

2017–2018 Minerals Yearbook

GHANA

THE MINERAL INDUSTRY OF GHANA

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

In 2017, Ghana was the second-leading producer of gold and manganese in Africa, after South Africa, accounting for 4% and 5% of world production, respectively. Other mineral commodities produced in Ghana included aluminum, bauxite, cement, crude petroleum and refined petroleum products, diamond, lead (secondary), salt, and silver. In 2017, the Government commenced Operation Vanguard, which was a task force to help fight illegal mining known as “galamsey” in Ghana. The initiative was part of the Government’s effort to safeguard the environment and water bodies, and to protect life and properties from illegal mining activities. The task force, which was composed of police and military personnel, was deployed to three administrative Regions of the country—Ashanti, Western, and Eastern—in August 2017. The operation resulted in the arrest of hundreds of illegal miners, including foreign nationals (Nyavor, 2018; Bank of Ghana, 2019, p. 9; Corathers, 2019; George, 2019; Ghana Statistical Service, 2019, p. 3).

Minerals in the National Economy

In 2017, Ghana’s mineral sector contributed 5.9% to the country’s real gross domestic product (GDP) compared with 4.2% in 2016, at constant 2006 prices. The value of mineral exports increased by 19% to \$6 billion in 2017 from \$5.06 billion in 2016. The quantity of gold exports increased by 20% driven mainly by an increase in gold prices. Crude petroleum exports increased by 91.3% owing to the start of production at the Tweneboa, the Enyenra, and the Ntomme Fields, which are collectively known as the TEN Field. Member companies of the Ghana Chamber of Mines employed a total of 10,503 people in 2017 compared with 11,628 in 2016 (Bank of Ghana, 2018, p. 9, 16; Ghana Chamber of Mines, 2018, p. 2–3, 11, 14).

Production

In 2017, crude petroleum increased by 64%; manganese ore (gross weight) and manganese content of the ore, by 53% and 47%, respectively; bauxite, by 29%; and gold production by large-scale producers, by 10%. Diamond production decreased by 42%; lead, by an estimated 36%; silver, by an estimated 22%; primary aluminum, by 13%; and gold production by artisanal and small-scale producers, by an estimated 2%. Data on mineral production are in table 1.

Structure of the Mineral Industry

The Ministry of Lands and Natural Resources (MLNR) oversees the sustainable management and use of Ghana’s lands, forests, and wildlife resources as well as the management of the mineral resources for socioeconomic growth and

development. The ministry consists of three subsectors—lands, forestry, and mining, which are distributed under the following six agencies: the Forestry Commission, the Ghana Geological Survey Authority, the Lands Commission, the Minerals Commission, the Office of the Administration of Stool Lands, and the Precious Minerals Marketing Company Ltd. Together, the Ghana Geological Survey Authority, the Minerals Commission, and the Precious Minerals Marketing Company Ltd. oversee all aspects of Ghana’s mineral sector. The Ghana Geological Survey Authority stores, disseminates, and archives relevant geoscientific data and oversees mapping and mineral exploration activities. The Minerals Commission is the main promotional and regulatory body for the mineral sector and is responsible for the regulation and management of mineral resources and the coordination and implementation of policies relating to mining. It also ensures compliance with Ghana’s mining and mineral laws and regulations. The Precious Minerals Marketing Company Ltd. is responsible for the purchase and marketing of Ghana’s diamond production and for promoting the development of the precious minerals and jewelry industries. In 2017, most of the mining operations in Ghana were privately owned, although artisanal mining accounted for all diamond production in the country and for about one-third of the country’s gold production. Table 2 is a list of major mineral industry facilities (Ministry of Lands and Natural Resources, 2018a–c; Precious Minerals Marketing Company Ltd., 2018).

