

THE MINERAL INDUSTRY OF SAUDI ARABIA

By Bernadette Michalski

The Kingdom of Saudi Arabia, the world's largest producer of crude oil, achieved a significant diversity in its mineral industry in recent years through the development of copper and gold mining operations, and of cement, fertilizer, and steel manufacturing facilities. Newly developing bauxite, iron ore, and polymetallic base metal mining operations were expected to further add to this diversity. The bulk of revenues and export earnings continued to be generated by the hydrocarbon industries, including downstream refining and petrochemicals. Estimated oil revenues for 1995 are \$29,000 million¹. The oil sector accounted for 37% of the gross domestic product, 75% of Government revenues, and 90% of total exports, which were valued in excess of \$40,000 million. As reported in the Middle East Economic Digest of February 23, 1996, page 4, Saudi Bankers estimate that the entrance of Iraqi oil into the market by 1996 would cut Saudi revenues by \$2,000 million, having an important impact on the economy.

Government Policies and Programs

The Government continued to emphasize the maintenance of national economic stability through careful management of Government expenditures. Emphasis was placed on the diversification and expansion of the economic base while securing a more balanced allocation of resources among the different regions of the country. The Directorate General of Mineral Resources (DGMR) has enlisted the cooperation of the U.S. Geological Survey and the Bureau de Recherches Géologiques et Minière of France in the mineral exploration and the assessment of the mineral resources of the country. The results of more than 25 years of exploration have been made available in Open File Reports, Technical Reports, Bulletins, Annual Reports, and Geoscience Maps. The Government has focused on development of the Kingdom's resources of bauxite, gold, iron ore, phosphate rock, and zinc. The Government continued to encourage private capital to participate in the Kingdom's economic development to the extent of offering low-interest loans to qualified companies.

Environmental Issues

Saudi Arabia created a ministerial committee to set standards and procedures relating to environmental

protection, such as emission controls and the monitoring of air and water pollution. The committee drew its membership from 12 ministries. Each ministry carried out its own environmental audit under the guidance of the Central Department on the Environment and the Department of Meteorological Observation and Environment.

Production

The average production of crude oil, the Kingdom's principal mineral commodity, was 8.23 million barrels per day (Mbbbl/d) in 1995 including 213,000 bbl/d from the Saudi Arabian share of production from the Divided Zone. (See table 1.) When Iraqi oil dropped out of the market in 1990, Saudi Arabia, with massive reserves and shut in capacity, was able to fill the gap by increasing output by about 3 Mbbbl/d. The 5-year petroleum production expansion project was virtually completed, increasing production capacity by 500,000 barrels per day (bbl/d) from the offshore Marjan Field. Similar expansion work was conducted at the Abqauq, Hawiyah, Safaniya, and Zuluf Fields. Additional capacity was brought on at three new fields south of Riyadh, adding a further 200,000 bbl/d capacity. Saudi Aramco attained a sustainable capacity of 10 Mbbbl/d by early 1994, well ahead of its 1995 target.

Trade

Exports were predominantly hydrocarbon products and derivatives. Crude oil exports averaged 6 Mbbbl/d while petroleum product exports averaged 850,000 bbl/d.

The geographical distribution of crude oil exports changed dramatically during the past decade. In the early 1980's, more than 50% of annual crude oil exports was delivered to the Far East, particularly Japan, and less than 10% to North America. By 1995, about 35% of crude oil shipments was directed to Europe, 25% to North America, and 25% to the Far East. During 1995, Europe imported 2 Mbbbl/d and Japan imported 1.3 Mbbbl/d. Petroleum imports by the United States totaled more than 1.3 Mbbbl/d, including 84,000 bbl/d of petroleum products, mostly unfinished oils, liquefied petroleum gases, motor gasoline, and petrochemical feedstock. Saudi Arabia remained the leading supplier to the United States, accounting for 15% of petroleum imports in

1995.

The value of nonoil exports increased rapidly during the past decade. In 1983, they were valued at about \$1 billion, rising to \$6.2 billion in 1994, representing a 12.5% increase from 1993. As more industries come on-stream, this trend was expected to continue.

