

THE MINERAL INDUSTRY OF

IRAN

By Philip M. Mobbs

In 2000, Iran, which was the world's fourth largest producer of crude oil, averaged about 3.72 million barrels per day (Mbbbl/d). Average crude production had been 3.56 Mbbbl/d in 1999 and 3.63 Mbbbl/d in 1998 (U.S. Energy Information Administration, 2001). At the end of 2000, Iran had the second largest natural gas reserves (23 trillion cubic meters) and the fifth largest crude oil reserves [89.7 billion barrels (Gbbbl)] in the world according to the Oil & Gas Journal (2000b). These figures apparently do not include 1999 or 2000 Iranian reserve additions. Petroleum continued to provide the bulk of Iran's foreign exchange.

The gross domestic product of this Middle Eastern country of about 63 million people was estimated to be \$110.8 billion in 1999 (the last year for which data were available) (World Bank Group, August 30, 2000, Iran, Islamic Rep. at a glance, accessed September 10, 2001, at URL http://www.worldbank.org/cgi-bin/sendoff.cgi?page=%2Fdata%2Fcountrydata%2Faag%2Firn_aag.pdf). Although inflation was high, according to the Iranian Central Bank, it dropped to about 13% in 2000 compared with 14.5% in 1998 and about 50% in 1995 (Middle East Economic Digest, 2001b).

Government Policies and Programs

During 2000, the Government merged the Ministry of Mines and Metals and the Ministry of Industry to form the Ministry of Industry and Mines. Parliament forwarded a draft investment law to the Council of Guardians for approval. When signed, the new law will replace the Law on Attraction and Protection of Foreign Investment (LAPFI) (Dinmore, 2000). Under LAPFI, direct foreign investment was restricted to joint ventures.

The loss of projected revenue during the oil price decline in 1997, 1998, and early 1999 focused the Government on the need for a more diversified economy. During the Third Five-Year Economic Development Plan for the Iranian years 1379 to 1384 (March 21, 2000, to March 20, 2005), the Government proposed to privatize 40 mineral industry companies affiliated with the Ministry of Industry and Mines and 23 companies associated with the Ministry of Petroleum. This continues the privatization program that has been ongoing for the past several years through which the Government has divested itself of numerous smaller mineral enterprises.

Since 1998, the Government has allowed foreign investment in solid mineral exploration joint ventures. Following the 1998 National Iranian Oil Co. (NIOC) proposal to contract out about 100 oil and gas projects to international companies, the Government invited foreign investment into the solid minerals sector in 1999 as it showcased 102 mining and mineral-processing projects at the First International Mines & Metals Investment Forum (Ministry of Mines & Metals, 1999).

Most proposed foreign investment contacts in the minerals sector were based on a buy-back scheme under which the contractors developed awarded projects for a contract-specified rate of return for a specified period after recovering their initial investment from the project's output. The Government had tailored the buy-back procedure to conform with Article 153 of the Iranian Constitution, which prohibited foreign control over natural resources (Corzine, 1998). During 2000, the Government evaluated various revisions to the buy-back procedure for petroleum operations to address published concerns that the current (2000) formula encouraged overproduction during the initial contract term, contrary to good reservoir management procedures and at the expense of long-term field production (Middle East Economic Digest, 2001c, p. 28).

The U.S. Government's Iran and Libya Sanctions Act of 1996 (ILSA) (Public Law 104-172), which proscribed any company (American or foreign) from exceeding a \$20-million-per-year investment or trading limit with Iran in the petroleum sector, initially had hampered foreign investment in petroleum and other mineral industry projects in Iran. Since 1998, however, many European nations have reestablished official relations with Iran and have not discouraged investment in Iran.

In 1998, the U.S. Government waived sanctions against an international consortium that was developing the offshore South Pars gasfield (Middle East Economic Digest, 1998). In 1999 and 2000, the U.S. Government lifted the restrictions on the sale of spare parts for Iranian civilian passenger aircraft; modified the restrictions on the export of food, medicine, and medical equipment to Iran; and allowed the import of Iranian carpets and certain food products into the United States. The gradual reduction of restrictions lead to the anticipation that the U.S. Government would allow the ILSA to expire in 2001. Without ILSA, additional international companies would probably invest in the Iranian minerals sector (Middle East Economic Digest, 2001a; Oil & Gas Journal, 2001). In addition to ILSA, American citizens and companies were banned from investing or participating in Iran's mineral sector activities under Presidential Executive Orders 12957 of March 15, 1995, 12959 of May 6, 1995, and 13059 of August 19, 1997.

Structure of the Mineral Industry

The overall management of the minerals sector was under the auspices of the Ministry of Industry and Mines. The Ministry's authority covers all mining, smelting, and refining industries except oil and gas, which were administered by the Ministry of Petroleum. Most of the estimated 2,700 active mines were privately owned, although the State retained operational control of the larger companies in the minerals sector.

Commodity Review

Metals

Aluminum.—Primary aluminum production was, for the most part, derived from the Iranian Aluminium Co. plant in Arak. Commissioning of Al-Mahdi Aluminium Corp.'s aluminum smelter at Bandar Abbas slowly continued; only 60 of the plant's 240 pots had been brought online since the smelter's 1997 startup (Metal Bulletin 2000a). Construction continued at the 280,000-metric-ton-per-year-(t/yr)-capacity alumina refinery at Jajarm, about 480 kilometers (km) northeast of Tehran; delays were attributed to design problems (Iran Daily, September 5, 2000, Jajrom alumina plant back on track, accessed September 11, 2000, at URL <http://www.iran-daily.com/4/>).

Chromite.—Sepahan Steel Co. of Iran and international investors were to develop an 18,000-t/yr chromite mine at Abadeh. ABB Industrie AG of Switzerland, Evicom of Austria, Baft Ferrochrome Industrial Co. of Iran, and Navid Ehya Sepahan of Iran reportedly agreed to build a 25,000-t/yr ferrochrome plant in Baft in Kerman Province and a 25,000-t/yr ferrochrome plant at Abadeh in Fars Province. Construction of the plants was projected to take 2 years (Iran Daily, June 18, 2000, \$74 million ferrochrome deal concluded, accessed June 19, 2000, at URL <http://www.iran-daily.com/1/>; Iran Daily, August 1, 2000, Swiss firms invest in Abadeh chromite mine, accessed August 4, 2000, at URL <http://www.iran-daily.com/2/>).

Copper.—Anglo Exploration GmbH of Germany and General Iranian Mining Co. of Iran explored for copper in Zarshuran and undertook regional exploration for copper, gold, and zinc. BHP Ltd. evaluated the porphyry copper deposit of the Jabal-Barez region in Hormozgan Province.

In 1999, Union Capital Ltd. of Australia explored the North-East Copperbelt with Ehya Sanaya Khorassan Co. of Iran. Identified copper prospects included the Halak Abad prospect in the northeast and the Hazy Kandy prospect in the northwest. Reconnaissance exploration of the Sistan-va-Baluchestan Province by Zarcán Minerals Inc. of Canada resulted in the acquisition of 15 exploration permits. Zarcán formed a joint venture with National Iranian Copper Industries Co. (NICICO) to explore the Kuh-e Lar prospect.

Construction continued at NICICO's Khatounabad copper smelter, 20 km from the Sar Cheshmeh copper complex in southeastern Iran. The 80,000-t/yr-capacity plant reportedly was 62% complete (Iran Daily, September 21, 2000, SCC production to double, accessed September 26, 2000, at URL <http://www.iran-daily.com/4/>). A 12,000-t/yr copper plant was proposed for Meshkin-Shahr in Ardebil Province (Iran Daily, September 28, 2000, European banks grant 30m euros for copper plant, accessed October 2, 2000, at URL <http://www.iran-daily.com/3/>). Also proposed was construction of copper mines at the Meiduk and the Songun prospects.

