

THE MINERAL INDUSTRY OF

JORDAN

By Thomas P. Dolley¹

The major mineral commodities produced in Jordan were bulk phosphate rock, phosphatic fertilizers, potash, and limestone. In 1994, Jordan ranked within the top five in global phosphate rock production and was a major world producer of potash. Jordan's gross domestic product for 1994 was \$5.9 billion.²

The Jordan Phosphate Mines Co. (JPMC), a company wholly owned by the Jordanian Government, is the most important industrial company in Jordan. The company has attempted to increase its global market share of phosphate and derivative products through aggressive marketing and third-party trading.

The Provisional Law of Natural Resources 37 of 1966, amended, was the basic mining law of Jordan. The law allowed for private Jordanian or foreign national ownership of a mine or quarry with the provision that mine management be conducted by a Jordanian operator.

Declining water resources represented the most significant environmental concern in Jordan. The increasing population was putting further demands on the water supply. Approximately 60% of Jordan's water supplies came from aquifers in the eastern part of the country. However, the overwhelming percentage of the country's population and demand was in the west, and intermittent rainfall did not supply sufficient recharge to aquifers in the east. The Government was attempting to increase its share of available water in the Middle East and disputes have arisen accordingly.

Along with phosphate rock, finished fertilizers, and potash, Jordan produced significant amounts of other industrial minerals, such as calcium carbonate, dolomite, building stone and aggregates. Jordan was a significant regional cement producer and Jordan Cement Factories Co. (JCFC) reported cement production at 3.4 million tons for 1994. (*See table I.*)

Revenues for Jordanian bulk phosphate and fertilizer exports typically account for almost one-third of the nation's total export revenues. The Government reported that Jordanian exports were valued at \$1.4 billion in 1994, with imports valued at \$3.5 billion. JCFC reported 887,023 tons of cement exported in 1994, mostly to Saudi Arabia and Yemen. Jordan imported most of its petroleum needs.

The Jordan Natural Resources Authority (NRA) was the Government agency responsible for all activities related to the exploration and development of minerals and mineral fuels. The exploitation of the major mineral commodities of

Jordan—cement, kaolin, phosphates, potash, and rock wool—were all controlled by parastatals. Aggregates, basalt, calcium carbonate, dimensional stone, glass sand, and natural sand were produced by private-sector firms.

For 1994, JPMC announced a \$3.3 million profit for its operations after reporting a \$29 million loss for 1993. Western European phosphate consumption trends account for some of the fluctuation, but JPMC has implemented cost cutting measures to achieve a profit status. The development of the phosphate reserves at the Ash Shidiya Mine, when fully completed, was expected to result in the latter mine replacing the existing Al-Hasa Mine and the mine at Wadi Al Abyad. This was expected to occur by the year 2000. In 1994, activity at the Al-Hasa Mine and Wadi Al Abyad was confined to removal of stockpiled ore, but not much active mining.

By yearend 1994, the Middle East Economic Digest reported the awarding of a \$60-million contract to France's Krebs & Compagnie and Chiyoda Corp. of Japan to construct a 300,000 metric tons per year compound fertilizer plant at Aqaba. The plant, to be completed in 1997, was expected to occupy a 55,000 square-meter site at Aqaba for the production of various fertilizer, including diammonium phosphate for export to Japan. The main company in the investment is the Jordanian/Japanese joint venture Nippon Jordan Fertilizer Co. Additional shareholders in the project were Jordan's Arab Potash Co. (APC) and JPMC.

Potash was produced by APC from brines at its Dead Sea facility. Since 1985, APC had sustained potash production at levels greater than 90% of design capacity, which was 1.8 million metric tons per year. Additionally, for 1995 APC was considering upgrades to its carnallite crystallization pond to increase surface area for evaporation. Australia's Neumann Equipment Ltd. was to supply APC with a new \$2 million bucketwheel suction dredge by midyear 1994 to mine salt from shallow excavation ponds in the Dead Sea and was to supervise the shipping, assembly, and commissioning of the dredge at the Dead Sea site. Jordanian Industrial Dead Sea Minerals Co. had been created at yearend 1994 to set up pilot studies for the harvesting of bromine and non-potash minerals from the Dead Sea.

