

# THE MINERAL INDUSTRIES OF THE COMMONWEALTH OF INDEPENDENT STATES

## ARMENIA, AZERBAIJAN, BELARUS, GEORGIA, KAZAKHSTAN, KYRGYZSTAN, MOLDOVA, RUSSIA, TAJIKISTAN, TURKMENISTAN, UKRAINE, AND UZBEKISTAN

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The Commonwealth of Independent States (CIS) was created in December 1991 by some of the republics of the former Soviet Union (FSU) and then included all the former republics except the Baltic States (Estonia, Latvia, and Lithuania). In the adopted Declaration, the participants of the CIS promised that their interaction would be based on the principle of the sovereign equality of all its members and that the member states were independent and equal subjects under international law. The CIS is not a state and does not have supranational powers. In 2004, the members of the CIS were Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan.

This report focuses on the major mineral-producing industries in the CIS that were in the process of significantly expanding production in 2004. Information on expansion plans provided in this report form the basis for the projected increases in production in the CIS in historic and projected output tables for mineral commodities found in the Minerals Yearbook, vol. III, Area Reports, International 2004—Europe and Central Eurasia. Given the increasing global demand for fuel and nonfuel minerals, this report provides information on planned or projected increases in mineral production in the CIS, which was the largest mineral-producing region in the world and a key supplier of minerals to world markets.

### ARMENIA

One-third of the Soviet Union's mine output of molybdenum came from the Republic of Armenia, and Armenia is estimated to produce an even greater share of CIS molybdenum output. The major producer of molybdenum in Armenia was the Zangezur copper and molybdenum mining complex, which is located near the town of Kadzharan 346 kilometers (km) from Yerevan. Kadzharan is known for its molybdenum mines and its copper and molybdenum plant (the Zangezur Copper and Molybdenum Plant). Armenia has 7.6% of the molybdenum reserves of the world, 90% of which belong to Zangezur. The mines at Kadzharan are known for their size and for the percentage of molybdenum contained in their ores (Hetq Online, 2005<sup>1</sup>).

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<sup>1</sup>References that include a section mark (§) are found in the Internet Reference(s) Cited sections.

The Zangezur complex was established in 1951. About 1 million metric tons (Mt) of ore was extracted by 1957. By 1989, 9 Mt of ore was being extracted. Work, however, was more or less suspended in 1992-93. Since 1994, production at the plant has increased regularly. In Soviet times, the complex had 1,600 employees. By 2004, it employed 2,800 people (Hetq Online, 2005§).

In December 2004, a contract was signed for the sale of Zangezur. The complex was sold for \$132 million; 60% of the shares was sold to a German company (Cronimet Mining GmbH); 15% went to Pure Iron OJSC, which operated a factory in Yerevan; 12.5% each went to Armenian Molybdenum Production enterprise and Zangezur Mining Ltd. of Armenia (Hetq Online, 2005§).

The fourth stage in the development of the complex, which was to be initiated in 2005, would increase production volume by 15%. The percentage of molybdenum and copper extracted from the ores will be increased. In coming years, production volume was expected to almost double (Hetq Online, 2005§).

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### AZERBAIJAN

For the past decade, Azerbaijan's offshore oil deposits in the Caspian Sea have been a major focus of global oil development. Since 1997, increases in the country's oil production have mainly been produced by the international consortium Azerbaijan International Operating Company (AIOC), which accounted for more than 70% of Azerbaijan's total oil exports. AIOC's partners were State Oil Company of Azerbaijan (SOCAR); Inpex Corp. and Itochu Corp. of Japan; Statoil ASA of Norway; Türkiye Petrolleri A.O. of Turkey; BP p.l.c. (BP) of the United Kingdom; Devon Energy Corp., Exxon Mobil Corp. (ExxonMobil), and Unocal Corp. of the United States; and the joint venture of Delta Oil Com. Ltd. of Saudi Arabia and Amerada Hess Corp. of the United States. Company activity included operations on the offshore ACG megastructure, which included the Azeri, the Chirag, and the deepwater Gunashli fields. The ACG was estimated to contain 5.4 billion barrels (Gbb) (756 Mt) of proven crude oil reserves according to BP,

which was the fields' operator and AIOC's largest stakeholder. SOCAR recently raised its assessment of the field's recoverable reserves from 5.4 Gbbl (756 Mt) to 6.9 Gbbl (966 Mt). During 2004, the AIOC reported that the fields' oil production averaged 132,000 barrels per day (bbl/d) [18,480 metric tons per day (t/d)], which was produced mostly from the Chirag-1 stationary platform. This production, which has been termed "early oil," was exported through the "Western Early Oil Pipeline," which extends to the Georgian port of Supsa on the Black Sea (U.S. Energy Information Administration, 2005§).

In the next decade, the main production development in Azerbaijan was expected to come from the three-phase development of the ACG megastructure. First oil flowed from the Central Azeri development of the ACG on February 12, 2005, and exports began in March 2005. During 2005, the new field was expected to produce an average of approximately 93,000 bbl/d (13,020 t/d). According to BP, the combined production from the Chirag and the Central Azeri fields was expected to average approximately 240,000 bbl/d (33,600 t/d) by the end of 2005. By 2007, total oil production from the ACG was projected to reach approximately 500,000 bbl/d (70,000 t/d) with the full implementation of Phase 1. If AIOC's Phase 2 plans are achieved, then production from the East Azeri and the West Azeri fields were expected to add more than 800,000 bbl/d (112,000 t/d). Production was expected to peak at about 1 million barrels per day (Mbb/d) [140,000 t/d] by 2009 following the completion of Phase 3, which included production from the deepwater Gunashli field, and will complete full ACG development (U.S. Energy Information Administration, 2005§).

Azerbaijan produced a number of mineral products besides oil. Azerbaijan's Government expected output in 2006 to total 30,000 metric tons (t) of primary aluminum, 1,230 t of steel pipes, and 1,117 t of cast iron. By 2010, production was expected to reach 110,000 t of primary aluminum, 1,325 t of steel pipe, and 1,203 t of cast iron (Interfax Central Asia & Caucasus Business Report, 2005§).

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Interfax Central Asia & Caucasus Business Report, 2005 (November 15-21), Azerbaijan's metals output expected to grow by quarter in 2006, accessed December 16, 2005, at URL <http://www.fbis.fedworld.gov>.  
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## BELARUS

Belarus had a number of significant mineral production enterprises, which included a steel minimill, a nitrogen production enterprise, and two oil refineries. The only mineral production enterprise that played a major role in world markets, however, was a Production Amalgamation Belaruskali potash-production enterprise that mined the Starobin deposit. With production estimated to be 4.3 Mt in 2004, Belarus ranked third in the world in potash production (Searls, 2005).

Belaruskali was one of the world's leading potash producers and the leading producer and supplier of potash mineral fertilizers in the CIS. Belaruskali comprised four mining and

refining complexes, auxiliary shops, and servicing units and employed about 20,000 people. Each of the four mining and refining complexes comprised a mine and a beneficiation plant to process ore and to produce potash fertilizers in the form of fine, fine crystallized, and granulated concentrate of potassium chloride and mixed potash salt. In addition, Belaruskali produced a variety of other salts (Production Amalgamation Belaruskali, undated§).

Belaruskali not only maintained its production capacity but consistently increased potash fertilizer production, which was possible because of its sufficient raw material base. In accord with a development program for Belaruskali for the period 2002-10, a number of investment projects were prepared and were underway. The goals of the program were to maintain the raw material base of Belaruskali, to improve technologies used for processing potassium ore through technical retrofitting and implementation of new beneficiation methods, to construct mine No. 5 "Krasnoslobodski," and to reduce environmental impacts (Production Amalgamation Belaruskali, undated§).