Gold.—Much of the gold recovered in Iran was a coproduct of NICICO's Sar Cheshmeh copper complex operations.

Additional gold was recovered from the Mouteh Mine and from gold placer mines in the Neyshabour area.

Zarcán was exploring for gold on the Agh Darreh prospect in northwestern Iran and the Baluchestan project in southeastern Iran. On the Agh Darreh gold property, the Pouya Zarcán Agh Darreh Co. (the joint venture of Zarcán and IRAMCO Aluminum Raw Material Co.) completed a prefeasibility study and a reverse circulation drilling program.

Iron and Steel.—Numerous iron and steel projects were at various stages of planning or construction. Voest-Alpine Industrieanlagenbau GmbH & Co. was contracted to increase the capacity of National Iranian Steel Co.'s 3.5-million-metric-ton-per-year-(Mt/yr)-capacity beneficiation plant at the Gol-e-Gohar iron ore mine to 5.2 Mt/yr (Metal Bulletin, 2000c). Other projects included the expansion of Isfahan Steel Co.'s plant with the addition of a 150-metric-ton (t) electric-arc furnace and a third blast furnace (1.4-Mt/yr capacity) proposed to be in production by 2003. At Khorasan, the 550,000-t/yr rolling mill was completed. Proposed expansion plans at Khorasan included a 110-t electric-arc furnace and a billet caster. Also proposed were a 800,000-t/yr sponge iron plant at the Zamzam Steel Mill in Khuzestan Province, a 765,000-t/yr rolling mill at Zagros, and a 70,000-t/yr cast iron plant in Asadabad in Hamedan Province (Metal Bulletin, 2000d; Mining Journal, 2000; Iran Daily, August 20, 2000, Economy—Steel Accord signed with China, accessed August 21, 2000, at URL <http://www.iran-daily.com/1/>; Tehran Times, April 21, 2001, Isfahan steel mill output hits 2m-ton mark, accessed April 20, 2001, at URL <http://www.tehrantimes.com/Description.asp?Da=4/21/01&Cat=9&Num=9>).

During 2000, Azarbaijan Steel Co.'s Mianeh Steel complex in East Azarbaijan Province started production at its new rolling mill. The mill had a capacity of 550,000 t/yr of light sections and industrial and construction round bars (Iran Daily, December 25, 2000, An introduction to Azarbaijan Still [sic] Mill (Mianeh), accessed December 25, 2000, at URL <http://www.iran-daily.com/daily.htm>). Installation of a 150,000-t/yr bar and section mill at Kerman Steel was underway. An 800,000-t/yr Midrex direct-reduced iron plant was under construction at Khuzestan Steel Complex in Ahwaz. Khuzestan's electric-arc furnaces were scheduled for rehabilitation (Metal Bulletin, 2000d).

In 1999, the Mobarakeh Steel plant expanded its mill's hot-rolled coil capacity to 3.1 Mt/yr from 2.5 Mt/yr. Planned further expansion would increase hot-rolled coil capacity to 4.1 Mt/yr. A sixth direct-reduced iron plant was proposed for Mobarakeh (Metal Bulletin, 2000d, 2001). Iran Ferrosilice Co. proposed to expand its total ferrosilicon production capacity by 50,000 t/yr with the construction of two new furnaces (Metal Bulletin, 2000c).

Lead and Zinc.—Most of the nation's lead and zinc production was derived from three mines—the Angouran, the Irankouh, and the Kushk. National Iranian Lead and Zinc Co.'s 40,000-t/yr-capacity lead smelter and Calcimine Co.'s 7,000-t/yr-capacity zinc smelter were at Angouran. In 2000, Calcimine started operations at its 5,000-t/yr Qeshm Zinc Melting Plant joint venture. Calcimine proposed to expand the

production capacity at Angouran to 14,000 t/yr and at Qeshm to 10,000 t/yr (Iran Daily, July 11, 2001, Zinc ingot exported to India, accessed July 17, 2001, at URL <http://www.iran-daily.com/5/>; Iran Daily, October 29, 2000, Promotional item—Calcimine Co., accessed October 30, 2000, at URL <http://www.iran-daily.com/1/>).

In June 2000, a 28,000-t/yr-capacity zinc smelter was dedicated at the Kushk Mine, near Yazd (Iran Daily, June 8, 2000, Major zinc agreement to be inked, accessed June 12, 2000, at URL <http://www.iran-daily.com/3/>).

Cominco Ltd. of Canada and Iran Zinc Mine Development Co. negotiated the formation of a joint venture to assess the feasibility of mining and leaching the zinc oxides of the Angouran zinc deposit and the building of a 100,000-t/yr zinc refinery (Cominco Ltd., 2000). Anzex Resources Ltd. of Canada secured the rights to evaluate the zinc sulfides at Angouran. The joint venture of General Iranian Mining (50%), Itok GmbH of Austria (25%), and Union Capital (25%) studied the proposed development of the Mehdiabad Zinc project as an open pit mine. The joint venture drilled and initiated environmental studies of the prospect.

Industrial Minerals

Cement.—Production capacity expansion of about 1 Mt/yr was underway in Iran. In 2000, the 100,000-t/yr Azadegan Cement Factory on Qeshm Island began operations. Cement plants were reportedly under construction in Darab and Bushehr (Bell and others, 2001, p. 166-167; Iran Daily, June 27, 2000, Cement production reaches 28 tons, accessed July 3, 2000, at URL <http://www.iran-daily.com/5/>; Iran Daily, July 10, 2000, Qeshm Cement factory goes on stream, accessed July 17, 2000, at URL <http://www.iran-daily.com/6/>).

Fertilizer.—The Geology and Minerals Exploration Organization planned to set up a 50,000-t/yr potash fertilizer plant in the Khour region of Isfahan Province. National Petrochemical Co. (NPC) proposed a 400,000-t/yr ammonia plant and a 660,000-t/yr urea plant at the Petrochemical Economic Zone at Bandar Iman Khomeini. In the Assaluyeh Special Economic/Energy Zone, NPC proposed to erect a fertilizer facility with production capacities of about 750,000 t/yr of ammonia and about 1.2 Mt/yr of urea. The Bandar Assaluyeh plant would use gas from the offshore South Pars Field (Stell, 2000; Iran Daily, November 2, 2000, New fertilizer plant to be tendered, accessed November 8, 2000, at URL <http://www.iran-daily.com/5/>; Tehrantimes.com, September 6, 2000, New fertilizer plant to produce 50,000 tons potash annually, accessed April 21, 2001, at URL <http://213.166.26.12/Detailview.asp?Keyword=minerals&Da=9/6/00&Cat=9&Num=13>).

Stone.—Decorative or dimension stone quarries produced granite, marble, and travertine. Stone quarries accounted for about 20% of Iran's active solid mineral extraction operations. The Government encouraged investment in additional stone cutting and processing facilities and attempted to reduce wastage by limiting explosives use in dimension stone quarries.

Mineral Fuels

An extensive survey of the Iranian portion of the Persian Gulf known as the "Persian Carpet 2000" offshore seismic survey was underway. Initial distribution of data was expected in 2001. As more international oil companies contributed to the development of Iranian oil and gasfields, NIOC was able to focus its attention on deferred exploration opportunities. Recent reserve additions could move Iran even higher on the list of countries with significant oil reserves. In 1999, the discovery of the 26-Gbbl Azadegan Field was announced (Mehrhad Balali, September 29, 1999, Iran makes massive \$100bn oil find, accessed September 29, 1999, at URL <http://www.headlines.co.za/news/sp99/iranoil29.htm>). In 2000, reserves of 1 Gbbl were attributed to the Changuleh prospect (Iran Daily, September 13, 2000, New oil finds, accessed September 18, 2000, at URL <http://www.iran-daily.com/4/>). Additional discoveries in 2000 included the Arash and the Ilam oilfields. As with many other Gulf States, Iran planned to increase production capacity. The proposed 1-Mbbl/d increase would be subject to quotas of the Organization of the Petroleum Exporting Countries (Middle East Economic Digest, 2001c).

