2017–2018 Minerals Yearbook

MOZAMBIQUE [ADVANCE RELEASE]

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The Mineral Industry of Mozambique

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Note: In this chapter, information for 2017 is followed by information for 2018.

In 2017, Mozambique was estimated to be the world's fourth-ranked producer of ilmenite, accounting for 11% of world production. Mozambique also produced zirconium (zircon concentrates), accounting for 5% of world production. Other mining and mineral-processing operations included those for aluminum, bauxite, beryl, cement, clay, coal, diatomite, gemstones (aquamarine, dumortierite, garnet, ruby, spinel, and tourmaline), gold, graphite, refined lead, natural gas, natural gas condensate, niobium, quartz, rutile, salt, stone (crushed and dimension stone), sand and gravel, and tantalum (Bedinger, 2019a, b).

Minerals in the National Economy

In 2017, Mozambique's gross domestic product (GDP) grew at a rate of 3.7% compared with a growth rate of 3.8% in 2016. The mineral industry, which included the mining sector, accounted for 5.6% of the GDP compared with 4.1% in 2016; the increase was attributed to increased coal production. Total exports were valued at $4.73 billion, of which coal accounted for 36%; aluminum, 22%; natural gas, 8%; ilmenite, rutile, and zircon, a combined total of 4%; and gemstones (emerald, sapphire, and ruby), 2% (Banco de Moçambique, 2018, p. 70–71; 2019a, p. 13, 59; Instituto Nacional de Estatística, 2018, p. 7–8).

Production

In 2017, the production of quartz increased by more than 1,000%; diatomite, by 248%; granite, by 193%; processed bentonite, by 128%; bauxite, by 119%; metallurgical coal, by 100%; bituminous coal, by 84%; tourmaline, by 70%; refined lead, by 53%; aquamarine, by 48%; garnet, by 27%; and niobium concentrate, by 25%. The production of beryl decreased by 71% in 2017; brick clay, by 49%; zircon, by 42%; limestone, by 40%; sand, by 37%; gravel, by 35%; gold, by 17%; natural gas (condensate), by 35%; natural gas (gross volume), by 27%; and titanium (ilmenite), by 11%. Data on mineral production are in table 1.

Structure of the Mineral Industry

The Ministério dos Recursos Minerais e Energia (MIREME) [Ministry of Mineral Resources and Energy] is responsible for the implementation of Government policies regarding geological research, the mining of minerals and energy resources, and the development and expansion of energy infrastructure projects for the supply of electricity, natural gas, and petroleum products. Most of Mozambique's mining and mineral-processing operations were privately owned. The mineral industry also included a number of small-scale and artisanal operations that produced construction materials, gemstones, gold, niobium, and tantalum. Table 2 is a list of the major mineral industry facilities in Mozambique (Ministério dos Recursos Minerais e Energia, 2019).

Commodity Review

Metals

Aluminum.—The Mozal aluminum smelter, which was operated by South32 Ltd. of Australia, was the only aluminum smelter in Mozambique and the second largest aluminum smelter in Africa. In fiscal year 2017 (South32 Ltd.'s fiscal year ended on June 30, 2017), the company produced 271,000 metric tons (t) of aluminum compared with 266,000 t in 2016 (South32 Ltd., 2018, p. 40).

Beryllium.—In 2017, beryl production decreased to 53,200 kilograms (kg) from 180,700 kg in 2016. Beryl occurrences in Mozambique had been identified in Nampula, Tete, and Zambezia Provinces. As of 2017, there was no reliable information regarding beryl mine locations or mining companies in the country (República de Moçambique, 2018, p. 30).

Gold.—In 2017, Xtract Resources Plc (Xtract) of the United Kingdom signed two mining contracts for the development of alluvial gold deposits at the Manica gold project in western Mozambique. The first agreement was signed on June 19, 2017, with Omnia Mining Ltd. (Omnia) and Moz Gold Limitada to mine the western half of the alluvial deposits. The agreement established Omnia as the operator of the project, which had an estimated mine life of 10 years. The second agreement was signed on July 11, 2017, with Sino Minerals Investment Company Ltd. (Sino Minerals) of Uganda. This agreement granted Sino Minerals the exclusive mining rights to the eastern half of the alluvial deposits and required Sino Minerals to have a fully operational processing plant by October 15, 2017. Upon commissioning, the plant was expected to have a processing capacity of about 200 metric tons per hour (t/hr) of ore, and the capacity would be increased to 400 t/hr by January 15, 2018. The agreement was for a period of 10 years or upon depletion of the gold resources, with the option to extend the mining operation for an additional 5 years if the gold resources are not depleted after 10 years (Xtract Resources Plc, 2018, p. 2, 6, 8; 2019b).