According to the Ministry of Finance and National Economy, the Kingdom's total imports were valued at nearly \$24 billion in 1995. The United States remained the largest supplier to the Kingdom, and accounted for 21% of Saudi Arabia's imports. Japan was second with 12% of the market share, followed by the United Kingdom and Germany at 8% of the market share.

Most imports were subject to customs duties at rates ranging from 12% to 20%. Imports from members of the Gulf Cooperation Council (GCC) were exempted, provided that at least 40% of the value added was effected in GCC countries and at least 51% of the capital of the producing firm was owned by citizens of GCC-member countries.

The monetary authorities and all other residents, including private persons, could freely and without license purchase, hold, and sell gold in any form, at home or abroad. They could also, without license and without payment of any customs duty or tax, trade gold in any form with the exception of gold of 14 carats or less, the import of which was prohibited.

Structure of the Mineral Industry

All minerals, including vast petroleum and natural gas reserves, were owned by the Government. Exploitation was predominantly controlled by Government organizations. (*See table 2.*) The government-owned Saudi Aramco was the only company authorized to engage in oil exploration and development.

COMMODITY REVIEW

Metals

Aluminum.—Reynolds Metals of the United States was selected to supply technology for, manage, and operate a new aluminum canmaking plant in Dammam. The plant was scheduled to produce up to 1.2 billion cans per year and was expected to be completed in 1996.

The Al-Amoudi Brothers Co. of Saudi Arabia and the Aluminium Processing Co. of Germany formed a joint venture creating the Causi Aluminium Recycling Co. in the Al-Jubayl Industrial Estate. The plant was expected to have the capacity to recycle scrap and beverage cans amounting to 12,000 to 18,000 metric tons per year (t/yr). Production was scheduled to begin in 1996.

Bauxite.—The DGMR continued plans for exploitation of the Az Zabirah bauxite deposit about 470 kilometers (km)

northwest of Riyadh. The deposit was part of a Cretaceous paleolaterite that outcropped in three main zones covering a distance of 105 km. Movable reserves were reported by the DGMR at 102 million metric tons (Mt) of essentially monohydrate ores averaging 57.5% aluminum oxide, 5.5% silicon dioxide, and 8% ferric oxide.

Copper.—Evn Resources of Canada signed a memorandum of understanding with the Alujain Co. of Saudi Arabia to develop a large copper deposit in the Arabian Shield about 340 km northeast of Jiddah in Jabal Sayid. The Alujain Co. projected a mining rate at 7.7 t/yr during a 12-year mine life. The deposit was defined by the Alujain Co. at 80 Mt grading 1.5% copper.

The copper smelter and refinery project was proceeding as scheduled, with startup anticipated by early 1998. The plant, at Madinat Yanbu Al-Sinalyah on the Red Sea coast, was expected to produce 150,000 t/yr of copper cathode. A part of the feedstock for the smelter was expected to be concentrates derived from the Alujain Co., the Jabal Sayid copper deposit, and the polymetallic deposit at Al Masane under development by the Arabian Shield Co.

Ferroalloys.—The Gulf Ferroalloys Co. (Sabayek), owned by GCC investors, had under construction a ferroalloy complex at Al-Jubayl, a location accessible to high-purity quartz and inexpensive energy. The complex is expected to include a 35,600-t/yr-capacity ferrosilicon plant, a 10,000-t/yr silicon metal furnace, and a 27,600-t/yr silicomanganese and 10,000-t/yr ferromanganese production. The ferrosilicon production was expected to be exported because domestic needs did not exceed 3,000 t/yr. Silicon metal, silicomanganese, and ferromanganese production was intended for local consumption. About one-half of the financing for the \$120 million project would be supplied by the Saudi Industrial Development Fund, Sabayek's equity holders would fund 30%, and bank loans would supply the remainder. The first production line was scheduled to be operative by July 1996. The ferroalloys and silicon metal output was expected to be needed for the steel and aluminum industries in the region.

Gold.—Gold recovery continued at the Mahd Adh Dhahab underground mine, 275 km northeast of Jiddah, and at the Sukhaybirat surface mine, about 480 km northwest of Riyadh. Production from Mahd Adh Dhahab exceeded 5 metric tons (t) while production at Sukhaybirat approached 3 t in 1995.