As indicated in table 1, Jordan did not have significant oil production. Though hydrocarbons had been detected in areas near the Dead Sea, no development had occurred. Domestic production accounted for less than 1% of the petroleum utilized in Jordan. Petroleum reserves at Azraq were

estimated at only 5 million barrels. Petroleum production at Hamzeh, which was never significant, was declining slowly.

The NRA estimated Jordanian phosphate rock reserves at 1 billion metric tons. Potash was obtained primarily from Dead Sea brines. The World Bank estimated that of the dissolved solids contained in the Dead Sea, 33 billion tons was sodium chloride and magnesium chloride and about 2 billion tons was potassium chloride. Geological surveys showed that Jordan had additional unexploited mineral deposits of bromine, dolomite, gypsum, glass sands, iron, lead, oil shale, pyrite, tin, travertine, and tripoli.

Jordan's infrastructure was sufficient for current mining operations. Railroads within Jordan consisted of 619 kilometers (km) of 1.05-meter-gauge single track. Crude oil pipelines within the country totaled 209 km. Primary export terminals were at the Port of Aqaba, where potash storage capacity was about 160,000 mt.

Various projects to improve the mining industry infrastructure, including a possible new oil refinery and fertilizer plant in Aqaba along with a more aggressive petroleum exploration program, indicated the Government's

willingness to improve that sector of the economy. The NRA claimed that 60,000 square kilometers of Jordan had been unexplored for economic minerals or mineral fuels. Jordan's apparent lack of domestic energy sources, mainly hydrocarbons, was expected to continue to stress the nation's balance of trade owing to fuel importation costs.

¹Text prepared July 1995.

²Where necessary, values have been converted from Jordanian dinars (JD) to U.S. dollars at the rate of JD0.70=US\$1.00.

Major Source of Information

Jordan Natural Resources Authority
P.O. Box 220
7 Amman, Jordan

Major Publication

Jordan Natural Resources Authority, *Natural Resources in Jordan*, Dec. 1988, 224 pp.

TABLE 1
JORDAN: PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Metric tons unless otherwise specified)

Commodity	1990	1991	1992	1993	1994 e/
Cement, hydraulic thousand tons	3,070	3,160	3,130	6,600	6,600
Clays	38,800	46,200	34,400	47,200	47,200
Gypsum	92,700	55,300	83,000	195,000	195,000
Iron and steel: Steel, crude	179,000	200,000	244,000	181,000	181,000
Lime	5,400	4,600	7,120	7,270	7,270
Petroleum:					
Crude e/ thousand 42-gallon barrels	116	50	50	50	50
Refinery products: e/					
Gasoline do.	3,400	3,300	3,300	3,300	3,300
Jet fuel do.	115	110	110	110	110
Kerosene do.	1,580	1,500	1,500	1,500	1,500
Distillate fuel oil do.	5,560	5,500	5,500	5,500	5,500
Residual fuel oil do.	5,140	5,100	5,100	5,100	5,100
Liquefied petroleum gas do.	185	1,100	1,100	1,100	1,100
Other do.	2,100	2,100	2,100	2,100	2,100
Total do.	18,100	18,700	18,700	18,700	18,700
Phosphate:					
Mine output:					
Gross weight thousand tons	6,080	4,430	4,300	4,280	4,220
P2O5 content e/ do.	2,010	1,460	1,410	1,410	1,400
Phosphatic fertilizers	596,000	600,000	570,000	491,000	491,000
Potash:					
Crude salts thousand tons	1,400	1,360	1,350	1,370	1,500
K2O equivalent do.	841	818	808	822	915
Salt	55,000	57,000	56,000	26,000	26,000
Stone:					
Limestone e/	3,600	136,000	115,000	5,340	5,340
Marble	484,000	180,000	200,000	112,000	112,000

e/ Estimated.

1/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.

2/ Table includes data available through July 1995.