Iron Ore and Vanadium.—In November 2017, the Government of Mozambique approved a resolution authorizing Capitol Resources Limitada (a subsidiary of Baobab Resources plc of the United Kingdom) to start mining and processing iron ore in the Chiuta District of Tete Province. The agreement, which was valid for 25 years, included the construction of a steel plant and a thermoelectric plant. Contained iron ore resources, measured by a Joint Ore Resources Committee (JORC)-compliant resource study, were estimated to be 759 million metric tons (Mt) (Campbell, 2017; Folha de Maputo, 2017).

Niobium and Tantalum.—In 2017, artisanal miners produced niobium and tantalum from the Muiane Mine in Zambezia Province. Previously, TAN Mining and Exploration of South Africa had abandoned the mine after equipment and facilities were destroyed during local civil unrest in November 2015 (Deutsche Welle, 2017).

Titanium and Zirconium.—Kenmare Resources plc of Ireland (Kenmare) produced ilmenite, rutile, and zircon at the Moma Mine in Nampula Province. In 2017, the company's ilmenite production increased to 998,200 t from 903,300 t in 2016, and its zircon production (primary and secondary), to 74,000 t from 68,200 t in 2016. The increase in production was attributed to improved recoveries at the mine (Kenmare Resources plc, 2018, p. 25).

In May 2017, Rio Tinto plc and Savannah Resources Plc of the United Kingdom, through its subsidiary AME East Africa Ltd., completed a scoping study at the Jangamo and the Mutamba mineral-sand deposits, collectively known as the Mutamba Heavy Mineral Sands Project (Mutamba project). The Mutamba project is a heavy-mineral deposit that includes the Chilubane, Dongane, Jangamo, and the Ravene deposits. The scoping study evaluated the risks and economics of the project through technical studies that included a drilling program at the Ravene deposit and a JORC-compliant resource estimate, which yielded an inferred mineral resource estimate of 900 Mt at a grade of 4.1% total heavy minerals. A prefeasibility study for the Ravene deposit was expected to be completed in early 2019. Production at the Mutamba project was expected to start in 2020 and to average 456,000 metric tons per year (t/yr) of ilmenite and 118,000 t/yr of nonmagnetic mineral concentrate (rutile and zircon) (Mining Technology, 2018; Savannah Resources Plc, 2018, p. 4, 9, 47).

Pathfinder Minerals Plc (Pathfinder) of the United Kingdom was considering the development of a new mine at the Moebase-Naburi project that could produce 1.24 million metric tons per year (Mt/yr) of ilmenite, 65,000 t/yr of zircon, and 24,000 t/yr of rutile. Resources were estimated to be about 2 billion metric tons (Gt) at grades of 3.32% ilmenite, 0.17% zircon, and 0.062% rutile. At yearend 2017, Pathfinder was engaged in a dispute with Pathfinder Moçambique, S.A. regarding the rights to the Moebase-Naburi project (Pathfinder Minerals Plc, 2011, p. 9, 12; 2018).

Industrial Minerals

Cement.—Cimentos de Portugal, SGPS, SA (Cimpor), which was the leading producer of cement in Mozambique, had five cement plants in the cities of Dondo, Matola, and Nacala with a total capacity of 3.1 Mt/yr. The company planned to complete a new plant at Nacala with a capacity of 1.5 Mt/yr by 2018. At yearend 2017, China International Fund Ltd. was building a plant with a capacity to produce 5,000 metric tons per day of cement in Maputo Province; construction work started in 2012 (International Cement Review, 2017; Global Cement, 2018).

Gemstones.—Ruby production in Mozambique decreased to 1,135 kg from 1,250 kg in 2016. Montepuez Ruby Mining Lda. (MRM) (Gemfields plc of the United Kingdom, 75%, and Mwiriti Lda., 25%) owned the Montepuez ruby deposit in Cabo Delgado Province. In the fiscal year that ended in June 2017, the Montepuez ruby deposit produced 1,760 kg of ruby and corundum compared with 2,060 kg in 2016. The decrease was attributed to a change in the company's extraction and processing strategy, which became focused on processing lower occurrence, higher-grade ore zones (Gemfields plc, 2016, p. 29; 2018, p. 33–34; República de Moçambique, 2018, p. 31).