Several commercially significant gold deposits have been discovered in the Arabian Shield. The Saudi Arabian Precious Metals Co. announced the discovery of a major gold deposit adjacent to the Sukhaybirat Mine. Preliminary estimates by the Saudi Arabian Precious Metals Co. concluded that the deposit was at least comparable to the Sukhaybirat Mine.

The Dhahab Co. Ltd., a Saudi Arabian/French joint venture, proceeded with the construction of a gold refinery at Jiddah with a nominal capacity of 100 t/yr.

Iron and Steel.—A feasibility study by British Steel Consultants recommended construction of a 2.2 million metric tons per year (Mt/yr) pelletizing plant to process concentrates from the Wadi Sawawin deposit 60 km from the Red Sea coast and 900 km north of Jiddah. The iron content of the fine-grained-taconite ore body ranged from 42% to 45%. Pilot plant tests produced a concentrate with an iron content of 67.5% at 75% recovery. The method of beneficiation developed for the project requires 1 cubic meters (m³) of clean water for every metric ton of ore processed. The basic iron ore agglomeration technology was developed using the Tilden process pioneered by the U.S. Bureau of Mines in the 1970's. The projected startup date was expected by 1997.

Zinc.—The Arabian Shield Development Co. of Dallas, Texas, was issued a lease by the DMGR to develop the Al-Masane polymetallic base metals sulfide deposit in southwestern Saudi Arabia containing demonstrated reserves of 7.2 Mt averaging 5.33% zinc, 1.44% copper, 1.2 grams per metric ton (g/t) gold, and 43 g/t silver, according to the Arabian Shield Development Co. Output was anticipated at 58,000 t/yr of zinc concentrates. The Saudi Industrial Development Fund loaned one-half of the \$81 million required to start up the mine. The remaining financing was expected to be derived from commercial banks and through equity offerings.

Industrial Minerals

Cement.—The Tabuk Cement Co. proceeded with plans to construct a 1.1-Mt/yr-capacity cement plant at Duba on the Red Sea coast. Investment was projected at \$240 million. Development was to be partially funded by a public offering of more than 7 million shares.

Fertilizers.—A reorganization of the Kingdom's fertilizer industry was implemented by the merger of three state-owned companies, Ibn Al Baytar, Safco, and Samad. These companies have the combined capacity to produce nearly 4 Mt/yr of fertilizers. The merger was intended to increase efficiency and boost earnings as a part of a general effort to reduce the budget deficit.

Abundant reserves of low-cost feedstocks formed the basis of the Arabian Gulf fertilizer industry. The regional fertilizer producers were poised to become a dominant supplier of nitrogen fertilizers in the international market.

Phosphate.—The exploitation of phosphate rock deposits in Al-Jalamid, about 120 km from Turayf, near the Jordanian border, came closer to realization. DGMR reported proven

reserves as 213 Mt of ore averaging 21% diphosphorus pentoxide. Contracts are scheduled to be awarded in 1996 for surface mining, beneficiation, pipeline transport, and the building of a 2.9-Mt/yr diammonium phosphate plant in Al-Jubayl. The beneficiation process was expected to involve the manufacture of 4.5 Mt/yr of phosphate concentrate that will be transported by a 1,200-km slurry pipeline to Al-Jubayl. The DGMR projected the total investment at \$147 million for mining and beneficiation, \$887 million for the fertilizer plant, and \$714 million for associated infrastructure.

Mineral Fuels

Natural Gas.—Most of Saudi Arabia's natural gas reserves are associated with petroleum production. The Ghawar Field accounts for more than one-third of the Kingdom's natural gas reserves. There were 64 gas-oil separation plants in the country. The Kingdom's master gas system had the capacity to process 45 billion m³ of natural gas. This amount was associated with a crude oil production of about 8.2 Mbbbl/d. With the completion of an expansion program bringing sustainable crude oil production capacity to 10 Mbbbl/d, Saudi Aramco's focus shifted to the expansion of natural gas processing installations and distribution networks. Among the major projects under consideration were the expansion of the Ju'aymah natural gas liquids (NGL) plant and the augmentation of the Uthmaniyah natural gas handling capacity.