On the natural gas front, NIOC announced the discovery of the Tabnak gasfield with reserves of 445 billion cubic meters of gas and 240 million barrels (Mbbl) of condensate, the Homa gasfield with reserves of 190 billion cubic meters of gas and 82 Mbbl of condensate, the Zireh gasfield with reserves of 23 billion cubic meters of gas, the Kerenj gasfield, and the Tosan gasfield (Oil & Gas Journal, 2000a; Iran Daily, August 21, 2000, Iran declares another energy discovery, accessed August 21, 2000, at URL <http://www.iran-daily.com/daily.shtml/>; Petrodata Ltd., August 14, 2000, Petrodata daily upstream—Iran announces onshore gas field discovery, accessed August 14, 2000, at URL <http://www.petrodata.co.uk/CGI/tbcgi.exe?CGILATEST>).

During 2000, construction began on the 72-km, 142-centimeter-diameter dry gas pipeline that would connect the onshore South Pars gas facilities at Assaluyeh to the third transcountry gas pipeline (Iran Daily, March 8, 2000, Construction of South Pars gas pipeline starts, accessed March 15, 2000, at URL <http://www.iran-daily.com/6/>).

A significant proportion of produced natural gas was reinjected. The Government proposed to terminate all gas flaring by the end of the Third Five-Year Economic Development Plan. Many of Iran's mature oilfields had reservoir pressure maintenance problems and were candidates for gas injection.

Plans to construct a 6- to 7.5-Mt/yr liquefied natural gas plant were proposed by a consortium of Indian, Iranian, and Malaysian companies and by the joint venture of BG International and Oil Industries Engineering and Construction Co. of Iran (BG International, 2000; Iran Daily May 21, 2000, Consortium to build \$3.5b Iranian LNG plant, accessed May 22, 2000, at URL <http://www.iran-daily.com/1/>).

For more extensive coverage of the natural gas and petroleum industry of Iran, see the Iran Country Analysis Brief presented by the U.S. Energy Information Administration at URL <http://www.eia.doe.gov/emeu/cabs/iran2.html>.

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Major Sources of Information

Geological Survey of Iran

P.O. Box 13185-1491
Tehran, Iran

Ministry of Industry and Mines

P.O. Box 1416
No. 248 Somayyeh Ave.
14155 Tehran, Iran

Telephone: +(98) 21-836050

Ministry of Petroleum

P.O. Box 1863
Tehran, Iran

Telephone: +(98) 21-6466563

Fax: +(98) 21-6465922

TABLE 1
IRAN: PRODUCTION OF MINERAL COMMODITIES 1/ 2/ 3/

(Metric tons unless otherwise specified)

| Commodity 4/ | 1996 | 1997 e/ | 1998 | 1999 | 2000 e/ |
|--|----------------|-------------------|------------------|------------------|------------------|
| METALS | | | | | |
| Aluminum: | | | | | |
| Bauxite, gross weight | 150,000 | 150,000 | 336,000 | 912,451 | 400,000 |
| Metal, primary ingot | 80,100 | 92,300 | 123,759 | 137,421 | 140,000 |
| Arsenic, orpiment and realgar, concentrates e/ | 500 | 492 | 323 r/ | 300 r/ | 400 |
| Chromite, mine output, concentrate 5/ | | | | | |
| Gross weight | 130,220 | 168,984 6/ | 313,937 | 311,235 | 310,000 |
| Cr ₂ O ₃ content e/ | 63,800 | 82,800 | 138,000 | 137,000 | 137,000 |
| Copper: | | | | | |
| Mine output: | | | | | |
| Ore mined (1% to 1.2% Cu): | | | | | |
| Gross weight | 14,150 | 14,200 | 13,740 | 13,770 | 13,800 |
| Cu content e/ | 120,000 | 117,000 | 137,000 | 138,000 | 138,000 |
| Concentrate (29% to 35% Cu): | | | | | |
| Gross weight e/ | 320,000 | 320,000 | 378,504 6/ | 381,346 6/ | 350,000 |
| Cu content | 108,000 e/ | 108,000 | 128,300 | 131,000 | 120,000 |
| Metal: | | | | | |
| Smelter output, blister/anode | 99,100 | 99,000 | 150,000 | 154,000 | 154,000 |
| Refined output, cathode | 99,200 | 103,300 | 129,000 | 131,700 | 132,000 |
| Gold, mine output, Au content 7/ | 640 | 684 6/ | 856 | 930 | 950 |
| Iron and steel: | | | | | |
| Ore and concentrate: | | | | | |
| Gross weight | 9,850 | 12,750 | 10,536 | 10,776 | 11,000 |
| Fe content e/ | 4,800 | 6,300 | 5,200 | 5,300 | 5,400 |
| Metal: | | | | | |
| Pig iron | 1,867 | 2,053 6/ | 2,087 | 2,147 | 2,200 |
| Direct-reduced iron | 3,778 | 4,380 6/ | 3,690 | 4,120 | 4,740 |
| Ferrochromium | 10,500 | 11,450 6/ | 13,745 | 13,680 | 14,000 |
| Ferrosilicon e/ | 40,000 r/ | 40,000 r/ | 40,000 r/ | 46,000 r/ | 40,000 |
| Steel, crude, ingots and castings | 5,415 | 6,322 6/ | 5,608 | 6,277 | 6,600 |
| Lead: | | | | | |
| Mine output, concentrate: | | | | | |
| Gross weight e/ | 30,000 | 37,000 | 21,216 6/ | 22,000 | 27,000 |
| Pb content | 15,700 e/ | 18,200 | 11,000 | 11,000 e/ | 15,000 |
| Refinery output, includes secondary | 46,900 | 49,400 | 47,000 | 47,000 e/ | 47,000 |
| Manganese, mine output, (30% to 35% Mn): | | | | | |
| Gross weight | 100,000 | 135,000 | 101,390 | 104,096 | 105,000 |
| Mn content e/ | 32,000 | 40,000 | 30,500 | 32,000 r/ | 32,000 |
| Molybdenum, mine output, concentrate (56% Mo): e/ | | | | | |
| Gross weight | 1,600 | 1,800 | 4,350 6/ | 4,906 6/ | 4,900 |
| Mo content | 560 | 600 | 1,400 | 1,600 | 1,600 |
| Silver, mine output, Ag content e/ | 40 | 30 | 19 6/ | 21 6/ | 22 |
| Zinc: | | | | | |
| Mine output, concentrate: | | | | | |
| Gross weight e/ | 152,000 | 132,000 | 160,000 | 160,000 | 170,000 |
| Zn content | 76,300 | 76,500 | 80,000 e/ | 80,000 e/ | 85,000 |
| Metal e/ | -- | 14,000 | 23,000 | 23,000 | 50,000 |
| INDUSTRIAL MINERALS | | | | | |
| Asbestos: e/ | | | | | |
| Concentrate, (3% to 8% marketable fiber) | 65,000 | 86,200 | 45,000 | 40,000 | 40,000 |
| Marketable fiber | 4,500 | 4,300 | 2,258 6/ | 2,000 | 2,000 |
| Barite | 150,000 e/ | 181,174 6/ | 187,677 | 183,850 | 185,000 |
| Boron, borax e/ | 500 | 420 | 2,086 6/ | 3,663 6/ | 3,700 |
| Cement, hydraulic e/ | 18,350 | 19,250 | 19,500 r/ | 22,080 r/ 6/ | 23,880 6/ |
| Clays: | | | | | |
| Bentonite | 85,000 | 105,300 6/ | 83,279 6/ | 64,957 | 70,000 |
| Other: e/ | | | | | |
| Industrial clays | 300,000 | 350,000 | 450,000 | 400,000 | 450,000 |
| Kaolin | 350,000 | 478,964 r/ 6/ | 582,485 6/ | 837,277 6/ | 800,000 |
| Total | 650,000 | 828,964 r/ | 1,030,000 | 1,237,000 | 1,250,000 |
| Diatomite e/ | 90 | 90 | 600 | 4,350 | 4,500 |
| Feldspar | 106,000 | 125,000 6/ | 185,709 | 239,779 | 240,000 |
| Fluorspar | 20,000 e/ | 24,846 r/ 6/ | 25,904 | 18,387 | 20,000 |

See footnotes at end of table.

