THE MINERAL INDUSTRY OF

KAZAKSTAN

By Richard M. Levine

Kazakstan was the second largest country in land area after Russia to form from the republics of the former Soviet Union (FSU). It is endowed with large reserves of a wide range of minerals. Kazakstan produced a major portion of the FSU's output of a number of metals, including beryllium, bismuth, cadmium, chromite, copper, ferroalloys, lead, magnesium, rhenium, titanium, uranium, and zinc. It had significant production of a number of other mineral products, including arsenic, barite, coal, gold, molybdenum, natural gas, oil, phosphate rock, and tungsten.

In 1995, the gross domestic product (GDP) decreased by 8.9% and industrial production by 8% compared with that of 1994. However, in 1995, according to statistics of the Commonwealth of Independent States (CIS), production of ferrous metals increased by 9%, nonferrous metals by 2%, and chemical and petrochemical products by 8% compared with that of 1994.

Government Policies and Programs

Growth in the mineral sector, which was contrary to general trends within the economy, coincided with Kazakstan adopting a new form of management for its mineral-production sector in 1995. At the end of 1994 and throughout 1995, Kazakstan engaged in a new program for the management of mineral industry enterprises that combined Government ownership, privatization, and foreign management. This program involved Kazakstan transferring the majority of its major mining and metallurgical industries, excluding gold, to the management of foreign companies for a limited number of years. Plans for 1996 called for extending foreign management to some gold-mining enterprises.

The foreign managers were to invest in upgrading equipment, dealing with social and ecological problems, paying off debts, striving to increase production and profitability, and attracting investment. Most foreign managed plants were reporting meeting these goals, so it appears that this new system of temporary foreign management was successful in reversing the downward trends in Kazakstan's mineral industries. Foreign management companies were being offered a share of current profits and (some were also being offered) the right to purchase stock in these enterprises.

Most mineral development licenses issued to foreign investors were for mineral extraction or a combination of geologic exploration and extraction with the greatest interest among investors in hydrocarbon and gold deposits. Of 1,014 license applications received by the Ministry of Geology and Underground Resources at yearend 1995, 45.2% were for precious metals, 7.1% for copper, and 4.4% for lead-zinc polymetallic deposits.

Environmental Issues

Mineral production and utilization was a major creator of industrial wastes that consisted in large part of flotation residues, ash slag wastes, blast furnace slag, asbestos cement wastes, and alumina production slurry. According to Kazakstan's Ministry of Ecology and Bioresources, metallurgical enterprises are a main source of pollution, accounting for about 15% of the waste generated in Kazakstan. Of this total, nonferrous metallurgical enterprises were producing about 60% by volume of the toxic wastes.

Air pollutants from metallurgical enterprises consisted mainly of sulfur dioxide and also consisted of toxic compounds of arsenic, copper, and lead. Permissible norms for sulfur dioxide concentration in the air were exceeded in the metallurgical centers of Oskemen and Leninogorsk by three times and in Balkhash by two times. High levels of lead pollution were observed in the cities of Shymkent, Dzhezkazgan, and Leninogorsk where the average lead concentration was one to two times above the permissible norm. The highest monthly average levels of lead pollution in the air in the city of Shymkent exceeded the permissible norms by 10 times, in Dzhezkazgan by nine times, and in Oskemen and Leningorsk by three times. At the lead plant in Shymkent, two extremely high cases of pollution were reported where lead in the air exceeded the permissible norm by 56 times and 62 times.

Nonferrous metallurgical enterprises were substantial contributors to water pollution, particularly for copper and zinc contamination. In 16 cases, the Glubochanka River registered lead levels that were 540 times above the permissible norm and in 1 case where the copper contamination was 140 times higher than the permissible norm. Reportedly, the Krasnoyarka River registered 5 cases where zinc contamination was 342 times higher than the permissible norm, the Breska River 6 cases of copper pollution 340 times above the permissible norm, the Bukhtarma River 1 case of copper contamination 194 times above the permissible norm, and the Ulba River 1 case of copper contamination 131 times above the permissible norm.

