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The Mineral Industry of Jordan

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Jordan was an important supplier of bromine, phosphate rock and phosphate-based fertilizers, and potash to the world in 2016. The country was the world's (excluding the United States) second-ranked producer of bromine after Israel and accounted for 29% of the world's (excluding the United States) output. Jordan was the world's fifth-ranked producer of phosphate rock after China, Morocco and Western Sahara, the United States, and Russia, and accounted for 3% of the world's production in 2016. The country was also the world's seventh-ranked producer of potash and accounted for 3% of the world's output. Other mineral commodities produced in Jordan included aluminum fluoride, calcium carbonate, cement, common and Dead Sea clay, crude petroleum, gypsum, iron and steel, kaolin, lime, limestone, marble, natural gas, pozzolanic materials, refined petroleum products, salt, industrial sand, sulfuric acid, travertine, and zeolites (table 1; Jasinski, 2018a, b; Schnebele, 2018).

Minerals in the National Economy

The mining and quarrying sector's share of Jordan's gross domestic product (GDP) in real values in 2016 was 1.7%; manufacturing, 19.3%; and construction, 5.5%. The country's GDP increased in real terms by 2.0% in 2016 compared with an increase of 2.4% in 2015. The value added of the mining and quarrying sector decreased by 12.1% in 2016 compared with increases of 11.0% in 2015 and 27.6% in 2014. The value added of the manufacturing sector, which included cement, fertilizer, and iron and steel production, increased by 1.1% in 2016 compared with increases of 1.3% in 2015 and 1.5% in 2014. The value added of the construction sector increased by 1.1% in 2016 compared with a decrease of 1.3% in 2015 and an increase of 6.8% in 2014 (Central Bank of Jordan, 2017, p. 7−9, 10−11).

In 2016, the Ministry of Energy and Mineral Resources (MEMR) managed Jordan's mineral resources under the Organization of Natural Resources Affair Law (law No. 12 of 1968). The law entrusted the MEMR with the responsibility of prospecting for copper, gold, lithium, and potassium, and carrying out geologic and economic studies needed for the development of the country's natural resources, oversight of mining methods, and mining of minerals in the country. The Energy and Minerals Regulatory Commission (EMRC) was an autonomous agency with oversight of the electricity, minerals, and nuclear installations in the country. In 2016, the EMRC issued 1,719 mineral export permits, 234 quarrying permits, 10 exploration permits, and 10 mining permits. The MEMR carried out mineral exploration studies for basalt, bentonite, calcite, copper, diatomite, and dolomite deposits at Al Farsh/Ras En Naqab; feldspar ore at Ar Rashidiya; kaolinitic clays at Wadi Al Mizrab; and oil shale at four locations in Ma'an Governorate. The MEMR also conducted exploration studies for coquina limestone at Al Hisa, silica sand at Ras En Naqab, and zircon sands in southern Jordan near the border with Saudi Arabia. The MEMR plan for 2016–18 included continued mineral exploration studies for such metals as copper and such industrial minerals as chalk, dolomite, and phosphate rock. Most of exploration studies, however, focused on oil shale (Natural Resources Authority, 1968; Ministry of Energy and Mineral Resources, 2016, p. 51; 2017, p. 19, 58, 61; Energy and Minerals Regulatory Commission, 2017, p. 104).

In 2016, the Government was focused on alternative sources of energy, such as oil shale, nuclear, solar, and wind. The national comprehensive energy strategy called for using oil shale as a fuel to generate electricity or to distill it to produce crude petroleum. One of the objectives of Jordan's energy strategy was to increase the share of renewable energy use to meet 10% of the country's primary energy needs by 2020 (Ministry of Energy and Mineral Resources, 2017, p. 9, 23).

