

THE MINERAL INDUSTRY OF EGYPT

By Bernadette Michalski

The Egyptian economy has been, for the most part, traditionally sustained by the mineral and mineral-related industries, particularly by petroleum and natural gas revenues and Suez Canal and Suez-Mediterranean (Sumed) oil pipeline revenues. In recent years, the hydrocarbons sector accounted for more than 15% of the gross domestic product (GDP). According to the Central Bank of Egypt, the GDP was \$60 billion in fiscal year July 1, 1994 to June 30, 1995.¹ In addition to hydrocarbon production, Egypt produced a wide variety of metals and industrial minerals. Production levels of these nonfuel minerals, however, remained relatively low when compared on a global scale.

Mining legislation dates back to the Mining and Petroleum Code Law No. 66 of 1953, the Mining Code Law No. 86 of 1956, and the evaporite salt Mining Code Law No. 151 of 1956. These laws provide the legal template for mineral exploration and exploitation. Laws No. 43 of 1979 and No. 50 of 1981 provide the governorate and local councils the power of administration for quarries in their particular districts. The Ministerial Decree No. 8 of 1990 was designed to assist the private sector in obtaining the required permits for mining. The Egyptian General Petroleum Corp. (EGPC) was created under law No. 20 of 1976. Recent petroleum policy calls for all oil exploration permits to be awarded as production-sharing agreements and conversion of all joint ventures into production-sharing agreements.

Egypt is not a member of the Organization of Petroleum Exporting Countries. Thus, a Government commission sets the price per barrel of crude oil to be exported. The Government's pricing formula stipulates that Egypt's benchmark crude oil, Gulf of Suez 33° API (American Petroleum Institute gravity), be priced at 60% of the prevailing price of North Sea benchmark crude oil plus 20% of the value of Iranian heavy crude oil coupled with 20% of the international assessed value of the Gulf of Suez crude oil. The resulting price averaged \$15.74 per barrel in 1995.

Law No.4 of 1994, the unified environmental legislation, was ratified and signed into law. The law empowers the Egyptian Environmental Affairs Agency with the right to enforce environmental regulations and standards on all aspects of Egyptian industry. The law also provides for the caveat that any new mining or quarrying projects initially will require an environmental impact assessment. Extant mining operations have a 3-year grace period to conform to

the new law, and the Government reserves the right to extend this period for 2 years if progress is made toward compliance with the law.

In 1995, Egypt produced approximately 25 different minerals from more than 600 mines, quarries, and salt deposits. Among nonfuel minerals produced in Egypt, phosphate rock and iron ore remained the most important, in terms of value. (*See table 1.*)

Crude petroleum and refined products were Egypt's leading exports. Asia remained the biggest market for Egyptian crude oil. In 1995, the United States imported 11.7 million barrels of crude oil from Egypt.

Egyptian natural gas exports to Israel via pipeline came closer to realization as an agreement in principal was concluded with Israel in April 1995 followed by a commitment from EGPC and Amoco Egypt to supply Israel with 2 to 2.5 billion cubic meters per year of natural gas over a 20-year period starting in 1999. Natural gas will be transported via a connecting pipeline between the East Mediterranean fields and Israeli and Palestinian consuming centers. The Egypt Trans-Gas Co. was established in November 1995 to manage the export operation. The International Egyptian Oil Company pipeline owned by Agip of Italy and Amoco of the United States will transport natural gas part of the way. The required additional pipeline is proposed for completion by 1999.

Trade transiting the Suez Canal is critical to the Egyptian economy. The Suez Canal, 193.5 kilometers (km) long, generated about \$2 billion in total revenue, despite operating below capacity. Toll rates were unchanged for 1995.

The 320-km-long Sumed pipeline complements the Suez Canal by linking Ain al-Sokhna on the Gulf of Suez to Sidi Krir on the Mediterranean coast. The pipeline's capacity was increased to 2.4 million barrels per day (Mbb/d) in late 1995, following a long series of improvements since the Sumed opened in 1977 at 1.5 Mbb/d capacity.