In addition to nonferrous metallurgy, chemical enterprises identified by the Ministry as significant polluters included the Khambyl Superphosphate plant and the Shymkent and Nodfas Phosphorus plants with atmospheric discharges of phosphorous anhydride, phosphoric hydrogen and hydrogen fluoride and the

Aktyaubinsk Chrome Compounds plant with atmospheric discharges of 4,380 kilograms of sixth valency chrome compounds in 1994, and the Temirtau carbide plan with atmospheric discharges of 166 kilograms of mercury in 1994.

As a result of the utilization of coal in powerplants from the Ekibastuz basin which has an extremely high ash content and does not undergo preliminary washing, large regions of the country are contaminated with atmospheric discharges of ash and other pollutants. In the region of oil and gas production, the main source of air pollution were carbon oxides and sulfur dioxide from natural gas production. Surface pollution was connected with oil spills and pipelines leakages.

Commodity Review

Metals

Aluminum.—In 1995, bauxite production reportedly increased by about 35% compared with 1994 to 3.3 million metric tons (Mt). Plans called for further development of bauxite mining in Kazakstan to supply the Pavlodar alumina plant. Pavlodar has the capacity to produce 1.2 million metric tons per year(Mt/yr) of alumina. A consortium of Kazakstan, Russian, and western firms including the United Kingdom's White Swan Ltd. and Iceland's Ivedon International Ltd. plan to develop the Eastern Ayat bauxite field with reserves reportedly of 90 Mt of bauxite.

The Pavlodar plant is currently being supplied by local sources, but is still forced to import about 300,000 metric tons per year (t/yr) from Australia and Guinea. In December 1994, White Swan gained the right to manage Pavlodar for a 5-year period.

Beryllium.—The Ulbinskiy plant in Oskemen was the only producer of beryllium metal in the FSU. The Ulbinskiy plant has been converted into a joint-stock company. Major shareholders include the Kazakstan firm KATER, an umbrella organization for the country's nuclear industries, and the Russian financial group TVEL. Plans for the Ulbinskiy plant called for maintaining production of the same types of mineral products, but converting a large portion of the output to civilian rather than military uses.

In March 1996, the U.S. International Trade Commission gave notice of the institution of a preliminary antidumping investigation of imports of beryllium metal and high-beryllium alloys exported to the United States from Kazakstan and alleged to be sold at less than fair market value.

Chromite.—The Donskoy complex in Kazakstan had produced more than 95% of the chromite output of the FSU. In 1995, chromite production reportedly increased by almost 20% to 2.9 Mt compared with 1994 output of 2.4 Mt. Following the breakup of the Soviet Union, output of chromite at Donskoy had fallen sharply from its peak levels of over 3.5 Mt/yr. Production occurred at three open pit mines and one underground mine. Underground mining accounted for almost one-half of the output, and it was envisaged that underground mining would account for three-fourths of output by the year 2000. Reserves at Donskoy's two open pits reportedly were on the verge of depletion and development of a third open pit had been delayed. In the ferrochromium sector, in 1995 the Aksu (formerly Yermak) ferroalloys plant reported producing at only 30% capacity and the Ferrokhrom (formerly Aktyubinsk) ferroalloys plant reported that three furnaces were idle during the year.

In 1995, Kazakstan started a new system of management in the chromite industry as the country turned the management of its chromite mining and ferrochromium industries over to the Japan Chrome Corporation (JCC). The arrangement reportedly met with success as in the second half of 1995 ferrochrome production increased by 32.6% at the Aksu (Yermak) and by 31.6% at the Ferrokhrom (Aktyubinsk) ferroalloys plants compared with the same period in 1994. Kazakstan was planning to increase production of ferrochrome output in 1996 to 720,000 tons (t), in part by converting production of some ferrosilicon capacity at the Aksu plant to ferrochromium production. Much of the increased output would be intended for world markets.

Under the management of JCC, the ferrochromium industry was reorienting its production towards world markets and away from sales for consumption primarily within the FSU. Along these lines, the Ferrokhrom plant stopped production of low-carbon ferrochromium primarily for the Russian market in favor of high-carbon ferrochromium production for world markets. This new management arrangement apparently caused disruptions in chromite supply to Russia, as one of JCC's first actions was to halt chromite shipments contracted to Russia. Kazakstan reportedly shipped 360,000 t of chromite to Russia during the first half of 1995, but during the second half of the year shipped almost none. This resulted in ferrochromium output falling at Russia's major ferroalloys plants.

