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ERITREA

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The Mineral Industry of Eritrea

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Eritrea is a part of the Arabian Nubian Shield, which is known to host valuable mineral deposits. The greenstone belt of Eritrea, which hosts base- and precious-metals deposits and occurrences, covers about 70% of the country. The greenstone belt contains volcanic massive sulfide (VMS) deposits, such as Adi Nefas, Bisha, Debarwa, and Emba Derho. Known gold mineralization predominately occurs in quartz veins and as disseminations within shear zones (Mining Journal, 2010).

All mineral resources in Eritrea were the property of the state, and licenses were required for the exploration and development of these resources. The legal framework governing the conduct of all mining and related operations in Eritrea includes Minerals Proclamation No. 68/1999, Mining Income Tax Proclamation No. 69/1995, and Regulations on Mining Operations Legal Notice No. 19/1995 (Mining Journal, 2010).

Minerals in the National Economy

In 2011, Eritrea was not a globally significant producer or consumer of minerals. Twenty new companies were licensed to work in Eritrea in 2010 and most of these companies were continuing with their work in exploration and development in 2011.

Production

Eritrea produced a variety of minerals and mineral products, which included basalt, cement, common clay, coral, granite, gravel, gypsum, lime, limestone, marble, pumice, quartz, salt, sand, and silver. In 2011, cement production increased by an estimated 411%. Gold and silver production increased sharply as the Bisha Mine had its first full year of production.

Structure of the Mineral Industry

Table 2 lists the locations of the major mineral industry facilities and their capacities.

Commodity Review

Metals

Copper, Gold, Silver, and Zinc.—In December 2010, Nevsun Resources Ltd. of Canada started production at the Bisha polymetallic mine. Nevsun produced about 11,800 kilograms (kg) of gold at Bisha in 2011; silver production was estimated to be about 20,000 kg. In 2011, Government-owned Eritrean National Mining Corp. (ENAMCO) announced that it would pay $253.5 million to exercise its option under Eritrean law to purchase a 30% interest in the Bisha Mine, which added to its existing 10% interest (Mining Journal, 2011; Nevsun Resources Ltd., 2012, p. 2–3).

Nevsun also announced a revised resource estimate for Bisha in 2011. At the start of 2011, reserves in the oxide zone of the deposit were estimated to be 4.65 million metric tons (Mt) at a grade of 29.6 grams per metric ton (g/t) silver and 7.06 g/t gold. In the supergene zone, reserves were 7.38 Mt at a grade of 3.9% copper, and in the primary zone, 16.3 Mt at a grade of 5.4% zinc and 0.97% copper (Nevsun Resources Ltd., 2011b).

Nevsun planned to produce between 5,900 and 6,500 kg of gold at Bisha in 2012. Based on previously stated production plans, silver production could be between 10,000 and 11,200 kg. In the first quarter of 2013, Nevsun planned to start mining from the supergene zone of the deposit after depleting the oxide zone. The company planned to mine 81,000 metric tons per year (t/yr) of copper, 34,900 kilograms per year (kg/yr) of silver, and 930 kg/yr of gold for 3 years. In the first quarter of 2016, Nevsun planned to start mining from the primary zone after depleting the supergene zone. The company planned to mine 80,400 t/yr of zinc, 16,600 t/yr of copper, 27,700 kg/yr of silver, and 510 kg/yr of gold until the end of 2023 (Nevsun Resources Ltd., 2011a; 2012, p. 2–3).

Chalice Gold Mines Ltd. of Australia held the license to the Koka gold deposit, which is part of the Zara project. Resources at Koka were estimated to be 5 Mt at a grade of 5.3 g/t gold, of which 4.6 Mt at a grade of 5.1 g/t gold was reserves. Depending on financing and the issuance of its mining license and other permits, Chalice planned to start mining at Koka in late 2013. Production was expected to be 3,200 kg/yr for the estimated 7-year life of the mine. In midyear 2011, the Government purchased a 30% participating interest in the Zara project, which increased its share to 40% from 10% (Chalice Gold Mines Ltd., 2011).

Sunridge Gold Corp. of Canada reported an updated resource estimate for the Debarwa VMS deposit, which is part of the Asmara Project. The Debarwa deposit was estimated to contain about 91,000 t copper, 33,600 t of zinc, 83,400 kg silver, and 5,500 kg of gold. Silver and gold grades in the transition zone were estimated to be 27 g/t and 2.85 g/t, respectively. The enriched supergene zone had a copper grade of 5.15%. The primary copper zone had grades of 3.92% zinc and 2.34% copper. Sunridge planned to complete its feasibility study on a new mine at Debarwa in the first quarter of 2012, and depending on the results of the study, to apply for a mining license in the second quarter of 2012 (Sunridge Gold Corp., 2011; 2012, p. 1).

Sunridge's Asmara North project, which is also part of the Asmara project, is composed of the Adi Nefas zinc-gold-copper VMS deposit, the Emba Derho copper-zinc-gold-silver deposit, and the Gupo gold deposit. Sunridge planned to complete updated resource estimates for Adi Nefas and Gupo by February 2012. The company planned to complete its prefeasibility study on Asmara North in the second quarter of 2012 and then to begin a feasibility study (Sunridge Gold Corp., 2012, p. 2).