TABLE 1--Continued
 IRAN: PRODUCTION OF MINERAL COMMODITIES 1/ 2/ 3/

(Metric tons unless otherwise specified)

| Commodity 4/ | 1996 | 1997 e/ | 1998 | 1999 | 2000 e/ |
|--|--------------|---------------|--------------|-------------|------------|
| INDUSTRIAL MINERALS--Continued | | | | | |
| Gemstones, turquoise e/ kilograms | 5,000 | 14,000 r/ 6/ | 6,000 6/ | 20,000 | 20,000 |
| Gypsum thousand tons | 8,570 | 9,966 r/ 6/ | 11,843 | 10,834 | 11,000 |
| Industrial or glass sand (quartzite and silica) e/ | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| Lime e/ thousand tons | 2,000 r/ | 2,500 r/ e/ | 2,737 r/ 6/ | 2,138 r/ 6/ | 2,200 |
| Magnesite e/ | 55,000 | 119,000 r/ 6/ | 109,597 6/ | 141,081 6/ | 141,000 |
| Mica e/ | 1,000 r/ | 1,086 r/ 6/ | 1,084 6/ | 1,425 6/ | 2,000 |
| Nitrogen: | | | | | |
| N content of ammonia | 882,000 | 879,800 6/ | 1,034,000 | 865,000 r/ | 965,000 6/ |
| N content of urea | 552,900 | 610,500 6/ | 800,000 e/ | 800,000 e/ | 800,000 |
| Perlite e/ | 6,000 | 10,000 | 13,320 6/ | 15,069 | 15,000 |
| Pigments, mineral, natural iron oxide, ochre e/ | 2,500 | 10,000 r/ | 13,300 r/ | 13,300 r/ | 13,500 |
| Pumice and related volcanic materials e/ | 200,000 | 200,000 | 150,000 | 150,000 | 150,000 |
| Salt | 1,000,000 e/ | 1,180,000 | 1,911,800 6/ | 1,600,000 | 1,600,000 |
| Sodium compound, caustic soda e/ | 15,000 | 15,000 | 20,000 | 20,000 | 20,000 |
| Stone: e/ | | | | | |
| Construction and building, crushed, n.e.s. thousand tons | 4,800 | 14,828 r/ 6/ | 11,670 r/ 6/ | 11,000 r/ | 12,000 |
| Dimension and decorative: | | | | | |
| Granite do. | 150 r/ e/ | 195 r/ 6/ | 181 6/ | 195 6/ | 200 |
| Marble: | | | | | |
| Blocks do. | 4,500 | 4,500 | 6,000 | 6,400 | 7,000 |
| Crushed do. | 450 | 450 | 500 | 500 | 550 |
| Slabs do. | 50 | 50 | 100 | 100 | 110 |
| Travertine: | | | | | |
| Blocks do. | 500 | 550 r/ | 516 6/ | 435 6/ | 500 |
| Crushed and slabs do. | 70 | 70 | 100 | 65 | 100 |
| Total do. | 5,720 r/ | 5,815 r/ | 7,400 r/ | 7,700 r/ | 8,500 |
| Dolomite do. | 200 | 267 r/ 6/ | 475 | 286 6/ | 300 |
| Limestone do. | 32,000 | 33,000 | 33,000 | 33,000 | 35,000 |
| Strontium, celestite e/ | 2,000 r/ | 2,000 r/ | 2,000 r/ | 1,650 6/ | 2,000 |
| Sulfates, natural: e/ | | | | | |
| Aluminum potassium sulfate (alum) | 12,000 | 12,000 | 12,000 | 12,000 | 12,000 |
| Sodium sulfate | 315,000 6/ | 480,000 | 264,973 | 308,093 | 300,000 |
| Sulfur: e/ | | | | | |
| Byproduct of petroleum and natural gas | 840,000 | 850,000 | 1,280,000 | 1,302,000 | 1,300,000 |
| Byproduct of metallurgical processing, S content of acid | 50,000 | 50,000 | 50,000 | 48,000 | 50,000 |
| Total | 890,000 | 900,000 | 1,330,000 | 1,350,000 | 1,350,000 |
| Talc e/ | 20,000 | 29,660 r/ 6/ | 27,038 r/ 6/ | 25,000 r/ | 25,000 |
| MINERAL FUELS AND RELATED MATERIALS | | | | | |
| Coal thousand tons | 1,840 | 1,750 | 1,711 | 1,507 | 1,500 |
| Coke e/ do. | 700 | 800 | 22,000 6/ | 20,000 | 25,000 |
| Gas, natural: | | | | | |
| Gross million cubic meters | 86,000 | 82,600 | 89,000 | 90,600 e/ | 120,000 |
| Dry do. | 39,077 | 47,000 | 50,000 | 51,000 e/ | 55,000 |
| Natural gas plant liquids e/ thousand 42-gallon barrels | 23,500 | 22,000 | 23,000 | 24,000 | 25,000 |
| Petroleum: | | | | | |
| Crude do. | 1,345,390 | 1,337,360 6/ | 1,325,000 | 1,300,000 e | 1,360,000 |
| Refinery products: e/ | | | | | |
| Liquefied petroleum gases do. | 23,000 | 14,500 | 15,700 | 15,000 | 16,000 |
| Motor gasoline do. | 54,400 | 54,500 | 65,700 | 60,000 | 65,000 |
| Jet fuel do. | 10,200 | 10,000 | 13,000 | 11,000 | 12,000 |
| Kerosene do. | 35,800 | 36,000 | 40,000 | 36,000 | 40,000 |
| Distillate fuel oil do. | 108,800 | 109,000 | 136,000 | 120,000 | 140,000 |
| Residual fuel oil do. | 98,600 | 98,000 | 163,000 | 140,000 | 160,000 |
| Other do. | 64,200 | 64,000 | 61,000 | 60,000 | 67,000 |
| Total do. | 395,000 | 386,000 | 494,400 | 442,000 | 500,000 |

e/ Estimated. r/ Revised.

1/ Table includes data available through August 31, 2001.

2/ Data are for Iranian years ending March 21 of that stated, except data for natural gas, plant liquids, and petroleum, which are for Gregorian calendar years.

3/ Estimated data are rounded to no more than three significant digits; may not add to totals shown.

4/ In addition to commodities listed, the following may have been produced, but information is inadequate to estimate output: ferromanganese, ferromolybdenum, nepheline syenite, phosphate rock, selenium, shell, vermiculite, and zeolite.

5/ Chromite content of concentrate estimated to be 48% to 50% Cr₂O₃ for 1995 through 1997 and 42% to 45% Cr₂O₃ for 1998 and 1999.

6/ Reported figure.

7/ Includes gold recovered from the Mouth gold mine and from the Sarcheshmeh copper complex.