Commodity Review

Metals

Gold.—In 2017, gold in Ghana was produced at both industrial and artisanal scales. Gold Fields Ltd. (Gold Fields) of South Africa operated the Tarkwa Mine, which was one of Ghana’s largest gold mines. Gold Fields held 90% of the shares in both the Tarkwa Mine and the Damang gold mine, and the Government held the remaining 10%. In late 2016, Gold Fields announced a reinvestment plan for the Damang gold mine to extend the life of the mine to 2025. Production from the Damang Mine had decreased since 2013 when gold output from the Damang pit ceased, and after that, operations were focused on the margins of the Damang pit. The reinvestment plan was expected to give access to the base of the existing pit, which would eventually provide access to the full Damang ore body. In 2017, the Damang Mine produced 4,465 kilograms (kg) of gold compared with 4,595 kg in 2016. The Tarkwa Mine produced 17,617 kg of gold compared with 17,668 kg in 2016 (Ghana Chamber of Mines, 2018, p. 16; Gold Fields Ltd., 2018).

In 2017, which was its first full year of operations, the Asanko gold mine, operated by Asanko Gold Inc. (Asanko) of Canada, produced 6,378 kg of gold compared with 4,588 kg in 2016.

Asanko was targeting production of between 6,400 kg and 6,800 kg of gold in 2018 (Asanko Gold Inc., 2018; Ghana Chamber of Mines, 2018, p. 23).

Newmont Mining Corp. (Newmont) of the United States owned and operated the Ahafo and the Akyem gold mines. The Ahafo Mine was composed of the following three open pits: Amoma, Awonsu, and Subika. In May, mining operations at Amoma ceased. The Ahafo Mine produced 10,855 kg of gold in 2017 compared with about 10,850 kg in 2016. Production from the Akyem Mine was 14,712 kg in 2017 compared with about 14,600 kg in 2016 (Newmont Mining Corp., 2018, p. 2, 37).

In March, Newmont received its environmental permit to build and operate the Subika underground project and, in June, achieved its first production. Commercial production was expected to begin in the second half of 2018. The Subika underground mine was expected to have an average annual gold production of between 4,600 kg and 6,200 kg per year for the first 5 years beginning in 2019 and to have a mine life of approximately 11 years. In 2017, Newmont began construction of the Ahafo mill expansion, which was expected to increase the existing plant capacity by approximately 3.5 million metric tons per year. The Ahafo mill expansion project was expected to reach first production in the first half of 2019, with commercial production expected in the second half of 2019 (Ghana Chamber of Mines, 2018, p. 17, 24; Newmont Mining Corp., 2018, p. 2, 37).

In 2017, Resolute Mining Ltd. (Resolute) of Australia performed a drilling program at the Bibiani Gold Mine. The program was designed to upgrade existing inferred mineral resources, identify new mineralization, improve project economics, and confirm a decision to mine. In October, Resolute announced that the updated mineral resource estimate for Bibiani resulted in a 40% increase in total resources from a previous estimate. The updated combined indicated and inferred resource was 21.7 million metric tons (Mt) at a grade of 3.6 grams per metric ton (g/t) gold at a cutoff grade of 2 g/t gold. Mining operations at Bibiani had ceased in 2013 and since then had remained on care-and-maintenance status (Resolute Mining Ltd., 2017, p. 6; 2018a, p. 4; 2018b, p. 7, 51).

AngloGold Ashanti Ltd. (AngloGold) of South Africa owned and managed two operations in Ghana, the Iduapriem Mine and the Obuasi Mine; as of 2017, the Obuasi Mine remained on care-and-maintenance status. The Iduapriem Mine produced 7,086 kg of gold in 2017 compared with 6,662 kg in 2016. The 6% increase was mostly attributed to the decision to mine in deeper and higher-grade areas. At yearend 2017, AngloGold was working on a feasibility study to determine whether the Obuasi Mine could be redeveloped into a profitable and productive operation (AngloGold Ashanti Ltd., 2018, p. 120; 2020; Ghana Chamber of Mines, 2018, p. 18).