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Searls, J.P., 2005, Potash: U.S. Geological Survey Mineral Commodity Summaries 2005, p. 126-127.

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Production Amalgamation Belaruskali, [undated], Our history, accessed December 17, 2005, at URL [http://www.belarus.net/kali/kali\\_1.htm](http://www.belarus.net/kali/kali_1.htm).

## GEORGIA

During the Soviet period, a range of minerals, which included arsenic, barite, bentonite, coal, copper, diatomite, lead, manganese, zeolite, and zinc, were mined in Georgia. The country had been a major producer of high-grade manganese ore for about a century, although ore reserves were being depleted. Part of the manganese was used within Georgia for ferroalloys production. Following the dissolution of the Soviet Union, mineral production declined steeply. Although production in the mineral industry was reviving, Georgia was not producing or planning to produce any mineral products in quantities that would be of more than regional significance.

Georgia's main role in world mineral supply was serving as a transport route for oil and gas shipments out of the Caspian region to world markets. Three of the new large oil and gas export pipelines that have been or are being constructed in the Caspian region pass through Georgia—the Baku-Supsa ("Western Early Oil Route"), the Baku-Tbilisi-Ceyhan (BTC), and the Baku-Tbilisi-Erzurum (BTE) pipelines. No routes were scheduled to cross Armenia owing to Azerbaijan's troubled relationship with Armenia (U.S. Energy Information Administration, 2004§).

In 1996, Georgian and Azerbaijani representatives signed a 30-year agreement whereby a portion of the AIOC's early oil would be pumped via Georgia to its Black Sea seaports of Batumi and Supsa, which are located 40 km apart. Georgian International Oil Company (a subsidiary of the AIOC) made substantial upgrades to the existing 829-km pipeline along this

route and built the \$565 million Supsa terminal on the Black Sea (U.S. Energy Information Administration, 2004§).

In 1999, this western route for AIOC early oil became operational. Its original design capacity was 100,000 bbl/d (14,000 t/d). By 2004, upgrades had raised capacity throughput to about 220,000 bbl/d (30,800 t/d) at Supsa and 140,000 bbl/d at Batumi. The Baku-Supsa route, however, was designed to carry only the early oil from the AIOC's ACG project. The AIOC was to export its future production via the BTC main export pipeline when it becomes operational (U.S. Energy Information Administration, 2004§).

The BTC pipeline was planned to be commissioned in 2005 and the BTE natural gas pipeline was to be completed in 2006. Georgia will be paid transit tariffs by the pipeline's operators and will be allotted a small percentage of the fuel that passes through the country (U.S. Energy Information Administration, 2004§).

The BTC pipeline will export Azeri oil and possibly up to 600,000 bbl/d (84,000 t/d) of oil from Kazakhstan along a 1,673-km route from Baku, Azerbaijan, via Georgia to the Turkish Mediterranean port of Ceyhan. This will allow oil shipments to bypass the Bosphorus Straits. A BP-led consortium will operate the pipeline. The first tanker deliveries from the pipeline were expected by the end of the fourth quarter of 2005. Oil exports via BTC were expected to reach from 200,000 bbl/d (28,000 t/d) to 300,000 bbl/d (42,000 t/d) by the end of 2005 and to 500,000 bbl/d (70,000 t/d) by the end of 2006 (U.S. Energy Information Administration, 2004§).

The BTE natural gas pipeline, which is also known as the South Caucasus Pipeline (SCP), will run parallel to the BTC oil pipeline for most of its route and then connect to Turkish natural gas infrastructure near the town of Erzurum. The 885-km-long SCP was being constructed to carry natural gas from Azerbaijan's Shah Deniz field; its initial design capacity was about 42 million cubic meters per day. Plans called for the pipeline's capacity to be expanded to about 84 million cubic meters by 2007. Completion of the SCP was scheduled for October 2006 in time to meet Shah Deniz's first contracted exports to Turkey. Although most of the natural gas will be exported to Turkey, some will be sent to Europe via a transit pipeline through Greece. The SCP consortium comprised BP and Statoil, each with 25.5%; the Russian-Italian venture LukAgip NV, Iran's National Iranian Oil Engineering and Construction Company, SOCAR, and France's Total S.A., each with 10%; and Turkey's TPAO, with 9% (U.S. Energy Information Administration, 2004§).

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## KAZAKHSTAN

Kazakhstan is the second largest country in land area after Russia to form from the republics of the FSU. It ranks second only to Russia among the countries of the FSU in its quantity of mineral production and is endowed with large reserves of a wide range of metallic ores, industrial minerals, and fuels. Its

metallurgical sector is a major producer of a large number of metals from domestic and imported raw materials. Its metal mining sector produced bauxite, chromite, copper, iron, lead, and zinc ores, and its metallurgical sector produced such metals as beryllium, bismuth, cadmium, copper, ferroalloys, lead, magnesium, rhenium, steel, titanium, and zinc. The country had significant production of other nonferrous and industrial mineral products, such as arsenic, barite, gold, molybdenum, phosphate rock, and tungsten. The country was a large producer of mineral fuels, which included coal, natural gas, oil, and uranium.

## Commodity Review

### Metals

**Aluminum.**—Kazakhstan had a bauxite mining industry and a large alumina production facility, but it did not have an aluminum smelter. Switzerland's Corica AG was planning to commission the first 60,000-metric-ton-per-year (t/yr) substage of an aluminum smelter in Pavlodar by the end of 2007. Corica pledged in 2003 to build the smelter in return for 31.76% of Aluminum of Kazakhstan, which controlled Kazakhstan's alumina industry. The entire 125,000-t/yr first stage of the smelter was scheduled to be commissioned by September 2008. The second stage, with a capacity of 125,000 t/yr of aluminum and 136,000 t/yr of baked anodes, was expected to be commissioned between 2010 and 2012. The smelter's total capacity will be 250,000 t/yr. Corica will receive its ownership share once capacity to produce 60,000 t/yr of aluminum is in place (Interfax Metals & Mining Weekly, 2005).

**Chromium.**—Kazakhstan's chromite mining industry began its development during the Soviet period in 1939 at the Donskoye group of deposits in western Kazakhstan; the reserves were estimated to be 320 Mt of ore at an average grade of more than 50% Cr<sub>2</sub>O<sub>3</sub>, which is a very high grade. Following development of the Donskoy mining complex, the Aktyubinsk ferroalloys plant was constructed in 1943. Further development of the ferroalloy sector took place from the 1960s through the 1980s with the construction of the Aksu (formerly Yermak) ferroalloys plant in Pavlodar. Aksu first specialized in ferrosilicon production and then switched to producing a broader range of ferroalloys.

In 1995, the firm Kazkhrom was founded, which included the Donskoy mining and beneficiation plant and the Aktyubinsk and the Aksu ferroalloys plants. In 2004, Kazkhrom ranked second in the world in chromite production. More than 50% of chromite production was exported, and the remainder was used in the domestic ferroalloys industry (WinNe, undated§).

The Molodezhnaya open pit mine was Kazkhrom's major source of ore. The company planned to switch to underground mining entirely in 2007, although it continued to develop the Poiskovy open pit, which had 5.5 Mt of ore remaining at the end of 2003. When the Poiskovy closes, ore will come from two underground operations—the Imeni 10-letiya Nezavisimosti Kazakhstana (formerly Tsentralnaya) and the Molodezhnaya (MBendi, 2005§).

The first stage of the Imeni 10-letiya Nezavisimosti Kazakhstana Mine was in operation and will reach full capacity

of 2 million metric tons per year (Mt/yr) of ore in 2 to 3 years. Total capacity for this mine was planned to be 4 Mt/yr of ore, but this will depend on the success of exploration in a new ore-bearing region in the southwest of Aktyubinskaya Oblast. The Molodezhnaya underground mine was projected to produce 2 Mt/yr of ore. Kazkhrom will need to renovate its beneficiation plants to increase extraction of metal from ore and to increase concentrate production (Edil'baev, 2004; MBendi, 2005§).

