



# 2011 Minerals Yearbook

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## UGANDA

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# THE MINERAL INDUSTRY OF UGANDA

By Harold R. Newman

Uganda's geology could possibly host diverse mineral resources. The Riff Valley, which is located within the African Plate, contains a wide variety of minerals, as evidenced by past mining records and the numerous mineral occurrences. Interest in the country's potential for mineral development has been increasing since the Government began revising its mining and investment laws.

The Ministry of Energy and Mineral Development provides policy guidance for the development and exploitation of the country's energy and mineral resources and consists of four departments—the Energy Resources Department, the Geological Survey and Mines Department, the Petroleum Exploration and Production Department, and the Petroleum Supply Department. The Geological Survey and Mines Department collects, collates, processes, analyzes, archives, and disseminates geoscience data; monitors operators, and enforces regulations in the mineral sector to ensure that the resources are developed, exploited, and used in a sustainable way (Department of Geological Survey and Mines of Uganda, 2011).

## Minerals in the National Economy

Uganda's reported metallic and nonmetallic mineral resources consisted of more than 50 mineral commodities. The country had many areas that were thought to have potential for the occurrence of minerals but that have remained relatively unexplored. The existence of more minerals may become known after the completion of the ongoing airborne geophysical surveys covering about 80% of Uganda's land surface. The surveys were being conducted along lines spaced at between 200 meters (m) and 500 m at a constant height of 80 m (Ssonko, 2011).

Uganda is endowed with favorable geologic conditions associated with a diverse mineral resource base. Notable mineral resources included bismuth, clay, columbite (tantallite), copper, gold, iron ore, mica, petroleum, salt, uranium, and vermiculite. Mining opportunities were considered by the Government to exist in industrial minerals and metallic minerals. Also, possible value-added opportunities could exist in gemstone cutting and polishing, and jewelry manufacturing utilizing locally produced gemstones and gold (Mutende, 2011).

## Production

In the past, Uganda has produced cobalt, gold, iron ore, lead, niobium (columbium), steel, tantalum, tin, and tungsten as well as such industrial minerals as beryl, gypsum, kaolin and other clays, lime, salt, soapstone, and vermiculite, and such building materials as cement, limestone, and pozzolanic materials. Output of hydraulic cement increased by 24% in 2011. Production of other mineral commodities was based on estimates except as noted. Production and export of Uganda's mineral commodities were dependent upon the world economy

and market conditions. The country was not a globally significant producer or consumer of mineral commodities in 2011. Data on mineral production are in table 1.

## Structure of the Mineral Industry

Most of Uganda's mining and mineral processing facilities were privately owned, including the cement and steel plants, cobalt and lead refineries, and the vermiculite mine. The Government held a 25% share in the cobalt refinery. Artisanal miners produced salt at Lake Katwe. Table 2 is a list of major mineral industry facilities in Uganda.

## Commodity Review

### Metals

**Cobalt and Copper.**—Kasese Cobalt Company Ltd. (KCCL) (Blue Earth Refineries Ltd., 75%) produced refined cobalt from a stockpile near Kasese using a bacterial leaching and solvent extraction/electrowinning process. Production was decreasing, and the stockpile was expected to be depleted in 2013 (Kasese Cobalt Company Ltd., 2011).

**Iron and Steel.**—Alam Group announced that it would construct a \$13 million iron ore smelter for its subsidiary Uganda Steel Rolling Mills Ltd. in the Jinja district. The plant's initial production would be 150 metric tons per day (t/d) of sponge iron. This amount would be doubled to 300 t/d of sponge iron in a second phase. The entire project was planned to be completed by yearend 2012. Initially, the plant would use hematite ore, which was readily available from the Kigezi region in southwestern Uganda. Later, magnetite ore would be used from other parts of the country. Uganda Steel Rolling Mills would use coal imported from South Africa as an energy source to smelt the ores; however, the company stated that it would substitute natural gas for coal to ease production costs when the country starts production of natural gas in the next couple of years (Bariyo, 2011a).

### Industrial Minerals

**Cement.**—Uganda's cement production increased to 1.66 million metric tons (Mt) in 2011 from 1.35 Mt in 2010. Hima Cement Ltd. completed the expansion of its capacity to 850,000 metric tons per year (t/yr) from 350,000 t/yr. Tororo Cement Ltd. accounted for a substantial majority of national cement production; the company was planning to increase its capacity to 2.2 million metric tons per year (Mt/yr) from 1 Mt/yr (International Cement Review, 2011; Uganda Bureau of Statistics, 2012, p. 51).

Residential construction was a source of an estimated 69% of cement demand, and commercial and infrastructure construction, about 31%. Cement prices in Uganda, which is a

landlocked country, were nearly \$200 per metric ton compared with \$120 per metric ton in Kenya and \$130 per metric ton in Tanzania (Renaissance Capital LLC, 2011, p. 1, 9, 34).