Golden Star Resources Ltd. (Golden Star) of Canada operated the Bogoso-Prestea open pits and underground gold mine (Prestea complex) and the Wassa Mine, which were located near the towns of Prestea and Tarkwa, respectively. In 2017, Golden Star was producing gold from both the Prestea open pits and the Prestea underground mine. The mine life of the Prestea open pits had been extended several times, and it was expected that mining operations would cease in the first half of 2018 owing to ore depletion. On the other hand, the Prestea underground

mine was expected to start commercial production in the first half of 2018. The Prestea complex produced 4,054 kg of gold in 2017 compared with 2,789 kg in 2016. In its first year of commercial production, the Wassa underground mine produced 1,912 kg of gold and the Wassa main pit produced 2,355 kg. Golden Star expected that the Wassa Mine would transition into an underground-focused operation in early 2018 (Golden Star Resources Ltd., 2018, p. 20–25; Ghana Chamber of Mines, 2018, p. 24).

Lead.—In 2017, Gravita Ghana Ltd., which was the only lead producer in Ghana, produced remelted lead ingots from raw lead battery scraps and lead scraps. The remelted lead ingots contained about 98% lead. In 2017, production of secondary lead decreased by 36% to 1,150 metric tons (t) from 1,800 t in 2016 (table 1; Gravita India Ltd., 2018, p. 23).

Manganese.—In May, Consolidated Minerals Ltd. (CONSMIN) of the United Kingdom announced the completion of the acquisition of CONSMIN Group by Tian Yuan Manganese Ltd., which was a subsidiary of Ningxia Tianyuan Manganese Industry Co. Ltd. of China. CONSMIN was the sole producer of high-grade manganese carbonate ore at the Nsuta Mine in Ghana's Western Region. In 2017, shipments of manganese increased to more than 45% owing to increased global demand for premium manganese (Consolidated Minerals Ltd., 2017; Ghana Chamber of Mines, 2018, p. 19).

Industrial Minerals

Diamond.—Ghana's diamond production was from small-scale and artisanal miners who operated in the Bonsa River valley near the town of Tarkwa and in the Birim River valley between the towns of Akwatia and Oda. In 2017, Ghana produced a total of 82,233 carats of rough diamond compared with 141,530 carats in 2016. Exports of diamond by the Precious Minerals Marketing Company Ltd. continued to decrease owing to low recoveries by small-scale miners (Ghana Chamber of Mines, 2018, p. 19; Kimberley Process Rough Diamond Statistics, 2018; Modern Ghana, 2018).

Lithium.—In 2016, IronRidge Resources Ltd. (IronRidge) of Australia had acquired access rights for a prospective lithium hard-rock site through an earn-in agreement with Barari Developments Ltd., Obotan Minerals Ltd., and Merlink Resources Ltd. The earn-in agreement provided access rights to an area of 314 square kilometers (km²). The project area was in the southern margin of the Cape Coast batholith, a granitic intrusive complex occurring along the southern-central coastline of Ghana and part of the West African shield. The deposit, called the Egyasimanku Hill lithium resource, had been drilled by the Ghana Geological Survey in 1962 and had a resource estimate of 1.48 Mt at a grade of 1.66% lithium oxide (Li₂O). In 2017, IronRidge conducted 100 meters (m) of trenching with 270 m of channel sampling and 130 m of surface rock-chip sampling, for a combined total of 1,545 kg of samples across the project area. In addition to lithium, IronRidge was prospecting for beryllium, cesium, gold, niobium, tantalum, and tin, which occur as accessory minerals within granitic pegmatites. It was expected that exploration work would continue throughout 2018 and that the work would range from initial reconnaissance work

to geophysical modeling and drilling (IronRidge Resources Ltd., 2018, p. 3, 11–15).

Mineral Fuels

Petroleum and Natural Gas.—In 2017, crude petroleum production from the Jubilee Field increased to 32.7 million barrels (Mbbbl) from 26.9 Mbbbl in 2016. The increase in production was mainly attributed to an increase in production performance and the postponement of the Turret Remediation project. The remediation project was to involve a 10-week planned shutdown of the Jubilee Floating Production Storage and Offloading vessel to address an issue with the turret bearing. In its first full year of production, the TEN Field produced 20.4 Mbbbl, which exceeded its expected production of 18.2 Mbbbl. The Jubilee and TEN Fields were operated by a consortium of companies led by Tullow Oil plc of the United Kingdom (table 2; Ministry of Finance, 2017, p. 8; Tullow Oil plc, 2018a, p. 26, 2018b).