Copper.—Mine output of copper in 1995 reportedly decreased to 260,000 t compared with 285,000 t in 1994. A major problem confronting Kazakstan's copper mining enterprises is depletion of ore reserves. At the Balkhash mining and metallurgical complex that produces about 135,000 t of cathode copper per year, copper was mined at three deposits in central Kazakstan and at a mine in western Kazakstan. Only one-third of the Balkhash refinery's demand for raw material, however, was being met by production from the Balkhash complex. Plans were being formulated in conjunction with Switzerland's Cam Finance S.A. to develop two new copper deposits in Pavlodar oblast enabling Balkhash to provide 100% of its own ore requirements.

In June 1995, management of the Dzhezkazgantsvetmet copper mining and metallurgical complex was turned over to Samsung Deutschland, a subsidiary of the Republic of Korea's Samsung. The new management company was committed to paying off Dzhezkazgantsvetmet's debt of 10 billion tenge ($157 million) and boosting output of copper cathode from 80,000 t/yr to 200,000 t/yr which was near Dzhezkazganstsvetmet's capacity. In September 1995, the Cyprus registered Dalex Trading Ltd. was granted the right to manage the East Kazakstan Copper and Chemical Complex.

Gallium.—The Pavlodar alumina plant which produces gallium is now under the management of the United Kingdom's White Swan Ltd. Plans call for turning Pavlodar into a major

producer and exporter of gallium.

Gold.—Primary gold production in 1995 was reported to be 15 t, which was an increase over 1994 primary gold output of 14.48 t. Nonferrous mining and metallurgical operations produced an estimated 10 tons of byproduct gold. The country foresees a large increase in gold production occurring from joint ventures and new investment with native gold production targeted to reach 50 t/yr in the year 2000. A number of gold deposits are being explored and considered for development. To accomplish this increase in gold production, in July 1995 the country enacted a new "Gold Law" allowing foreign companies to export all of the precious metals they produce.

Kazakstan has issued licenses for the exploration of over 100 gold deposits including joint ventures with foreign companies. These include joint ventures to develop the Yubeleynoye gold deposit near Aktobe and the Vasilkovskoye deposit in northern Kazakstan, to explore for gold in the Akmola region, and to develop the Bakyrchik deposit in northeastern Kazakstan.

The United Kingdom's Kazakstan Minerals Corp. (KazMinCo) is involved in the exploration of the Shatyrgul and Zhaisan copper-gold-molybdenum deposits, the Samarskoye and Vavarinskoye gold-copper deposits, the Akbakai goldbelt, and the Duman-Shuak, Gagarinskoye, Samarskoye, and Shokai gold deposits. KazMinCo has operational control of seven joint ventures with Kazakstan partners for advanced gold and copper exploration projects.

The Santa Fe Pacific Gold Corp. of the United States signed a joint-venture agreement with Kazakstan for exploration and development of over 3 million hectares of land in northeastern Kazakstan. Santa Fe Pacific reportedly has agreed to spend $6 million for exploration over a 5-year period and will be responsible for financing any development.

Pegasus Gold Inc. from the United States became a 50-50 joint-venture partner with Canada's Goldbelt Resources Ltd. in a project to process tailings from the Leninogorsk polymetallic complex that Goldbelt already had been involved in for 3 years. Reportedly, about 100 million tons of tailings grading 0.022 ounces per ton of gold and 0.167 ounces per ton of silver have been accumulating at Leninogorsk.

Iron and Steel.—In 1995 production of crude steel and pig iron increased, but both were still only approximately one-half of their 1992 production levels.

Kazakstan's major steel mill is the Karaganda steel complex, Karmet, with the capacity to produce 5.1 Mt/yr of pig iron, 6.3 Mt/yr of crude steel, and 4.7 Mt/yr of rolled steel. Karmet was only working at below 50% capacity. In October 1995, the United Kingdom's Ispat International Ltd. won the right to manage Karmet. The previous management firm, the Israeli Eisenberg Group, a subsidiary of U.S. Steel, had its management rights removed by the Kazakstan government.