In 2017, Mustang Resources Ltd. of Australia continued production of ruby from alluvial and colluvial deposits at its Montepuez ruby project, which was located near MRM's mine. The company's first auction was held in October 2017 and included 405,000 carats from which 29,463 carats of rough ruby was sold. At yearend 2017, the company was assessing its options to determine future operational and marketing strategies to improve sales (Oil & Gas 360, 2017; Minen Portal, 2018).

In September 2017, Fura Gems Inc. (Fura) of Canada acquired all the issued and outstanding shares of Cobadale Ltd. of the United Kingdom, which owned an 80% effective interest in four ruby licenses in the Montepuez District of Cabo Delgado Province. Fura started a drilling program in the prospective mineralized zones in October 2017. It was expected that drilling results would be ready in the first quarter of 2018 (Marketwired, 2017).

In 2017, Mozambique's garnet production totaled 159,143 kg compared with 125,078 kg in 2016. In 2017, 33,805 kg of the garnet produced was of gem quality. Tourmaline production was 1,932 kg in 2017 compared with 1,135 kg in 2016, and 46 kg of the tourmaline produced was of gem quality. Other than ruby, nearly all gemstones in Mozambique were mined by artisanal miners (table 1; República de Moçambique, 2018, p. 31).

Graphite.—In November 2017, Syrah Resources Ltd. of Australia (Syrah) achieved its first production of salable flake graphite at the Balama graphite operation in Cabo Delgado Province. Graphite fines were produced in December 2017 and production rampup was expected in the first quarter of 2018. The Balama graphite operation's estimated combined proven and probable reserves were 81.4 Mt at an average total graphitic carbon (TGC) grade of 16.2% and a flake graphite content of 13.2 Mt. The estimated combined measured, indicated, and inferred resources were 1.1 Gt at a TGC grade of 11% and contained an estimated 128.5 Mt of graphite. For 2018, the company was targeting annual graphite concentrate production to be between 160,000 and 180,000 t (Syrah Resources Ltd., 2018, p. 9, 11).

In 2017, GK Ancuabe Graphite Mine SA, which was a subsidiary of Graphit Kropfmühl GmbH of Germany, restarted mining activities at the Ancuabe Mine in Cabo Delgado Province. The Ancuabe Mine, which previously had been in operation from 1994 to 1999, was expected to have an annual capacity of 9,000 t/yr of flake graphite (AMG Advanced Metallurgical Group N.V., 2018, p. 7; Extractive Industries Transparency Initiative, 2018, p. 14).

In 2017, Battery Minerals Ltd. of Australia (formerly Metals of Africa Ltd. of Australia) continued developing the Montepuez graphite project (Montepuez) and the Balama Central graphite project (Balama), both located in Cabo Delgado Province. In February 2017, the company announced that the Montepuez project's total mineral resource was 105.9 Mt at a TGC grade of 7.74% and a cutoff TGC grade of 2.5% TGC.

Mine commissioning of the Montepuez site was expected to take place in the last quarter of 2018, and graphite flake concentrate production was expected to begin in the first quarter of 2019; export rates were expected to be 45,000 to 50,000 t/yr at an average flake concentrate grade of 96.7% TGC. At yearend 2017, the company was awaiting mining license approval by the Government (Battery Minerals Ltd., 2018a, p. i, 10, 15; 2018b, p. 4).

The Balama Central graphite project was located adjacent to the Syrah Resources Balama graphite operation. In 2017, Battery Minerals was completing a drilling program at Balama to convert a portion of the inferred resource of 7.4 Mt at a grade of 11.8% TGC to the indicated category. A feasibility study was expected to be completed by mid-2018 (Battery Minerals Ltd., 2017, p. 1–2).

In December 2017, Triton Minerals Ltd. of Australia (Triton) completed a definitive feasibility study in the Ancuabe graphite project located adjacent to the GK Ancuabe graphite mine. The study revealed a JORC-compliant ore reserve of 24.9 Mt at a grade of 6.2% TGC. Triton was expecting to obtain mining concession permits and environmental and construction approvals in 2018. The company considered Ancuabe to be a high-purity, large-flake graphite deposit and expected production to begin in 2020 (Triton Minerals Ltd., 2019a).

