



2008 Minerals Yearbook

IRAQ

THE MINERAL INDUSTRY OF IRAQ

By Mowafa Taib

The mineral resources of Iraq include base-metal deposits in the Northern Thrust Zone and the Zagros Suture, which are located in the northeast near the borders with Iran and Turkey; nonmetallic minerals and industrial rocks, which are spread throughout the eastern and southern parts of the country; and fuel minerals, which are spread throughout Iraq from the Turkish border in the north to the Gulf and the Kuwaiti borders in the south. Iraq was a significant crude oil producer in 2008; its average production was 2.4 million barrels per day (Mbbbl/d), which accounted for 3.0% of the world's crude oil output. The rehabilitation and restoration of the state-owned mineral production enterprises of Iraq following decades of wars and sanctions proceeded at a faster pace in 2008 because of the sharp decline in the level of violence despite the continued weakness in the security situation (Al-Bassam and Hak, 2006, p. 288; BP p.l.c., 2009, p. 8; U.S. Energy Information Administration, 2009).

Minerals in the National Economy

In 2008, Iraq's economy grew at an annual rate of 9.8% at constant 1988 prices compared with a growth rate of only 1.5% in 2007. The hydrocarbon sector was the country's main economic activity and accounted for more than 85% of both the gross domestic product and Government revenue. The value of Iraqi exports in 2008 reached \$63.7 billion. Crude petroleum exports accounted for \$61.9 billion of the total value and refined petroleum products exports accounted for \$1.5 billion. The value of hydrocarbon exports was 61% greater in 2008 than in 2007 because of higher crude petroleum prices, which averaged, for Iraq, \$93 per barrel in 2008 compared with \$63 per barrel in 2007, and because of the increased volume of exports. Iraq exported more than 708 million barrels (Mbbbl) of crude petroleum and refined petroleum products out of the 995 Mbbbl the country produced in 2008 (Central Bank of Iraq, 2009, p. 61, 80; International Monetary Fund, 2009, p. 36; Organization of Arab Petroleum Exporting Countries, 2009, p. 19, 57).

A surge of private foreign investment in Iraq took place in 2008 following the significant decline in countrywide violence that began in the fourth quarter of 2007. Twenty-two investment projects valued at about \$43 billion were reported in 2008 compared with 17 projects valued at \$2.7 billion in 2007. The majority of investments, which were announced in 2008, went to hydrocarbon projects in Basrah, Dohuk, Erbil, and Wasit, and to real estate sector projects in Baghdad, Erbil, and Sulaimaniya (Dunia Frontier Consultants, 2009, p. 13).

Production

In 2008, bentonite production increased by 182%; clay, by 74%; cement, by 43%; refined petroleum products, by 40%; natural gas, by 29%; gravel, by 24%; and crude oil, by 13% compared with the respective production levels in 2007. There

was also reported production of about 5,000 metric tons (t) of bauxite for the first time. Data on mineral production are in table 1.

Structure of the Mineral Industry

The Ministry of Oil manages the country's hydrocarbon sector activity and the Ministry of Industry and Minerals (MIM) administers the activity of the nonfuel mineral sector. The State Company of Geological Survey and Mining (GEOSURV), which is an agency of the MIM, conducts studies on Iraq's geology, mapping, and mineral exploration.

The proposed new Iraq Hydrocarbon Law, which was first proposed on February 26, 2007, but did not receive parliamentary approval, was resubmitted to the Gas and Oil Committee of the Iraqi Parliament on October 26, 2008, and was returned without approval to the Council of Ministries. The law would create a national oil company, assign the entities responsible for natural gas and oil exploration, and include formulas for the sharing of oil revenue among the different regions (State Company for the Geological Survey and Mining, 2009; U.S. Department of State, Bureau of Near Eastern Affairs, 2009, p. 8, 9).

Law No. 91 of 1988 and its amendments regulates investment in mining and other natural resources and Investment law No. 13 of 2006 covers all areas of investment other than the oil and gas sector. The Government issued calls for investors to create joint ventures to rehabilitate public industrial enterprises, including cement, fertilizer, float glass, steel, and sulfur plants (Ministry of Industry and Minerals, undated). Table 2 is a list of major mineral facilities.