Industrial Minerals

Cement.—In June 2011, Ghedem Cement Factory started production at Ghedem in the Northern Red Sea Region. By early September, the company reported that it was producing about 1,000 metric tons per day (t/d) of cement, which was shipped to various construction companies. Ghedem was looking to extend its product line by producing various types of cement. Limestone and soft coral shells resources were adequate to support cement production for about 30 years if the plant produced at a rate of 1,600 t/d (Ghebrehiwet, 2011).

Potash.—South Boulder Mines Ltd. of Australia's Colluli potash project is located in the Danakil Depression region about 200 km east of Asmara. In 2011, South Boulder estimated that resources at Colluli were 564 Mt at a grade of 18.6% potassium chloride (KCl). The company hoped to complete a feasibility study by 2013 and to increase resources to between 1.25 and 1.75 billion metric tons at a grade of between 18% and 20% KCl. Depending on the results of the study, South Boulder could start mining at Colluli in 2016 and produce 1 million metric tons per year during the estimated 17-year life of the mine. Capital costs were estimated to be $736 million (South Boulder Mines Ltd., 2011).

Outlook

An impending mining boom and the development of metallic deposits in the near future could have a positive effect on Eritrea's mineral industry. Exploration for gold as well as for copper will likely continue. The potential for shear-hosted gold deposits is demonstrated from the gold discovery at Zara. The decline in gold production resulting from the depletion of the oxide zone at Bisha is likely to be offset partially by the opening of the Koka Mine. Copper production is likely to start in 2013, and zinc and potash production, in 2016.

Eritrea's proximity to Europe and the Middle East would be favorable for the export of minerals if the mineral industry continues to develop. The relatively liberal mining terms are expected to continue and could encourage foreign mining companies to explore in Eritrea. The largest challenges to mining in Eritrea are the country's lack of available water, lack of infrastructure, and lack of a reliable energy supply.

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TABLE 1
ERITREA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2, 3]		2007	2008[e]	2009[e]	2010[e]	2011[e]
Basalt		45,335 [4]	50,000	45,000	50,000	50,000
Cement[e]		45,000	45,000	45,000	45,000	230,000
Clays:						
Common		3,700 [4]	4,000	4,000	4,500	4,500
Kaolin		183 [4]	200	175	200	200
Coral		67,332 [4]	65,000	60,000	58,000	58,000
Gold	kilograms	87 [4]	30	30	50 [r]	11,800 [4]
Granite		21,394 [4]	25,000	25,000	25,000	25,000
Gravel		79,913 [4]	80,000	78,000	80,000	80,000
Gypsum		874 [4]	800	800	800	800
Laterite		NA	NA	NA	NA	NA
Lime		165,000	165,000	165,000	170,000	170,000
Limestone[e, 5]		3,000	3,000	3,000	3,000	3,000
Marble:						
Block	square meters	31,010 [4]	35,000	32,000	36,000	36,000
Chip		NA	NA	NA	NA	NA
Pumice		55	60	60	60	60
Quartz		90	100	100	100	100
Salt		7,448 [4]	7,500	7,500	7,800	7,800
Sand	thousand metric tons	2,309 [4]	2,200	2,200	2,200	2,200
Silver	kilograms	NA [4]	NA	NA	35	20,000

[e]Estimated; estimated data are rounded to no more than three significant digits. [r]Revised. NA not available.
[1]Table includes data available through March 12, 2013.
[2]Values converted from cubic meters to metric tons. Specific gravity, in grams per cubic meter—basalt, 2.8; clay, 1.09; kaolin, 1.03; gypsum, 1.60; laterite, 2.55; lime, 1.54; marble chips, 2.56; pumice, 0.64; quartz, 1.55; salt, 1.44; sand, 2.0; and silica sand, 1.44.
[3]In addition to the commodities listed, feldspar and talc reportedly were produced, but information is inadequate to make reliable estimates of output.
[4]Reported figure.
[5]For other than cement.

TABLE 2
ERITREA: STRUCTURE OF THE MINERAL INDUSTRY IN 2011

(Metric tons unless otherwise specified)

Commodity		Major operating companies	Location	Annual capacity
Cement		Eritrea Cement Works	Massawa	45,000
Gold	kilograms	Bisha Mining Share Co. (Nevsun Resources Ltd., 60%, and Eritrean National Mining Corp., 40%)	Bisha Mine near Bishia	12,800
Granite	cubic meters	Margran plc	Gogne	3,000 [e]
Lime		Badme Construction Co.	Plants at Gogne[1]	7,300 [e]
Do.		do.	Plant at Barentu	3,600 [e]
Marble		Margran plc	Gheleb	NA
Salt		Assab Salt Works	Assab	180,000
Do.		Salina Salt Works	Massawa	80,000
Silver	kilograms	Bisha Mining Share Co. (Nevsun Resources Ltd., 60%, and Eritrean National Mining Corp., 40%)	Bisha Mine near Bishia	22,000

[e]Estimated. Do., do. Ditto. NA Not available.
[1]Not producing at the end of 2010.