

THE MINERAL INDUSTRY OF REPUBLIC OF YEMEN

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Yemen's mineral industry was dominated by crude oil production and natural gas liquids recovered from associated natural gas. Other mineral output included dimension stone, gypsum, salt, and the manufacture of cement. While natural gas reserves were significant, relatively few installations were currently in place to recover and utilize natural gas. Plans call for a liquefied natural gas (LNG) plant with a projected annual capacity of 5 million metric tons (Mt). Feedstock for the plant was expected to be nonassociated gas from the Marib-Jawf area. LNG exports were scheduled to commence in the year 2000. In 1995, 31 petroleum exploration concessions were active, covering about one-half of the Nation's land mass.

The petroleum industry was still recovering from damage done during a civil war in mid-1994. While disruptions at petroleum production facilities were minimal, the Aden refinery suffered damage to five storage tanks, a pumping unit and two distillation tapping units. In spite of war damage, refining operations continued at about 60,000 barrels per day (bbl/d) gradually increasing to 100,000 bbl/d. In mid-1995, the Aden Refinery Co. issued tender documents for the rehabilitation and upgrading of the refinery. After completion, capacity was expected to be 150,000 to 170,000 bbl/d.

Crude oil production averaged 338,000 bbl/d in 1995. Slightly more than one-half of the production was derived from the Masila Fields and the remainder from the Marib al Jawf Fields. Production from the Shabwa region never exceeded 5,000 bbl/d and was discontinued in 1994. (See table 1.)

The Government liberalized import regulations for a number of commodities related to the construction and agricultural industries. These included cement, iron and steel manufactures, and fertilizers. Individual import licenses have the following ceilings: 15,000 metric tons (t) for cement, \$600,000 for iron products, and \$350,000 for fertilizers.

Petroleum accounted for more than four-fifths of the Republic of Yemen's total export earnings. Additional revenue was realized when the Masila Fields came on-stream, augmenting annual exports by approximately 60 million barrels (Mbbbl). Total petroleum exports in 1995 exceeded 100 Mbbbl. Most of these exports were destined for Asian markets; however, the United States imported 1.9 Mbbbl of crude and unfinished oils in 1995.

The Republic of Yemen formulated mining legislation

guaranteeing the rights of private property in the mining of most mineral commodities. The royalty rate due to the Government in any mining operation is 5% on precious metals and 3% on all other minerals. The precious stone and hydrocarbon industries remained the exclusive domain of the Government. In an effort to accelerate exploration and development, the Government entered into multiple-exploration and production-sharing agreements with private companies offering both expertise and capital.

The Yemen Corp. for the Production and Marketing of Cement awarded a design and construction supervision contract for the turnkey Al Buh cement works near Mafrag. The 500,000-metric-ton-per-year (t/yr) capacity cement plant was financed by Japan's Overseas Economic Cooperation Fund at \$145 million. Completion of this project was expected to raise total annual cement production capacity to 1.25 Mt.

Associated natural gas production was separated and stripped of natural gas liquids. The remaining gas was reinjected at the rate of 18 million cubic meters per day. Plans progressed for the development of the Marib Al-Jawf nonassociated natural gas reservoir. A consortium was established with Total of France as project leader having 36% equity; Yemen General Gas Corp., 26%; Hunt Oil Co. of the United States, 14.6%; Exxon Corp. of the United States, 14.1%; and the Republic of Korea's Yukong, 9.3%. The consortium plans call for the production of 5 million metric tons per year (Mt/yr) of LNG over a 25-year period.

Yemen's crude oil production was derived from Canadian Occidental Petroleum's Masila Fields producing 40.4 ° API gravity crude oil and Yemen Exploration and Production Co. (YEPC) operations producing 30.5 ° API gravity crude oil in the Marib al Jawf region. Hunt Oil was expected to begin production from the Hawelah Field in 1996. Initial production was anticipated at 10,000 bbl/d. The Aden Refinery processed about 60,000 bbl/d after sustaining damage during the 1994 civil war. Output reached 100,000 bbl/d by the start of 1995 with the restoration of the main pumping station and two tapping units. About 40% of the refinery throughput was contract crude oil from Iran, Malaysia, and Oman. The Aden refinery was scheduled to undergo a modernization program, including the installation of a new control system, and the upgrading of the two crude distillation units and the reforming unit.

The combined estimated proven crude oil reserves of the

Republic of Yemen were reported in the International Petroleum Encyclopedia at 4 billion barrels concentrated in five areas: Marib-Jawf, East Shabwa, Masila, Jannah, and Iyad. Natural gas reserves were reported at 565 billion cubic meters (m³), of which 200 billion m³ were proven reserves in the Marib al Jawf region.

Three pipelines service the petroleum industry bringing export crude to the Red Sea and to the Gulf of Aden. A 438-kilometer (km) pipeline brought crude from the Marib oilfields to the floating oil export terminal at Ras Isa on the Red Sea. A 204-km pipeline connected the Shabwa Fields to Al-Huwaymi terminal on the Gulf of Aden. A third export pipeline transported crude oil 138 km from the Masila Fields to the export terminal near Ash Shir.

Liberalized mining and petroleum exploration laws and foreign investment regulations have attracted not only foreign oil companies with development financing but metallic mineral exploration groups as well. The prospect of further commercial finds was expected to be a realistic one. However, the key to realizing this potential was political stability.

Major Sources of Information

The Petroleum and Mineral Resource Ministry
Sanaa, Republic of Yemen
The Ministry of Economy, Supply, and Trade
Sanaa, Republic of Yemen

TABLE 1
REPUBLIC OF YEMEN: PRODUCTION OF MINERAL COMMODITIES 1/

| Commodity | 1991 | 1992 | 1993 | 1994 | 1995 e/ |
|------------------------------------|------------|------------|------------|--------------|---------|
| Cement thousand metric tons | 850 | 800 | 800 e/ | 500 e/ | 1,000 |
| Gypsum metric tons | 66,000 r/ | 80,000 | 90,000 r/ | 80,000 e/ | 80,000 |
| Natural gas: | | | | | |
| Gross e/ million cubic meters | 66,000 r/ | 80,000 | 90,000 r/ | 100,000 | 100,000 |
| Liquids thousand 42-gallon barrels | 25 | 40 | 2,600 | 2,600 e/ | 2,600 |
| Petroleum: | | | | | |
| Crude do. | 72,100 | 62,000 r/ | 87,600 | 122,275 r/ | 123,400 |
| Refinery products: | | | | | |
| Gasoline do. | 6,000 | 9,600 | 10,000 | 8,000 e/ | 10,000 |
| Kerosene do. | 2,000 | 4,900 | 4,500 | 2,500 r/ e/ | 3,500 |
| Distillate fuel oil do. | 9,000 | 13,700 | 13,000 | 10,500 r/ e/ | 11,500 |
| Residual fuel oil do. | 10,400 | 15,500 | 15,500 e/ | 12,000 e/ | 15,000 |
| Other e/ do. | 2,500 | 2,500 | 2,000 | 1,000 e/ | 2,000 |
| Total do. | 29,900 r/ | 46,200 | 45,000 e/ | 34,000 r/ e/ | 42,000 |
| Salt metric tons | 115,800 r/ | 107,000 r/ | 110,000 r/ | 110,000 r/ | 110,000 |
| Stone: Dimension e/ cubic meters | 410,000 | 410,000 | 410,000 | 410,000 | 410,000 |

e/ Estimated. r/ Revised.

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