**Vermiculite.**—In May 2011, Gulf Industrials Ltd. of Australia restarted vermiculite production at the Namekara Mine. Gulf Industrials planned to increase the capacity at Namekara to 30,000 t/yr from 15,000 t/yr by mid-2012; the company was also considering a further capacity increase to 100,000 t/yr by mid-2015. The Joint Ore Reserves Committee (JORC)-compliant inferred resources at Namekara were estimated to be 55 Mt of contained vermiculite. The Namekara Mine is located in eastern Uganda near Tororo, which is close to the Kenyan border (Gulf Industrials Ltd., 2011, p. 1–2).

Gulf Industries announced that it had increased the size of its mining lease, along with adding additional exploration licenses, at the Namekara Mine as part of its plan to realize the potential of the project. The expanded mining lease covered an area of 19.5 square kilometers and included an old phosphate mine (closed) and additional phosphate and vermiculite areas of mineralization. Gulf Industries produced large-, medium-, and fine-grained vermiculite; it was a significant producer in 2011 when supply was tight and demand was high (Elliot, 2011).

### *Mineral Fuels and Other Sources of Energy*

**Geothermal Energy.**—The Government believed that the country's rampant power shortages could be lessened by exploiting the 450 megawatts of geothermal capacity that was estimated to exist in the country. Geothermal energy was a high-priority alternative to hydropower; however, development of wells was a high-risk and very expensive venture. Government studies were focused on three geothermal prospects—the Buranga, the Katwe, and the Kibiro—because their volcanic and tectonic features are indicators of their heat sources and permeability. The Government had licensed two areas for geothermal development to private sector firms—Cozumel Energy Ltd. in Katwe and Gids Consult in Bulanga (Nantaba, 2012).

**Natural Gas and Petroleum.**—A total of 71 petroleum wells had been drilled in the Lake Albert Rift since 2006, and only three did not encounter any evidence of hydrocarbon occurrence. The average cost, including seismic surveys and exploratory and appraisal drilling, to find commercial petroleum reserves in Uganda was about \$1 per barrel compared with the average cost worldwide of from \$5 to \$25 per barrel. Less than 40% of the Lake Albert Rift that was thought to have the potential for natural gas and petroleum had been exploited (Kasita, 2012).

The Government rescinded the resolution that blocked Tullow Oil plc of the United Kingdom's \$2.9 billion sale of some of its assets to China National Offshore Oil Co. (CNOOC) and Total S.A. of France. This included three exploration blocks in the Lake Albert Rift basin that were identified as Block 1 (Total), Block 2 (Tullow), and Block 3A (CNOOC). The Government also restored two of Tullow's licenses in the Lake Albert Rift basin that had been withdrawn at the height of the dispute. The Government had declined to endorse the purchases by CNOOC and Total because of a tax dispute concerning Tullow's

\$1.45 billion purchase of some of its former partner's natural gas and petroleum interests in Uganda (Bariyo, 2011b).

Tullow announced that the Tweneboa-4 appraisal well in the Deepwater Tano license had successfully encountered gas condensate in a sandstone reservoir. The Tweneboa-4 well, which is located 3.9 kilometers (km) southwest of the Tweneboa-2 appraisal well, was drilled to 4,007 meters in the western flank of the sandstone reservoir by the *Deepwater Millennium* drill ship to complete the appraisal of the Tweneboa gas-condensate discovery. The four wells were the start of a program involving exploration and appraisal drilling, seismic acquisition, and well testing to access the potential in the basin and expand the resource base (Alexander's Gas & Oil Connections, 2011).

The Government announced plans to build a new 120,000-barrel-per-day (bbl/d) refinery at Hoima in western Uganda to meet local demand for petroleum products as opposed to constructing a crude oil export pipeline. The refinery, which would have an initial capacity of 20,000 bbl/d, would cost an estimated \$2 billion to build. It would be developed in stages and would reach 120,000 bbl/d of capacity by 2016. The crude oil in the Albertine Graben has a high wax content, which means that a 1,300-km-long transportation pipeline to Mombasa for the export of the crude oil would require installation of one of the longest heated pipelines in the world; it would be very expensive to build and maintain. The refinery was expected to generate about \$2.6 billion per year as opposed to a pipeline that would generate about \$1.4 billion per year (Kisambira, 2011).

### **Outlook**

Uganda's mineral industry could expand significantly in the near future. The country's mineral resources and recent discovery of petroleum are likely to attract investment in the medium term. Cement and vermiculite production are also likely to increase; cement consumption is expected to double by 2017, and vermiculite demand is also expected to increase. Natural gas and petroleum production will likely start. The continuation of cobalt production beyond 2013 depends on KCCL securing new sources of ore and (or) tailings.

