

THE MINERAL INDUSTRY OF

ETHIOPIA

By Philip M. Mobbs

The minerals industry was a minor contributor to Ethiopia's economy in 1996, although there was increasing foreign investor activity in the sector. Gold was the most significant mineral export whereas fertilizer and petroleum products were the most significant mineral imports. Construction materials—including brick clay; limestone and shale mined for cement production; gypsum for cement and plaster; sand and gravel; crushed and dimension stone—were also important Ethiopian mineral commodities. A variety of other minerals were also produced. (*See table 1.*) Additional minerals, such as lignite, natural gas, phosphate, and potash are known to occur in deposits of potentially economic size and grade in various parts of the country (Ministry of Mines and Energy, undated).

A mountainous high plateau in the northwestern half of the country was capped mostly by thick Tertiary basalt flows rather barren of valuable mineral deposits. But Precambrian basement, hosting many metallic and industrial mineral resources, was exposed in river gorges and along the edges of the basalt cap, particularly in the far northern highlands and in the western and southern lowlands. Drainage, with high potential for hydroelectric power, was mostly westward into the Nile River system. Splitting the country about in half, a major rift valley extended southwesterly from Djibouti in the northeast to Lake Turkana in the southwest. That valley was the locale for a number of evaporite and other industrial mineral deposits, salt lakes, and geothermal sources. The eastern one-third of the country, mainly covered by Mesozoic sediments, offered construction materials sources and oil and gas targets. Oil and gas evidence also was found in the southwestern lowlands near the Sudan.

The Government was actively promoting further mineral development. Mining Proclamation 52/1993 and the Mining Income Tax Proclamation 53/1993 were designed to offer competitively attractive terms to international investors. The Mining Operations Council of Ministers Regulation No. 182/1994 expanded on Mining Proclamation 52/1993 (Wegner and Häußler, 1996). An investment promotion document on Ethiopian minerals, country and economic information, and geology and mining was issued late in 1994 by a U.S. consulting firm under contract with the Government and funded by the United Nations (U.N.). (Techno-Economic Consulting, Inc., 1994). The Investment Proclamation of June 1996 replaced decree 15/1984. During 1996, the House of Representatives amended Mining Proclamation 52 and Mining Income Tax Proclamation 53. Mining income tax was reduced to 35% compared with 45% under the original proclamation. The Government also reduced its free carried interest in mineral operations to 2% compared with up to 10% free carried interest

formerly allowed. Mining operations were subject to national and regional governmental approval.

Environmental impact studies were required for submittal with applications for exploration and exploitation concessions. Pollution controls and site restoration plans had to be specified in applications.

Under the former Government's central planning, most larger industrial enterprises were state-owned. Enterprise privatization was proceeding more slowly than the opening of the mineral sector to new private investors. One state-owned company that was very active was the Ethiopian Mineral Resources Development Corp. (EMRDC). It operated the Lega Dembi gold mine about 350 kilometers (km) south of Addis Ababa, which had a capacity for producing 3,000 kilograms per year (kg/yr) of gold ingot with about one-half coming from a gravity plant and the rest from a tank-leach-electrowinning plant. EMRDC ran the Kenticha open pit columbite-tantalite mine and pilot plant, approximately 50 km southeast of Lega Dembi, with an output capacity of 20 metric tons per year (t/yr) of concentrate. The Adola Gold Development Enterprise, a section of EMRDC, managed a smaller placer gold mining operation in the Adola region east of Lega Dembi, producing about 300 kg/yr. As part of the Lakes Soda Ash Development Project, EMRDC operated a 20,000-t/yr soda ash plant at Lake Abijata in the rift valley about 125 km south of Addis Ababa. EMRDC also had projects for developing gemstone deposits and industrial minerals to support a ceramics industry.

The Ethiopian Institute of Geological Surveys continued regional mapping of the country and was studying the nation's base metals, feldspar, gold, iron, kaolin, phosphate, and potash resources.

