Artumas Group Inc., 2006, p. 3, 10).

Petroleum.—Tanzania's only refinery was shut down in 2000 because of its outdated technology and high transportation costs; the country has since depended on imported petroleum

products to meet its petroleum requirements. In October 2005, Aminex plc of the United Kingdom signed a production-sharing agreement with the Government for an area in the Ruvuma Basin in southern Tanzania. Energulf Resources Inc. of Canada signed an agreement with JEBCO Seismic Ltd. of the United Kingdom to explore at the Tanga Block (Aminex plc, 2005; Energulf Resources Inc., 2005). Petrobras Group of Brazil held Block 5 in the Mafia Basin; the company won the concession for Block 6 in May 2005. Ophir Energy Company Ltd. of South Africa won the concession for Block 1 in May; the company signed a production-sharing agreement with the Government for Block 1 in October. Maurel et Prom of France also held an exploration license.

Uranium.—In August 2005, Goldstream announced plans to form Uranex NL to hold its uranium exploration assets. Goldstream planned to make an initial public offering of 50% of the shares in Uranex and would retain the remaining 50% of the shares. Uranex planned to spend \$2.4 million during a period of 2 years on exploration at its properties in Tanzania. Expenditures at Bahi in central Tanzania were expected to be about \$960,000; at Mkuju in the southern part of the country, about \$600,000; at Ambussel in the northeast, about \$360,000; and at other areas of the country, \$480,000 (Goldstream Mining NL, 2005, p. 4, 29-31, 34).

Infrastructure

TANESCO had powerplants with a combined capacity of 851 MW in its grid network, of which 561 MW was hydroelectric and 290 MW was thermal. Hydroelectric power stations included Kidatu, with a capacity of 204 MW; Kihansi, 180 MW; Mtera, 80 MW; Pangani Falls, 68 MW; Hale, 21 MW; and others, 8 MW. The Ubungo thermal plant had a capacity of 190 MW and, Tegeta, 100 MW. The Tegeta plant, which used heavy fuel oil, was owned and operated by Independent Power Tanzania Ltd.; the Government planned to convert Tegeta to a gas-fired plant. By December 2005, low rainfall reduced the effective capacity at Kidatu and Mtera to 100 MW and 30 MW, respectively (EastCoast Energy Corp., 2006, p. 20). In addition to the plants in the grid network, isolated mini-hydroelectric generators supplied small amounts of output; isolated diesel generators supplied power to gold mines.

TANESCO planned several new projects to alleviate shortfalls in hydropower supply and to meet expected increases in demand. The company planned to install a gas-fired plant with a capacity of 200 MW in Dar es Salaam by the end of 2006. The Mtwara plant was expected to replace diesel-fired plants at Lindi, Masasi, and Mtwara in 2006. An expansion of the Tegeta plant's capacity by 45 MW was planned for January 2007. TANESCO also planned to build a new gas-fired plant at Kinyerzi in Dar es Salaam with a capacity of 250 MW by 2010 (Artumas Group Inc., 2006, p. 10; EastCoast Energy Corp., 2006, p. 20-21).

Outlook

Tanzania's mineral industry, particularly gold mining, is likely to grow in the near future. With increased production

from the Geita Mine and the development of such projects as Buckreef, Tanzania's gold production could rise to about 59 t in 2007 followed by a slight decrease to 58 t in 2009. Diamond production could increase to more than 1 million carats in 2009. Natural gas production is expected to increase. Artisanal tanzanite production is likely to fall because of resource depletion; to what extent increased production by TanzaniteOne will offset the decline is unclear. The development of nickel and PGM resources depends heavily upon world market conditions. The International Monetary Fund (2006, p. 184) predicted that Tanzania's GDP would grow by 5.8% in 2006 and 7% in 2007. If similar rates of growth happen in the construction industry, the production of construction materials, such as brick clay, gypsum, limestone, and sand and gravel, could increase substantially.