Production

In 2016, kaolin production was estimated (based on export data) to have increased by 43% in 2016 compared with that of 2015; zeolites, by 37%; asphalt, by 27%; diammonium phosphate, by 15%; and jet fuel, by 12%. Notable decreases in mineral commodity production in 2016 compared with that of 2015 included Dead Sea salt, which decreased by 59%; aluminum fluoride, by 50%; graphite, by 46%; travertine, by 42%; clinker and residual fuel, by 33% each; marble, by 32%; natural gas, by 24%; phosphoric acid, by 19%; potash, by 15%; distillate fuel oil, by 14%; total refinery products, by 13%; gasoline, by 11%; and crude petroleum, by 10%. Data on mineral production are in table 1.

Structure of the Mineral Industry

Except for the National Petroleum Co. and Jordan Petroleum Refinery Co. Ltd., which were state owned, all other mining companies in Jordan were privately owned or had mixed ownership. Arab Company for White Cement, Arab Potash Co. (APC), Jordan Abyad Fertilizers and Chemicals Co. P.S.C. (JAFCCO), Jordan India Fertilizer Co. (JIFCO), Jordan Lafarge Cement Factories Co. P.S.C. (JCFC), Jordan Phosphate Mines Co. p.l.c. (JPMC), and Nippon Jordan Fertilizer Co. had mixed ownership, whereas the remaining mining companies were privately owned. Table 2 is a list of major mineral facilities.

Mineral Trade

In 2016, Jordan's total exports decreased by 6% to $7.5 billion from $7.8 billion in 2015. The value of phosphate rock exports decreased to $434 million in 2016 from $523 million in 2015. The quantity of phosphate rock exports decreased to 4.7 million metric tons (Mt) in 2016 from 4.8 Mt in 2015. The main destinations for phosphate rock exports were India, which received 64% of Jordan's phosphate rock imports; Indonesia, 22%; and Lebanon, 3%. Nitrogen fertilizers exports decreased to $126 million in 2016 from $153 million in 2015. In terms of

quantity, Jordan exported 318,000 metric tons (t) of diammonium phosphate, 138,000 t of compound fertilizer (containing nitrogen, phosphorus, and potassium, or NPK), 134,000 t of potassium nitrate, 68,000 t of phosphoric acid, and 15,000 t of triple superphosphate. Major phosphate fertilizer export destinations included India, which received 38% of Jordan's fertilizer exports; Turkey, 23%; and Iraq, 13%. Jordan's potash exports decreased to $434 million in 2016 from $620 million in 2015. Exports went mainly to China, India, Indonesia, and Malaysia (Arab Potash Co., 2017, p. 27, 61; Jordan Phosphate Mines Co. p.l.c., 2017, p. 15, 23, 34, 41; United Nations Statistics Division, 2017, p. 218).

In 2016, Jordan exported various quantities of other industrial minerals, including calcium carbonate (422,467 t), volcanic tuff (21,770 t), silica sand (9,899 t), marble (6,166 t), salt (3,707 t), travertine (2,645 t), graphite (1,589 t), Dead Sea mud (1,211 t), kaolin (830 t), and Dead Sea clay (116 t) (Energy and Minerals Regulatory Commission, 2017, p. 105).

In 2016, mineral fuel imports were valued at $2.7 billion. In addition to mineral fuels, Jordan imported such mineral commodities as aluminum, copper, gold, iron and steel, liquid ammonia, and sulfur for use in fertilizer manufacturing. Finished and semifinished steel products imports increased to about 1.2 Mt in 2016 from 863,000 t in 2015 (World Steel Association 2017, p. 57; United Nations Statistics Division, 2017, p. 217).

The value of Jordan's exports to the United States increased to $1.55 billion in 2016 from $1.50 billion in 2015, and the value of imports increased to $1.46 billion in 2016 from $1.36 billion in 2015. The main mineral commodity exported by Jordan to the United States was inorganic chemicals (hydrochloric and phosphoric acids), which decreased in value to $5.2 million in 2016 from $17.3 million owing to the drop in chemical acids prices on the world market in 2015. The top mineral and mineral-related commodities imported by Jordan from the United States included natural gas ($58.5 million), excavating machinery ($13.5 million), petroleum products ($10.2 million), finished metal shapes ($5.5 million), nonferrous metals ($3.7 million), and aluminum and alumina ($2.9 million) (U.S. Census Bureau, 2017a, b).