Commodity Review

Metals

Aluminum.—MIM invited investors to rehabilitate the state-owned aluminum plant of Ur State Company for Engineering Industries in Thi-Qar Governorate, which is located 380 kilometers (km) south of Baghdad. The plant had a production capacity of 16,500 metric tons per year (t/yr), a rolling unit, two extrusion units with a combined capacity of 8,200 t/yr, an anodizing and coloring unit, a 2,845-t/yr-capacity foil unit, and a 10,000-t/yr-capacity foundry unit. The cost of rehabilitation was estimated to be \$413 million (Ministry of Industry and Minerals, undated).

Iron and Steel.—In March 2007, MIM called on international investors to modernize and rehabilitate the State Company for Iron and Steel at Khor Al-Zubair in Basrah Governorate, which is located in southern Iraq. ArcelorMittal of Luxembourg and Al-Ittefaq Steel Products Co. of Saudi Arabia had reportedly submitted proposals to rehabilitate the Khor Al-Zubair steel plant to increase the production capacity to 2.9 million metric tons per year (Mt/yr) at a cost of between \$500 million and \$1 billion (Ministry of Industry and Minerals, undated).

Industrial Minerals

Cement.—Iraq's cement production from 18 state-owned plants and Lafarge S.A. of France's Bazian plant was estimated to be about 6.44 million metric tons (Mt) in 2008. This level of production was well below the combined design capacity of 23 Mt/yr for the existing plants, and far less than market demand. Iraq's annual production level before 2003 was about 10 Mt, which in turn was below the country's full capacity because the country had been under a decade of economic sanctions by the international community. Iraq reportedly imported 6 Mt of cement from neighboring countries to cover domestic consumption. In 2008, the size of Iraq's cement market was estimated to be 14.5 Mt, and it was expected to grow by 16% in 2009.

The main ingredient in Iraq's cement production—limestone—is found in Iraq mostly near the surface, and it contains a high percentage of calcium carbonate; the limestone occurs throughout Iraq in multiple bands that extend from the northwest to the southeast of the country. Because of the abundance of limestone, cement production has the potential to thrive again in Iraq and the country could again become a cement exporter as it was in the 1980s. For this to happen, other production components, such as power and capital investment, would need to be secured. In 2008, MIM was in the process of reviewing modernization and rehabilitation proposals received for cement plants in Badush, Falluja, Karbala, Kubaisa, and Sinjar (Arabian Business, 2008; Gilani, 2009, p. 8; Lafarge S.A., 2009b, p. 7; Ministry of Industry and Minerals, undated).

Lafarge entered Iraq's cement market following the company's acquisition of Orascom Construction Industries of Egypt in January 2008. Lafarge held majority ownership in two plants at Bazian and Tasluja in northern Iraq. The two plants were located within 30 kilometers of each other and had a combined annual capacity of 5 Mt. Lafarge produced 3.5 Mt of cement from the Bazian and the Tasluja plants in 2008 (Lafarge S.A., 2009a).

Phosphate Rock.—General Phosphate Co., which was one of the state-owned companies under MIM, produced phosphate rock from the Akashat Mine and phosphoric acid, superphosphate fertilizer, and sulfuric acid at the Al-Qaim plant. In 2008, the company sold about 75,000 t of compound fertilizer (Ministry of Industry and Minerals, undated).

Mineral Fuels

Natural Gas.—In October 2008, first gas from the Khor Mor field, which is located in the Kurdistan region of Iraq, was announced by the 50-50 joint venture of Dana Gas PJSC and Crescent Petroleum, both of which were private companies based in the United Arab Emirates. In April 2007, the joint venture signed a strategic alliance protocol and service contract with the Kurdistan Regional Government (KRG) that included an investment of \$660 million by the joint venture to produce natural gas and build gas pipelines to supply powerplants for the cities of Erbil and Sulaimaniya in northern Iraq. In July 2008, Gas Cities LLC, which was another joint venture of Dana Gas and Crescent Petroleum, signed an agreement with the KRG

to develop Kurdistan Gas City, which would cover an area of 42.8 square kilometers (km²) and would host manufacturing and petrochemical industries (Dana Gas PJSC, 2008a, b).

In September 2008, Royal Dutch Shell plc (Shell) of the Netherlands and the Ministry of Oil agreed to the formation of a joint venture of state-owned South Gas Co. (51%) and Shell (49%) to market and treat associated gas from a 19,000-km² area in the Governorate of Basrah in southern Iraq. Under this 25-year agreement, flared natural gas (estimated to be about 60% of associated gas production) would be captured and used locally as a reliable source of energy; the surplus captured gas would be exported as liquefied natural gas (Royal Dutch Shell plc, 2008; U.S. Energy Information Administration, 2009).