Mineral Fuels

Coal.—Vale S.A. of Brazil operated the Moatize Mine in Tete Province. In 2017, the Moatize Mine produced 7 Mt of metallurgical coal and 4.3 Mt of thermal coal compared with 3.5 Mt and 2 Mt, respectively, in 2016. The increase was attributed to the rampup of a new coal-handling processing plant. In March 2017, Vale S.A. sold 15% of its 95% stake in the Moatize Mine to Mitsui & Co., Ltd. of Japan (Vale S.A., 2018, p. 5, 7, 57).

International Coal Ventures Private Ltd. (ICVL) and Tata Steel Ltd. of India planned to restart mining operations at the Benga Mine, which was adjacent to the Moatize Mine. In 2015, the mining operations at the Benga Mine were suspended owing to the decrease in coal prices. Production had not restarted as of the end of 2017 (Business-Standard, 2017).

In February 2016, the Chirodzi Mine, which was owned by Jindal Steel & Power Ltd. of India, had been placed on care-and-maintenance status because of low demand for coking coal. Mining operations restarted in October 2016. In 2017, the company was gradually ramping up operations at the mine and producing 125,000 metric tons per month of coal (Chandra Prasad, 2016; Jindal Steel Power Ltd., 2016, p. 15; 2017, p. 7).

Natural Gas.—In June 2017, Eni S.p.A. of Italy (Eni) launched the Coral South LNG (liquefied natural gas) implementation phase of its offshore LNG project in Area 4 of the Rovuma basin. The project contained an estimated 450 billion cubic meters of gas in place. The development of the project included drilling, construction, installation, and commissioning contracts as well as installation of a floating LNG facility with a capacity of 3.4 Mt/yr. The stakeholders of this project were Eni (25%), Exxon Mobil Corp. (25%), China National Petroleum Corp. (CNPC) (20%), Empresa Nacional de Hidrocarbonetos E.P. (10%), Korea Gas Corp. (10%), and Galp Energia, SGPS, S.A. (10%). Eni was the lead operator and ExxonMobil led construction and processing facilities operations. Production was expected to start in 2022 (Eni S.p.A., 2017, 2018).

Sasol Ltd. of South Africa operated the Pande and Temane Petroleum Production Agreement license in Inhambane Province. In 2017, the company was conducting exploration and production drilling programs while awaiting approval of a strategic environmental assessment. Inhambane Province held proven reserves of about 73 billion cubic meters of natural gas (Sasol Ltd., 2017, p. 41; International Trade Administration, 2018).

MINERAL INDUSTRY HIGHLIGHTS IN 2018

In 2018, Mozambique was estimated to be the world's second-ranked producer of graphite, accounting for more than 9% of world production. In 2018, Mozambique's GDP growth rate was estimated to be 3.4 compared with a rate of growth of 3.7% in 2017. The mining sector accounted for 7.3% of the GDP. Total export revenues were valued at $5,196 million, of which coal accounted for 33%; aluminum, 24%; natural gas, 6%; ilmenite, rutile, and zircon, a combined total of 5%; and gemstones (emerald, sapphire, and ruby), 2% (Banco de Moçambique, 2019a, p. 13, 59; 2019b, p. 13; Olson, 2020).

In 2018, beryl production increased by 616%; sand and gravel (including crushed rock), by 254%; tourmaline, by 224%; gold, by 205%; sand, by 156%; limestone, by 141%; metallurgical coal, by 90%; quartz, by 83%; zircon, by 63%; bauxite, by 57%; processed bentonite, by 40%; natural gas (condensate), by 24%; granite, by 21%; crude bentonite, by 19%; natural gas (gross volume), by 12%; and tantalum, by 11%. The production of aquamarine decreased by 98%; refined lead, by 22%; and ruby, by 48%. The country started production of graphite in late 2017 and in 2018 achieved its first full year of production of 106,773 t (table 1).

In 2018, in its first full year of production, Xtract produced 187.9 kg of gold from alluvial deposits at the Manica gold project compared with 39.7 kg in 2017. In 2018, Mwiriti Limitada continued prospecting for gold in the Montepuez District of Cabo Delgado Province and confirmed finding gold. As of 2018, the company was trying to quantify its gold reserves at the site and raising funds to purchase an ore-processing unit (Achá, 2018; Xtract Resources Plc, 2019a, p. 1).