Commodity Review

Industrial Minerals

Phosphate Rock.—In 2016, JPMC, which was the country's only phosphate rock producer, produced 8.0 Mt of phosphate rock, which was a 4% decrease compared with the 8.3 Mt produced in 2015. Seventy-three percent of Jordan's phosphate rock output came from the Eshidiya Mine, 19% from the Wadi Al Abiad Mine, and 8% from the Al Hassa Mine. The Eshidiya Mine contained more than 1.0 billion metric tons (Gt) of total reserves, including proven, probable, and possible reserves. The Wadi Al Abiad Mine held 8.7 Mt of proven reserves, and the Al Hassa Mine had 19.6 Mt of proven reserves. JPMC also produced 738,000 t of sulfuric acid, 396,000 t of diammonium phosphate fertilizer, and 228,000 t of phosphoric acid at its fertilizer complex in Aqaba. Fifty-nine percent of Jordan's phosphate rock produced in 2016 was exported. The remainder was used locally by fertilizer manufacturers (Jordan Phosphate Mines Co. p.l.c., 2017, p. 12−14, 16, 23, 49).

In 2016, JIFCO was ramping up production of phosphoric acid at its phosphoric acid complex, located in Eshidiya in Ma'an Governorate. JIFCO received 1.7 Mt of phosphate rock from JPMC's Eshidiya Mine and expected to produce 470,000 t of phosphoric acid in 2017. JIFCO was a joint venture formed by JPMC (48% interest), Indian Farmers Fertilizers Cooperative of India (IFFCO) (27% interest), and Kisan International Trading FZE (KIT) of the United Arab Emirates (25% interest); it was created to build a 547,500-metric-ton-per-year (t/yr)-capacity phosphoric acid plant and 1.5-million-metric-ton-per-year (Mt/yr)-capacity sulfuric acid plant. JMPC signed a long-term agreement with IFFCO in 2008 to supply JIFCO with 2 Mt/yr of phosphate rock. KIT was responsible for shipping 70% of JIFCO's phosphoric acid output to India. IFFCO used its share as feedstock for IFFCO's Kandla fertilizer plant, which is located in Gujarat State (Jordan India Fertilizer Company L.L.C., 2017; Jordan Phosphate Mines Co. p.l.c., 2017, p. 19; Kisan International Trading FZE, 2017).

JPMC was committed to supply 800,000 t/yr of phosphate rock for PT Petro-Jordan Abadi Co.'s 200,000-t/yr phosphoric acid plant in Indonesia. The plant was a 50−50 joint venture of JPMC and Petrokimia Gresik of Indonesia (Jordan Phosphate Mines Co. p.l.c., 2017, p. 19, 79; PT Petrokimia Gresik, 2017).

Potash.—In 2016, potash production by APC, which was the sole producer of potash in the country, decreased by 17% to 2.0 Mt from 2.4 Mt in 2015. The decrease was owing to the shutdown of the company's hot-leach plant for about 2 months during 2016. Fifty-one percent of the potash produced was a standard grade, 41% was fine grade, 7% was granular grade, and less than 1% was industrial grade. APC employed 1,925 people in 2016 and had several subsidiaries, including Arab Fertilizers and Chemicals Industries Ltd. (Kemapco), which produced 123,000 t of potassium nitrate and employed 243 people in 2016, and Numiera Mixed Salts and Mud Co., which extracted Dead Sea mud for use as cosmetics and employed 78 workers. APC was a partner with Jordan Bromine Co. (JBC), which produced bromine from the Dead Sea and manufactured potassium hydroxide and other chemicals. Other companies that were affiliated with APC were Jordan Industrial Ports Co. and Jordan Safi Salt Co.; the latter had been under liquidation since 2009 and was expected to finalize the liquidation process by yearend 2017. Nippon Jordan Fertilizer Co., which produced compound fertilizer (NPK) and ammonium phosphate, was a joint venture of JPMC (70% interest), APC (20% interest), and Mitsubishi Corp. of Japan (10% interest) (Arab Potash Co., 2017, p. 10, 13, 23, 42, 66, 109; Jordan Bromine Co. Ltd., 2017).