TABLE 2
IRAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2000 1/ 2/

(Thousand metric tons unless otherwise specified)

| Commodity | Major operating companies (and major equity owners) | Location of facilities | Annual capacity |
|-----------|--|--|--------------------|
| Aluminum | Iran Aluminium Co. (Government) | Arak | 120 |
| Do. | Al-Mahdi Aluminium Corp. (National Iranian Copper Industries Co., 33.32%, International Development Corp., 18.9%, Iran Aluminium Co., 13.9%, Maydook Copper Co., 11.95%) | Bandar Abbas | 110 |
| Do. | Qeshm Aluminium Co. (Prime International Ltd.) | Qeshm Island Free Trade Area | NA |
| Arsenic | NA | Zarshuran Mine, Tabak | 440 |
| Barite | Iran Barite Falat Co. | Lar Mine, Tehran | 46 |
| Do. | do. | Elit Mine, Amol | 21 |
| Do. | do. | Dasht-E-Deh Mine, Kavir Dar Anjir | 12 |
| Do. | do. | Haji abad Mine; Komsheh Cheh Mine; Kashan, Ardekan Mine; Djasb Mine; and Vardeh Mine | 18 |
| Do. | Other companies | Other mines | 148 |
| Boron | NA | Gharagol Mine, Tabak | 2,800 |
| Cement | Abadeh Cement Co. | Abedeh | NA |
| Do. | Abyek Cement Co. (Fars & Khuzestan Cement Co.) | Abyek, 80 kilometers northwest of Tehran | 2,300 |
| Do. | Ardebil Cement Co. (Ehdasse Sanat Corp.) | About 20 kilometers from Ardebil | 840 |
| Do. | Azadegan Cement Factory | Qeshm Island | 100 |
| Do. | Behbahan Cement Co. (Fars & Khuzestan Cement Co.) | Behbahan | 880 |
| Do. | Bojnourd Cement Plant | Bojnourd | 700 |
| Do. | Bushehr Cement Co. (Ehdasse Sanat Corp.) | Borazjan | 1,100 3/ |
| Do. | Darab Cement Co. (Ehdasse Sanat Corp.) | Near Shiraz | 1,100 3/ |
| Do. | Doroud Cement Co. (Fars & Khuzestan Cement Co.) | Doroud | 1,440 |
| Do. | Ekbatan Cement Co. | Ekbatan | NA |
| Do. | Estahban Cement Co. | Estahban | NA |
| Do. | Fars Cement Co. (Fars & Khuzestan Cement Co.) | Fars | 1,050 |
| Do. | Ghaen Cement Co. (Iran National Industrial Organization) | Ghaen | 600 |
| Do. | Gharb Cement Co. | Kermanshah | 640 |
| Do. | Gorgon Cement Co. | NA | 640 |
| Do. | Hegmatan Cement Co. (Ehdasse Sanat Corp.) | East of Razan | 840 |
| Do. | Hormozgan Cement Co. (Ehdasse Sanat Corp.) | About 52 kilometers west of Bandar Abbas | 2,200 |
| Do. | Ilam Cement Co. | Ilam | NA |
| Do. | Isfahan Cement | Isfahan | 710 |
| Do. | Karoon Cement Co. | Karoon | NA |
| Do. | Kerman Cement Co. | Kerman | 1,150 |
| Do. | Khash Cement Co. (Ehdasse Sanat Corp.) | Khash | 730 |
| Do. | Khazar Cement Co. | Khazar | 640 |
| Do. | Khuzestan Cement Co. (Ehdasse Sanat Corp.) | Ramhormoz | 1,100 |
| Do. | Kordestan Cement Co. (Ehdasse Sanat Corp.) | North of Bijar | 800 |
| Do. | Mazandaran Cement Co. | Neka | NA |
| Do. | Meshed Cement Co. | Meshed | 500 |
| Do. | Ourmia Cement Co. | Urumiyeh | 740 |
| Do. | Ourmia White Cement Co. | do. | 180 |
| Do. | Nyriz White Cement Co. | Nyriz | NA |
| Do. | Saveh White Cement Co. | Saveh | 180 |
| Do. | Sepahan Cement Co. | Sepahan | 2,100 |
| Do. | Shahrud Cement Co. | Sharoud | NA |
| Do. | Sharg Cement Co. | Mashhad | NA |
| Do. | Shomal Cement Co. | Shomal | 880 |
| Do. | Shomal White Cement Co. | do. | NA |
| Do. | Simansaz Cement Co. | Loshan | 100 |
| Do. | Sufiyan Cement Co. | Sufiyan | 1,500 |
| Do. | Tabriz Cement Co. | Tabriz | NA |
| Do. | Tehran Cement Co. | Tehran | 3,000 |
| Do. | Yazd Bohrouk Cement Co. | Yazd | NA |
| Do. | Yazd White Cement Co. | Hemgaman | NA |
| Chromite | Faryab Mining Co. | Faryab Mine, Minab, Hormuzgan | 180 |
| Do. | NA | Mine at Esfandaqeh | 30 |
| Do. | NA | Forumad Mine, Mayami, Semnan | 6 |
| Do. | NA | Mir Mahmud Mine, Mayami, Seman | 6 |
| Do. | NA | Bandan Mine, Khorasan | 5 |
| Do. | NA | Mokki Mine, Zahedan | 4 |
| Do. | NA | Nok Abad, Zahedan | 3 |
| Do. | NA | Gaft Mine, Khorasan | 2 |

See footnotes at end of table.

TABLE 2--Continued
 IRAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2000 1/ 2/

(Thousand metric tons unless otherwise specified)

| Commodity | Major operating companies and major equity owners | Location of facilities | Annual capacity |
|--------------------------|---|---|-----------------|
| Chromite--Continued: | Other companies | Other mines | 21 |
| Clay: | | | |
| Bentonite | Iran Barite Falat Co. | Mehrijan Mine, Farrokhi, Esfahan | 39 |
| Do. | do. | Zarrin Mine, Kavir Dar Anjir, Yazd | 3 |
| Do. | Other producers | Other mines | 121 |
| Industrial and fire clay | Iranian Refractory Procurement and Production | Mine and plant, Tehran | 40 |
| Do. | Other producers | Other mines | 1,117 |
| Kaolin | Khorasan Kaolin Co. | Shurkesht Mine, Sabzevar, Khorasan | 50 |
| Do. | do. | Mine (inactive) at Torbat Hydarieh, Khorasan | 20 |
| Do. | do. | Plant at Torbat Hydarieh, Khorasan | 20 |
| Do. | Other companies | Other mines | 700 |
| Coal | Iran Foulad Co. | Paradeh 3 Mine, Tabass, Khorasan | 14 |
| Do. | Kerman Coal Co. (National Iranian Steel Company [Nisco]) | Various mines | 854 |
| Do. | Central Alborz Coal Co. (Nisco) | Zirab, Mazandaran | NA |
| Do. | Eastern Alborz Coal Co. (Nisco) | Shahrud, Mazandaran | NA |
| Do. | do. | Razi coal mine, Semnan | 39 |
| Do. | Western Alborz Coal Co. (Nisco) | Near Sangroud, Gilan | NA |
| | | Total--Central, Eastern, and Western Alborz Coal | 641 |
| Do. | NA | East Mazinoo and West Mazinoo, Khorasan | 4 |
| Coal Tar | Isfahan Coal Tar Refinery | Refinery, 40 kilometers east of Esfahan | 100 |
| Cobalt | NA | Eglide Mine, Fars | NA |
| Coke | Isfahan Steel Co. (Nisco) | Isfahan complex, 40 kilometers east of Esfahan | 1,150 |
| Copper | National Iranian Copper Industries Co. (Government) | Sar Cheshmeh Mine, 60 kilometers south of Rafsanjan | 13,400 |
| Do. | do. | Songun copper mine | 400 3/ |
| Do. | do. | Meiduk copper mine | 5,000 3/ |
| Do. | do. | Qal'eh Zari Mine, near Birjan | 15 |
| Do. | do. | Smelter, Sar Cheshmeh copper complex | 154 |
| Do. | do. | Smelter, Khatounabad | 80 3/ |
| Do. | do. | Refinery, Sar Cheshmeh copper complex | 120 4/ |
| Do. | do. | Electrowon plant, Sar Cheshmeh copper complex | 12 4/ |
| Do. | do. | Rolling mill (billet), Sar Cheshmeh copper complex | 3 |
| Do. | do. | Rolling mill (slab), Sar Cheshmeh copper complex | 7 |
| Do. | do. | Wire rod plant, Sar Cheshmeh copper complex | 51 |
| Do. | Shahid Bahonar Copper Industries Co. (Social Security Investment Co.) | Mill at Kerman | 35 |
| Do. | Simco. | Wire plant at Rasht | NA |
| Copper, secondary | Niru Metal Smelting Factory (Niru Battery Manufacturing Co.) | Ghani Abad Factory, Tehran | NA |
| Diatomite | NA | Kamel Abad, Tabriz | 2 |
| Ferroalloys: | | | |
| Ferromanganese | Faryab Mining Co. | Faryab, Kerman | 15 |
| Do. | Navid Manganese Co. | NA | 15 |
| Do. | Faryab Mining Co. | Kerman | 15 |
| Ferromolybdenum | Pars Molybdenum Co. | NA | 1 |
| Do. | National Iranian Copper Industries Co. (Government) | Khatounabad smelter | 2 |
| Do. | Zanjan Bronze | NA | 1 |
| Ferrosilicon | Iran Ferrosilice Co. | Azna, Semnan | 25 |
| Do. | Iran Ferroalloy Ind. | NA | 23 |
| Do. | Navid Alyaj Co. | NA | 1 |
| Fertilizer: | | | |
| Ammonia | Razi Petrochemical Co. (National Petrochemical Co.) | Bandar Iman Khomeini | 660 |
| Do. | Shiraz Petrochemical Co. (National Petrochemical Co.) | Southeast of Shiraz | 432 |
| Do. | Khorasan Petrochemical Co. (National Petrochemical Co.) | Khorasan Province | 330 |
| Di-ammonium phosphate | Razi Petrochemical Co. (National Petrochemical Co.) | Bandar Iman Khomeini | 240 |
| Urea | do. | do. | 726 |
| Do. | Shiraz Petrochemical Co. (National Petrochemical Co.) | Southeast of Shiraz | 543 |
| Do. | Khorasan Petrochemical Co. (National Petrochemical Co.) | Khorasan Province | 495 |
| Fluorspar | NA | Kamar Mehdi Mine, 165 kilometers southwest of Tabas | 20 |
| Do. | NA | Emaft Mine, 30 kilometers from Zirab, Mazandaran | 3 |
| Do. | NA | Kamarposht Mine, 20 kilometers from Zirab | 5 |
| Do. | NA | Helali Gonabad Mine, 27 kilometers from Gonabad-Bajestan road | 2 |
| Do. | NA | Delijan Region Mines, 10 kilometers from Delijan, Markazi | 6 |