Total Egyptian exports were reported at \$4.96 billion in the fiscal year 1994-95. Of this figure, exports of crude petroleum and products accounted for \$1.63 billion. Comparable figures for July 1, 1993 to June 30, 1994 were total exports of \$3.34 billion of which petroleum accounted for \$1.36 billion.

Trade turnover between Israel and Egypt totaled \$78 million in 1995, a sizable increase from \$45 million in 1994.

More than one-third of Egyptian exports to Israel was petroleum products.

Petroleum products were also Egypt's principal mineral import. Other mineral imports included asbestos, barite, chromite, copper, graphite, iron and steel products, lead, nickel, pumice, silver, sulfur, tin, titanium, tungsten, and zinc.

Imports from the United States totaled 455,000 barrels of petroleum products in 1995.

Virtually all mining and mineral processing in Egypt is carried out by Government-owned mining companies. Egypt's parastatal Mining and Refractories Corp. (Maric) controls the mining and refractories industries. In turn, Maric controls five major parastatals that dominate the Egyptian mining industry. These companies are the El Nasr Phosphate Co., Red Sea Phosphate Co., Misr Phosphate Co., the Sinai Manganese Co., and the El Nasr Saline Co.

The Government hopes to generate revenues totaling \$7,900 million in 1996 from the sale of state-owned assets. (See table 2.)

The Aluminium Company of Egypt (Egyptalum) was on target with its extensive refurbishment and modernization of the Nag Hammadi primary smelter, its rolling mills, and a new aluminum extrusion plant. The modernization project was expected to increase production capacity from 179,000 metric tons per year (t/yr) to 300,000 t/yr by the year 2000. A possible seventh potline was under consideration. If implemented, capacity would be increased to 350,000 t/yr by the year 2005.

The smelter's alumina supply has been secured by long-term contracts concluded during 1995 with Billiton, a member of South Africa's Gencor group, and with the Swiss-based Glencore group.

Ten percent of the equity in Egyptalum was scheduled for public offering, while an additional 10% was to be reserved for company employees at preferential rates in 1996. This is the first phase in implementing the Government's plan of eventually selling 45% of the company.

Egyptian iron ore was mined in the El Gedida area of Bahariya Oasis in the Western Desert. Primarily high-grade iron ore, at 55% iron, was mined.

Alexandria National Iron and Steel Co. showed net profits up by 5% in 1995 to \$35.5 million compared with \$33.8 million the previous year. The company has embarked on a \$350-million expansion and modernization program. Total production rose slightly to just over 1.2 million metric tons (Mt) of steel reinforced bars. During 1995, a series of contracts was awarded under an expansion program that should increase output capacity to 1.5 million metric tons a year (Mt/yr). The expansion program included a \$115 million-second module of the Midrex direct reduction plant, a \$46-million expansion of the steelmaking plant, and a \$40-million expansion at the rod-mill plant. Completion is scheduled for 1997.

By yearend 1994, Sinai Manganese Co. announced plans

to build and operate a 20,000-t/yr silicomanganese production unit by mid-1996. The existing facility at Abu Zenema has a 40,000-t/yr production capacity and produces high-carbon ferromanganese and slag utilizing ore grading 48% manganese imported from a wide range of countries, including Australia, Brazil, and South Africa. The imported high-grade ore is blended with locally mined lower graded manganese, which grades 25% to 40% Mn. More than 50% of the ferromanganese produced was used in Egypt's steel industry. The main export markets for Sinai Manganese Co. were Germany, Japan, Libya, and Taiwan.

The nation's installed cement production capacity was approximately 20 Mt/yr. Egypt continued to be virtually self-sufficient in the mineral commodities needed to manufacture cement. However, the industry has been under increasing pressure to address environmental problems associated with the industry.

Egypt has four nitrogenous fertilizer complexes, the largest of which is in Abu Qir. The others are in Kima, Suez, and Talkha. The nation's three other fertilizer complexes produce phosphate-base fertilizers. Egypt currently imports about 70,000 t/yr of potassium fertilizers with demand projected to rise to 200,000 t/yr by the turn of the century. The Government has issued two U.S. companies licenses for exploration and development of potash deposits. BHP Minerals International Exploration Inc. has obtained a license in a 14,800-square kilometer (km²) area near Ras Gharib on the Gulf of Suez, and Bota was granted a license over a 14,000-km² area in the region of the Gulf of Suez and the Red Sea.