In 2018, Kenmare produced 958,500 t of ilmenite and 76,600 t of zircon (primary and secondary). In December 2018, Kenmare reported its first production of 1,900 t of mineral sands concentrate—a product containing monazite, rutile, and zircon. The mineral sands concentrate was reported as concentrates together with secondary zircon. Production of mineral sands concentrate was part of Kenmare's plans to expand the mining and processing capacity at the Moma Mine by approximately 20% by 2021 (Kenmare Resources plc, 2019, p. 24).

In 2018, Dingsheng Mining Co., Ltd. of China continued exploration (started in 2014) of heavy mineral sands at a site in Chibuto, Gaza Province. At yearend 2018, the company had already installed a sand-processing plant with the capacity to process 10,000 metric tons per day of material. Production was expected to start in 2019 (Governo de Moçambique, 2018; Mozambique Resources Post, The, 2018).

In 2018, Triton acquired full ownership of Grafex Limitada. The transaction gave the company access to seven exploration licenses in three graphite project areas: the Ancuabe project, the Balama North project, and the Balama South project. In June 2018, Triton received a provisional environmental license for the Ancuabe graphite project from the Mozambique Ministry of Lands, Environment and Rural Development and expected to receive a final environmental license allowing construction to start at the site. Triton started preliminary work at the site consisting of bulk earthworks and clearing; the company expected to start construction in 2019 and to proceed to targeted production in 2020 (Macauhub, 2018; Triton Minerals Ltd., 2019b, p. 2, 6).

In March 2018, the Government accepted Battery Minerals's environmental impact assessment for the Montepuez project and granted the company a mining license. In December 2018, Battery Minerals announced that the Balama Central project feasibility study revealed a 27-year mine life at a production rate of 58,000 t/yr at a grade of 96% TGC and ore reserves of 19.6 Mt at a grade of 11.06% TGC. At yearend 2018, Battery Minerals was in the process of completing full project financing for the Montepuez project. The company expected to develop the Balama Central project after the Montepuez project is commissioned (Battery Minerals Ltd., 2018c, p. 2; 2019, p. 3, 12).

In its first full year of operations, Syrah's Balama graphite project produced 104,000 t of natural flake graphite. Rampup continued throughout 2019 (Syrah Resources Ltd., 2019, p. 3, 9).

In 2018, the Mozambique Rovuma Venture—a joint venture owned by ExxonMobil, Eni, and CNPC (70%), alongside Empresa Nacional de Hidrocarbonetos E.P. (10%), Galp Energia, SGPS, S.A. (10%), and Korea Gas (10%)—submitted a plan to the Government of Mozambique for the first phase of development of the Rovuma LNG project. The project was expected to produce, liquefy, and market natural gas from the Mamba fields, which are located in the Area 4 block of the Rovuma basin (offshore). The first phase of the development plan proposed two LNG trains, which would each produce 7.6 Mt/yr of LNG. LNG production was expected to start in 2024 (Exxon Mobil Corp., 2018).

Outlook

Mozambique's abundant natural resources, particularly metals, gemstones, industrial minerals, and hydrocarbons, have played a key role in the economic development of the country. In 2018, the mineral industry was the fastest growing sector of the country's GDP. As of 2018, Mozambique became one of the world's leading producers of natural graphite alongside Brazil, Canada, China, and India. GDP growth outlook for 2019 is expected to increase to 4.7%. Mozambique's mineral industry is expected to grow by 14% in 2019 supported by the coal, graphite, heavy mineral sands, natural gas, and ruby industries. LNG projects are likely to continue to be developed offshore Cabo Delgado Province. Development of the Manica gold project and gold prospecting in Cabo Delgado Province will likely contribute to an increase in gold production in 2019 and following years (República de Moçambique, 2017, p. 22; Banco de Mocambique, 2019b, p. 14; Olson, 2020).