**Copper.**—Kazakhstan was the second ranked producer of copper in the CIS. The country's leading copper producer was the production association Kazakhmys plc (an international company with branches in Kazakhstan, Germany, and the United Kingdom). Its main business was the mining, processing, smelting, refining, and sale of copper and copper products, which included cathodes and rods. As byproducts, the company, together with its subsidiaries in Kazakhstan and Germany ("the Group"), also processed, refined, and sold gold, silver, and zinc. On the basis of 2004 production figures, Kazakhmys was the world's 10th ranked mined copper and refined copper producer (Kazakhmys plc, undated a§).

The Group's corporate headquarters are situated in London and the Group has approximately 66,000 employees worldwide; the bulk of the Group's operations, however, are in Kazakhstan. The Group exports its products to world markets, particularly the burgeoning Chinese copper market. It operates open pit and underground mines and smelting and refining complexes across the region through its sites in Balkhash, East Kazakhstan, and Zhezkazgan (Kazakhmys plc, undated a§).

The Group had a number of mining projects in Kazakhstan intended to provide for production growth and, in the longer term, production replacement. The majority of these projects were anticipated to come online in the short to medium term and to include both new sites and expansion of existing mines.

The Aktogay project, which was located in the Balkhash area, was the Group's main project. Aktogay reportedly had reserves of 1,594 Mt of ore at a grade of 0.36% copper. Planned annual ore production was 50 Mt that contains 180,000 t of copper. The project plans also included a dedicated concentrator onsite to process the ore. Construction was scheduled to begin in 2006, and production was expected to start in 2009 (Kazakhmys plc, undated b§).

The Zhaman-Aybat project was the Group's main project in the Zhezkazgan complex. The underground mine will use trackless room-and-pillar mining with secondary pillar extraction. The shaft systems were commissioned, and underground development was almost complete. A rail line that was under construction will connect the mine to Zhezkazgan by rail. Production at the mine was slated to begin in 2006 (Kazakhmys plc, undated b§).

Development of the Artyemyevskoe mine in East Kazakhstan was intended to replace reduced production at the Nikolaevskoe mine. Ore will be sent by rail to the Nikolaevskoe concentrator. Production was expected to begin in 2006 (Kazakhmys plc, undated b§).

The East Saryoba Mine was being developed as part of the Zhezkazgan complex and was planned to provide production growth and replacement. Ore will be accessed via an underground adit from the base of an open pit mine. Plans

called for using a room-and-pillar mining system. Production was scheduled to begin in 2007 (Kazakhmys plc, undated b§).

The Taskura open pit mine will be developed as part of the North mine at the Zhezkazgan complex and is intended to replace production. Production at Taskura is scheduled to commence in 2008 (Kazakhmys plc, undated b§).

The Akbastau and the Kosmurun mine development projects are located in the eastern region; according to plans, Kosmurun ore will replace production from the Abyz Mine. Subsequently, output from Akbastau would take the place of production from Kosmurun. Both will be open pit mines, and ore will be sent by rail to the Karagayly concentrator. Production was planned to begin at Kosmurun in 2012, and at Akbastau, in 2017 (Kazakhmys plc, undated b§).

The Boschekul open pit mine north of Balkhash was a longer term project that was scheduled to begin production late in the next decade. It is intended to augment production from the four mines associated with the Balkhash complex. Project plans included a concentrator onsite to process the ore; the concentrate will then be shipped by rail to the Balkhash complex for smelting and refining (Kazakhmys plc, undated b§).

**Lead and Zinc.**—Kazakhstan was the major lead and zinc producer in the CIS and had been the leading producer of these metals during the Soviet era. Kazzinc JSC (joint stock company) controlled all lead and zinc production except for the zinc output associated primarily with copper, which was controlled by Kazakhmys. Kazzinc was a major fully integrated lead and zinc producer with considerable copper and precious-metals output. The company's operations were located in Kazakhstan and employed about 21,000 people in mining, ore beneficiation, metallurgy, power generation, and other operations (Kazzinc JSC, undated§).

Kazzinc was established in 1997 through the merger of eastern Kazakhstan's three main lead and zinc companies—the Leninogorsk (now Ridder) polymetallic complex, the Ust-Kamenogorsk lead and zinc complex, and the Zyryanovsk lead complex; these had been majority-owned by the Government of Kazakhstan. The Bukhtarma Hydroelectric Power Station was also included in the new company under a long-term concession to improve its appeal to potential investors. The controlling block of shares in Kazzinc has since been sold by the State to the private sector; Glencore International AG of Switzerland was the company's main investor (Kazzinc JSC, undated§).

As part of Kazzinc's development plan, the company launched a new mining subsidiary to operate the Shubinsky underground mine, which is located in the vicinity of Ridder. The Shubinskoe deposit has reserves of polymetallic and copper ores. Mining was scheduled to begin in the fourth quarter of 2004 (Kazzinc JSC, undated§).

The Maleevsky Mine, which was commissioned in June 2000, was Kazzinc's largest underground mine; the initial production capacity was 1.5 Mt/yr of ore. By yearend 2001, capacity had been expanded and production increased to 2.25 Mt/yr. Ore grades at the mine averaged 7.5% for zinc, 2.3% for copper; 1.3% for lead, 75 grams per metric ton (g/t) silver, and less than 1 g/t gold, with proven reserves sufficient to sustain production at 2004 rates for the next 18 years. The mine produced the majority of Kazzinc's zinc and copper concentrates and supplied

all the zinc smelter feed used by the Ust-Kamenogorsk zinc plant and 85% of the company's total copper concentrates production (Kazzinc JSC, undated§).

The Grekhovskiy Mine, which was a smaller underground mining operation, produced about 400,000 t/yr of zinc-lead ores with approximately 3.8% combined metal content. After more than 30 years in operation, its reserves were nearing depletion. Plans called for production to continue at 2004 levels until 2009 (Kazzinc JSC, undated§).

The Zyryanovsk concentrator, which is located on the eastern outskirts of the town of the same name, primarily treated ore from the Maleevskiy Mine. Ore from the Grekhovskiy Mine and minor quantities of ore from the Alexandrovskiy Mine also were treated at the Zyryanovsk complex. The copper, gold, lead, and zinc concentrates were transported to the Ust-Kamenogorsk zinc and lead plants and also to third party copper smelters (Kazzinc JSC, undated§).

The Tishinsky Mine, which is located 15 km south of the town of Ridder, was an underground operation that produced 1.25 Mt/yr of polymetallic ores at an average grade of 5.3% zinc and about 1% copper and lead combined. Ore was shipped by rail to the Ridder concentrator. Reserves were considered to be sufficient to sustain 2004 production levels for another 20 years (Kazzinc JSC, undated§).

The Ridder-Sokolny gold mine, which was located on the outskirts of Ridder and adjacent to the concentrator, produced 2 Mt/yr of ore with an average gold content of 2.5 g/t. Gravity and flotation gold concentrates were primarily produced along with some zinc and copper concentrates (Kazzinc JSC, undated§).

A separate section of the Ridder concentrator treated all ores from the Ridder-Sokolny, Shubinsky, and Tishinsky Mines and gold-bearing tailings. The Ridder refinery treated zinc concentrates, but copper concentrates were sold to third parties, and lead and gold concentrates were shipped to the Ust-Kamenogorsk lead smelter for pyrometallurgical processing (Kazzinc JSC, undated§).