The Government opened the Abu Tartor phosphate mine, about 50 km west of the Kharga Oasis in the Western Desert, in July 1995. When at full production, scheduled for 1997, the annual crude phosphate rock output should reach 4.5 Mt at 31% P₂O₅, yielding a refined product of 2.2 Mt. A 650-km railway will transport the phosphate from Abu Tartor to Safaga on the Red Sea coast.

The nation's first coal mine opened in December 1995 in the northern Sinai. The Maghara Mine was expected to produce 600,000 t/yr. The main coal-bearing seam at Haghara was 2 meters (m) thick. The first coal face is 150 m across.

Natural gas accounts for 35% of total energy consumption in Egypt. The Government planned to further utilize natural gas resources through improvements in production, transportation, and infrastructure. The EGPC predicted a 12% increase in natural gas production during the next 5 years.

More than one-half of the nation's total natural gas production is derived from two fields. In 1995, the Abu Madi Field yielded nearly 4 billion cubic meters of natural gas followed by Badreddin which yielded 3 billion cubic meters. Twelve natural gas plants operate in Egypt with a total capacity of nearly 48 million cubic meters per day in three different regions of the country: the Mediterranean region

(with more than 50% of the total output), the northern edge of the Western Desert (with more than 30% of the output), and the Nile Delta. Some associated gasfields were also in production in the Gulf of Suez and the Sinai peninsula.

Crude oil output has held steady at approximately 900,000 barrels per day (bbl/d) for the past decade. About four-fifths of the country's total output is derived from within the 20,000 km² Gulf of Suez basin. Declining yields in more mature fields have been offset by improved recovery rates in other fields after artificial lift systems were installed. Several new but small fields entered production in 1994 and 1995. Largest among these was the Zaafarab Field in the Gulf of Suez, which entered production in August 1994 at 12,000 bbl/d and reached its peak level of 24,000 bbl/d late in 1995, and the Qarun Field in the Western Desert, which entered production in late 1995 and was expected to reach peak output of 40,000 bbl/d by the close of 1996.

Egypt's seven refineries process just over 500,000 bbl/d. The existing refineries produce a disproportionately high volume of fuel oil, which accounts for almost 50% of total refinery output. New refining projects are directed toward increasing production of lighter products and decreasing the need for imports. Among these is the Middle East Oil Refinery—a joint venture with Israel. The export refinery under construction in Alexandria is scheduled for completion in 1999. It is to process 100,000 bbl/d of crude oil and will include a 25,000 bbl/d hydrocracker geared to produce light products. EGPC will have 20% equity but will supply 30% crude with the remaining crude oil obtained from the expanded Sumed pipeline.

According to the Arab Oil and Gas Journal, Egypt's crude petroleum reserves were reported at 3.3 billion barrels. Egypt's gas reserves are 680 billion cubic meters and include recent new discoveries in the Nile Delta and eastern Mediterranean during 1995, according to the Ministry. Natural gas reserves increased by nearly 70% in the last 3 years and represent nearly three-fifths of the country's total hydrocarbon reserves.

The Government estimated phosphate rock reserves at 1,270 Mt, estimated iron ore reserves at 450 Mt, and estimated manganese ore reserves totaling about 1.5 Mt.

Railways within Egypt totaled 5,110 km. There were more than 51,925 km of roadways and 1,171 km of crude oil pipelines. Installed electrical generation capacity was 14,000 megawatts divided among 37 thermal power stations and 4 hydro-electric plants. Approximately 80% of the electrical output was generated by natural gas with the remainder generated by hydroelectric means. Egypt has embarked on a program that interconnects its power grid with neighboring countries. The first of these projects interconnected with the

Libyan power grid in 1994. Plans include future Egyptian power grid connections with Jordan, Syria, and Turkey.

The allowance of 100% cost recovery on mineral resource concession agreements should favor future foreign investment.