The production of NGL substantially increased during the past few years with output exceeding 600 million barrels per year (Mbbbl/yr). Most of this production was exported. Saudi Arabia remained the world's largest exporter of NGL with fractionation plants at Yanbu and Ju'aymah.

Increased fractionation capacity at the Saudi Aramco NGL plant at Ju'aymah was approved in 1995 involving installation of a third train at the complex. This facility, due to be completed by 1998, should almost double the 300,000 bbl/d processing capacity of the existing two trains. The existing plant at Ju'aymah produced 5,500 cubic meters per day (m³/d) of ethane, 156,000 bbl/d of propane, 75,000 bbl/d of butane, and 60,000 bbl/d of natural gasoline. Saudi Aramco is also expanding the three gas processing plants of its master gas system. ABB Lummus Global of the United States should complete the expansion of the Berri plant in 1996 adding 10 million m³/d for a total natural gas processing capacity of 30 million m³/d. Other plants scheduled for expansion are Shedgum and Uthmaniyah.

Saudi Arabia was the largest producer of ammonia and methanol in the Arabian Gulf, the largest methanol exporter, and the third largest ammonia exporter. Natural gas remained an inexpensive feedstock at \$0.45 per million British thermal units. Ammonia production capacity was 1.6 Mt/yr.

Saudi Arabia was one of two Arabian Gulf countries to

produce methanol. The Al-Razi plant production capacity of 1,320 t/yr, was the largest in the world, and Saudi Arabia's second methanol plant, the Ibn-Sina plant, had a production capacity of 770 t/yr. In addition to marketing methanol from these two domestic facilities, Saudi Basic Industries Corp. (Sabic) also marketed methanol from Bahrain, bringing total marketing to 2.4 Mt/yr.

Petrochemicals.—Sabic ranked as the world's third largest producer of petrochemicals accounting for 22 Mt in 1995. Representing an increase of about 5% over 1994. The principal markets for these products were the Far East and Western Europe. Plans continued for the construction of new facilities, while upgrading and expansion were underway on many of the company's existing facilities.

Affiliates of Sabic have a total production capacity of 2.8 Mt/yr of the gasoline additive, methyl tertiary butyl ether (MTBE), in 1995. However, soft world demand and accompanying weak international prices were responsible for the plants' under capacity output. The Saudi Petrochemical Co. concluded financing arrangements for a major expansion that is expected to include the construction of a MTBE/Ethyl tertiary butyl ether (ETBE) unit.

The Alujain Corp. was moving ahead with a MTBE plant in Yanbu. The project management consultant, Bechtel of the United States is evaluating two bids for the lump sum turnkey contract. The plant is scheduled to have a 800,000 t/yr capacity with production beginning in late 1998. The plant will be owned by a new company called National Fuel Additives Co. This will be the first private sector MTBE plant in the Kingdom.

Petroleum.—Production.—Saudi Arabia maintained an average production level slightly more than 8.2 Mbb/d in 1995. Saudi Aramco has developed new light sweet fields to maximize revenues while operating within the Organization of Petroleum Exporting Countries (OPEC) quota. Located in the center of the Kingdom, in the Najd region, four new fields came on-stream in late 1994. The fields yielded about 200,000 bbl/d of crude oil designated as Arab Super Light (50.4° API gravity and 0.03% sulfur content). A fifth field in the region is under development and is expected to come on-stream in late 1997, boosting production from the area to 275,000 bbl/d. Saudi Aramco announced plans to develop the Shuaybah Field in the southeast in the Rub Al Khali. Field production is estimated by the company at 500,000 bbl/d to 600,000 bbl/d of 42° API gravity sweet crude oil. Because of the field's remoteness, development cost is estimated at \$2 billion and completion is anticipated in late 1998 or early 1999.

Refining.—The combined capacity of eight refineries, including the 30,000-bbl/d Khafji refinery in the Divided Zone, was reported at 1,625 Mbb/d. (*See table 2.*)

Saudi Aramco downsized its ambitious 10-year refinery

upgrade and expansion of its Ras Tanura refinery from a planned \$12.5 billion upgrade to a more modest \$1.7 billion upgrade and expansion. The revised upgrade plans called for the installation of a 100,000-bbl/d hydrocracker, a 40,000-bbl/d continuous catalytic reformer, a visbreaker, a sulfur recovery unit, a hydrogen plant, and a sour water treatment plant. The upgrades were scheduled to come on-line in mid-1998. Saudi Aramco also was engaged in major revamping of its domestic distribution network that involves laying product pipelines from the refineries to the Kingdom's major consumption and export areas.