The Ust-Kamenogorsk metallurgical complex consisted of a 162,000-t/yr zinc refinery, a 140,000-t/yr lead smelter and refinery, and a precious-metals refinery. The three plants shared a common infrastructure. The production site is located at Kazzinc's headquarters on the edge of the city of Ust-Kamenogorsk (Kazzinc JSC, undated§).

The Ust-Kamenogorsk zinc refinery originally was constructed in the 1960s to be an extension of the since-decommissioned old zinc refinery. Its production capacity gradually has been expanded to 162,000 t/yr of zinc metal and alloys. The refinery's feedstock was zinc sulfide concentrates from the Maleevskiy Mine that assays 53.5% zinc (Kazzinc JSC, undated§).

The Ridder zinc refinery used practically the same standard roasting leaching-electrowinning technology as did the Ust-Kamenogorsk zinc refinery; the main distinction was that the Ridder refinery treated zinc ferrite residues exclusively in coke-fired Waelz furnaces, but the Ust-Kamenogorsk processed some residues directly in the lead smelter. The Ridder refinery had the capacity to produce 105,000 t/yr of zinc metal and alloys (Kazzinc JSC, undated§).

The Ridder lead smelter used a standard sintering-smelting-pyrometallurgical refining process. Certain modifications were made that enabled the smelter to work in close conjunction with the zinc plant to achieve enhanced metal recoveries through the cross treatment of residues and byproducts from the two processes. This process resulted in the production of between 100,000 and 140,000 t/yr of refined lead, 7,000 t/yr of blister copper, and small amounts of indium, mercury, selenium, sodium antimonite, tellurium, and thallium. The Ridder precious-metals refinery produced about 350 t/yr of silver and 7 t/yr of gold.

The Tekeli Mine is located about 800 km south of Kazzinc's major area of activity near Ust-Kamenogorsk. After more than 60 years of mining, reserves of zinc and lead ore were depleted, and the mine was shut down in mid-2003 (Kazzinc JSC, undated§).

The Tekeli concentrator was originally built to treat locally mined ore. The concentrator was reconstructed in 2003 for flotation of Waelz clinker from Ridder and Ust-Kamenogorsk to produce copper concentrates and to regenerate unburnt coal and coke for use at the Tekeli thermal power station and in Kazzinc's metallurgical processes (Kazzinc JSC, undated§).

### *Mineral Fuels*

**Natural Gas.**—Kazakhstan's proven natural gas reserves were reportedly between 1.82 trillion and 1.96 trillion cubic meters; these numbers were comparable with those of Canada and Kuwait and placed the country among the top 20 in the world in gas reserves. Despite this, since independence, the country has mostly been a net natural gas importer. By 2004, however, Kazakhstan's production was near its consumption level of approximately 15.6 billion cubic meters. According to the 15-year strategy issued by Kazakhstan's Ministry for Energy and Mineral Resources, the country planned to increase its natural gas production to 46.48 billion cubic meters by 2010 and to 51.5 billion cubic meters by 2015 (U.S. Energy Information Administration, 2005§).

The Karachaganak oil and gas condensate field, which had proven natural gas reserves of between 448 billion and 560 billion cubic meters, held about 25% of the country's reserves. A consortium that was developing Karachaganak expected peak production by 2010 to be about 28 billion cubic meters. Exploratory drilling began in 2001 at another important natural gas field, Amangeldy, which is located in the south of the country near Zhambyl; it has indicated reserves of up to 50.4 billion cubic meters. Amangeldy was being developed primarily by Kazmunaigas Exploration & Production LLP, which projects initial production to be about 981 million cubic meters per year (U.S. Energy Information Administration, 2005§).

**Petroleum.**—Kazakhstan had most of the Caspian Sea's largest known oilfields, with combined onshore and offshore proven hydrocarbon reserves estimated to be between 9 Gbbl [1.26 billion metric tons (Gt)] and 29 Gbbl (4.06 Gt), which was comparable to Algeria on the lower end and Qatar on the higher end. Kazakhstan also recently completed an assessment of its estimated proven and probable oil reserves that increased oil reserves to 29 Gbbl (4.06 Gt) in comparison with an earlier

assessment in the 1990s of about 16 Gbbl (2.24 Gt) (U.S. Energy Information Administration, 2005§).

Kazakhstan produced approximately 1.22 Mbbl/d (166,000 t/d) of oil in 2004 and planned to increase production levels to about 3.5 Mbbl/d (490,000 t/d) by 2015. The country expected that the majority of the growth will come from four huge fields—Karachaganak, Kashagan, Kurmangazy, and Tengiz. This increased production would include about 1 Mbbl/d (140,000 t/d) from Kashagan, 700,000 bbl/d (98,000 t/d) from Tengiz, 600,000 bbl/d (84,000 t/d) from Kurmangazy, and 500,000 bbl/d (70,000 t/d) from Karachaganak. Other smaller fields would account for the remainder. The country will become a more-significant exporter to world oil markets during the next decade (U.S. Energy Information Administration, 2005§).

The Tengiz field is located in swamplands along the northeastern shores of the Caspian Sea. Since 1993, it has been developed by the Tengizchevroil (TCO) joint venture [ChevronTexaco Corp. (Chevron), 50%; ExxonMobil, 25%; Kazmunaigaz, 20%; LukArco, 5%]. Consortium member Chevron had estimated recoverable crude oil reserves of from 6 to 9 Gbbl (840 Mt to 1.26 Gt). In January 2003, the Government of Kazakhstan and the TCO joint venture initiated a \$3 billion expansion project designed to increase production to approximately 450,000 bbl/d (63,000 t/d) by 2006. Chevron estimated that Tengiz could potentially produce 700,000 bbl/d (98,000 t/d) by the end of the decade. Owing to Government regulations against the flaring of associated natural gas, Tengiz's production during 2005 may stagnate until the field's operators can find use for this gas. A plan to reinject all the associated sour gas was scheduled to begin by May 2006 (U.S. Energy Information Administration, 2005§).

The onshore Karachaganak oil and gas/condensate field in northern Kazakhstan near the border with Russia's Orenburg field is being developed by the Karachaganak Integrated Organization (KIO), which was a consortium led by Britain's BG Group plc and ENI S.p.A. of Italy. According to BG, the field has reserves of more than 2.4 Gbbl (336 Mt) of oil and 448 billion cubic meters (16 trillion cubic feet) of gas, which would be recoverable during the 40-year life span of the project. Oil and condensate production from Karachaganak, which averaged 230,000 bbl/d (32,200 t/d) during the first half of 2005 and represented 18% of total Kazakh production, was planned to increase to 500,000 bbl/d (14,000 t/d) by 2010 (U.S. Energy Information Administration, 2005§).

The Kashagan field off the northern shore of the Caspian Sea near the city of Atyrau is the largest oilfield outside of the Middle East and the fifth largest in the world in terms of reserves. In June 2002, the consortium operating the field, the Agip Kazakhstan North Caspian Operating Company [Agip KCO (formerly OKIOC)], estimated the field's recoverable reserves to be from 7 to 9 billion barrels (980 Mt to 1.26 Gt) of oil equivalent; potential reserves could total 9 to 13 Gbbl (1.26 to 1.82 Gt) by using such secondary recovery techniques as gas injection. The field, however, was still being appraised. Oil production was not expected to begin until 2008 with initial production levels of about 75,000 bbl/d (10,500 t/d) and with

subsequent levels of about 450,000 bbl/d (63,000 t/d). By 2016, peak production was expected to be 1.2 Mbbl/d [168,000 t/d]. Owing to complications in negotiations regarding the sale of some consortium shares, little progress was made on Kashagan's development, which could possibly extend the start of production beyond 2008 (U.S. Energy Information Administration, 2005§).