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TABLE 1 TANZANIA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity ²		2001	2002	2003	2004	2005
Calcite ^e		40	40	40	40	40
Cement, hydraulic	thousand metric tons	900	1,026	1,186	1,281	1,375
Coal, bituminous		77,789	79,210	54,610	65,041	74,800
Copper, contained in concentrates and doré		2,645	4,222 ^r	3,715 ^r	4,240 ^r	3,462
Diamond ³	carats	254,271	239,761	236,582	303,920	219,600
Gemstones, excluding diamond: ⁴						
Amethyst ^e	kilograms	277 5	270	270	280	340
Aquamarine	do.	454	600 ^e	278	290 ^e	350 ^e
Cordierite (iolite) ^e	do.	312 5	310	310	330	400
Garnet	do.	19,508	13,000 e	5,911	6,200 ^e	7,400 ^e
Ruby	do.	1,174	1,800 e	2,675	2,800 e	3,400 e
Sapphire	do.	3,576	2,400 e	1,338	1,400 e	1,700 e
Tanzanite	do.	5,473	6,461	4,490	3,100 r, e	3,100 e
Other ^e	do.	66,092 5	171,000	1,520,000	1,600,000	1,920,000
Total	do.	96,866	196,000	1,540,000	1,610,000	1,940,000
Gold	do.	30,088	43,320	48,018	48,178 ^r	52,236
Gypsum and anhydrite, crude		72,000	73,000	33,232	59,231 ^r	63,377
Natural gas	million cubic meters				119	408
Phosphate minerals:						
Apatite		4,000	1,182	3,738	6,570	7,096
P ₂ O ₅ content		1,200	350	1,100	1,300 ^r	1,300
Salt, all types		65,000	71,200	58,978	57,062 ^r	135,410
Silver, contained in concentrates and doré	kilograms	6,861	7,669	7,986	13,216 ^r	12,891
Steel, semimanufactured		16,340	25,418	38,794 ^r	40,029	47,652
Stone, sand, and gravel:						
Aggregates		NA	20,223	107,960	120,000 e	140,000 ^e
Dolomite		NA	NA	2,197	2,500 e	2,900 e
Limestone, crushed		2,269,359	2,856,711	1,206,000	1,390,900	2,780,000
Pozzolanic materials		41,468	52,000	105,910	152,679	163,499
Sand		NA	503,485	2,035,960	2,400,000 e	2,800,000 e

^eEstimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. ^rRevised. NA Not available. -- Zero.

¹Table includes data available through October 24, 2006.

²In addition to the commodities listed, modest quantities of lime, silica sand, and crude construction materials, including brick clay, are produced, but available information is inadequate to make estimates of output.

³Diamond figures are estimated to represent 85% gem-quality or semigem-quality and 15% industrial-quality stones. Does not include smuggled artisanal production.

⁴Other precious and semiprecious stones produced include alexandrite, chrysoprase, emerald, kyanite, moonstone, opal, peridot, quartz, spinel, and tourmaline. Does not include smuggled artisanal production.

⁵Reported figure.

${\bf TABLE~2}$ ${\bf TANZANIA:~STRUCTURE~OF~THE~MINERAL~INDUSTRY~IN~2005}$

(Metric tons unless otherwise specified)

Con	nmodity	Major operating companies	Location of main facilities	Annual capacity
Cement	imounty	Tanzania Portland Cement Co. Ltd.	Plant at Wazo Hill	670,000 cement;
Cement		(HeidelbergCement AG, 69.3%)	Tiant at wazo iini	510,000 clinker.
Do.		Tanga Cement Co. Ltd. (Holcim South Africa	Plant at Tanga	500,000 cement;
D0.		(Pty) Ltd., 62.5%)	Flant at Tanga	500,000 cellent, 500,000 clinker.
Do.		Mbeya Cement Co. Ltd. (LaFarge Group,	Plant at Mbeya	250,000 cment;
D0.		58%).	Flant at Mbeya	250,000 cement; 250,000 clinker.
Coal hituminaus		Tanzania-China Kiwira Coal and Power	Kiwira Mine	
Coal, bituminous		(Hunan International Economic and	Kiwira Mille	150,000 run of mine; 93,000 washed.
		Technical Cooperation Co., 62%,		93,000 washed.
		and Government, 38%)		
C			Dulanda Minana Wahana	5 200
Copper, in concentrate and doré	es	Kahama Mining Corp. Ltd. (Barrick Gold	Bulyanhulu Mine near Kahama	5,300.
		Corp., 100%).	Myyadyi Mina naan Shinyanga	4 000 000 are processing
Diamond		Williamson Diamonds Ltd. (DeBeers Group, 75%, and Government, 25%)	Mwadui Mine near Shinyanga	4,000,000 ore processing.
Do.	carats	do.	do.	250,000 diamond.
Do.	do.	El Hillal Minerals Ltd.	Near Mwadui Mine	24,000. ^e
Glass		Kioo Ltd.	Dar es Salaam	36,000.
Gold		Geita Gold Mining Ltd. (AngloGold Ashanti	Geita Mine near Nyakabale	6,000,000 ore processing.
		Ltd., 100%)		
Do.	kilograms	do.	do.	25,200 gold.
Do.		Kahama Mining Corp. Ltd.	Bulyanhulu Mine near Kahama	1,095,000 ore processing.
Do.	kilograms	do.	do.	14,100 gold.
Do.		Placer Dome Gold Inc.	North Mara Mine in Tarime District	2,800,000 ore processing.
Do.	kilograms	do.	do.	9,800 gold.
Do.	-	Resolute Mining Ltd.	Golden Pride Mine near Isanga	2,600,000 ore processing.
Do.	kilograms	do.	do.	4,200 gold.
Do.		Meremeta Ltd. (Government of Tanzania)	Buhemba Mine, 47 km southeast	1,200,000 ore processing.
			of Musoma	
Do.	kilograms	do.	do.	3,300 gold.
Do.		Barrick Gold Corp., 70%, and Exploration Minières du Nord Ltée, 30%	Tulawaka Mine	365,000 ore processing.
Do.	kilograms	do.	do.	4,400 gold.
Lime		Athi River Mining Ltd.	Plant at Tanga	40,000.
Natural gas	million cubic meters	EastCoast Energy Corp.	Gasfield on Songo Songo Island	720.
Petroleum products ¹	thousand 42-gallon	Tanzanian and Italian Petoleum Refining Co.	Refinery at Dar es Salaam	5,440.
Totaloream products	barrels	Ltd.		
Phosphate rock		Minjingu Phosphate Co. Ltd.	Mine at Minjingu	30,000.
Silver	kilograms	Kahama Mining Corp. Ltd.	Bulyanhulu Mine near Kahama	11,000.
Steel	<u>U</u>	Aluminum Africa Ltd.	Plant at Dar es Salaam	45,000. ^e
Do.		SITA Rollings Ltd.	do.	14,000 rolled.
Do.		MM Integrated Steel Mills Ltd.	do.	2,000 rolled.
Do.		Aluminum Africa Ltd.	do.	40,000 galvanized.
Do.		MM Integrated Steel Mills Ltd.	do.	36,000 galvanized.
Tanzanite		TanzaniteOne Ltd.	Mine at Merelani, Block C ²	120,000 garvanized.
Do.	kilograms	do.	do.	1,600 tanzanite.
Do.	do.	Tanzanite Africa Ltd. (IPP Media Ltd.)	Mine at Merelani, Block D Extension	NA.
Do.	do.	Kilimanjaro Mines Ltd.	Mine at Merelani, Block D Extension Mine at Merelani, Block A	NA.
Do.	do.	Small-scale and artisanal miners	Mines at Merelani, Blocks B and D	NA.
<u>D</u> U.	do.	Sman-scare and arusanal lilliers	ivinies at iviciciani, blocks b and b	11/1.