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TABLE 1

MOZAMBIQUE: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons, gross weight, unless otherwise specified)

Commodity[2]		2014	2015	2016	2017	2018
METALS						
Aluminum:						
Bauxite		3,325	4,985	1,451	3,182	5,000 e
Aluminum, metal, primary		567,000	558,000	571,000	577,000	571,000
Beryl	kilograms	3,000 r	35,400	180,700	53,200	381,000
Gold, mine, Au content	do.	197	242	201	166	507
Lead, refinery, secondary[3]		1,933	2,310	2,494	3,828	3,000 e
Niobium, mineral concentrate, columbite-tantalite:						
Gross weight	kilograms	111,767	62,607	91,661	114,325	120,600
Nb content	do.	4,837 r	2,735 r	4,005 r	3,700 e	4,000 e
Tantalum, mineral concentrate, columbite-tantalite, Ta content	do.	22,666 r	12,818 r	18,767 r	18,000 e	20,000 e
Titanium, mineral concentrates:						
Ilmenite and leucoxene		926,800	828,893	1,340,330	1,197,419	1,283,075
Rutile		6,100	5,981	7,781	9,137	8,830
Zirconium, zircon		63,100	57,858	215,222	124,022	202,022
INDUSTRIAL MINERALS						
Cement, hydraulic	thousand metric tons	1,512 [4]	1,585 [4]	2,446 r	2,350	2,400 e
Clay:						
Bentonite:						
Crude		27,167	70,917	71,000 e	71,000 e	84,276
Processed		1,250	3,300 e	1,250 r	2,847	4,000 e
Brick clay		410,000 e	588,758	645,917	328,725	330,000 e
Diatomite		78	80 e	1,305 r	4,539	5,000 e
Gemstones:						
Aquamarine	kilograms	--	--	343 r	508	9
Dumortierite		30 e	30 e	8 r	--	--
Garnet	kilograms	362,762	383,963	125,078	159,143	154,864
Ruby	do.	610 e	2,018	1,250	1,135	593
Tourmaline	do.	176,233	20,169	1,135	1,932	6,265
Graphite, crystalline flake		--	--	--	1,042	106,773
Salt, sea[e]		160,000	160,000	170,000	170,000	170,000
Stone, sand, and gravel:						
Sand and gravel, construction:						
Gravel, including crushed rock	cubic meters	1,700,312	2,855,148	1,270,051	819,556	2,902,761
Sand		1,955,200	3,109,690	2,612,252	1,656,281	4,237,944
Silica, mine, quartz	kilograms	98	580	580	197,665	361,390
Stone, crushed:						
Limestone		900,788	844,111	728,431	437,501	1,052,912
Rhyolite		75,411	1,973	-- e	--	--
Stone, dimension, granite		57 r	60 r, e	160 e	468	564
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Bituminous		3,784,603	4,786,611	3,862,959	7,113,341	6,891,201
Metallurgical		2,546,586	1,813,717	2,203,430	4,400,813	8,355,292
Natural gas:						
Gross volume	million cubic meters	4,223	4,975	5,077	3,731	4,171
Condensate, in volumetric units	thousand 42-gallon barrels	298	467	477	311	386

[e]Estimated. [r]Revised. do. Ditto. -- Zero.

[1]Table includes data available through December 30, 2019. All data are reported unless otherwise noted. Estimated data are rounded to no more than three significant digits.

[2]In addition to the commodities listed, other gemstones may have been produced, but available information was inadequate to make reliable estimates of output.

[3]Production is based on fiscal year, with a starting date of April 1 of the year shown.

[4]Reported cement sales by Cimentos de Moçambique SARL only.