Ispat reportedly agreed to invest $950 million in the Karaganda steel mill. The agreement reportedly calls for Ispat to buy assets and clear liabilities valued at about $450 million and then to invest $500 million to upgrade the steel mill. Ispat stated that it planned to increase output of rolled steel by 30% in 1996 and by 50% in 1997 over 1995 levels. Plans also include reducing the work force at Karaganda from 38,000 to 28,000 employees and expanding the plants exports. Ispat reportedly was offered significant ownership shares in Karmet.

Iron Ore.—In 1995 iron ore and concentrate production in Kazakstan increased to 14.9 Mt compared with 10.4 Mt in 1994 and pellet production increased to 7.2 Mt compared with 4.8 Mt in 1994. The Icelandic firm Ivedon International Ltd. received a 5-year contract to manage the Skolovsko-Sarbay iron ore mining and beneficiation complex, Kazakstan's largest iron ore producer and only pellet producer. Ivedon promised to extend a $56 million credit to the complex and to pay off with a loan a $17 million debt owed by customers. The management contract calls for 75% of Sokolovsko-Sarbay's output to be sold outside Kazakstan.

In 1995, iron ore production at Sokolovsko-Sarbay increased to almost 10 Mt of iron ore and concentrate and 7.2 Mt of pellets compared with 1994 production at Sokolovsko-Sarbay of almost 6 Mt of iron ore and concentrate and 4.8 Mt of pellets.

Lead-Zinc.—Mine output of lead concentrates in Kazakstan had fallen by more than two-thirds since 1992. In 1995, mine output of lead fell by almost one-third to 40,000 t compared with 57,000 t in 1994. Production of refined lead fell by almost 60% since 1992 and fell by almost one-third in 1995 compared with 1994. Mine output of zinc had fallen by more than 25% since 1992, but in 1995 remained at the 1994 level of 190,000 t. Kazakstan's two zinc smelters in East Kazakstan, the Ust-Kakmenogorsk and Leninogorsk smelters, were not receiving adequate amounts of concentrates.

Several lead-zinc industry enterprises in 1995 were placed under new domestic management. A Kazakstan company, Metalou Ltd., was assigned the right to manage the Ust-Kamenogorsk lead-zinc enterprise and the Zyryanovsk lead plant. The Kazakstan Postovalov Co. obtained a 5-year contract to manage the Karagaily lead-zinc mining and beneficiation complex.

Titanium.—The Ust-Kamenogorsk titanium-magnesium plant, with an estimated capacity of 35,000 t/yr of titanium sponge, had produced 40% of the titanium sponge in the FSU. Titanium raw material came from Ukraine and carnallite and other raw materials from Russia; curtailments in raw materials shipments caused raw material shortages at Ust-Kamenogorsk.

Reportedly Ust-Kamenogorsk was the most modern of the plants in the FSU and was fully integrated to the ingot stage; it was the only plant in the CIS that used vacuum distillation of sponge.

In 1995, the Government signed over the management of the Ust-Kamenogorsk titanium-magnesium plant to the Belgium Specialty Metals Co. for a 5-year period. Plans call for enlarging the domestic raw material base for Ust-Kamenogorsk.

Industrial Minerals

Phosphate.—After decreasing sharply in the first half of the 1990's, production of phosphate rock began to increase in 1995. The major producer of phosphate rock was the Karatau complex where the phosphate rock has a P_2O_5 content ranging from 21% to 29%. The Chilisay complex in Kazakstan had also been under development, but the P_2O_5 content of the ore was less than

at Karatau.

Mineral Fuels

Coal.—Coal production in 1995 fell by about 20% compared with 1994 to 83.2 Mt. The fall was attributed in part to coal mining enterprises lacking working capital as consumers were in arrears in paying for coal. These financial constraints prevented the industry from making needed renovations.

Plans call for increasing coal production in 1996 to 96.1 Mt, with a portion of this increase to come from the Shubarkol open pit, the management of which was assigned to the Global Mineral Reserves, Inc. from the United States. Kazakstan reportedly was also seeking foreign investment for developing new coal fields at explored deposits.