In September, the Special Chamber of the International Tribunal for the Law of the Sea (ITLOS) ruled in favor of Ghana concerning the delimitation of the maritime boundary between Ghana and Côte d'Ivoire in the Atlantic Ocean. ITLOS declared that Ghana had not violated Côte d'Ivoire's sovereign rights when conducting petroleum exploration activities in the TEN field. Tullow was expected to restart drilling work in the field at the end of 2017 (Thomson Reuters, 2017; Tullow Oil plc, 2017).

In October, the Government of Ghana approved the Greater Jubilee Full Field Development Plan submitted by Tullow. The plan aimed to maximize and sustain crude petroleum production and gas exports through a multiyear incremental drilling program. For 2018, Tullow expected gross production from the Jubilee Field to average about 27.6 Mbbbl; this projected figure included the likely effects of the planned shutdown associated with the Turret Remediation project (Tullow Oil plc, 2018a, p. 27).

In 2017, Eni S.p.A. (Eni) of Italy started production from the Integrated Oil & Gas Development Project in the Offshore Cape Three Points (OCTP) Block. The project, located about 60 kilometers (km) off the coast of Ghana's Western Region, was being developed by a joint venture composed of Eni (44.44%), Vitol Ghana Upstream Ltd. (part of Vitol Group of the Netherlands) (35.56%), and the Ghana National Petroleum Corp. (20%). The project would include the development of the Sankofa Main, the Sankofa East, and the Gye-Nyame Fields, which had about 770 million barrels (Mbbbl) of oil equivalent in place. In 2017, the project achieved the planned peak production of 45,000 barrels per day. Gas production was expected to start in 2018. The OCTP was the only deepwater nonassociated gas development project that would be dedicated to Ghana's domestic gas market (Eni S.p.A., 2018b, p. 47; 2018c).

MINERAL INDUSTRY HIGHLIGHTS IN 2018

In 2018, Ghana's real GDP growth rate, at constant 2013 prices, was estimated to be 6.3% compared with 8.1% in 2017. GDP growth in the mining sector was 23%, and the mineral sector contributed 13.6% to the GDP. Total mineral exports accounted for about 70% of the country's total export earnings in 2018.

Export of minerals decreased by 3.7% to \$5.78 billion in 2018 from \$6 billion in 2017. Exports of gold decreased by 5.6%, whereas crude petroleum exports increased by 12%. Member companies of the Ghana Chamber of Mines employed a total of 10,109 people in 2018. In December, Ghana's Inter-Ministerial Committee on Illegal Mining developed a comprehensive policy framework to regularize small-scale mining in the country (Nyavor, 2018; Bank of Ghana, 2019, p. 13; Ghana Chamber of Mines, 2019, p. 14, 17; Ghana Statistical Service, 2019, p. 3, 5).

In 2018, production of manganese ore (gross weight) and manganese content of the ore increased by 52% and 68%, respectively; gold production by artisanal and small-scale producers, by an estimated 33%; crude petroleum, by 7%; natural gas, by 17%; and aluminum, by 14%. Diamond production decreased by 35%; bauxite, by 32%; and refined lead, by 13%. Data on mineral production are in table 1.

In 2018, gold production by large-scale miners remained nearly unchanged at 87,336 kg. In 2018, Gold Fields continued implementing the reinvestment plan at the Damang gold mine to extend the life of the mine; the mine was expected to reach full production by 2020. In 2018, the mine produced 5,624 kg of gold, which was an increase of 26% from that of 2017. In March, Gold Fields announced the transition from owner mining to contract mining at the Tarkwa Mine. According to Gold Fields, the transition would be essential to ensure sustainability and extension of the mine life. In 2018, the Tarkwa Mine produced 16,325 kg of gold, which was a 7% decrease from production in 2017. In July, Gold Fields acquired a 50% interest in the Asanko gold mine by signing a joint-venture agreement with Asanko (Ghana Chamber of Mines, 2019, p. 11, 20; Gold Fields Ltd., 2019, p. 35, 37, 43).