Mineral Fuels, Related Materials, and Other Sources of Energy

Nuclear Energy and Uranium.—Jordanian Uranium Mining Co. (JUMC) estimated the country's Joint Ore Reserves Committee (JORC)-compliant mineral resources as of December 2016 to be 40,000 t of uranium oxide, including 8,100 t of indicated resources. The estimates were based on the results of assays that covered 40% of the study area in central Jordan. In 2016, JUMC conducted a pilot study to produce its first kilogram of yellow cake (uranium concentrate) from

the processing of 6 t of uranium ore. The company planned to extract 2 t of uranium concentrate from 20,000 t of uranium ore in 2017. At least some portion of the uranium produced in Jordan was expected to be used as substrate for the planned nuclear powerplant, which was expected to have 2,000 MW of capacity and to be completed by 2025. In 2016, Rosatom State Atomic Energy Corp. of Russia was conducting a feasibility study for the $10 billion project. The study would be completed in 2017. The two-unit powerplant would contribute 48% of Jordan's electricity and enable exports to neighboring Syria and Iraq (Toukan, 2016, p. 10; Ministry of Energy and Mineral Resources, 2017, p. 55; World Nuclear Association, 2017).

Oil Shale.—In 2016, the Government was actively promoting foreign investment in Jordan's large oil shale resources. Jordan's national energy strategy included a target of 12% for oil shale's share as a source of alternative energy in the country's energy mix by 2020. The estimates for geological oil shale reserves in five main deposits in Jordan (Attarat Um Al Ghudran, El-Lajjun, Jurf Ed Darawish, Sultani, and Wadi Maghar) were estimated to be more than 70 Gt, including measured and indicated resources of 7 Gt of crude petroleum (Abu Salah and others, 2015, p. 15; Ministry of Energy and Mineral Resources, 2017, p. 23, 41).

As of yearend 2016, the MEMR had offered concessions to seven international and local companies for oil shale production, which would be used to generate electricity through direct burning and surface retorting. These companies included Karak International Oil Co. (KIO); Jordan Oil Shale Energy Co. (JOSE), which was a subsidiary of Eesti Energia Consortium of Estonia; Jordan Oil Shale Co. (JOSCO), which was a subsidiary of Royal Dutch Shell plc of the United Kingdom; and Saudi Arabian Corporation for Oil Shale (SACOS). The concession held by JOSCO included several locations and covered 22,270 square kilometers (km^2). JOSCO developed a subsurface model for mining oil shale using an in situ conversion process, which would eliminate the need to transport oil shale to processing plants. Attarat Power Company (APCO) held the Attarat concession, which is located at the Attarat Um Al Ghudran property, covers 42 km^2 in central Jordan, and held 2 Gt of oil shale reserves. The concession area could be increased in the future by the company acquiring adjacent land to include an additional 4 Gt of oil shale reserves. APCO, along with Eesti Energia Consortium, YLT Power International Berhad of Malaysia, and Yudeam Group Co. Ltd. of China, were building the first oil-shale-fired powerplant in the region. The 470-megawatt (MW)-capacity plant was expected to begin production in the first half of 2020. The project was financed by the Bank of China and the Industrial and Commercial Bank of China (Jordan Oil Shale Co., 2017; Ministry of Energy and Mineral Resources, 2017, p. 42).