Petroleum.—Iraq's proven petroleum reserves were equivalent to about 10% of the world's reserves. Iraq was the world's third ranked country after Saudi Arabia and Canada in terms of the volume of its petroleum reserves. It was believed by many petroleum geologists, however, that Iraq may hold between 45 billion barrels (Gbbbl) and 100 Gbbbl of recoverable oil on top of the 115 Gbbbl of proven reserves. The reasons given for this theory are the presence of unexplored areas in the western and southern deserts and the fact that Iraq's reserves data, which were mostly based on 2-dimensional seismic data from about 30 years ago, had not been changed from 2001 (U.S. Energy Information Administration, 2009).

DNO International ASA of Norway made four new oil discoveries in 2008 and completed the first phase of the Tawke production-sharing contract (PSC) with the KRG in northern Iraq. DNO amended Dohuk, the Erbil, and the Tawke's PSCs, which were signed in 2006, in accordance with the KRG's new petroleum law, which gave DNO a 55% working interest and a 75% paying interest in the Tawke PSC and a 40% paying interest in each of the Dohuk and the Erbil PSCs; the royalty for all three PSCs was set at 10% (DNO International ASA, 2009, p. 24, 28-29, 32, 93).

A consortium led by Korea National Oil Corp. (KNOC) (Government of the Republic of Korea, 100%) signed a \$2.1 billion PSC with the KRG in November 2007 for the development of the Hawler, the Qush Tapa, and the Sangaw South fields and the Bazian Block in the Kurdistan region of Iraq. The area covered by the PSC had estimated crude oil reserves of 7.2 Gbbbl; the consortium would have the right to produce 1.9 Gbbbl of these reserves. Following the withdrawal of some consortium partners, KNOC decided to continue solo in the project and signed a contract with KRG that gave KNOC access to eight oilfields in northern Iraq (IHS Global Insight Inc., 2007; Petroleum Economist, 2008a, p. 36; U.S. Department of State, Bureau of Near Eastern Affairs, 2009, p. 11).

In August 2008, North Oil Co., which was a Government-owned oil company, signed a \$3 billion agreement with China National Petroleum Corp. for the development of the Al-Ahdab oilfield, which was expected to increase production to 115,000 barrels per day (bbl/d) from 90,000 bbl/d after 7 years of the 20-year contract (Petroleum Economist, 2008b, p. 36; Sunday Morning Herald, The, 2008).

Outlook

The Government plans to boost oil production to 12 Mbbl/d by 2016 from the current (2008) production level of 2.4 Mbbl/d and aspires to become the world's leading crude oil producer. More than \$100 billion would likely need to be invested by international oil companies to develop the country's oilfields, which are in acute need of modernization. Thus, rehabilitation of other production facilities, such as the General Company of Iron and Steel at Khor Al-Zubair and the State Company for Engineering Industries' Ur aluminum plant in Thi-Qar Governorate could be essential for creating a diversified economy, supplying local aluminum and steel products needed for the development of the gas and petroleum industry, and for rebuilding the country's infrastructure.

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TABLE 1
IRAQ: PRODUCTION OF MINERAL COMMODITIES¹

(Thousand metric tons unless otherwise specified)

Commodity ²	2004	2005	2006	2007	2008
INDUSTRIAL MINERALS					
Bauxite metric tons	NA	NA	NA	NA	4,928
Bentonite do.	NA	NA	NA	570 ³	1,605
Cement, hydraulic: ^c					
Portland	2,500	3,000	3,500	4,500	6,440
White ^e	15	15	15	15	15
Clay ⁴	NA	NA	NA	5,871	10,234
Gravel	NA	NA	NA	7,823	9,708
Gypsum ⁴	NA	NA	NA	1,848	1,917
Ironstone	NA	NA	NA	40	3
Kaolin	NA	NA	NA	4	2
Limestone ⁴	NA	NA	NA	14,753	2,035
Nitrogen, N content of ammonia ^c	30	30	10	10	10
Salt ^e	50	50	50	153 ^r	109
Sand, feldspathic	NA	NA	NA	543	--
Sand, standard	NA	NA	NA	32	26
Silica sand	NA	NA	NA	32	26
MINERAL FUELS AND RELATED MATERIALS					
Gas, natural:					
Gross million cubic meters	10,500 ^r	11,350 ^r	11,900 ^r	13,596 ^r	14,781
Dry do.	1,000 ^r	1,540 ^r	1,450 ^r	1,460 ^r	1,880
Natural gas plant liquids ⁴ thousand 42-gallon barrels	11,000 ⁵	11,000	11,000	11,000	11,000
Petroleum:					
Crude, including lease condensate do.	740,950 ^r	669,045 ^r	729,635 ^r	782,560 ^r	884,395
Refinery products:					
Liquefied petroleum gas do.	18,177 ^r	20,550 ^r	20,550 ^r	6,315 ^r	11,060
Gasoline do.	14,673 ^r	14,235 ^r	14,856 ^r	17,703 ^r	17,228
Kerosene and jet fuel do.	15,987 ^r	12,264 ^r	12,264 ^r	9,855 ^r	17,119
Distillate fuels do.	39,603 ^r	28,105 ^r	28,105 ^r	18,871 ^r	30,551
Residual fuels do.	79,351 ^r	84,461 ^r	87,089 ^r	58,400 ^r	76,577
Other do.	19,454 ^r	14,455 ^r	13,836 ^r	5,291 ^r	10,620
Total do.	187,245 ^r	174,070 ^r	176,700 ^r	116,435 ^r	163,155
Sulfur ⁵	20	30	30	30	30

^eEstimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. ^rRevised. do. Ditto. -- Zero.

¹Table includes data available through December 31, 2009.

²In addition to the commodities listed, fertilizer, phosphate rock, secondary aluminum, and secondary lead also may have been produced but available information is inadequate to estimate output.

³Reported.

⁴Reported in cubic meters and converted to metric tons.

⁵From petroleum and natural gas processing.

TABLE 2
IRAQ: STRUCTURE OF THE MINERAL INDUSTRY IN 2008

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity	
Cement:				
Portland	Southern Cement Co. (Government, 100%)	Al Jinoob plant, Samawa; Al Najaf Al Ashref plant, Kufa; Al Sadaa plant, near Sadat Al Hindia; Karbala plant, Karbala; Kufa I plant, Kufa; Muthena plant, near Muthena; As Samawa plant, Samawa; and Um Qasr plant, Um Qasr	7,500,000 ¹	
Do.	Iraqi Cement Co. (Government, 100%)	Al Qaim plant, Al Qaim; Al Tamim plant, Kirkuk; Fallujah plant, Fallujah; and Kubaisa plant, Kubaisa	5,200,000 ¹	
Do.	Northern Cement Co. (Government, 100%)	Badoosh I, II, and III plants, Mosul; Hammam Al Alil I and II plants, Mosul; and Sinjar plant, Mosul	3,740,000 ¹	
Do.	Lafarge S.A.	Bazian plant at Sarchinar, near Hayasi	2,700,000 ²	
Do.	do.	Tasluja plant, near Suleimaniyah	2,300,000	
White	Iraqi Cement Co. (Government, 100%)	Fallujah white cement plant, Fallujah	300,000 ¹	
Fertilizers	State Company for Fertilizers (Government)	Ammonia plant at Abu Al-khasib, near Basra	660,000 ¹	
Do.	do.	Urea plant at Abu Al-khasib, near Basra	1,060,000 ¹	
Do.	do.	Urea plant at Baiji	500,000	
Do.	State Enterprise for Phosphate (Government)	Phosphatic fertilizer plant at Al-Qaim	130,000 ¹	
Petroleum:				
Crude	North Oil Co. (Government)	Ain Zaleh, Ajil, Balad, Bai Hassan, East Baghdad, Jambur, Kirkuk, Sufaiya, Tikrit, and West Butmah fields	(3)	
Do.	South Oil Co. (Government)	Abu Ghraib, Amara, Burzurgan, Fakka, Halfaya, Luhais, Majnoon, Nahr Umar, North Rumaila, South Rumaila, West Qurna, and Zubair fields	(3)	
Refined products ⁴	42-gallon barrels per day	Midland Refineries Co. (Government)	Daura refinery at Daura	110,000 ¹
Do.	do.	North Refineries Co. (Government)	Baiji (North and Salahudin) refineries at Baiji	310,000 ¹
Do.	do.	South Refineries Co. (Government)	Basra refinery at Basra	150,000 ¹
Phosphate rock	General Phosphate Co. (Government)	Akashat	NA	
Sulfur	Misraq Sulphur State Enterprise (Government)	Near Al Qayyarah	820,000 ¹	

Do., do. Ditto. NA Not available.

¹Actual production was significantly less than design capacity.

²Under construction.

³Average production capacity for all Iraqi fields in 2008 was about 2,423,000 barrels per day.

⁴In addition to the three large refineries, several small (2,000- to 12,000-barrel-per-day capacity) topping plants were repaired.