Newmont's Subika underground project, which was part of the Ahafo Mine, achieved commercial production in 2018. Production of gold from the Ahafo Mine increased by 25% to 13,561 kg owing to higher ore grade milled and higher recovery rates. Production of gold from the Akyem Mine decreased by 12% to 12,877 kg owing to lower mill throughput, ore grade, and mill recovery rates (Newmont Mining Corp., 2019, p. 2, 73).

In 2018, Golden Star's Wassa Mine produced 4,656 kg of gold; this was an increase of 9% compared with that of 2017. The Prestea complex transitioned to an underground operation and started commercial production in February. The Prestea complex produced 2,335 kg of gold, which was a decrease of 42%, owing to the cessation of open pit mining (Golden Star Resources Ltd., 2019, p. 4, 26).

In 2018, AngloGold and the Government of Ghana signed an agreement to start the redevelopment of the Obuasi Mine. The redevelopment was expected to transform the mine into a mechanized underground mining operation. Implementation of the project would be undertaken in two phases; the first phase would target a production rate of 2,000 metric tons per day (t/d) for the first operating year and the second phase, a rate of 4,000 t/d by the end of 2020. The Obuasi Mine had ore reserves of about 180,000 kg of contained gold, resources of 1.1 million kg of contained gold, and a mine life of more than 20 years. In 2018, Obuasi remained on care-and-maintenance status; its first production was expected by the end of 2019 (AngloGold Ashanti Ltd., 2019, p. 30, 49, 58, 63; 2020).

In 2018, IronRidge acquired a lithium pegmatite tenement package (the Cape Coast lithium project) through earn-in agreements. The additional area covered 318 km² and included the Ewoyaa and the Abonku prospects and access rights to the Egyasimanku Hill lithium deposit. In 2018, IronRidge completed pitting, trenching, and mineralogical studies at the Ewoyaa and Abonku prospects, which revealed spodumene pegmatites containing the lithium ore mineral spodumene. At yearend 2018, IronRidge continued performing exploration and resource drilling at the Ewoyaa and Abonku prospects (IronRidge Resources Ltd., 2019, p. 10–12).

In June, gas production started at Eni's Sankofa Field. Gas production from this field would be sent to an onshore treatment plant to be used for domestic consumption (Eni S.p.A., 2018a, p. 47).

In 2018, crude petroleum production from Ghana's three main commercial fields—Jubilee, TEN, and Sankofa-Gye Nyame—was 62.8 Mbbl compared with 58.7 Mbbl in 2017. The increase was attributed to increased production from the TEN and Sankofa-Gye Nyame Fields. In January, Exxon Mobil Corp (ExxonMobil) of the United States signed an agreement with the Government of Ghana to acquire exploration and production rights for the Deepwater Cape Three Points Block. The block was located 92 km off the coast of Ghana and covered an area of 1,482 km². Exploration activities, including seismic data acquisition and analysis, were expected to start in late 2018. In October, the Government of Ghana announced its first offshore licensing round for six blocks offshore Cape Three Points. The effort was expected to contribute to the growth in offshore exploration activities in the country (Exxon Mobil Corp., 2018; Ministry of Finance, 2019, p. viii, 1, 9, 33).