Petroleum.—In 1995, Kazakstan reportedly extracted 300,000 t more crude oil than was produced in 1994. In 1995, Kazakstan exported 6,989,400 t of oil and gas condensate, of which 3,725,300 t was exported outside the FSU and 3,264,100 t within the FSU. Refinery output reportedly was 9,280,000 t of petroleum products, of which 2,190,000 t was gasoline, 3.3 Mt diesel fuel, and 3,790,000 t fuel oil, with Kazakstan also exporting refinery products.

Despite Kazakstan's large oil and gas reserves, over the past 3 years oil and gas production had fallen by 25% to 30%. Furthermore there was a sharp decrease in domestic geologic exploration. Exploration of Kazakstan's Caspian Sea Shelf extending over an area of 100,000 square kilometers was underway by a consortium comprised of seven major western firms with reportedly predicted resources of 3.5 to 4.8 billion t of oil and 2 trillion cubic meters (m3) of natural gas. Kazakstan, based on the Soviet reserve classification system, reportedly has 2.21 billion t of explored oil reserves, 690 Mt of explored condensate reserves, and 2.249 trillion m^3 of explored natural gas reserves. (Refer to the U.S Geological Survey Minerals Yearbook Russia chapter for an explanation of the Soviet reserve classification system.)

There were 13 joint ventures that had been established in the Kazakstan oil industry, but their level of activity was quite diverse, with a number of the joint ventures not having engaged or having delayed development. Kazakstan had a total of 20 oil and gas joint ventures, 5 of which were formed in 1995. Only 11 of the joint ventures were in operation, producing in 1995 a total of 2.5 Mt of oil and 2 billion m^3 of natural gas. Kazakstan has two major oil fields, the Tengiz oil field with estimated reserves reportedly between 500 to 800 Mt of oil and the Mangyshlak oil and gas condensate field containing the Karachaganak deposit with estimated reserves reportedly of more than 200 Mt of oil, more than 650 Mt of gas condensate, and 1.3 trillion m^3 of natural gas. Development of the Tengiz field which is being conducted by a joint venture with the United States Chevron Corp., was delayed because of the lack of a transport network to export the oil to major Western and Southeast Asian markets and because of inadequate refining facilities. Although an agreement was reached between Kazakstan, Oman, and Russia to construct a pipeline to export Tengiz oil to Russia's Black Sea Coast, the pipeline had not been built owing to both financial and political difficulties. In the spring of 1996, an agreement was reached by Kazakstan, Oman, and Russia which could help break the deadlock on financing the export pipeline for Tengiz oil. According to this agreement, Russia, Kazakstan, and Oman no longer will own the entire shares for the pipeline, but rather the shares also are to be distributed among a consortium of international companies, and there was a major reduction in Oman's share holdings.

At the Karachaganak deposit in the Mangyshlak basin, maximum production was reached in 1991 of 4.2 Mt/yr of oil and 4.5 billion m^3 of natural gas. Production in 1995 was at only about one-half the 1991 peak production levels. In 1992, the United Kingdom's British Gas plc and Italy's Agip S.p.A. won a tender to develop Karachaganak and had spent $50 million on a study of the deposit. In an effort to expedite development at Mangyshlak, the Kazakstan Government approved the request of Russia's main natural gas producing company, Gazprom, to acquire a 15% of the shares of the Karachaganak project through negotiations with the foreign investors. Gazprom controls the transport facilities for exporting Mangyshlak gas to West European markets.

In the area of offshore hydrocarbon development, the states of the FSU bordering the Caspian Sea and Iran by mid-1966 had not reached a solution regarding development rights, and this lack of agreement is hindering hydrocarbon development in this region. A treaty signed in 1940 between Iran and the Soviet Union regarding rights in the Caspian Sea was no longer considered operative by a number of the states bordering the Caspian Sea.

By yearend 1995, Kazakstan had privatized 78% of its oil and gas companies, turning them into joint-stock companies.