The 7.33-Gbbl (997-Mt) Kurmangazy field has undergone the least development of Kazakhstan's oilfields. In July 2005, Kazakhstan and Russia signed a \$23 billion production sharing agreement for development of Kurmangazy. This field could increase Kazakhstan's total oil output by an additional 600,000 bbl/d (84,000 t/d) during the next decade (U.S. Energy Information Administration, 2005§).

**Uranium.**—According to the head of Kazakhstan's Kazatomprom, which was the state firm that controlled the country's uranium industry, the company planned to become the world's leading uranium producer by 2010. Kazatomprom planned to increase uranium mine output to 15,000 t/yr within 5 years from its 2004 level of more than 3,000 t/yr. If these plans are realized, then Kazatomprom will overtake Canada's Cameco, which was the world leader in 2004. To achieve this goal, \$600 million will be invested in the construction of new mines and in the development of existing ones. No plans existed at present to privatize Kazatomprom, and the company was planning to set up joint ventures with Japan's Kansai Electric Power Company and Sumitomo Corp. to mine and process uranium ore in Kazakhstan (Interfax Central Asia & Caucasus Business Report, 2005§).

Kazatomprom was also negotiating joint projects with China National Nuclear Corp. and planned to open a joint venture with Korea Hydro & Nuclear Power Company and Korea Resources Corp. Kazatomprom's main markets were China, Japan, the Republic of Korea, and the United States. The company was negotiating long-term supply contracts to 2030 with the Chinese Government (Interfax Central Asia & Caucasus Business Report, 2005§).

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## KYRGYZSTAN

During the Soviet period, Kyrgyzstan was the Soviet Union's main producer of mined mercury and of mercury and antimony metal. However, following the dissolution of the Soviet Union, the country's leading mineral sector has become the gold mining sector, which accounts for about 20% of the country's GDP. The main mineral production enterprise was the Kumtor gold mine. Canada's Centerra Gold Inc. owned 100% of the Kumtor gold mine through its wholly owned subsidiary Kumtor Gold Company. Kumtor is located about 350 km southeast of the capital Bishkek and about 60 km north of the border with China. It is the largest gold mine, in terms of production, operated in Central Asia by a Western-based company, having produced 5 million troy ounces (about 156 t) of gold between 1997 and the end of November 2004. Commercial production began in the second quarter of 1997 and more than 502,000 troy ounces (about 15.6 t) was produced that year (Centerra Gold Inc., 2004§, 2005§; Ivanov, undated§). From 1997 to the end of 2004, more than 40 Mt of ore was milled with an average gold content of 4.7 g/t. Total gold production was 5.043 million troy ounces (about 157 t) (table 4). Kumtor was expected to produce about 512,000 troy ounces (15.9 t) of gold in 2005 (Centerra Gold Inc., 2005§). (Gold production at Kumtor from 1997 to 2004 is listed in table 4; the estimated gold reserves and resources of Kumtor as of December 31, 2004, are listed in table 5).

In Kyrgyzstan, the Dzeruy gold deposit was being developed; the deposit had reported reserves of more than 100 t of gold in ore that graded between 5 and 9 g/t gold. Production was slated to begin in 2005; output was estimated to be up to 7 t/yr of gold (Kozyrev, 2004).

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## MOLDOVA

Moldova had one of the two steel minimills built in the FSU. Other than operating this steel mill, the country did not possess significant mineral resources or engage in mineral production of more than regional significance.

## RUSSIA

Russia is one of the world's leading mineral-producing countries and accounted for a large percentage of the FSU's production of a range of mineral products, which included aluminum, bauxite, cobalt, coal, diamond, mica, natural gas, nickel, oil, platinum-group metals, and tin. The mineral industry was of great importance to the Russian economy. Enterprises considered to be part of the mineral-raw material complex contributed more than 70% of the budget revenues derived from exports; oil and gas were the chief export earners (U.S. Energy Information Administration, 2005§).

Russia's gross domestic product (GDP) grew by approximately 7.1% in 2004, which was the country's sixth consecutive year of economic expansion. Energy exports during the past 5 years have been the main driver of economic growth, particularly given the increase in Russian oil production and relatively high world oil prices (U.S. Energy Information Administration, 2005§).

With this type of growth, the Russian economy is dependent on oil and natural gas exports and vulnerable to fluctuations in world oil prices. Although estimates vary widely, a World Bank analysis estimated that Russia's oil and gas sector, although employing less than 1% of the population, may have accounted for up to 25% of the GDP in 2003 (U.S. Energy Information Administration, 2005§).

The rebound in Russian oil production has continued since 1999, resulting in total liquids production of roughly 9.27 Mbb/d (1,297,800 t/d) in 2004, of which 8.8 Mbb/d (1,232,000 t/d) was crude oil. The total was a 10% increase compared with that of 2003 and was almost 40% higher than that of 1998. Accordingly, in 2003, Russia was the world's second ranked producer of crude oil after Saudi Arabia. From March to May 2004, Russian crude oil output exceeded that of Saudi Arabia. Oil companies in Russia were applying new techniques to older oilfields to improve production. Some analysts attributed production problems in late 2004 to actions taken against Yukos that resulted in the dismantlement of Russia's leading oil-producing company and the imprisonment of its top executives. The Russian oil sector, however, faced other difficulties. A recent report from the Siberian branch of the Russian Academy of Sciences stated that nearly 60% of all proven reserves in Western Siberia, which was the country's main oil-producing region, were near depletion (U.S. Energy Information Administration, 2005§).

In 2004, the Russian ferrous metals sector had a successful year because metal and ore prices remained high. Iron ore, coal, and coke prices stayed at a high level throughout the year, and steel prices rose by almost 60%. Having accumulated sufficient liquid assets, Russian metals companies found ways to invest them in increasing production capacity or in acquiring new assets (Interfax Metals & Mining Weekly, 2005).

Russia's nonferrous metals industry generally had a successful year in 2004, in large part owing to rising prices caused by strong demand from China. Within the sector, a new copper holding was formed, the Russian Copper Company (RMK), which became the country's third ranked copper producer after MMC Noril'sk Nickel and the Urals Mining

and Metallurgical Company (UGMK). RMK included four refined copper producers—the Kyshtym Copper Electrolyte Plant, the Novgorod Metallurgical Plant, the Revda Nonferrous Metals Processing Plant, and the Zavod Tochnykh Splavov (Precision Alloys Plant)—and the nonferrous scrap merchant Yekaterinburg Trade and Industry Company. The Russian titanium market also saw some changes, as Verkhnyaya Salda Metallurgical Production Association (VSMPO), which was the country's major producer of rolled titanium products, and Avisma Titanium-Magnesium Works, which was the country's main producer of titanium sponge, merged into the world's largest integrated titanium corporation, VSMPO-Avisma. In 2004, for the first time, Noril'sk disclosed data on its nickel and copper reserves at the Talnakhskoye and the Zhdanovskoye deposits on the Taymyr and Kola peninsulas, respectively (Interfax Metals & Mining Weekly, 2005e).

Companies in the precious-metals and stones markets had favorable conditions in 2004 owing to a strong market and to certain steps taken to liberalize the market gradually. In compliance with its obligations under the Kimberley Process to combat the trade in conflict diamond, Russia declassified statistics on production and trade of rough diamond, but data on diamond reserves and sales inside the country and all data on platinum-group metals (PGM) remained classified. According to published data, Russia mined 17.763 carats (3.5526 grams) of diamond worth \$948 million in the first half of 2004. For the full year 2003, Russia mined 33.02 million carats (6,604 kilograms) valued at \$1.676 billion, which made Russia the world's leading diamond producer by volume; it ranked second in value after Botswana. Russia was the second ranked rough diamond exporting entity by volume in 2003 after the European Union (EU) and the largest exporter by volume among diamond mining countries. Russia was the world's seventh ranked exporter of rough diamond in terms of value. Data on reserves of major gold lodes were declassified in 2004. This enabled data to be released on one of Russia's largest deposits, the Olimpiada, the license to which is held by the Polyus Gold Mining Company, which manages the gold assets of Noril'sk (Interfax Metals & Mining Weekly, 2005e).