Outlook

The Government plans to increase the contribution of the mineral industry in Jordan's economy by supporting existing phosphate rock and potash industries and by promoting investment in new oil shale projects. The outputs of fertilizer, phosphate rock, and potash are likely to increase during the next 5 years owing to increased demand and higher prices for these commodities, but the rate of the increase will largely depend on regional and global demand. The Government is likely to continue to focus on oil shale and uranium mining in the short- to medium-term as a source of alternative energy. Jordan's first 470-MW oil-shale-fired powerplant was expected to commence operations in 2020.

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TABLE 1
JORDAN: PRODUCTION OF MINERAL COMMODITIES[1]

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

Commodity		2012	2013	2014	2015	2016
METALS						
Iron and steel, raw steel[e]		150	150 [r]	150 [r]	150 [r]	150
INDUSTRIAL MINERALS						
Bromine[2]		60	80	100	100	100
Cement:						
Hydraulic		4,000	4,200	4,450	4,550 [r]	4,800
Clinker		1,026	906	865	853	575
Clay:						
Common clay		1,097	1,100 [e]	1,100 [e]	1,100 [e]	1,100 [e]
Dead Sea mud	metric tons	156 [r]	218 [r]	135 [r]	115 [r]	116
Kaolin	do.	44,200 [r]	2,720 [r]	10,400 [r]	581 [r]	830
Fluorspar, aluminum fluoride		9	8	8	8	4
Graphite	metric tons	690	2,182	2,998	2,929	1,589
Gypsum[e]		857	860	870	880	880
Phosphate rock, mine production:						
Gross weight		6,383	5,399	7,144	8,336	7,991
P_2O_5 content		2,043	1,728	2,286	2,668	2,557
Diammonium phosphate		551	494	590	344	396
Phosphoric acid		447 [r]	444 [r]	498 [r]	426 [r]	344
Potash:[3]						
Crude salts		1,824	1,744	2,091	2,355	2,003
K_2O equivalent		1,094	1,046	1,255	1,413	1,202
Potassium nitrate		106	107	128	133	123
Potassium sulfate		--	34	116	116	150
Salt:						
Brine		32	8 [e]	8 [e]	8 [e]	8 [e]
Dead Sea[4]	metric tons	1,790 [r]	3,260 [r]	1,740 [r]	2,960 [r]	1,210
Stone, sand, and gravel:						
Sand and gravel, construction		2,500 [e]	2,500 [e]	2,500 [e]	2,500	2,500
Sand and gravel, industrial, unspecified		69	70 [e]	70 [e]	70 [e]	70 [e]
Stone, dimension, travertine	metric tons	5,905 [r]	8,914 [r]	6,311 [r]	4,526 [r]	2,623
Stone, dimension, marble	do.	16,394 [r]	9,340 [r]	4,815 [r]	9,056	6,166
Stone, crushed:						
Calcium carbonate		623	322 [r]	313 [r]	412 [r]	422 [r]
Limestone, pure		1,984	2,000	2,000	2,000	2,000
Pozzolanic material		846 [r]	600 [r, e]	600 [r, e]	600	600
Sulfur, sulfuric acid:[5]						
Gross weight		1,419	1,488	1,500 [e]	1,500 [e]	1,500 [e]
S content		460	486	490 [e]	490 [e]	490 [e]
Zeolites, tuff, crude	metric tons	3,131 [r]	30,423 [r]	19,297 [r]	15,910 [r]	21,770

See footnotes at end of table.