At yearend, the state-owned Zuqualla steel rolling mill at Debreiziet, 80 km south of Addis, was installing a 100,000-t/yr mill. Cement plants at Addis Ababa, Dire Dawa, and Muger (the last two about 360 km east-northeast and 60 km northwest of Addis Ababa, respectively) were units of the state-owned Ethiopian Cement Corp. Kiln output capacities were indicated as being about 50,000; 20,000; and 600,000 t/yr, respectively. Grinding capacities were higher.

Privately owned operations that mostly were producing construction materials ranged from local sand and gravel pits to export-oriented dimension stone quarries at various sites. However, gold production (1,500 kg/yr) was attributed to artisanal operations in the north and west, as well as in the south.

More than 25 companies had active prospecting licenses. Gold headed the list of mineral commodities attracting investment attention during 1996. Behre Dolbear & Co. Inc. of

the United States was facilitating the privatization of the Lega Dembi gold mine. The open pit operation in the southern part of the country had began operations in 1991. Thirteen offers were reportedly submitted (Ethiopian News, 1997), including bids by Canyon Resources Africa Ltd., a subsidiary of Canyon Resources Corp. of the United States, and joint-venture partner JCI Ltd. of South Africa; the HRC Development Corp. of Canada and Inmet Mining Corp. of Canada joint venture; National Mining Corp. of Saudi Arabia; and the Canadian joint venture of Rift Resources Ltd. and Echo Bay Mines.

The joint venture between Ashanti Goldfields Co. Ltd. of Ghana and Ezana Mining Development plc of Ethiopia was sampling soil on the Hawsen and Shire prospects in northern Ethiopia (Tigray). Ezana Mining was owned by the Tigray regional government. Canyon Resources and JCI were exploring the Megado Serdo license area in southern Ethiopia, near the Lega Dembi Mine. Canyon Resources and JCI also acquired the exploration license for the Meleka Adeba property.

Emerging Africa Gold Inc., a subsidiary of Ste. Geneviève Resources Ltd. of Canada, acquired two permits in the western highlands, the Sirkole gold concession and the Yubdo platinum concession. International Roraima Gold Corp. of Guyana acquired Roraima Mining Co.'s four exploration licenses on the Koko Kenticha property in southern Ethiopia. Iscor Ltd. of South Africa had the option to earn 55% interest in the Koko Kenticha gold licenses.

National Mining Corp. was exploring on its gold exploration licenses at Dawa-Digati and Okote in southern Ethiopia. Pan African Resources Corp., a subsidiary of Golden Star Resources Ltd. of Canada, was drilling and trenching on the Dul prospect in western Ethiopia.

Rift Resources Ltd. of Canada completed its initial exploration programs on the Negele-Bul Bul gold license area, approximately 500 km south of Addis Ababa, and on the Humera gold prospect, approximately 600 km north-northeast of Addis Ababa. In December 1996, Rift acquired a gold exploration license for the Moyale concession, approximately 600 km south of Addis Ababa on the Kenya border. Rift also proposed to work in a joint venture with Ezana Mining on four properties in the north and the west. Tan Range Exploration Corp. of Canada acquired precious metals exploration rights to the Hageremariam, the Tulu Dimtu, and the Tulu Kapi licenses. Asteria of Italy reportedly obtained an exploration license near Babile (Africa Energy & Mining, 1996).

Petroleum exploration concessions in effect included International Petroleum Corp. in the west on the Sudan border and Hunt Oil Co. in the south. The Ethiopian Oil & Natural Gas Exploration & Development Organization operated the 18,000-barrel-per-day refinery in Assab, Eritrea. Ethiopia received 80% of the refinery's output. The Calub Gas Development Share Co., having national and local governments as well as private individuals as shareholders, was proceeding with development of motor and household fuels production from the Calub Gasfield in the Ogaden region in the southeast.

The physical infrastructure had limitations, primarily associated with war damage. Roads from Addis Ababa to the Red Sea Port of Assab, Eritrea (about 1,000 km), carried almost

90% of landlocked Ethiopia's exports. The Government encouraged increased utilization of the railroad from Addis Ababa to the Red Sea Port of Djibouti (about 750 km). The Chemin de Fer Djibouto-Ethiopienn, which had formerly been a major regional transportation link, was operated as a joint venture by the Djiboutian and Ethiopian Governments. During 1996, rehabilitation of rail operations was the subject of a study by a joint government commission.