Private investment spearheads Egypt's economic reform program. Egyptalum has scheduled 20% of its shares for public offering. Majority holdings are offered by Alexandria Cement, Ameriya Cement, Tourah Portland Cement, Helwan Portland Cement, El-Nasr Glass & Crystal, as well as Egyptian Metal Construction. The Government hopes to generate revenues nearing \$8 billion in 1996 from the sale of these and other state-owned assets.

The country is suffering from high levels of unemployment, and both foreign investment and private sector development will be required if further progress is to be made. More natural gas fields than oilfields are under development. Three new Mediterranean nonassociated gasfields are scheduled to enter production in 1996, and two Western Desert fields are scheduled to enter production in 1997 and 1999. Coal exports are expected to commence in the near future.

¹Where necessary, values have been converted from Egyptian pounds (£E) to U.S. dollars at a rate of £E3.38=US\$1.00.

Major Sources of Information

Egyptian Geological Survey and Mining Authority

3 Salah Salem Road
Abbassiya, Cairo, Egypt
Telephone: 20 (2) 831242, 831377
Fax: 20 (2) 820128

Egyptian General Petroleum Corp.

Osman Abdul Hadiz St.
Box 2130
Naser City, Cairo, Egypt
Telephone: 20 (2) 603899

Suez Canal Authority

Pilotage Bldg.
Ismailia, Egypt
Telephone: 20 (64) 5788350
Fax: 20 (64) 320784, 320785

Sumed Arab Petroleum Pipelines Co.

P.O. Box 158, El Sray
Alexandria, Egypt
Telephone: 20 5864138
Fax: 20 5871295

TABLE 1
EGYPT: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity	1991	1992	1993	1994	1995 e/	
METALS						
Aluminum metal	177,707	177,838	179,900	188,464 r/	190,000	
Chromite	649	600	600 e/	600 e/	600	
Copper, refined, secondary e/	3,600	4,000	4,000	4,000	4,000	
Iron and steel:						
Iron ore and concentrate	thousand tons	2,144	2,400	2,190	2,100 e/	2,100
Metal:						
Pig iron	do.	1,250	1,200	1,130	1,100 e/	1,150
Ferroalloys, ferrosilicon		7,900	7,900	40,136	40,000 e/	40,000
Direct Reduction	thousand tons	1,100	826	837	774	850
Steel, crude	do.	2,556 r/	2,524	2,772	2,622	2,642
Ferromanganese e/		--	10,000	30,000	35,000 r/	35,000
Manganese		--	11,000	15,000	15,000 e/	15,000
INDUSTRIAL MINERALS						
Asbestos		450	373	604 r/	514 r/	500
Barite		5,943	7,841 r/	2,535 r/	419 r/	500
Cement, hydraulic	thousand tons	16,427	17,000	16,000	16,000 e/	16,000
Clays:						
Bentonite		5,916 r/	4,215 r/	4,994 r/	2,379 r/	2,500
Fire clay		475,000	475,000	421,292	420,000 e/	420,000
Kaolin		192,870 r/	203,473 r/	184,004 r/	180,000 r/	180,000
Feldspar, crude		32,636	49,623 r/	53,649 r/	39,745 r/	39,000
Fluorspar		1,790	1,290 r/	773	514 r/	800
Gypsum and anhydrite, crude	thousand tons	1,239	1,425 r/	1,199	1,200 e/	1,200
Lime		749,421	749,000 e/	747,636	750,000 e/	750,000
Nitrogen, ammonia, N content	thousand tons	863	943	941	900 e/	900
Phosphate:						
Phosphate rock	do.	1,200 r/	2,000	1,585	1,600 e/	1,596
P ₂ O ₅ content	do.	217 r/	404 r/	302 r/	300 r/	400
Salt	do.	1,240 r/	1,096 r/	986 r/	1,008 r/	1,000
Sodium compounds:						
Soda ash		52,000	51,000	51,000 e/	50,492 r/ e/	50,000
Sodium sulfate		41,100	41,000	25,600	26,000 e/	26,000
Stone, sand and gravel:						
Basalt	thousand cubic meters	1,016	1,000	551	600 e/	600
Dolomite e/	thousand tons	910	900	952	1,000	1,000
Granite, dimension	cubic meters	10,496	10,000	12,856	13,000 e/	13,000
Gravel	thousand cubic meters	11,000	11,000	7,177	7,200 e/	7,200
Limestone and other calcareous, n.e.s.	do.	280	18,000	18,093	18,000 e/	18,000
Marble blocks (including alabaster)	cubic meters	58,000	57,000	15,752	16,000 e/	45,000
Sand:						
Industrial sand (glass sand)	thousand tons	500	500	743	740 e/	740
Construction sand	do.	26,000	26,000	21,648 r/	22,000 e/	22,000
Sandstone	thousand cubic meters	182	180	180 e/	200 e/	200
Sulfur: e/						
Elemental, byproduct		7,600	7,600	4,100	4,000	4,000
Sulfuric acid		101,000 2/	100,000	100,000	100,000	100,000
Talc, steatite, soapstone, pyrophyllite		9,091 r/	9,000	2,091 r/	2,000	2,000
Vermiculite		519	500	942	1,000 e/	1,000
MINERAL FUELS AND RELATED MATERIALS						
Coke, oven and beehive	thousand tons	1,210	1,000	1,180	1,200 e/	1,200
Gas, natural:						
Gross production	million cubic meters	9,620	9,600	11,433 r/	12,143 r/	12,000
Dry	do.	7,900	8,000	8,000 e/	8,000 e/	8,000