TABLE 1—Continued
JORDAN: PRODUCTION OF MINERAL COMMODITIES[1]

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

Commodity		2012	2013	2014	2015	2016
MINERAL FUELS AND RELATED MATERIALS						
Natural gas, gross	million cubic meters	205	187	162	152	116
Petroleum:						
Crude	thousand 42-gallon barrels	7,330	7,330	5,864	3,665	3,297
Refinery:						
Asphalt	do.	588	612	970	1,139	1,452
Distillate fuel oil	do.	8,273	7,448	6,938	7,893	6,781
Gasoline	do.	6,086	5,870	5,408	5,550	4,956
Jet fuel	do.	2,856	2,600	2,544	2,056	2,296
Kerosene	do.	744	264	488	705	752
Liquefied petroleum gas	do.	1,183	905	1,056	928	940
Residual fuel oil	do.	6,653	6,649	5,408	5,894	3,953
Total	do.	26,400 [r]	24,300 [r]	22,800 [r]	24,200 [r]	21,100

[e]Estimated. [r]Revised. do. Ditto. -- Zero.

[1]Table includes data available through February 20, 2018. All data are reported unless otherwise noted. Totals and estimated data are rounded to no more than three significant digits; may not add to totals shown.

[2]Revised to reported capacity of elemental bromine. Does not include bromine salts and other products.

[3]Fertilizers output is listed under potash as potassium nitrate and potassium sulfate.

[4]Extracted from the Dead Sea for therapeutic use; contains bromide, calcium, chloride, magnesium, and potassium salts.

[5]From imported sulfur.

TABLE 2
JORDAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2016

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum fluoride	Jordan Phosphate Mines Co. p.l.c. (JPMC) (Kamil Holding Ltd., 37.00%; Government Shareholdings' Management Co., 25.66%; Social Security Corp., 16.46%; Government of the State of Kuwait, 9.33%; Other investors, 11.55%)	Plant at Aqaba	14,000
Bromine	Jordan Bromine Co. Ltd. (JBC) [Arab Potash Company Ltd. (APC), 50%, and Albemarle Corp., 50%]	Plant at Ghur Al Safi, Dead Sea	100,000
Calcium carbonate	Jordan Carbonate Co.	Mine at Al Jeeza	NA
Do.	Qatrana Cement Co. (Arabian Cement Co., 100%)	Mine at Karak	NA
Do.	Petra Calcium Carbonate Co.	do.	NA
Do.	do.	Plant at Amman	NA
Cement	Al Rajhi Cement-Jordan (Al Rajhi Cement Holding)	Plant at Mafraq	2,000,000
Do.	Arab Company for White Cement Industry [Jordanian Syrian Company for Industry, 50%; General Establishment for Cement (Syria), 25%; Jordan Finance Ministry, 15%; Social Security Corp., 10%]	Plant at Amman	130,000
Do.	Jordan Lafarge Cement Factories Co. P.S.C. (JCFC) (Lafarge S.A., 50.28%; Social Security Corp., 21.86%; others, 27.87%)	Plants at Fuheis[1] and Ar-Rashadiya	4,000,000
Do.	Modern Cement and Mining Co. (Manaseer Group for Industries and Commercial Investments of Jordan, 100%)	Plant at Al Qatranah	1,200,000
Do.	Qatrana Cement Co. (Arabian Cement Co., 100%)	do.	1,800,000
Do.	Northern Cement Co.	Plant at Muwaqar	1,000,000
Clay, kaolin	Al-Faori Enterprise for Mining	Mine at Al-Adasieh	110,000
Do.	Jordanian Company for Mining and Processing of Kaolin and Feldspar	Mine at Qanasieh	216,000
Do.	Modern Cement and Mining Co. (Manaseer Group for Industries and Commercial Investments of Jordan, 100%)	Mine at Al Qatranah	250,000
Do.	Qatrana Cement Co. (Arabian Cement Co., 100%)	Mine at Al Qatranah	400,000
Do.	Public Mining Company Ltd.	Mine at Fuaheis[1]	38,000
Do.	do.	Mine at Batn el-Ghoul	31,000
Feldspar	General Mining Co. Ltd.	Mine at Al-Jaishiah	10,000
Do.	Jordanian Company for Mining and Processing of Kaolin and Feldspar	Mine at Qanasieh	216,000
Gypsum	Al-Nasr Mining Establishment	Mines at Mujib	31,000
Do.	Al-Nisr-Ali Manaseer	do.	89,000
Do.	Al-Noor Mining Co.	do.	11,000
Do.	Falahat Mining Establishment	do.	25,000
Do.	Isam Alshoouly & Maksim	do.	13,000
Do.	Jordan Lafarge Cement Factories Company P.S.C.	Mine at Zarqa	73,000
Do.	Mansour Al Shoabaki Establishment	Mines at Mujib	2,000
Do.	Public Mining Co. Ltd.	do.	68,000
Do.	Shaker Al-Talib Establishment	Mine at Subeihi	15,000
Natural gas million cubic meters	National Petroleum Co. (Government, 100%)	Risha gasfield	150
Petroleum:			
Crude thousand 42-gallon barrels	do.	Hamza oilfield	4,000
Refined do.	Jordan Petroleum Refinery Co. Ltd. (Government, 100%)	Refinery at Zarqa	90,400
Phosphate:			
Phosphate rock	Jordan Phosphate Mines Co. p.l.c. (JPMC) (Kamil Holding Ltd., 37.00%; Government Shareholdings' Management Co., 25.66%; Social Security Corp., 16.46%; Government of the State of Kuwait, 9.33%; other investors, 11.55%)	Wadi Al-Abiad, Al-Hassa, and Eshidiya Mines	7,000,000
Phosphatic fertilizers	do.	Plant at Aqaba	650,000