Although an increasing global demand for mineral products resulted in rising prices for mineral commodities, which served as an incentive to increase mineral production, a number of Russian mining enterprises were experiencing the depletion of high grade ore reserves; most of the mining enterprises in Russia, which include the mixed sulfide deposits of Noril'sk that produce most of the country's cobalt, copper, nickel, and PGM; the Khibiny group of apatite deposits that produce most of the country's phosphate raw material; and the iron ore deposits of the Kursk Magnetic Anomaly that produce most of the country's iron ore, were developed between the 1930s and 1980s (Tsyganov and others, 2005).

Russia will develop production of its main nonferrous metals sectors between 2006 and 2008, according to the Economic Development and Trade Ministry in a report that discussed the forecast for Russia's socioeconomic development. Aluminum production was expected to increase by 2% per year in 2006 and 2007 as a result of potline upgrades at the Krasnoyarsk Aluminum Plant and the Urals Aluminum Plant

and improvement in technological processes at a number of enterprises. Production was expected to grow by 6.2% in 2008 as a result of second potlines being brought into operation at the Kandalaksha and the Sayansk aluminum plants and an increase in production at ob'yedinnoye Aktsionernoye Obshchestvo (OAO) Alucom-Taishet (Interfax Metals & Mining Weekly, 2005c).

According to the Economic Development and Trade Ministry, stabilization in deliveries of copper concentrate from Mongolia was expected to create conditions for about 1% growth in refined copper production in 2006 and annual growth of 1.3% to 1.5% in 2007 and 2008. The share of tolling in zinc production will remain at 17% to 20% as a result of a deficit in domestic raw materials. A total of 73.2% of zinc was to be produced from Russian raw materials in 2004. Russian enterprises were meeting 84.4% of the country's demand for zinc (Interfax Metals & Mining Weekly, 2005c).

Nickel production from 2006 to 2008 would remain at the same level as that of 2004 according to the Economic Development and Trade Ministry's report. Taking into account that more than 90% of Russian nickel was produced by Noril'sk and that Russia exported more than 95% of the nickel it produced, metal production trends were determined by the price level for metal on the foreign market. The increase in nickel prices that has resulted since the Ministry's projection has caused Noril'sk to change its production strategy to increase nickel output by as much as 20% during this period (Interfax Metals & Mining Weekly, 2005c).

Russian nonferrous metal consumption is expected to rise in 2008 compared with consumption levels in 2004. In particular, aluminum consumption is expected to rise by 16% to 31%; copper consumption, by 14.5% to 15%; and nickel consumption, by 4%. The growth in consumption from the 2004 very low level was attributable to an increase in demand from the manufacturing sector, in particular automobiles, electrical equipment, electronic and optical equipment, and transport (Interfax Metals & Mining Weekly, 2005c).

## Commodity Review

### Metals

**Aluminum and Bauxite and Alumina.**—In 2004, Russia was the world's second ranked producer of aluminum. Its aluminum industry was still in the process of expanding its production of alumina, aluminum, and bauxite. The country's largest aluminum producer, RUSAL Ltd., was formed in 2000. RUSAL was the world's third ranked producer of aluminum and alloys with 9.9% of global aluminum production. RUSAL produced 2.7 Mt of aluminum in 2004 (RUSAL Ltd., 2005a\$, b\$).

In 2004, RUSAL's development and expansion investments exceeded \$534 million. With more than 50,000 employees, RUSAL planned to increase aluminum production to more than 5 Mt/yr and alumina production to 8 Mt/yr by 2013. Alloy production was planned to increase to 50% of total output. Only 9% of RUSAL's growth in aluminum production was planned for outside Russia, but 77% of its growth in alumina production

would be abroad. RUSAL was planning to concentrate on the following projects in Russia: preparatory work for a new 600,000-t/yr aluminum smelter in Irkutsk with construction scheduled to start in 2006, preparatory work for constructing the 350,000-t/yr Khakassk aluminum smelter, a feasibility study to construct a new alumina refinery at the Severnaya Onega bauxite deposit, and expansion of the Achinsk alumina refinery to 1.2 Mt/yr (RUSAL Ltd., 2005a§, b§).

The remainder of the country's aluminum and alumina not produced by RUSAL was produced by the Russian firm SUAL, which was Russia's major producer of bauxite. SUAL employed 60,000 people and had operations that spanned nine Russian regions and in Ukraine. The company initiated the Komi Aluminium Project, which was one of the most comprehensive projects ever undertaken within the Russian aluminum industry. The project will involve the development of the vertically integrated aluminum complex Komi Aluminum, which is located 1,200 km northeast of Moscow near the city of Ukhta in the Komi Republic. The project will involve the development, construction, and operation of a bauxite, alumina, and aluminum complex based on the extensive SUAL-owned Middle Timan bauxite reserves, which are located 270 km northwest of the proposed complex.

The Middle Timan deposit with proven reserves of 260 Mt of ore is Eurasia's largest. The project will involve increasing annual bauxite extraction at the Middle Timan bauxite deposit from 1.5 Mt in 2004 to more than 6 Mt by 2008; constructing an alumina refinery in Sosnogorsk in the Komi Republic with an annual alumina production capacity of 1.4 Mt; and building an aluminum smelter with the capacity to produce between 300,000 and 500,000 t/yr of primary aluminum. Construction of the complex would result in a 50% increase in total Russian alumina production to 4.5 Mt and increase the Russian aluminum industry's use of domestic raw materials to between 70% and 80% from 40%. On April 25, 2005, RUSAL and SUAL signed an agreement that will make them equal partners in the Komi Aluminum Project. The agreement defined the terms for joint implementation of the second stage of the project, which is to build the alumina refinery in Sosnogorsk (SUAL, 2005§).

#### **Copper, Nickel, and Platinum-Group Metals.—**

Approximately 75% of the country's copper and more than 90% of its nickel and PGM output were mined by Noril'sk; its operations were mainly on the Taymyr Peninsula in East Siberia and on the Kola Peninsula. The remainder of the country's copper and nickel were produced by mining enterprises in the Urals, and a lesser amount of PGM that consisted almost entirely of platinum was mined from alluvial deposits throughout the country.

Although Noril'sk's development plan to 2015, which had been issued in 2003, called for Noril'sk to maintain the total amount of ore mined on the Taymyr Peninsula close to the 2004 level of 14 Mt/yr, a newer projection issued in 2005 called for Noril'sk to raise output on the Taymyr Peninsula to 18 Mt/yr by 2009. The 2003 plan, however, stated that on the basis of market conditions, Noril'sk could increase its base metals and PGM production by increasing the volume of ore mined, raising production on the Taymyr Peninsula to up to 20 Mt/yr, and accelerating processing of stored pyrrhotite and other

concentrates (MMC Norilsk Nickel, 2003§). Projected long-term ore output as of 2005 was raised to 22 Mt/yr. With metal prices and demand at very high levels, the new projections seem in accord with Noril'sk's marketing strategy. This new strategy called for a more than 25% increase in ore output by 2009 and could result in a similar proportional increase in metals output because Noril'sk will continue to mine primarily nickel-rich ore until 2009. For 2010, plans called for significantly increasing output of cuprous and disseminated ores in proportion to the nickel-rich ores being mined in 2004 (Kaytmazov and others, 2005).