Saudi Arabia continued to acquire a worldwide network of refining, storage, and distribution facilities. Saudi Aramco made its entry into the European downstream market in 1995. Saudi Aramco's purchase of 50% equity in Motor Oil Hellas' Corinth refinery in Greece introduced the company to its first downstream presence in Europe. Added to existing interests in Star Enterprise in the United States with a 600,000 bbl/d refining capacity and in Sangyong in the Republic of Korea where capacity was expanded to 500,000 bbl/d, Saudi Aramco had a direct interest in downstream refining and market ventures that can process up to 1.4 Mbb/d of the Kingdom's crude oil. The company's long-term goal was to refine and market one-half of its crude output through companies in which it has an ownership interest. Negotiations for positions in China, France, Indonesia, and Italy continued. Direct investment in foreign refining, marketing, and distribution operations established for Saudi Arabia a guaranteed market for crude oil and provided stability in the face of inevitable market fluctuations.

Reserves

According to the International Petroleum Encyclopedia, Saudi Arabia has the world's largest known concentration of oil representing more than 26% of total world proven reserves. Proven oil reserves were reported by Saudi Aramco at 261.6 billion barrels (bbl) including 1.6 billion bbl representing the Saudi Arabian share of reserves in the Divided Zone. At the present rate of output, Saudi Arabia enjoys a reserve-production ratio sufficient to last nearly 90 years at current production levels. The bulk of the Kingdom's reserves were contained in a few massive fields. These included Ghawar, the world's largest onshore field with remaining reserves of about 70 billion bbl; Safaniya, the world's largest offshore field with 19 billion bbl; Abqauq, with 17 billion bbl; Berri, with 11 billion bbl; Manifa, with 11 billion bbl; Zuluf, with 8 billion bbl; Shuayba, with 7 billion bbl; Abu Saafa, with 6 billion bbl; and Khursaniya, with 3.5 billion bbl.

Natural gas reserves were reported by Saudi Aramco at 5.3 trillion m³. Most of the Kingdom's reserves were in the form of associated gas contained in the country's oilfields. The giant Ghawar Field was thus the largest source of natural gas and accounted for approximately 35% of the total gas

reserves.

Infrastructure

Electric power generation and distribution is conducted under the five regional authorities of the Saudi Consolidated Electric Companies operating powerplants with a combined installed capacity of more than 20,000 megawatts (MW). Additional power generation capacity (2,000 MW) is under the authority of the Saline Water Conversion Corp. which operates seawater desalination plants. Electric power installed capacity is scheduled to increase from nearly 22,000 MW in 1995 to about 28,000 MW in 2010.

Extensive port and harbor facilities served Al-Jubayl on the east coast and Yanbu on the west coast. Al-Jubayl had an industrial port with a 10-km-long causeway for dry and liquid bulk cargo and a commercial port for general cargo. A fertilizer terminal was completed consisting of two jetties for loading vessels from 5,000 to 50,000 deadweight tons (dwt). In Yanbu, the 15-km-long King Fahd Industrial Port was the largest oil port on the Red Sea and one of the longest in the world. The oil terminal at Yanbu was expanded to handle 6.6 Mbb/d and could accommodate tankers from 80,000 to 500,000 dwt.

Outlook

The Kingdom's business climate had developed favorably since the Gulf War, contributing to a significant construction boom. Both state and private companies were expanding, although the former has somewhat scaled down its programs in view of the downturn in petroleum prices.

At the same time, Saudi Aramco's expansion program placed the Kingdom in a position to take advantage of the expected growth in world oil demand later in this decade.

Because most of the national income is dependent upon markets outside the Kingdom, the economy remains vulnerable to sudden changes in volume and pattern of worldwide trade in crude and refined petroleum and petrochemicals. Purchasing equities in refining, marketing, and distribution companies in the United States, the Republic of Korea, the Philippines, and Europe eased that vulnerability.