See footnotes at end of table.

TABLE 2--Continued
 IRAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2000 1/ 2/

(Thousand metric tons unless otherwise specified)

| Commodity | Major operating companies and major equity owners | | Location of facilities | Annual capacity |
|-----------------------|--|--|--|-----------------|
| Fluorspar--Continued: | NA | | Mahalat Mine, 5 kilometers from Mahalat, Markazi | 2 |
| Do. | NA | | Pachi Miyana Mine, 30 kilometers from Zirab | 2 |
| Do. | NA | | Jouimand Mine, 23 kilometers northwest of Gonabad, Khorasan | NA |
| Do. | NA | | Derasele deposit | NA |
| Gemstones, turquoise | NA | | Neyshabour Mine | 6 |
| Gold, ore | kilograms | NA | Moteh Mine, Esfahan | 500 |
| Do. | do. | Iranian Gold Co. | Cengedeh operation | 128 |
| Do. | do. | Artisanal placer operations | Neyshabour area | NA |
| Gold 4/ | do. | National Iranian Copper Industries Co. | Sar Cheshmeh | 500 |
| Gypsum | Private owner | | Semnan-Mazandran Mine, Semnan | 476 |
| Do. | do. | do. | Saran 2 Mine, Tehran | 181 |
| Do. | do. | do. | Zevan Mine, Semnan | 171 |
| Do. | do. | do. | Saran 1 Mine, Tehran | 134 |
| Do. | do. | do. | Aftar Mine, Semnan | 130 |
| Do. | do. | do. | Momenabad Mine, Semnan | 118 |
| Do. | Other producers | | Various mines | 8,154 |
| Iron | | | | |
| Ore | Gol-e-Gohar Iron Ore Co. (Nisco) | | Gol-e-Ghar Mine, Kerman | 5,200 3/ |
| Do. | Chadormalou Mining and Industrial Co. (Nisco) | | Chadormalou Mine, 90 kilometers north of Tchogart | 3,800 |
| Do. | Iran Central Iron Ore Co. (Nisco) | | Choghart Mine, Bafgh, Yazd | 3,250 |
| Do. | NA | | Sangan Mine, Golestan | 100 |
| Do. | Iran Barite Falat Co. | | Deh-Zaman Mine, Khorassan | 4 |
| Do. | Ajin Iron Mining Co. | | NA | NA |
| Metal | Mobarekeh Steel Co. (Nisco) | | Direct reduction iron plant (Midrex process) at Esfahan | 3,200 |
| Do. | Khuzestan Steel Co. (Nisco) | | Direct reduction iron plant (HYL I, Midrex 3/, and Purofer processes), Ahwaz | 2,230 |
| Do. | Isfahan Steel Co. (Nisco) | | Direct reduction iron plant (Ghaem process) at Esfahan | 600 6/ |
| Lead | | | | |
| Ore | Iran Zinc Mine Development Co. | | Angouran Mine, Zanjan | 450 7/ |
| Do. | Bama Mining Co. | | Irankouh Mine, Esfahan | 290 7/ |
| Do. | National Iranian Lead and Zinc Co. | | Kushk Mine, Yazd | 175 7/ |
| Do. | do. | do. | Douna Mine | 38 |
| Do. | do. | do. | Nakhlak Mine, 60 kilometers northeast of Anarak | 25 |
| Do. | do. | do. | Emarat Mine, Markazy | NA |
| Do. | do. | do. | Ravanj Mine, Markazy | NA |
| Metal | do. | do. | Smelter at Zanjan | 40 |
| Do. | do. | do. | Refinery at Zanjan | 40 |
| Do. | do. | do. | Refinery at Naklak | NA 8/ |
| Lead, secondary | Niru Metal Smelting Factory (Niru Battery Manufacturing Co.) | | Tehran | 40 |
| Lime | National Iranian Copper Industries Co. | | Sarcheshmeh Copper Complex | NA |
| Do. | Ardebil Cement Co. | | Azarshahr Lime Plant | NA |
| Manganese | Iran Manganese Mines Co. | | Venarch Manganese Mine, Qom | 70 |
| Do. | Qom Manganese Mines Co. | | Shahrestouak Mine, Qom | 3 |
| Methanol | Kharg Petrochemical Co. (National Petrochemical Co.) | | Kharg Island | 660 |
| Do. | Shiraz Petrochemical Co. (National Petrochemical Co.) | | Shiraz | 100 |
| Do. | Fanavaran Petrochemical Co. (National Petrochemical Co.) | | Bandar Imam | 1,000 3/ |
| Mica | metric tons | Private owner | Qareh Bagh Mine, Uroumiyeh region | 1,386 |
| Do. | do. | do. | Other mines | 320 |
| Molybdenum | National Iranian Copper Industries Co. | | Sarcheshmeh Copper Complex | NA |
| Natural gas: | | | | |
| Production 9/ | National Iranian Gas Co. (Government) | | Kangan | 21 |
| Do. | do. | do. | Nar | 17 |
| Do. | do. | do. | Dalan | 8 |
| Do. | do. | do. | Aghar | 6 |
| Processing | do. | do. | Vali Asr gas refinery, 40 kilometers from Bandar Taheri | 38 |
| Do. | do. | do. | Sarkhoun-2, near Bandar Abbas | 4 |
| Do. | do. | do. | Dalan | 13 |
| Do. | do. | do. | Khangiran | 8 |
| Do. | do. | do. | Bid Boland | NA |
| Do. | do. | do. | Qeshm Island | NA |
| Do. | do. | do. | Marun-4 | NA |

See footnotes at end of table.