Along with switching to mining a greater proportion of cuprous and disseminated ores, Noril'sk was developing new mines to replace depleted reserves of nickel-rich ore. The Skalistyy Mine on the Taymyr Peninsula, which was under development, will achieve design capacity of 1.2 Mt/yr of nickel-rich ore in 6 to 7 years. Skalistyy was scheduled to produce 310,000 t of ore in 2004. Development of the Gluboky Mine on the Taymyr Peninsula, which is scheduled to come onstream by 2014 was underway. The Gluboky and the Skalistyy will produce 2 Mt/yr of nickel-rich ores (Interfax Metals & Mining Weekly, 2004a). Although new mine development will compensate in part for depletion of nickel-rich ores, additional beneficiation capacity will be added to the Talnakh beneficiation plant to be used mostly for treating the increase in cuprous ore output. The older Noril'sk beneficiation plant will switch to treating almost exclusively disseminated ores. This arrangement will improve the quality of the concentrates at both plants (Kaytmazov and others, 2005).

Although reserves of nickel-rich ore on Taymyr were considered to be adequate for 30 years, the large quantities of cuprous and disseminated ores were projected to be adequate much further into the future. The cuprous ores have a much lower nickel content and somewhat lower copper content, and the disseminated ores are lower in all base-metals content than the nickel-rich ores. The nickel-rich, cuprous, and disseminated ores are not that dissimilar in their PGM content. After 2010 with the change in the ratio of ore types mined, the percentages of copper and PGM produced will increase in proportion to the amount of nickel produced (Kaytmazov and others, 2005; Levine and Wilburn, 2003§; MMC Norilsk Nickel, 2003§).

Aside from production from Noril'sk, Russian copper output will increase with the development of the large Udokan copper deposit in Chita oblast in the eastern part of the country. According to Russian reserve calculations, this deposit has confirmed reserves of 20 Mt of ore with an average copper content of 1.5%. About 70% of the ore can be mined by open pit operations. The rights to develop Udokan were to be auctioned off; the main contenders were Noril'sk and UGMK (Interfax Metals & Mining Weekly, 2005a). Only Russian firms will be bidding for Udokan because in 2005, in accordance with a new law on subsurface resources regarding development of strategic resources, Russia's Ministry of Natural Resources named the Anatoly Titov and the Roman Trebs oilfields, the Chayandinskoye oilfield and gasfield, the Sukhoy Log gold deposit, and the Udokan copper deposit as strategic deposits. Strategic deposits may have oil reserves of more than 150 Mt (1.101 Gbbl), gas reserves of more than 1 trillion cubic meters

(880.6 Gt), or copper reserves of more than 10 Mt. Auctions of the rights to develop strategic deposits will not be open to Russian companies or persons that form part of a group made up of foreign companies or persons (Interfax Eurasia Business Report, 2005§).

**Gold.**—In 2004, the Russian gold mining sector experienced a continuation of key trends that have been affecting the sector for the past 5 years. Mine production has remained at about the same level for the past 3 years, the share of gold from lode deposits was increasing, the number of small gold mining companies was being reduced, the major companies were playing an even larger role in gold output, and foreign gold companies in the past 2 years were intensifying their investment activities. Although proven gold reserves are in one-half of the Russian regions, only six Russian regions, all in the eastern part of the country, were producing more than 10 t/yr of gold and accounted for almost 80% of Russian gold output.

In 2004, increased gold production was achieved primarily owing to the increased production (11.3 t) of recycled gold. Reserves at existing enterprises were being depleted, and access to licenses for exploration and mining of small deposits could no longer be obtained locally but must be issued by the Ministry of Natural Resources. The development of a number of major deposits has been continuously postponed, most notably that of the Sukhoy Log deposit in the Irkutsk oblast that has reserves of more than 1,000 t of gold.

Despite the temporary lull in the growth of gold mining, the expansion of activities of the major gold mining companies acquiring exploration and development rights and foreign firms investing in gold development were expected to lead to a significant increase in Russian gold output. Foreign firms actively investing in the Russian gold mining sector in 2004 included Rio Tinto Ltd. of Australia; Barrick Gold Corp., Bema Gold Corp., Consolidated Puma Minerals Corp., High River Gold Mines Ltd., and Kinross Gold Corp. of Canada; Minco PLC of Ireland; AngloGold Ashanti Ltd. and Gold Fields Ltd. of South Africa; and Celtic Resources Holdings Plc, Eurasia Mining PLC, Highland Gold Mining Ltd., Peter Hambro Mining PLC, and Trans-Siberian Gold plc of the United Kingdom (Kochetkov, 2005).

**Tin.**—The Novosibirsk Tin Complex (NOK), which was Russia's largest tin producer, controlled the country's tin mining enterprises and largest smelter and had four subsidiary mining groups—Khingaolovo in the Jewish Autonomous Region; Vostokolovo and Dalolovo, which operate in an integrated production chain in the Khabarovsk territory; and Sakhaolov in the Sakha Yakutia Republic. NOK also controlled Tyanshanolovo, which mined tin in Kyrgyzstan (Interfax Metals & Mining Weekly, 2005f).

NOK company officials stated that NOK needed to optimize the supply arrangements regarding where raw materials are mined and processed. Shipping raw materials to Novosibirsk from the Russian Far East is very expensive, and the company was looking to develop a multiple-option strategy that will provide various possibilities for using mined raw materials and finished products (Interfax Metals & Mining Weekly, 2005f).

NOK management developed a strategic program under which primary processing of tin concentrate will be partially

outsourced to other plants, possibly in China or Malaysia. Only part of the primary concentrate-processing facilities will be preserved at the core plant in Novosibirsk, which will focus on improving facilities to make value-added products, such as solders and alloys, from semimanufactures made from primary processing at other plants (Interfax Metals & Mining Weekly, 2005f).

The plant in Novosibirsk will retain primarily smelting facilities, which will be modernized to boost efficiency and to reduce pollution. Work was underway to free up space and land for other uses (Interfax Metals & Mining Weekly, 2005f).

NOK planned to increase production of tin concentrate at its mining subsidiaries to 8,000 t/yr by 2009. Management did not rule out an agreement with a foreign partner that might include this partner's participation as an investor in the development of these mining subsidiaries. NOK mines shipped 2,270 t of tin in concentrate in 2004. NOK plans to boost efficiency at its core plant and mining subsidiaries in 2005 and to increase production of tin concentrate by 25%. NOK plans to process about one-half of the raw materials mined at its mining and beneficiation complexes and to sell the other one-half to other processors (Interfax Metals & Mining Weekly, 2005f).

NOK's Vostokolovo subsidiary, which mined the Festivalnoye, the Perevalnoye, and the Pravouimiiskoye deposits, planned to double production of tin concentrate to 2,000 t in 2005 from 980 t in 2004. According to the Russian reserve calculations, these three deposits have combined recoverable tin reserves of 180,000 t with the potential to produce an estimated 1,700 t/yr of tin in concentrate. The Festivalnoye and the Perevalnoye deposits were expected to supply 1,500 t of tin in concentrate in 2005 compared with 830 t in 2004. Pravouimiiskoye, which has not reached commercial mining capacity levels, was expected to triple shipments to 500 t from 150 t in 2004 (Interfax Metals & Mining Weekly, 2005f).

About 20 million rubles (more than \$700,000) was invested in Vostokolovo's operations in 2004 following an investment of \$5 million in 2002-03. The money was spent on mine preparation work at the Festivalnoye and the Perevalnoye deposits and the conversion of the beneficiation plant at the Molodezhny Mine from processing tailings to processing ore. The plant, which began commercial operations in 2004, was expected to double productivity in 2005 owing to modernization and to double productivity again in 2006 (Interfax Metals & Mining Weekly, 2005f).