See footnotes at end of table.

TABLE 1--Continued
EGYPT: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity	1991	1992	1992	1994	1995 e/	
MINERAL FUELS AND RELATED MATERIALS--Continued						
Petroleum:						
Crude	thousand 42-gallon barrels	319,000 r/	321,565 r/	323,580 r/	319,375 r/	324,850 2/
Refinery products:						
Liquefied petroleum gas	do.	3,800 r/	3,825 r/	4,460 r/	4,800 r/	4,800
Gasoline and naphtha	do.	31,400 r/	31,500 r/	33,800 r/	34,000 r/	34,000
Kerosene and jet fuel	do.	20,400 r/	18,400 r/	18,750 r/	19,000 r/	19,000
Distillate fuel oil	do.	31,450 r/	32,825 r/	36,050 r/	36,500 r/	36,500
Residual fuel oil	do.	77,050 r/	74,700 r/	77,700 r/	78,250 r/	78,250
Lubricants	do.	1,625 r/	1,440 r/	1,400 r/	1,400 r/	1,400
Asphalt	do.	3,650 r/	3,480 r/	3,700 r/	3,700 r/	3,700
Unspecified	do.	1,800 r/	2,375 r/	2,430 r/	2,600 r/	2,600
Total	do.	171,175 r/	168,545 r/	178,290 r/	180,250 r/	180,250

e/ Estimated. r/ Revised.

1/ Table includes data available through May 15, 1996.

2/ Reported figure.

TABLE 2
EGYPT: STRUCTURE OF THE MINERAL INDUSTRY FOR 1995

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity	
Aluminum	Aluminum Co. of Egypt (Government, 100%)	Nag Hammadi	179.	
Cement	Helwan Portland Cement Co. (Government, 100%)	Helwan	1,400.	
Do.	Tourah Portland Cement Co. (Government, 100%)	Tourah	1,400.	
Fertilizers	Societe d'Engrais & d'Industries Chimiques (Government, 100%)	Talkha	1,370 (nitrogen).	
Do.	do.	Abu Qir	900 (nitrogen).	
Iron	Egyptian Iron and Steel Co. (Government, 100%)	Helwan steel plant	1,500.	
Petroleum, crude	million 42-gallon barrels	Egyptian General Petroleum Corp., (Government, 100%) and Amoco Egypt Oil Co.	El Morgan, Suez Gulf	42.
Do.	do.	do.	July, Suez Gulf	51.
Do.	do.	do.	Ramadan, Suez Gulf	37.
Petroleum, refined	Suez Oil Processing Co. (Government, 100%)	Mostorod	29.	
Do.	do.	Alexandria Petroleum Co. (Government, 100%)	Alexandria	23.