Despite the downturn in the public sector, private sector investments were flourishing. Business confidence remained solid because the private sector, which accounted for more than two-thirds of economic activity, was liquid and continued to invest.

The Kingdom affirmed that it would support measures by oil exporters that were equitable and effective but it would no longer make unilateral cutbacks. The Kingdom was committed to a prudent fiscal policy by holding output at present levels, taking a realistic view of oil prices, and slashing the deficit.

Since Saudi Aramco intends to maintain a maximum

sustainable capacity of 10 Mbb/d, less profitable fields will be shut down as new producing fields come on-stream. Revenue increases can be anticipated through cutting back on the sale of Arabian heavy in favor of its lighter premium crudes.

Movement toward more of a user-pays approach were introduced in January 1995 when water and electricity tariff increases were introduced. Prices have been highly subsidized covering only 40% of the real cost of electricity.

¹Where necessary, values have been converted from Saudi riyals (SRIs) to U.S. dollars at the rate of SRIs3.7450=US\$1.00.

Major Sources of Information

Directorate General of Mineral Resources

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Jiddah, 21191 Saudi Arabia

Ministry of Petroleum and Mineral Resources

Jiddah, Saudi Arabia

General Organization Petroleum and Mineral Resources (PETROMIN)

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Saudi Arabian Oil Co. (Saudi Aramco)

Dhahran 31311, Saudi Arabia

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Al-Jubayl Fertilizer Co. (SAMAD)

P.O. Box 10046

Al-Jubayl, Saudi Arabia

Telephone: [966] (3) 341-6488

Fax: [966] (3) 341-5894

National Chemical Fertilizer Co.(IBN AL-BAYTAR)

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Al-Jubayl 31961, Saudi Arabia

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Saudi Arabian Basic Industries Corp. (SABIC)

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Riyadh 11422, Saudi Arabia

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Saudi Iron and Steel Co. (Hadeed)

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Publications

Kingdom of Saudi Arabia,
Ministry of Finance and National Economy,
Central Department of Statistics,
Statistical Yearbook, annual.
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Research and Statistics Department,
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Kingdom of Saudi Arabia, Ministry of Planning
Fifth Development Plan 1990-95.

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Atlas of Industrial Minerals
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Kingdom of Saudi Arabia
Directorate General of Mineral Resources
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Jiddah, 1994.

TABLE 1
SAUDI ARABIA: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity	1991	1992	1993	1994	1995 e/
Copper: Cu content of concentrate and bullion 2/	900	868	925	917 r/	925
Cement, hydraulic	11,400	15,324	15,300	16,000 r/	16,000
Gold:					
Mine output, gross weight:					
Ore	450,000	806,000	859,353 r/	900,000 e/	900,000
Concentrate 2/	7,800	3,900	4,492 r/	4,500 e/	4,500
Bullion, crude, gross weight	6,400	9,343	9,253	9,300 e/	9,300
Au content of concentrate and bullion	4,300	5,626	7,519	7,630 e/	8,080 3/
Gas, natural: 4/					
Gross	52,000	66,100	67,300 r/	68,000 r/ e/	68,000
Dry	31,500	34,000	35,900	37,700 r/ e/	37,700
Gypsum	375,000 e/	269,298 r/	326,661 r/	375,000 e/	375,000
Iron and steel:					
Direct reduction iron	1,117	1,611 r/	2,015 r/	2,111	2,129 3/
Iron and steel: Metal, steel, crude	1,790	1,823 r/	2,318	2,411 e/	2,451 3/
Lead: Pb content of concentrate e/ 2/	200 r/	150 r/	50 r/	50	50
Lime e/	12,000	12,000	12,000	12,000	12,000
Natural gas liquids:					
Propane	109,135	114,245 r/	120,450 r/	120,500 e/	120,500
Butane	57,000	59,495	56,575	56,600 e/	56,600
Natural gasoline and other	41,600	43,435	40,150 r/	45,000 r/ e/	45,000
Total	207,735 r/	217,175 r/	217,175 r/	222,100 r/ e/	222,100
Nitrogen: N content of ammonia	827	741	1,097 r/	1,340 r/	1,327 3/
Petroleum:					
Crude 4/	2,960,000	3,100,000	2,990,000	2,970,000	3,004,300 3/
Refinery products:					
Liquefied petroleum gas	11,315 r/	13,505 r/	14,965 r/	15,000 r/ e/	8,000
Gasoline	93,075 r/	88,695 r/	89,425 r/	92,800 r/	93,000
Jet fuel	66,430 r/	21,170 r/	25,200 r/	40,000 e/	40,000
Kerosene	31,755 r/	35,400 r/	35,770 r/	36,450 r/ e/	38,000
Distillate fuel oil	167,900 r/	163,880 r/	171,800 r/	169,800 r/	170,000
Residual fuel oil	175,930 r/	179,550 r/	180,700 r/	156,640 r/	165,000
Unspecified	28,010 r/	64,970 r/	62,580 r/	73,900 r/ e/	74,000
Total	574,415 r/	567,170 r/	580,440 r/	584,590 e/	588,000
Silver: Ag content of concentrate and bullion 2/	16,410	17,780	17,990	16,990 r/	16,900
Sulfur: Byproduct, hydrocarbons	2,000	2,370 r/	2,400 e/	2,300 e/	2,400
Urea	598	644	650	1,300 r/ e/	1,500
Zinc: Zn content of concentrate 2/	2,475	525 r/	542 r/	500 r/ e/	500