TABLE 2
MOZAMBIQUE: STRUCTURE OF THE MINERAL INDUSTRY IN 2018

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity[1]
Aluminum		Mozambique Aluminum SARL (South32 Ltd., 47.1%; Mitsubishi Corp., 25%; Industrial Development Corp. of South Africa Ltd., 24%; Government, 3.9%)	Mozal smelter at Beluluane	561,000.
Bauxite		Mina Alumina Lda.	Vila de Manica	12,000.[e]
Beryl		African Rare Gemwood	Mine in Zambezia Province	NA.
Cement		Cimentos de Moçambique SARL [Cimentos de Portugal, SGPS, SA (Cimpor), 82.46%]	Plants at Dondo, Matola, and Nacala	3,100,000.
Do.		Cimentos de Nacala S.A. [Cimentos de Portugal, SGPS, SA (Cimpor), 100%]	Plant at Nacala	350,000.
Do.		Cimentos de Beira (Ambrian plc, 100%)	Plant at Beira	800,000.
Do.		Limak Holding	Plant near Maputo	700,000.
Do.		Austral Cimentos Sofala S.A. (Heidelberg Cement, 100%)	Plant at Dondo	400,000.
Do.		Cimento Nacional Lda.	Plant at Maputo	325,000.
Do.		Fabrica Cimentos de Cabo Delgado	Plant in Metuge District	250,000.
Do.		S & S Cimentos	Plant at Matola	210,000.[e]
Do.		Maputo Cement and Steel	Plant at Maputo	130,000.
Do.		Adil Cimentos	Plant at Tchumene	120,000.
Clay, bentonite		Minerais Industriais de Moçambique Lda.	Mine at Mufiane	30,000.
Coal, bituminous		Vale Moçambique, Limitada [Vale S.A., 80.75%; Mitsui & Co., Ltd., 14.25%; Empresa Moçambicana de Exploração Mineira S.A. (EMEM), 5%]	Moatize Mine in Tete Province	22,000,000.
Do.		International Coal Ventures Private Ltd., 65%, and Tata Steel Ltd., 35%	Benga Mine in Tete Province	2,400,000.
Do.		Jindal Steel & Power Ltd.	Chirodzi Mine in Tete Province	3,000,000.
Do.		Beacon Hill Resources plc (BHR)	Minas Moatize Mine near Tete[2]	880,000.
Diatomite		Diatomites de Moçambique Lda.	Diana quarry near Manica	4,800.
Gemstones:				
Aquamarine	kilograms	Mozambique Gems Ltd.	Mine near Mavuco[2]	3,600.[e]
Garnet	do.	Sociedade Vision 2000 Lda.	Cuamba in Niassa Province	8,000.[3]
Do.		Artisanal miners	Various locations	NA.
Ruby	kilograms	Montepuez Ruby Mining Lda. (Gemfields plc, 75%, and Mwiriti Lda., 25%)	Montepuez ruby mine in Cabo Delgado Province	1,600.[e]
Do.	do.	Mustang Resources Ltd.	Montepuez ruby project	40.[e]
Do.		Artisanal miners	Niassa Province	NA.
Tourmaline		do.	Various mines in Barue District in Manica Province	NA.
Gold	kilograms	Artisanal miners	do.	600.[e]
Do.	do.	Xtract Resources Plc (Explorator Limitada, 100%)	Manica gold project	600.[e]
Graphite		GK Ancuabe Graphite Mine SA. [Graphit Kropfmühl GmbH, 90%, and Empresa Moçambicana de Exploração Mineira, S.A. (EMEM), 10%]	Ancuabe graphite mine, Cabo Delgado Province	9,000.
Do.		Syrah Resources Ltd. (Twigg Exploration and Mining Limitada, 100%)	Balama graphite operation, Cabo Delgado Province	350,000.
Lead, refined		Gravita Mozambique Lda. (Gravita India Ltd., 100%)	Plant at Maputo	4,500.
Natural gas	million cubic meters	Sasol Ltd., 70%, and Empresa Nacional de Hidrocarbonetos, E.P., 30%	Temane and Pande, Inhambane Province	5,100.
Niobium (columbium) and tantalum, columbite-tantalite, ore and concentrate		Noventa Ltd.	Mine at Marropino[2]	270 Ta_2O_5.
Do.		Artisanal miners	Mine at Muiane	34 Ta_2O_5.
Titanium mineral concentrates		Kenmare Resources plc	Moma Mine at Topuito in Nampula Province	1,200,000 ilmenite; 21,000 rutile.
Do.		Haiyu (Mozambique) Mining Company Lda.	Mine at Sangage in Manica Province	80,000[e] ilmenite.

See footnotes at end of table.

TABLE 2—Continued
MOZAMBIQUE: STRUCTURE OF THE MINERAL INDUSTRY IN 2018

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity[1]
Zirconium, zircon	Kenmare Resources plc	Moma Mine at Topuito in Nampula Province	75,000 zircon.
Do.	Haiyu (Mozambique) Mining Company Lda.	Mine at Sangage in Manica Province	14,000[e] zircon.

[e]Estimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.
[1]Abbreviations used in this table for commodities include the following: Ta_2O_5—tantalum oxide.
[2]Unknown status at yearend 2018.
[3]Gem-quality only.