Outlook

Ghana's abundant mineral resources, particularly gold, diamond, and hydrocarbons, have played a key role in the country's economic development. The GDP is expected to increase by more than 7% in 2019, supported by the financial services and petroleum and mining subsectors. Following the ITLOS ruling regarding Ghana and Côte d'Ivoire's maritime boundary dispute and the Government's approval of the Greater Jubilee Full Field Development Plan, it is likely that drilling activities will continue to increase at the Jubilee and TEN Fields, which could result in increased production of petroleum and natural gas in the coming years. Exploration activities at the Deepwater Cape Three Points Block and the Government offshore licensing round initiative is expected to attract investment in the country. The OCTP project is expected to be a reliable natural gas supply that will support access to energy and economic development of the country (Ghana Chamber of Mines, 2019, p. 3).

The signed agreement between the Government and AngloGold to start the redevelopment of the Obuasi Mine in 2019, the commencement of the Subika underground mine, and the Ahafo mill expansion are expected to increase gold production in the coming years. As global demand for lithium increases, lithium exploration in Ghana is likely to continue and to expand to other areas of the country.

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TABLE 1
GHANA: PRODUCTION OF MINERAL COMMODITIES¹

(Thousand metric tons, gross weight, unless otherwise specified)

Commodity ²		2014	2015	2016	2017	2018
METALS						
Aluminum:						
Bauxite		906	1,026	1,144 ^r	1,477	1,011
Metal, primary ^c		38 ^r	40 ^r	40	35	40
Gold, mine, Au content:						
Artisanal and small-scale producers	kilograms	46,336	45,000 ^c	45,000 ^c	46,000 ^c	61,000 ^c
Large-scale producers	do.	90,754	80,325 ^r	79,196 ^r	87,352	87,336
Lead, refinery, secondary	metric tons	2,817	3,048	1,800	1,150	1,000 ^c
Manganese, mine:						
Gross weight		1,497	1,478	1,967	3,004	4,552
Mn content		418	416	553	810	1,364
Silver, mine, Ag content, exported ore ^c	kilograms	3,400	3,200	2,300 ^r	1,800	1,800
INDUSTRIAL MINERALS						
Cement, hydraulic		4,500 ^c	3,830	4,000 ^{r, c}	3,800 ^c	4,000 ^c
Diamond, gem, unspecified	thousand carats	242	174	142	82	54
Salt ^c		250	250	250	250	250
MINERAL FUELS AND RELATED MATERIALS						
Natural gas	thousand cubic meters	53,983 ³	68,558	68,600 ^c	68,600 ^c	80,000 ^c
Petroleum, crude	thousand 42-gallon barrels	37,202	37,412	35,770	58,660	62,771

^cEstimated. ^rRevised. do. Ditto.

¹Table includes data available through January 16, 2020. All data are reported unless otherwise noted. Estimated data are rounded to no more than three significant digits.

²In addition to the commodities listed, clays, lime, limestone, petroleum products, sand and gravel, and stone may have been produced, but available information was inadequate to make reliable estimates of output.

³Natural gas exported from the Jubilee Field to the Atuabo natural-gas-processing plant.