e/ Estimated. r/ Revised.

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

2/ Mahd Adh Dhahab final products include a bulk flotation concentrate containing gold, silver, copper, lead, and zinc and a crude bullion containing gold, silver, and copper. Ore containing gold and silver from the Sukhaybirat surface mine is included.

3/ Reported figure.

4/ Includes Saudi Arabian one-half share of production in the Kuwait-Saudi Arabia divided zone.

TABLE 2
SAUDI ARABIA: STRUCTURE OF THE MINERAL INDUSTRY FOR 1995

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of facilities	Annual capacity
Cement	Saudi Consolidated Cement Co. (Government, majority shareholder)	Ayn Dar, 75 kilometers southwest of Dammam	1,875
Do.	do.	Al-Hufuf	1,800
Do.	Arabian Cement Co. Ltd. (Government, 100%)	Rabigh	1,700
Do.	Southern Province Cement Co. (Government, 100%)	Suq al-Ahad, 10 kilometers northeast of Jizan	2,500
Do.	Yanbu Cement Co. (Government, 100%)	Yanbu	1,300
Do.	Yamaha Cement Co. (Government, 100%)	Riyadh	3,000
Do.	Qasim Cement Co. (Government, 100%)	Buraydah	1,400
Ferroalloys	Gulf Ferroalloys Co. (Sabayek) (United Gulf Industries Corp., 26%; Sabic, 15%; Demetal Aussenhandelsgesellschaft, 7%; remainder owned by Arab investors and financial institutions)	Al-Jubayl	--
Fertilizer:			
Urea	Al-Jubayl Fertilizer Co. (Samad)	do.	632
Amonia	(Sabic, 50%; Taiwan Fertilizer Corp., 50%)		300
Urea	National Chemical Fertilizer Co. (Ibn al-Baytar)	do.	500
Granular urea	(Sabic, 50%; Safco, 50%)		500
Amonia, liquid			500
NPK			500
TSP			200
DAP			100
Liquid fertilizer			10
Urea	Saudi Arabian Fertilizer Co. (Safco) (Sabic, 41%; Saudi Arabian private interests, 59%)	Dammam	330
Amonia			200
Sulfuric acid			100
Melamine			20
Amonia	do.	Al-Jubayl	500
Granular urea			600
Gold:			
Ore	General Organization for Petroleum and Mineral Resources (Petromin) (Government, 100%)	Mahd Adh Dhahab, 270 kilometers northeast of Jiddah	180
Metal	kilograms		5,000
Ore	The Saudi Company for Precious Metals (Petromin, 50%; Boliden International Mining, 50%)	Sukhaybirat, 480 kilometers northwest of Riyadh	700
Metal	kilograms		2,800
Natural gas	million cubic meters	Saudi Aramco (Government, 100%)	35,000
Do.	do.	do.	20,150
Do.	do.	do.	4,600
Natural gas liquids 1/	million barrels	do.	397
Do.	do.	do.	300
Do.	do.	do.	60
		Uthmaniya, 30 kilometers west of Al Hufuf	120
		Berri, 15 kilometers north of Al-Jubayl	20
Petrochemicals:			
Ethylene	Saudi Petrochemical Co. (Sadaf)	Al-Jubayl	760
Ethylene dichloride	(Sabic, 50%; Pecten Saudi Arabia, 50%)		560
Styrene			360
Industrial ethanol			300
Caustic soda			450
Methanol	National Methanol Co. (Ibn Sina)	do.	900
Methyl-tertiary-butyl-ether	(Sabic, 50%; Celanese Arabian, 25%; Texas Eastern Arabian, 25%)	do.	700
Methanol	Saudi Methanol Co. (Al-Razi) (Sabic, 50%; Japan Saudi Arabia Methanol Co., 50%)	do.	1,320
Ethylene	Arabian Petrochemical Co.	do.	1,150
Polystyrene	(Sabic, 100%)	do.	135
Propylene		do.	300
Butadiene		do.	100
Benzene		do.	70