Infrastructure

Kazakstan, which is approximately four times as large as the State of Texas, is the second largest country in land area and fourth most populous to form from the FSU. Kazakstan borders Russia to the north, China to the east, and Kyrgyzstan, Uzbekistan, and Turkmenistan to the south. Although landlocked, Kazakstan borders two major inland seas, the Aral and the Caspian.

Major lakes in Kazakstan include the Alakol, Balkhash, and Zaysan. There are about 4,000 kilometers (km) of navigable river routes. The major rivers are the Ertis, Syrdarlya, Ishim, and Ile; these rivers are important sources of hydroelectric power and provide water for irrigation.

As of 1992, Kazakstan had 14,460 km of railroads, not including industrial lines, and 189,000 km of highways, of which 80,900 km were dirt roads. In 1992, the country had more than 2,800 km of crude oil pipelines and more than 3,400 km of gas pipelines.

Covering a large area, Kazakstan extends from the Volga River to the Altai Mountains and from plains in western Siberia to desert in central Asia. The climate in Kazakstan has wide temperature variations both between the northern and southern parts of the country and between summer and winter temperatures. In the coldest northern regions winter

temperatures average -20° C in comparison with -1° C in the south, while in summer the climate in the northern part averages 18° C in comparison with 29° C in the south.

The population of Kazakstan is almost evenly split between Kazakhs and Russians, with Kazaks comprising slightly more and Russians slightly less than 40% of the total population. The remaining ethnic groups are primarily Ukrainians, German Russians, Uzbeks, and Tatars.

Outlook

The outlook for Kazakstan's mineral industry could be quite favorable given the size and variety of its mineral reserves and the fact that Kazakstan has a wide range of mineral commodities that it produces in excess of its consumption needs which could be exported. Kazakstan has the potential to be a much larger supplier of minerals to world markets if it diverts trade away from the FSU and further develops its mineral reserves. A number of Kazakstan's mineral industries will require substantial investment to become major world suppliers, and Kazakstan is involved in capitalizing these industries through foreign management, joint ventures, and privatization.

It still remains to be seen to what extent foreign investors can be attracted to participate in the development of some of Kazakstan's major mineral industries, including its copper and lead-zinc industries. Kazakstan's future as a major world mineral producer will depend in large measure on its ability to attract investment to develop and renovate its mineral industries.

OTHER SOURCES OF INFORMATION

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TABLE 1
KAZAKSTAN: ESTIMATED PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity		1992	1993	1994	1995
METALS					
Alumina		1,100,000	1,000,000	700,000	1,000,000
Arsenic trioxide		2,000	2,000	1,500	1,500
Bauxite		3,040,000 2/	3,000,000	2,430,000 2/	3,300,000 2/
Beryllium, metal		NA	NA	NA	NA
Bismuth, metal	kilograms	90,000	90,000	117,000 2/	135,000
Cadmium, metal		1,000	1,000	995 2/	1,000 2/
Chromite		3,500,000	2,900,000	2,020,000 2/	2,400,000
Cobalt, mine output, metal content		1,500	1,500	1,394 2/	1,400 2/
Copper:					
Mine output, metal content		300,000	300,000	285,000 2/	260,000 2/
Metal:					
Smelter, primary		360,000	360,000	326,600	333,000
Refined, primary		360,000	360,000	326,600 2/	333,000 2/
Gold, mine output		24	25	26	26
Iron and steel:					
Iron ore, marketable		17,300,000	13,000,000	10,500,000	15,000,000
Metal:					
Pig iron 2/		4,659,000	3,544,000	2,432,000	2,490,000
Ferroalloys:					
Ferrochromium		400,000	328,000 2/	200,000	350,000
Ferrosilicon		500,000	450,000	350,000	350,000
Silicomanganese		--	--	40,000	20,000
Steel:					
Crude		5,680,000	4,280,000	2,969,000	3,029,000
Finished		4,300,000	3,400,000	2,300,000	2,100,000
Lead:					
Mine output, metal content		130,000	100,000	57,000 2/	40,000
Metal, refined		210,000	190,000	130,000 2/	90,000
Magnesium		3,000	2,000	--	--
Manganese ore, marketable		100,000	150,000	133,000	80,000
Molybdenum, mine output, metal content		600	600	534 2/	282 2/
Nickel, mine output, metal content		10,000	10,000	8,500 2/	9,900 2/
Silver		900	700	506 2/	430 2/
Tin, mine output, metal content		100	50	24 2/	15 2/
Titanium, metal		30,000	30,000	27,200 2/	25,000
Tungsten, metal, W content		100	100	114 2/	228 2/
Vanadium		1,400	1,200	878 2/	924 2/
Zinc:					
Mine output, metal content		260,000	200,000	190,000 2/	190,000
Metal, smelter		260,000	220,000	170,000	170,000
INDUSTRIAL MINERALS					
Asbestos, all grades		300,000	225,000	187,500 2/	150,000
Barite		200,000	200,000	175,000	150,000
Boron		100,000	90,000	80,000	75,000
Cement 2/		6,400,000	4,000,000	2,000,000	1,800,000
Fluorspar		100,000	90,000	80,000	75,000
Phosphate rock		3,500,000	2,500,000	1,740,000	2,000,000
Sulfur:					
Native		200,000	150,000	100,000	90,000
Byproducct		200,000	225,000	250,000	255,000
MINERAL FUELS					
Coal 2/		127,000,000	112,000,000	105,000,000	83,200,000
Natural gas 2/	million cubic meters	8,100	6,700	4,500	4,800
Petroleum, crude 2/		25,800,000	23,000,000	20,300,000	20,600,000
Uranium concentrate, U content		3,000	2,700	2,000	1,800