Ethiopia's electrical generating capacity of 371 megawatts (MW) was of limited availability outside urban areas, but the Government proposed new generation (385 MW) and distribution facilities. A pilot plant to evaluate geothermal electricity generation near Lake Langanano, about 150 km south of Addis Ababa, was announced during 1995 (Africa Economic Digest, 1995).

Water was generally available from river or ground water sources in the minerals-rich areas. Telecommunications were reported reasonably adequate internationally and between regional centers with improvements and expansions planned.

The outlook was for increased activity by domestic and international minerals companies, eventually resulting in increased utilization of Ethiopia's considerable resources.

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Major Sources of Information

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Major Publication

Techno-Economic Consulting, Inc., 1994, Mineral Investment Opportunities in Ethiopia, v. 1, country and economic information and v. 2, geology and mining: Techno-Economic Consulting, Inc., New York.

TABLE 1
ETHIOPIA: ESTIMATED PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Metric tons unless otherwise specified)

Commodity	1992	1993	1994	1995	1996	
Cement, hydraulic	320,000	350,000	464,396 3/	611,437 3/	700,000	
Clays: 4/						
Brick	15,000	15,000	10,000	7,000	7,000	
Kaolin (China clay)	420	500	8 r/	15 r/	15	
Diatomite	5	10	150 3/	150 3/	150	
Feldspar	10,000	10,000	4,000	4,000	4,000	
Gold, mine output, Au content	kilograms	2,224	3,387	2,370	4,500 3/	2,500
Gypsum and anhydrite, crude	2,650	2,500	30,700	124,000 r/ 3/	124,000	
Lime	100	100	2,727 r/ 3/	3,091 r/ 3/	3,100	
Petroleum refinery products	thousand 42-gallon barrels	2,530 3/	4,000	--	--	
Platinum, mine output, Pt content 5/	grams	500	--	100 r/	100	
Pumice 4/	49,000	40,000	127,000	360,000	360,000	
Salt:						
Marine	100,000	120,000	--	--	--	
Rock	10,000	10,000	5,000	5,000	5,000	
Scoria	8,000	8,000	190,000 r/	240,000 r/	250,000	
Soda ash, natural	500	248 3/	2,150 3/	20,000 3/	20,000	
Stone, sand and gravel: 4/						
Construction stone, crushed	thousand tons	860	1,000	300	750	750
Dimension stone 6/		2,000	3,000	42,000	38,000	38,000
Limestone 7/	thousand tons	100	100	700	3,215,000	3,300,000
Sand 8/	do.	700	1,000	6,040	1,600	1,600
Silica sand		40,000	40,000	5,000	6,000	6,000
Tantalite, concentrate (40% Ta ₂ O ₅)	14	17 3/	26 3/	20 3/	20	

r/ Revised.

1/ Data are for year ending July 7 of the year listed. For 1993, some production (particularly cement and component limestone, shale or clay, gold, gypsum, petroleum refinery products, salt, and stone) may be in Eritrea, which became independent in May 1993.

2/ In addition to the commodities listed, some lignite and semiprecious gemstones reportedly were produced, and silver was reportedly contained in gold ingots from the Lege Dembi Mine, but information is inadequate to reliably estimate output.

3/ Reported figure.

4/ When reported as volume or pieces, conversions to metric tons are estimated.

5/ No platinum production was officially reported after 1988. However, some artisanal platinum probably continued to be produced, and platinum was also reported by others as being contained in gold ingots from the Lege Dembi gold mine, which started up in 1990; but information is inadequate to reliably estimate output.

6/ Includes marble.

7/ Apparently does not include production for cement manufacture for 1992-94. Normally, the manufacture of 1 ton of cement requires 30 to 50 kilograms of gypsum as well as 1.3 to 1.8 tons of limestone and up to 0.5 ton of shale and/or clay.

8/ May include gravel.