TABLE 2--Continued
SAUDI ARABIA: STRUCTURE OF THE MINERAL INDUSTRY FOR 1995

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of facilities	Annual capacity
Petrochemicals--continued:				
Methyl-tertiary-butyl-ether		Saudi European Petrochemical Co. (Ibn Zahr)	do.	1,200
Polypropylene		(Sabic, 70%; Ecofuel, 10%; Neste Oy, 10%; Arab Petroleum Investments Corp., 10%)	do.	800
Petroleum, crude	million barrels	Saudi Aramco (Government, 100%)	Eastern Province and offshore	3,500
Do.	do.	Arabian Oil Co., (AOC)	Khafji	110
		(Japan Petroleum Trading Co., 80%; Kuwait, 10%; Saudi Arabia, 10%)	Al Hout	10
Do.	do.	Saudi Arabian Texaco (former Getty Oil Co.)	Wafra, South Fawaris, and	
		Divided Zone production shared by Saudi Arabia and Kuwait)	South Umm Gudair	50
Petroleum products	million barrels	Saudi Aramco (Government, 100%)	Ras Tanura	95
Do.	do.	Rabigh Petroleum Refining Co.	Rabigh	118
		(Saudi Aramco, 50%; Petrola, 50%)		
Do.	do.	Jubail Petroleum Refining Co.	Al-Jubayl	108
		(Saudi Aramco, 50%; Shell, 50%)		
Do.	do.	Yanbu Petroleum Refining Co.	Yanbu	110
		(Saudi Aramco, 50%; Mobil, 50%)		
Do.	do.	Saudi Aramco (Government, 100%)	do.	60
Do.	do.	Jiddah Oil Refinery Co. (Saudi Aramco)	Jiddah	40
		(Government, 100%)		
Do.	do.	Riyadh Oil Refinery Co. (Saudi Aramco)	Riyadh	50
		(Government, 100%)		
Do.	do.	Arabian Oil Co.	Al-Khafji	10
		(Japan Petroleum Trading Co., 80%; Kuwait, 10%; Saudi Arabia, 10%)		
Steel		Saudi Iron and Steel Co. (Hadeed) (Sabic, 95%)	Al-Jubayl	2,400
Do.		Jiddah Steel Rolling Mill (Sulb) (Government, 100%)	Jiddah	245
Titanium dioxide		The National Titanium Dioxide Co. (Cristal)	Yanbu	52
		(Shairco for Trading and Contracting, 25%; National Industrialization Co., 24%; Gulf Investment Corp., 24%; Kerr-McGee Chemical Corp., 25%; private individuals, 2%)		

1/ Natural gas is pumped through the Master Gas System to three processing plants at Berri, Shedgum, and Uthmaniya.

2/ These fields were severely damaged during the Gulf crises and even partial production was not resumed at Wafra until Mar. 1992, while production from the South Fawaris and South Umm Gudair Fields resumed by yearend. Combined production from all three fields did not exceed 50,000 bbl/d by the close of 1992, but attained combined productions levels of more than 200,000 bbl/d in 1995.