TABLE 2
GHANA: STRUCTURE OF THE MINERAL INDUSTRY IN 2018

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum		Volta Aluminum Co. Ltd. (VALCO) (Government, 100%)	Aluminum smelter at Tema	200.
Bauxite		Ghana Bauxite Company Ltd. (GBCL) (Bosai Minerals Group Co. Ltd., 80%, and Government, 20%)	Bauxite mine at Awaso	1,600.
Cement		Ghana Cement Company Ltd. (GHACEM) (HeidelbergCement AG, 93.1%)	Clinker grinding plant at Takoradi	2,200.
Do.		do.	Clinker grinding plant at Tema	2,200.
Do.		Diamond Cement Ghana Ltd.	Cement plant at Aflao ¹	1,500.
Do.		Savanna Cement Company Ltd. (SAVACEM) and Diamond Cement Ghana Ltd.	Town of Buipe, Central Gonja District	300.
Diamond	thousand carats	Great Consolidated Diamond Ghana Ltd. (Government, 100%)	Placer mine at Akwatia, ² Birim Valley	360.
Do.	do.	Artisanal diamond miners	Birim Valley	500 to 900.
Gold	kilograms	AngloGold Ashanti Ltd., 90%	Obuasi surface and underground mine, ² 60 kilometers south of Kumasi	1,700.
Do.	do.	do.	Iduapriem Mine, 70 kilometers north of Takoradi	8,800.
Do.	do.	Resolute (Bibiani) Ltd. (Resolute Mining Ltd., 90%, and Government, 10%)	Bibiani Mine, ³ 250 kilometers northwest of Accra	3,400.
Do.	do.	Golden Star (Bogoso-Prestea) Ltd. (Golden Star Resources Ltd., 90%, and Government, 10%)	Bogoso-Prestea open pit mine, 300 kilometers west of Accra	7,300.
Do.	do.	Golden Star Resources, 90%, and Government, 10%	Wassa Mine, 30 kilometers northwest of Tarkwa	7,000.
Do.	do.	Gold Fields Ltd., 90%, and Government, 10%	Tarkwa open pit mine and carbon-in-leach and heap-leach plants, 300 kilometers west of Accra	21,800.
Do.	do.	do.	Damang gold mine and carbon-in-leach plant, 360 kilometers west of Accra	6,000.
Do.	do.	Asanko Gold Inc., 45%; Gold Fields Ltd., 45%; and Government, 10%	Asanko Gold Mine, Ashanti Region	7,600.
Do.	do.	Newmont Mining Corp., 90%, and Government, 10%	Ahafo Mine and Subika underground mine Brong Ahafo Region	17,100.
Do.	do.	do.	Akyem Mine	14,700.
Do.	do.	Endeavour Mining Corp., 90%, and Government, 10%	Nzema Mine, 280 kilometers west of Accra, east municipal district	3,100.
Do.	do.	Chirano Gold Mine Ltd. (Kinross Gold Corp., 90%, and Government, 10%)	Chirano Mine, 100 kilometers from Kumasi, southwestern Ghana	9,000.
Do.	do.	Perseus Mining Ltd.	Edikan gold mine	6,200.
Do.	do.	Artisanal and small-scale gold miners	Throughout Ghana	46,000.
Lead, secondary		Gravita Ghana Ltd. (Gravita India Ltd.)	Tema	6.
Limestone and lime		Carmeuse Lime Products (Ghana) Ltd. (Carmeuse SA)	Takoradi	NA.
Manganese ore		Tian Yuan Manganese Ltd., 90%, and Government, 10%	Open pit mine at Nsuta-Wassaw Western Region	1,500.
Natural gas	thousand cubic meters	Eni Ghana, 44.44%; Vitol Ghana 35.56%; Ghana National Petroleum Corp., 20%	Offshore Cape Three Points, Sankofa Field	1,860,000. ^e

See footnotes at end of table.

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

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Petroleum, crude	barrels per day	Tullow Oil plc, 35.48%; Anadarko Petroleum Corp., 24.08%; Kosmos Energy LLC, 24.08%; Ghana National Petroleum Corp. (GNPC), 13.64%; Petro SA, 2.73%	Jubilee Field, 60 kilometers offshore western Ghana	120,000.
Do.	do.	Tullow Oil plc, 47.18%; Kosmos Energy LLC, 17%; Anadarko, 17%; Ghana National Petroleum Corp. (GNPC), 15%; Petro SA, 3.82%	TEN Field, Tano Block, about 60 kilometers offshore western Ghana	80,000.
Do.	do.	Eni S.p.A., 44.44%; Vitol Ghana 35.56%; Ghana National Petroleum Corp., 20%	Offshore Cape Three Points, 60 kilometers offshore western Ghana	58,000.
Petroleum products	thousand 42-gallon barrels	Tema Oil Refinery (Government, 100%)	Refinery at Tema	16,400.
Salt		Panbros Salt Industry Ltd.	Salt pan at Mendskrom, near Accra	250.
Do.		Elmina Salt Producers Association	Artisanal salt pan mining near Elmina	NA.

Do., do. Ditto. NA Not available.

¹Used imported clinker.

²On care-and-maintenance status.

³Under redevelopment.