e/ Estimated. NA Not available
1/ Table includes data available through Aug. 5, 1996.
2/ Reported data.

TABLE 2
KAZAKSTAN: STRUCTURE OF THE MINERAL INDUSTRY FOR 1995

(Metric tons unless otherwise specified)

Commodity	Major operating facility	Location	Annual capacity e/
Alumina	Pavlodar alumina refinery	Pavlodar	1,200,000.
Arsenic, trioxide	Chimkent polymetallic enterprise and other nonferrous metallurgical enterprises	Shymkent (Chimkent) 1/	3,500.
Asbestos	Dzhetygara complex	Kustanay oblast	1,000,000 total.
Do.	Chilisay complex	Aktyubinsk phosporite basin	
Barite	Karagailinskiy mining and beneficiation complex	Karagaili region	300,000 total.
Do.	Tujuk Mine	Alma-Ata region	
Do.	Achisay polymetallic complex	Kentau region	
Bauxite	Turgai, Krasnooktyabr bauxite mining complexes	Central Kazakhstan	600,000 total.
Beryllium, metal	Ulbinskiy metallurgical plant	Oskemen (Ust-Kamenogorsk) 1/	NA.
Bismuth, metal	Ust-Kamenogorak lead-zinc metallurgical plant	do.	70 total.
Do.	Leninogorsk Lead Smelter	Leninogorsk	
Cadmium	Leninogorsk mining and beneficiation complex	do.	1,200.
Chromite	Donskoy mining and beneficiation complex	Khromtau region	3,800,000.
Coal	Karaganda basin	Central and North Central part of the country	50,000,000.
Do.	Ekibastuz basin	do.	85,000,000.
Do.	Maykuben basin	do.	10,000,000.
Do.	Turgay basin	do.	1,000,000.
Copper, mining, recoverable copper content	Balkhash	Balkhash region	200,000.
Do.	Dzhezkazgan	Dzhezkazgan region	250,000.
Do.	Irtysh	Irtysh region	10,000.
Do.	Leninogorsk	Leninogorsk region	15,000.
Do.	Zhezkent	Zhezkent region	25,000.
Do.	Zyryanovsk mining and beneficiation complexes	Zyryanovsk region	5,000.
Do.	East Kazakhstan copper-chemical complex	Ust-Kamenogorsk region	10,000.
Copper: Metallurgy, metal	Balkhash	Balkhash region	150,000.
Do.	Dzhezkazgan	Dzhezkazgan region	250,000.
Do.	Irtysh smelting and refining complex	Irtysh region	40,000.
Ferroalloys	Aktyubinsk plant	Aqtöbe (Aktyubinsk) 1/	High-carbon 60% ferrochrome, 150,000; medium-carbon 60% ferrochrome, 130,000.
Do.	Yermak plant	Ermak (Yermak) 1/	Ferrosilicon 700,000; ferrosilicochrome, 700,000; high-carbon ferrochrome 400,000.
Gallium	Pavlodar alumina plant	Pavlodar	NA.
Gold	Byproduct of polymetallic ores and native gold mining	Colocated with nonferrous metals mining	30.
Iron and steel:			
Pig iron	Karaganda Steelworks	Karaganda	5,000,000.
Steel, crude	do.	do.	6,300,000.
Steel, finished	do.	do.	4,700,000.
Iron ore, marketable	Sokolovsko-Sarbay, Lisakovskiy mining and metallurgical complexes	Kustanay oblast	25,000,000 total.