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TABLE 1  
UGANDA: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons unless otherwise specified)

Commodity <sup>2</sup>	2007	2008 <sup>c</sup>	2009	2010	2011 <sup>e</sup>
Aggregate, syenitic	8,994	11,000	14,027	14,338	9,765 <sup>3</sup>
Beryllium, mine output, Be content	2	-- <sup>3</sup>	--	--	--
Cement, hydraulic	995,807	1,193,361 <sup>3</sup>	1,162,241	1,347,327	1,666,235 <sup>3</sup>
Clay:					
Kaolin	8,152	3,738 <sup>3</sup>	4,721	27,237	20,883 <sup>3</sup>
Other <sup>c</sup>	50,000	50,000	50,000	50,000	50,000
Cobalt, refined	698	663 <sup>3</sup>	673	624 <sup>r</sup>	661 <sup>3</sup>
Gold:					
Mine, placer <sup>4</sup>	kilograms	25	20 <sup>r</sup>	--	--
Refined	do.	--	-- <sup>3</sup>	324 <sup>r</sup>	325
Gypsum	168	84 <sup>3</sup>	--	--	--
Iron ore	366	1,740 <sup>3</sup>	972	3,795	2,134 <sup>3</sup>
Lead, mine output, metal content	38	20	--	--	--
Lime, hydrated and quick <sup>c</sup>	10,000	10,000	10,000	10,000	10,000
Limestone	447,463	520,000	588,945	634,673	932,348 <sup>3</sup>
Niobium (columbium) and tantalum, ore and concentrate:					
Gross weight	kilograms	100	80	50	10
Nb content <sup>c</sup>	do.	14	11	7	1
Ta content <sup>c</sup>	do.	8	7	4	1
Pozzolanic material	280,522	360,000	440,292	446,316	690,911 <sup>3</sup>
Salt <sup>c</sup>	15,000	15,000	15,000	15,000	15,000
Steel <sup>c</sup>	7,000	7,000	7,000	7,000	7,000
Tin, placer	23	40 <sup>3</sup>	--	19	10
Tungsten, mine output, W content	86	48 <sup>3</sup>	9	55 <sup>r</sup>	10 <sup>3</sup>
Vermiculite	3,269	--	--	1,121	7,960 <sup>3</sup>

<sup>c</sup>Estimated; estimated data are rounded to no more than three significant digits. <sup>r</sup>Revised. do. Ditto. -- Zero.

<sup>1</sup>Table includes data available through June 30, 2012.

<sup>2</sup>In addition to the commodities listed, corundum, refined lead, marble, sand and gravel, silica sand, and soapstone are presumably produced, but available information is inadequate to estimate output.

<sup>3</sup>Reported figure.

<sup>4</sup>Does not include smuggled artisanal production.

TABLE 2  
UGANDA: STRUCTURE OF THE MINERAL INDUSTRY IN 2011

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Cement		Tororo Cement Industries Ltd.	Tororo	1,000,000
Do.		Hima Cement Industries Ltd. (Bamburi Cement Ltd., 70%)	Kasese	850,000
Cobalt, refined		Kasese Cobalt Company Ltd. (KCCL) (Blue Earth Refineries Ltd., 75%, and Government, 25%)	do.	1,000
Gold:				
Mine, placer	kilograms	Artisanal miners	Burama Ridge, Isingiro and Ntungamo District	NA
Refined	do.	Victoria Gold Star Ltd.	Kampala	21,000
Lead, refined secondary		Uganda Batteries Ltd.	do.	1,000
Niobium (columbium) and tantalum	kilograms	M/S Technical Support and Services Ltd.	Wampewo	NA
Salt		Artisanal miners	Lake Katwe	15,000 <sup>e</sup>
Soapstone		African Minerals Ltd.	Moroto	NA
Steel: <sup>1</sup>				
Crude		Steel Corp. of East Africa Ltd. (subsidiary of Madhvani Group)	Jinja	50,000 <sup>e</sup>
Do.		Steel Rolling Mills Ltd. (subsidiary of Alam Group Ltd.)	do.	21,000
Billet		Steel Corp. of East Africa Ltd.	do.	50,000
Rolled		do.	do.	30,000
Do.		Steel Rolling Mills Ltd.	do.	40,000
Do.		BM Technical Services Ltd.	Mbarara	20,000
Do.		Sembule Steel Mills Ltd.	Kampala	20,000
Stone, crushed		Hima Cement Industries Ltd.	Kasese district	NA
Do.		Kilembe Mines Ltd.	do.	NA
Do.		Tororo Cement Industries Ltd.	Tororo district	NA
Do.		Zzimwe Construction Ltd.	Mukono district	690,000
Tin		Various artisanal	Burama Ridge, Isingiro and Ntungamo Districts	NA
Tungsten		Krone Uganda Ltd.	Nyamurilo	115
Vermiculite		Gulf Industrials Ltd.	Namekara	15,000

<sup>e</sup>Estimated. Do., do. Ditto. NA Not available.

<sup>1</sup>In addition to its crude, billet, and rolled steel facilities, Uganda has a galvanized steel plant with a capacity of 30,000 metric tons per year.