TABLE 2--Continued
 IRAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2000 1/ 2/

(Thousand metric tons unless otherwise specified)

| Commodity | Major operating companies and major equity owners | | Location of facilities | Annual capacity |
|--------------------------------|---|---|---------------------------------------|-----------------|
| Natural gas--Continued: | | | | |
| Processing | do. | do. | Ahwaz | 1 |
| Liquids | | | | |
| million 42-gallon barrels | do. | do. | NGL 1200, Gachsaran | 9 3/ |
| Do. | do. | do. | Ahwaz | 7 |
| Do. | do. | do. | NGL 1300, Siyah Makan | 6 3/ |
| Do. | do. | do. | Lavan | NA 3/ |
| Peat | metric tons | Private owner | Mazandaran | 1,430 |
| Perlite | do. | do. | Miyaneh Mine, Tabriz | 7,000 |
| Do. | do. | do. | Shahriyar Mine, Tabriz | 5,000 |
| Do. | do. | Private owners | Other operations | 8,400 |
| Petroleum: | | | | |
| Crude production | | | | |
| million 42-gallon barrels | National Iranian Oil Co. (NIOC) (Government) | | Ahwaz Asmari Field | 292 |
| Do. | do. | do. | Gachsaran Field | 219 |
| Do. | do. | do. | Marun Field | 208 |
| Do. | do. | do. | Agha Jari Field | 69 |
| Do. | do. | do. | Ahwaz Bangestan Field | 58 |
| Do. | do. | do. | Bibi Hakimeh Field | 55 |
| Do. | do. | TotalElfina Group (55%), Agip (45%) | Doroud Field, offshore | 53 |
| Do. | do. | NIOC | Abouzar Field, offshore | 46 |
| Do. | do. | do. | Karanj Field | 46 |
| Do. | do. | do. | Rag-e-Safid Field | 37 |
| Do. | do. | do. | Salman Field, offshore | 31 |
| Do. | do. | TotalElfina Group (70%), Petronas (30%) | Sirri E Field, offshore | 31 |
| Do. | do. | NIOC | Pazanan Field | 29 |
| Do. | do. | do. | Mansuri Field | 22 |
| Do. | do. | do. | Kupal Field | 20 |
| Do. | do. | do. | Nargesi Field | 18 |
| Do. | do. | do. | Binak Field | 18 |
| Do. | do. | do. | Ab-Teymur Field | 16 |
| Do. | do. | NIOC | Haft Kel Field | 15 |
| Do. | do. | do. | Lab-e-Safid Field | 15 |
| Do. | do. | do. | Cheshmeh Khush Field | 14 |
| Do. | do. | do. | Forozan Field, offshore | 13 |
| Do. | do. | do. | Ramshir Field | 11 |
| Do. | do. | do. | Naft Safid Field | 9 |
| Do. | do. | do. | Sirri C and Sirri D Fields, offshore | 9 |
| Do. | do. | do. | Bahregansar Field, offshore | 7 |
| Do. | do. | Total (70%), Petronas (30%) | Sirri A Field, offshore | 7 |
| Do. | do. | NIOC | Shadegan Field | 7 |
| Do. | do. | Iranian Offshore Engineering & Construction Co. | Soroosh Field, offshore | 7 |
| Do. | do. | NIOC | Resalat and Reshadat Fields, offshore | 5 |
| Do. | do. | do. | Naft-Shahre Field | 5 |
| Refined products | | | | |
| Do. | do. | National Oil Refining and Distribution Co. | Abadan | 164 |
| Do. | do. | do. | Esfahan | 97 |
| Do. | do. | do. | Bandar Abbas | 85 |
| Do. | do. | do. | Tehran | 82 |
| Do. | do. | do. | Arak | 55 |
| Do. | do. | do. | Tabriz | 41 |
| Do. | do. | do. | Shiraz | 15 |
| Do. | do. | do. | Kermanshah | 11 |
| Do. | do. | do. | Lavan | 7 |
| Phosphate Rock | | | | |
| Do. | Phosphate Mines Development C | | Esfordi Mine, Yazd | 141 |
| Do. | Other companies | | Other mines | 29 |
| Pozzolana | | | | |
| Do. | Private owner | | Keshavarz Mine | 39 |
| Do. | Other companies | | Other mines | 105 |
| Salt | | | | |
| Rock | Private owner | | Melhe Mine, Semnan | 116 |
| Do. | do. | | Khohdasht Kohan Mine, Semnan | 95 |
| Do. | do. | | Salar Mine, Semnan | 54 |
| Do. | do. | | Gaem Mine, Semnan | 37 |
| Do. | Other companies | | Other mines | 419 |

See footnotes at end of table.

TABLE 2--Continued
 IRAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2000 1/ 2/

(Thousand metric tons unless otherwise specified)