See footnotes at end of table.

TABLE 2—Continued
JORDAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2016

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Phosphate:—Continued			
Phosphatic fertilizers—Continued	Jordan Abyad Fertilizers and Chemicals Co. P.S.C. (JAFCCO) [Jaffco Bahrain Co., 42.79%, Jordan Phosphate Mines Co. p.l.c. (JMPC), 25%; Venture Capital Bank, 14.4%; Arab Mining Co., 10%; Sea Field Trading, 5%, Al-Fares Investments, 2.81%]	Plant at Aqaba	80,000
Do.	Nippon Jordan Fertilizer Co. [Jordan Phosphate Mines Co. p.l.c. (JPMC), 70%; Arab Potash Co. Ltd. (APC), 20%; Mitsubishi Corp., 10%]	Plant at Eshidiya	300,000
Phosphoric acid	Jordan Phosphate Mines Co. p.l.c. (JPMC) (Kamil Holding Ltd., 37.00%; Government Shareholdings' Management Co., 25.66%; Social Security Corp., 16.46%; Government of the State of Kuwait, 9.33%; other investors, 11.55%)	Plant at Aqaba	350,000
Do.	Jordan India Fertilizer Co. (JIFCO) [Indian Farmers Fertilizers Cooperative of India (IFFCO), 52%, and Jordan Phosphate Mines Co. p.l.c. (JPMC), 48%]	Plant at Eshidiya	475,000
Do.	Indo-Jordan Chemicals Co. Ltd. [Jordan Phosphate Mines Co. p.l.c. (JPMC), 87% , and Arab Investment Co., 13%]	do.	224,000
Potash	Arab Potash Co. (APC) (Potash Corporation of Saskatchewan, 28%; Government Investments Management Co., 27%; Arab Mining Co., 20%; Social Security Corp., 10%; Iraqi Government, 5%; Libyan Arab Company for Foreign Investments, 4%; Kuwait Investment Authority, 4%; other investors, 2%)	Plant at Ghur Al Safi	2,450,000
Potassium nitrate	Arab Fertilizers and Chemicals Industries Ltd. (Kempaco) [Arab Potash Co. Ltd. (APC), 100%]	Plant at Aqaba	150,000
Potassium sulfate	Jordan Abyad Fertilizers and Chemicals Co. P.S.C. (JAFCCO) [Venture Capital Bank, 57.2%; Al-Fares Investments, 17.8%; Jordan Phosphate Mines Co. p.l.c. (JMPC), 15%; Arab Mining Co., 10%]	do.	80,000
Pozzolanic material	Jordan Lafarge Cement Factories Co. P.S.C. (CFC)	Quarry at Tell Remah	350,000
Do.	do.	Quarry at Aarityan	150,000
Do.	Alialeel for Mining and Extraction of Raw Materials	Quarry at Al Mafraq	NA
Do.	Modern Cement and Mining Co. (Manaseer Group for Industries and Commercial Investments of Jordan, 100%)	Quarries at Karak, Tafilah	NA
Salt	Arab Potash Co. Ltd. (APC), 100%	Brines at Ghur al-Safi	17,000