^eEstimated; estimated data are rounded to no more than three significant digits. NA Not available.

¹Shut down in 2000.

 $^{^2 \}mbox{Formerly}$ the graphite processing plant at Merelani operated by Phoenix Minerals Ltd.

TABLE 3
TANZANIA: GOLD RESOURCES AND RESERVES IN 2005

		Grade			
Project	Major operating companies	Tonnage (million metric tons)	(grams per metric ton)	Contained gold (metric tons)	
Reserves:	V 1 C 1		,		
Bulyanhulu ¹	Kahama Mining Corp. Ltd. (Barrick Gold Corp., 100%)	25.9	12.9	334	
Geita ²	Geita Gold Mining Ltd. (AngloGold Ashanti Ltd., 100%)	62.4	4.2	264	
North Mara ²	Placer Dome Gold Inc.	38.2	3.5	134	
Buzwagi ^{1, 3}	Kahama Mining Corp. Ltd.	39.2	1.9	74	
Golden Pride ²	Resolute Mining Ltd.	12.3	1.6	20	
Tulawaka ¹	Barrick Gold Corp., 70%, and Exploration Minières du Nord Ltée, 30%	1.4	12.1	17	
Total		179.4	4.7	843	
Resources:					
Geita	Geita Gold Mines	96.2	4.3 4	414	
Bulyanhulu	Kahama Mining Corp. Ltd.	29.7	13.1 4	408	
North Mara	Placer Dome Gold Inc.	50.2	3.3	166	
Buzwagi ³	do.	58.0	1.7	100	
Golden Ridge	Kahama Mining Corp. Ltd.	49.0	1.4	68	
Buckreef/Rwamagaza:	Gallery Gold Ltd.	27.1	2.1	58	
Golden Pride	Resolute Mining Ltd.	28.8	1.8	52	
Buhemba	Meremeta Ltd. (Government of Tanzania)	11.4	2.0	23	
Mgusu	Shanta Gold Ltd.	6.2	3.7	23	
Nyakafuru	Gallery Gold Ltd.	3.6	6.3	23	
Tulawaka	Barrick Gold Corp., 70%, and Exploration Minières du Nord Ltée, 30%	1.5	11.2	17	
Kitongo:		_			
Main Zone	Gallery Gold Ltd.	10.5	1.4	15	
Isegenghe Hill	do.	0.2	14.4	2	
Miyabi	African Eagle Resources plc	8.3	1.5	13	
Kisunge Hill	Tan Range Exploration Corp.	9.4	1.0	9	
Ikungu	Lakota Resources Inc.	2.5	2.3	6	
Total		393	3.6	1,397	

¹Definitions of resources and reserves are based on National Instrument 43-101, as required by Canadian securities regulatory authorities.

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²Definitions of resources and reserves are based on the Australasian Code for the Reporting of Identified Mineral Resources and Ore Reserves issued by the Joint Committee for the Australasian Institute of Geoscientists and the Australian Mining Industry Council.

³Formerly known as Chocolate Reef.

⁴Note that, in most cases, the grade of resources is lower than the grade for reserves, but in this case, the grade of the less economic material is higher, leading to the paradox of a higher resource grade.