| Commodity | Major operating companies and major equity owners | Location of facilities | Annual capacity |
|------------------------------------|--|--|-----------------|
| Salt--Continued: | | | |
| Solar | Bandar Imam Petrochemical Co. (National Petrochemical Co.) | Bandar Iman Khomeini operation, Khuzestan | 400 |
| Do. | Shiraz Petrochemical Co. (National Petrochemical Co.) | Maharlo Shiraz facility, Fars | 352 |
| Do. | Private owner | Gavehkoni Mine, Esfahan | 42 |
| Do. | Other companies | Other operations | 91 |
| Silver | National Iranian Lead & Zinc Co. | Zanjan lead smelter, Zanjan | 12 |
| Steel: | | | |
| Crude | Mobarekeh Steel Co. (Nisco) | Steel plant near Esfahan | 3,100 |
| Do. | Isfahan Steel Co. (Nisco) | Steel plant at Esfahan | 1,940 |
| Do. | Iran National Steel Industrial Group (Nisco) | Steel plant at Ahwaz | 1,000 |
| Do. | Khuzestan Steel Co. (Nisco) | do. | 1,000 |
| Do. | Khorasan Steel Co. (Nisco) | Steel plant at Neyshabur | 600 3/ |
| Do. | Iran Alloy Steel Co (Nisco, 63%; Bank Saderat Iran, 37%) | Yazd steel plant | 250 |
| Rolling mills | Mobarekeh Steel Co. (Nisco) | Rolling mills (hot strip) at Esfahan | 3,100 |
| Do. | do. | Rolling mills (cold reduction) at Esfahan | 875 |
| Do. | Saveh Rolling and Profile Mills Co. | Pipe and section mill at Saveh | 805 |
| Do. | Kaavian Steel Co. (Nisco) | Rolling mills | 800 |
| Do. | Isfahan Steel Co. (Nisco) | Rolling mill (medium sections) at Esfahan | 700 |
| Do. | do. | Rolling mill (light sections) at Esfahan | 700 |
| Do. | Ahwaz Rolling & Pipe Mills Co. (Government) | Rolling mill mill at Ahwaz | 600 |
| Do. | Esfahan Steel Co. (Nisco) | Rolling mill (heavy sections) at Esfahan | 550 |
| Do. | Khorasan Steel Co. (Nisco) | Rolling mill at Khorasan | 550 |
| Do. | Mianeh Steel Plant (Azarbaijan Steel Co.) | Rolling mill in East Azarbaijan | 550 |
| Do. | Khuzestan Steel Co. (Nisco) | Rolling mill at Ahwaz | 540 |
| Do. | Iran Alloy Steel Co (Nisco, 63%; Bank Saderat Iran, 37%) | Rolling mill (heavy sections) at Yazd | 210 |
| Do. | Sepahan Industrial Group Co. | Tube & pipe mill at Esfahan | 200 |
| Do. | Kerman Steel Co. | Bar & section mill | 150 3/ |
| Do. | Iran Alloy Steel Co (Nisco, 63%; Bank Saderat Iran, 37%) | Rolling mill (light sections) at Yazd | 145 |
| Do. | Iran Spiral Co. | Tube and pipe mill (41 to 305 centimeters diameter) at Esfahan | 120 |
| Do. | Isfahan Steel Co. (Nisco) | Wire rod plant at Esfahan | 120 |
| Do. | Ahwaz Rolling & Pipe Mills Co. | Tube and pipe mill (0.1 to 15 centimeters diameter) at Ahwaz | 80 |
| Do. | Kalup Co. | Tube and pipe mill (15 to 36 centimeters diameter) at Saveh | 60 |
| Stone, sand and gravel: 10/ | | | |
| Dolomite | Private owners | Sundry quarry operations | 300 |
| Granite | metric tons Private owner | Tavandasht Mine, Lorestan | 3,000 |
| Do. | do. do. | Gasaban Mine, Hamedan | 800 |
| Do. | do. Private owners | Other operations | 243,000 |
| Do. | square meters Saeid Granite Co. | Stone processing factories at Ghorveh and Tehran | 60,000 |
| Limestone | Private owner | Bibisharh bani Mine, Tehran | 1,700 |
| Do. | do. | Chelleh Kaneh Mine, Tabriz | 1,500 |
| Do. | do. | Lashtegan Mine, Hormozgan | 1,200 |
| Do. | do. | Pirbakran Mine, Esfahan | 1,110 |
| Do. | do. | Asmari Mine, Khuzestan | 1,000 |
| Do. | do. | Kash Mine, Sistan & Baluchestan | 890 |
| Do. | do. | Doroud Mine | 830 |
| Do. | do. | Karzan Mine, Ilam | 760 |
| Do. | do. | Shiraz Mine, Fars | 720 |
| Do. | do. | Ablou Mine, Mazardaran | 670 |
| Do. | do. | Hozmahi Mine, Esfahan | 470 |
| Do. | do. | Chenareh Mine, 200 kilometers from Khoramshahr City | 300 |
| Do. | Private owners | Various other quarry operations | 31,100 |
| Marble | Private owner | Tangeh Hanna E Nyriz Mine, Fars | 8,000 |
| Do. | do. | Libeed Mine, Esfahan | 1,100 |
| Do. | do. | Chahsavar South Nyriz Mine, Fars | 600 |
| Do. | do. | Lashtar Mine, Esfahan | 445 |
| Do. | do. | Asgaran Mine, Lorestan | 320 |
| Do. | do. | Aligodare Mine, Lorestan | 270 |
| Do. | do. | Hetnabad Mine, Esfahan | 220 |
| Do. | do. | Gadamgah Mine, Hormozgan | 190 |
| Do. | Ahjar Dehbid Com., Co. | Dehbid Mines, Fars | 180 |
| Do. | Private owner | Jashegangali Mine, Esfahan | 120 |

See footnotes at end of table.

TABLE 2--Continued
 IRAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2000 1/ 2/

(Thousand metric tons unless otherwise specified)

| Commodity | Major operating companies and major equity owners | Location of facilities | Annual capacity |
|------------------------|---|---|-----------------|
| Marble--Continued: | Private owner | Darbehchah Mine, Lorestan | 119 |
| Do. | do. | Najafabad Mine, Esfahan | 46 |
| Do. | do. | Gavoshani Mine, Jordestan | 27 |
| Do. | do. | Falard Mine, Shahrekord | 21 |
| Do. | do. | Sirjan Mine, Kerman | 20 |
| Do. | do. | Doroud Mine, Lorestan | 9 |
| Do. | do. | Gohareh Mine, Kermanshah | 8 |
| Do. | Private owners | Various other quarry operations | 2,500 |
| Do. | NA | Stone cutting facilities at the Sangal-e-Nyriz complex | NA |
| Onyx | Private owner | Sefied Koh Mine, Yazd | 7 |
| Do. | do. | Borg Mine, Yazd | 5 |
| Do. | do. | Deh rostan Mine, Kerman | 4 |
| Do. | Private owners | Various other quarry operations | 54 |
| Silica and silica sand | do. | Various sand pit operations | 1,719 |
| Travertine | Private owner | Hajiabad Mine, Arak | 118 |
| Do. | do. | Targ Mine (Natanz), Esfahan | 22 |
| Do. | do. | Vargoran Targ Mine (Natanz), Esfahan | 19 |
| Do. | do. | Alvan Varton Mine, Esfahan | 10 |
| Do. | Private owner | Nadinlou Mine (Azarshahr), Tabriz | 10 |
| Do. | do. | Colvanag 1 Mine, Tabriz | 10 |
| Do. | do. | Sardarabad Mine, Tabriz | 10 |
| Do. | do. | Colvanag 2 Mine, Tabriz | 8 |
| Do. | Private owners | Other operations | 365 |
| Do. | NA | Travertine cutting complex at Sangal-e-Azarshahr | NA |
| Sulfur: | National Oil Refining and Distribution Co. | Abadan, Bandar Abbas, Tehran, Isfahan, Arak, Tabriz | NA |
| Do. | National Petrochemical Co. | Kharg Chemical Complex, Kharg Island | 216 |
| Do. | National Iranian Gas Co. | Various gas plants | NA |
| Talc | Private owner | Deh Haji Mine, Lorestan | 10 |
| Do. | do. | Other operations | 12 |
| Vermiculite | NA | Mohammad abad Klaybar | 2 |
| Zeolite | Private owner | Aftar Mine, Semnan | 10 |
| Do. | do. | Mjyaneh Mine, Tabriz | 10 |
| Do. | do. | Amir Abad Mine, Tabriz | 8 |
| Do. | do. | Abeh Garm, Semnan | 6 |
| Zinc | | | |
| Ore | Iran Zinc Mine Development Co. | Angouran Mine, Zanjan | 450 7/ |
| Do. | BAMA Co. | Irankouh (Goushfil, Tapeh Sorhk, and Kolah Darvazeh pits) Mine, Esfahan | 290 7/ |
| Do. | National Iranian Lead & Zinc Co. | Kushk Mine, Yazd | 175 7/ |
| Do. | Bafgh Mining Co. | N/A | 25 |
| Do. | National Iranian Lead & Zinc Co. | Ahangaran Mine | NA |
| Concentrate | Iran Zinc Mine Development Co. | Dandi Calcination plant, Zanjan | 50 |
| Do. | Calcimine Co. | Khoramshar plant | 4 8/ |
| Do. | Mineral Processing Co. of Iran | N/A | NA |
| Metal | Bafgh Zinc Smelting Co. | Bafgh, Yazd | 28 |
| Do. | Angoran Zinc Melting Co. (Calcimine Co.) | Smelter at Angouran Mine, Zanjan | 7 |
| Do. | Qeshm Zinc Melting Co. (Calcimine Co.) | Qeshm Island | 5 |

e/ Estimated. NA Not available.

1/ About 2,700 mines are in Iran, about 2,000 of which are active. About 65% of the active mines produce building and construction materials.

2/ Data were augmented by input from the Iranian National Committee of the World Mining Congress.

3/ Under construction.

4/ Refinery and electrowon output included 730-centimeter x 66-centimeter x 12.7-centimeter slabs (41,000-t/yr capacity), 730-centimeter x 25-centimeter billets (34,000-t/yr capacity), 8-millimeter wire rod (107,000-t/yr capacity), copper powder, or brass alloy.

5/ Gold is also recovered from Sar Chemesh copper plant slimes.

6/ In addition, a 600,000-metric-ton-per-year-capacity Zam Zam process direct reduction iron plant was under construction.

7/ Includes lead and zinc ores.

8/ Closed.

9/ Only includes non-associated gas production.

10/ Approximately 500 dimension stone (decorative stone) quarries are in Iran.