See footnotes at end of table.

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

(Metric tons unless otherwise specified)

Commodity	Major operating facility	Location	Annual capacity e/
Lead and zinc, mining: (recoverable lead and zinc content of ore)	Achisay	Kentau and Karatau regions	Lead 40,000, zinc 20,000
Do.	Akchatau	Balkhash region	Lead 10,000, zinc 30,000.
Do.	Irtysh	Ust-Kamenogorsk region	Lead 10,000, zinc 50,000.
Do.	Karagaili	Karagaili region	Lead 20,000 zinc 55,000.
Do.	Leninogorsk	Leninogorsk region	Lead 60,000, zinc 120,000.
Do.	Tekeli	Tekeli, Taldi-Kurgan regions	Lead 20,000, zinc 30,000.
Do.	Zhayrem	Zhayrem region	Lead 20,000, zinc 40,000.
Do.	Zyryanovak complexes	Zyryanovak region	Lead 20,000, zinc 40,000.
Do.	East Kazakhstan copper-chemical complex	Ust-Kamenogorsk region	Zinc 15,000 , (lead currently not recovered).
Molybdenum, mining, (recoverable molybdenum content of ore)	Kounrad Mine	Balkhash complex	6,000 total.
	Karaobinskoye deposit	Karaoba region	
Do.	Sayak deposit	Sayak region	
Molybdenum, metal	Akchatau molybdenum metal plant	Dzhezkazgan oblast	NA.
Petroleum and natural gas	Aktyubinskneft	Aktyubinsk region	28,000,000 (total crude oil). 10 million cubic meters (total natural gas).
Do.	Embaneft	Embinskiy District	
Do.	Mangyshalakneft	Mangyshlak Peninsula	
Do.	Tengiz deposit	Tengiz deposit	
Phosphate rock	Karatau production association	Dzhambul and Chimkent oblast	10,000,000 total.
Do.	Chilisay mining directorate	Aktyubinsk phosphorite basin	
Rare metals (columbium, indium, selenium, tellurium).	Aktau complex	Shevchenko	NA.
Do	Belogorsky rare metals plant	Belogorsk	NA.
Do.	Chimkent polymetallic plant	Shymkent	NA.
Do.	Ust-Kamenogorsk lead-zinc plant	Oskemen	NA.
Do.	Akchatau mining and beneficiation complex	Dzhezkazgan oblast	NA.
Rhenium	Balkhash copper mining and metallurgical complex	Balqash (Balkhash) 1/	NA.
Tantalum	Yermak ferroalloy plant	Ermak	NA.
Tin	Akchatau mining and beneficiation complex	Akzhal deposit, Dzhezkazgan oblast	700.
Titanium, metal	Ust-Kamenogorsk titanium-magnesium plant	Oskemen	35,000.
Silver, byproduct	Ust-Kamenogorsk	do.	1,200 total.
Do.	Leninogorsk	Leninogorsk	
Do	Chimkent metallurgical plants	Shymkent	
Uranium, U content	Stepnogosk	Stepnogosk	3,500 total.
Do.	Shevchenko	Shevchenko	
Do.	Taboshara	Taboshara	
Do.	Prikaspiskiy ore enrichment center	Shevchenko	
Do.	Tselinny chemical complex	Stepnogosk	

e/ Estimated. NA Not available.

1/ New names and spellings are given when available. The old name will appear in parentheses the first time the new name is used.