Do.	Amra Salt Co.	Dead Sea Salinas, plant at Abdullah II Ibn Al-Hussein Industrial Estate, Sahab	360,000
Sand, silica	Middle East Regional Development Enterprises	Mine at Ras En Naqab	530,000
Do.	Al-Habahbeh and Sons Company for Mining	do.	28,000
Do.	Al-Rehab for Industrial and Trading Establishment	do.	27,000
Do.	Al-Fares Company for Glass Sand Mining	do.	17,000
Do.	International Silica Industries	Mine at Dabbet Hanot-Ras En Naqab	NA
Do.	Green Technology Group	Mine at Al-Homaimeh	NA
Steel:			
Crude	Jordan Steel Co. p.l.c. (Jordan Steel Group, 100%)	Plant at Amman[2]	360,000
Semimanufactured	do.	do.	506,000
Do.	National Steel Industry Co.	Plant at Zarqa	120,000
Stone:			
Basalt	Jordan Rock Wool Industries Co. Ltd.	Quarry at Qa'a Hanna	5,000
Limestone	Arab Company for White Cement Industry [Jordanian Syrian Company for Industry, 50%; General Establishment for Cement (Syria), 25%; Jordan Finance Ministry, 15%; Social Security Corp., 10%]	Mine at Khalidiah	NA
Do.	Jordan Magnesia Co.	Mine at Al Qatranah	NA
Do.	Sufian Nusair Assoc.	do.	NA
Do.	Khaled Shamayleh Co.	Mine at Siwaqa	NA

See footnotes at end of table.

TABLE 2—Continued
JORDAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2016

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Stone:—Continued			
Marble	Al Zammar Group	Quarries at Ajloun, Jordan Valley, Karak	NA
Travertine	Alghor Alawsat Mining Establishment	Quarry at Balqa	NA
Do.	Travertine and Granite Co.	do.	NA
Sulfuric acid	Jordan Abyad Fertilizers and Chemicals Co. P.S.C. (JAFCCO) [Venture Capital Bank, 57.2%; Al-Fares Investments, 17.8%; Jordan Phosphate Mines Co. p.l.c. (JMPC), 15%; Arab Mining Co., 10%]	Plant at Aqaba	800,000
Do.	Jordan Indian Fertilizer Co. (JIFCO) [Indian Farmers Fertilizers Cooperative of India (IFFCO), 52%, and Jordan Phosphate Mines Co. p.l.c. (JPMC), 48%]	Plant at Eshidiya	1,485,000
Do.	Indo-Jordan Chemicals Co. [Jordan Phosphate Mines Co. p.l.c. (JPMC), 87%, and Arab Investment Co., 13%]	do.	66,000
Zeolites	Amana Agricultural & Industrial Co.	Mine at Tel Hesban	NA
Do.	Green Technology Group of Jordan for Mining	Mine at Al Aritayn-Marfaq	NA
Do.	Jordanian Factory for Soil Development & Moisture Drying Co.	do.	NA

Do., do. Ditto. NA Not available.
[1]Production stopped in 2013.
[2]Production stopped in 2015.