In 2003 and 2004, Vostokolovo prepared the Pravouimiiskoye deposit for more-intensive mining. The deposit had been mined only on a seasonal basis by cooperatives. Vostokolovo bought equipment, built transportation and other infrastructure, and refurbished the beneficiation plant. Tin mining began in 2004 and production was expected to more than triple in 2005 (Interfax Metals & Mining Weekly, 2005f).

**Tungsten.**—By the beginning of 2000, Russia's tungsten industry was in a difficult situation as the main consumers of concentrate switched to imports, which comprised primarily cheaper Chinese concentrate, and purchases from the state reserve. Having lost the domestic market, Russian tungsten mining enterprises could not switch to exports quickly enough because the export duty made it very difficult to compete with

producers from Southeast Asia (Interfax Metals & Mining Weekly, 2005d).

The Tyrnauz tungsten-molybdenum mining and beneficiation complex, which was Russia's largest tungsten concentrate producer in the North Caucasus with more than 30% of the country's tungsten reserves, practically stopped producing and was not shipping any product owing to price problems with its main customer. In the Russian Far East, the Primorsky mining and beneficiation enterprise, the Lermontov mining company, and the Kvarts enterprise were also close to closing down. At yearend 2002, the Government agreed to lift the 6.5% export duty on concentrate, which enabled tungsten producers in the Russian Far East to resume steady operations. The tungsten consumers, the Gidrometallurg and the Pobedit and metallurgical plants, could help restore the Tyrnauz complex, which could then become a reliable source of tungsten for the European part of Russia (Interfax Metals & Mining Weekly, 2005d).

### *Industrial Minerals*

**Diamond.**—The Russian diamond industry was controlled by the diamond-producing monopoly Alamzy Rossii Sakha (Alrosa), which was based in the Sakha Yakutiya Republic. Alrosa produced about 98% of the country's diamond and accounted for about 22% of the world's rough diamond production. Alrosa, which was jointly owned by Russian central government organizations in Moscow and the Sakha Yakutiya Republic, operated mines in Russia and Angola. In 2004, it employed 37,561 people. Alrosa's largest shareholder was the Russian Ministry of State Property (37%). About 50% of the company's rough diamond was sold in foreign markets. Alrosa had a distribution agreement with the De Beers Group's marketing arm (Diamond Trading Company), but was reducing the amount of diamond it supplied to De Beers. The company also marketed its own stones and supported a growing Russian diamond-cutting industry (Alamzy Rossii Sakha, 2004§; Hoover's Inc., undated§).

Alrosa planned to expand its underground mining operations and exploration activities. According to the company's president, the 2005 program, which was based upon Alrosa's 10-year development guidelines, called for the expansion of underground mine production as its first priority. Alrosa was developing underground mining operations at the Aikhal, the Mirny, and the Udachnyy enterprises in the Sakha Yakutiya Republic. It was beginning underground mining at the Lomonosov field in Arkhangel'skaya oblast (Alamzy Rossii Sakha, 2004§; U.S. Geological Survey, unpub. data). By switching to underground mining, Alrosa believed that it would have enough reserves to last for an additional 40 years (Interfax Mining and Metals Report, 2002).

The Lomonosov diamond field, which was the largest in Europe, was discovered in 1980; it is located 100 km from Arkhangel'sk. The value of its estimated reserves was reported to be \$12 billion by Alrosa in a 2005 news release. About 60% of its reserves is gem-quality diamond that can be used in the jewelry industry. When ore treatment plant No. 1 was put into operation at Lomonosov on June, 28, 2005, it was the beginning

of commercial diamond production in the region. The design capacity of the plant is about 1 Mt/yr of ore. The diamond deposit's effective life is about 50 years (Alamzy Rossii Sakha, 2005§).

Severalmaz the subsidiary of Alrosa, which started to mine the Lomonosov diamond field in Russia's Arkhangel'sk region in 2005, applied to the Russian Finance Ministry for a quota to export 500,000 carats of rough diamond in 2006. Severalmaz also applied for a long-term quota to export 5.45 million carats of diamond from 2006 to 2010. Alrosa owned 92.3% of Severalmaz, and the Arkhangel'sk regional government owned 5.1% (Interfax Financial & Business Report, 2005§).

### *Mineral Fuels*

**Natural Gas.**—In 2004, natural gas production in Russia was 633.95 billion cubic meters, which was a 2.8% increase compared with that of 2003. Gazprom produced 544.4 billion cubic meters of gas, which was 0.8% more than that of 2003. Vertically integrated Russian oil companies produced 44.87 billion cubic meters in 2004 (Interfax Oil & Gas Weekly, 2005b).

Russia has the world's largest natural gas reserves, estimated to be 1,680 trillion cubic feet (47.04 trillion cubic meters), which was nearly twice the size of reserves in the next largest country, Iran. In 2004, Russia was the world's largest natural gas producer and the world's largest exporter; exports totaled 7.1 trillion cubic feet (198.8 billion cubic meters). Gas production and consumption in Russia, however, have remained at about the same level since independence in 1991 (U.S. Energy Information Administration, 2005d§).

Gazprom, which was Russia's state-run natural gas monopoly, had nearly one-third of the world's natural gas reserves and produced nearly 90% of Russia's natural gas. It also operated the country's natural gas pipeline network. Three major fields in Western Siberia (the Medvezh'ye, the Urengoy, and the Yamburg) accounted for more than 70% of Gazprom's total natural gas production. Production at these fields, however, was in decline as reserves were being depleted. Gazprom was Russia's largest foreign currency earner and the company's tax payments accounted for about 25% of federal tax revenues (U.S. Energy Information Administration, 2005d§).

The "Energy Strategy of Russia for the Period up to 2020," which was approved in May 2003, revised downwards previously projected gas-production estimates. In the energy strategy's modest-case projection, gas production was estimated to be about 620 billion cubic meters by 2010 and 650 billion cubic meters by 2020, and in an optimistic scenario, about 650 billion cubic meters by 2010 and 700 billion cubic meters by 2020. The older projection called for gas production to increase to about 630 billion cubic meters by 2010 and to about 660 billion cubic meters by 2020. East Siberia and the Russian Far East would be the sources of increased production as production was projected to decline in the country's major producing region of West Siberia and to increase only slightly in the much smaller gas-producing regions of the European part of Russia (International Energy Agency, 2003§; U.S. Energy Information Administration, 2005d§).

Historically, most of the natural gas produced from the Soviet Union was sent to customers within the Soviet Union and Eastern Europe. Since the mid-1980s, the Soviet Union began seeking to diversify its export options. Russia, which produced most of the gas in the Soviet Union, continued to export significant amounts of natural gas to customers in the CIS, although Gazprom has shifted much of its natural gas exports to serve the rising demand in countries of the EU, Japan, Turkey, and other Asian countries. Natural gas exports rose during 2004 compared with those of previous years, but the Ministry of Energy expects natural gas exports in 2005 to grow at a slower rate. The Ministry released data at the beginning of 2005 that forecasted exports of 7.2 trillion cubic feet per year (203.88 billion cubic meters per year) for 2005. If Gazprom is to fulfill its long-term goal of increasing its European sales, then it will have to increase its production and also construct more export pipeline routes. Several proposed new export pipelines would serve European markets if constructed (U.S. Energy Information Administration, 2005d§).

**Petroleum.**—In 2004, extraction of oil with gas condensate in Russia was 458.808 Mt, which was the largest amount of oil the country had produced since independence in 1991. Vertically integrated Russian oil companies extracted 420.994 Mt of oil in 2004, which included Yukos (85.678 Mt), Lukoil (84.1 Mt), TNK-BP (70.26 Mt), Surgutneftegas (59.6 Mt), Sibneft (33.98 Mt), Tatneft (25.09 Mt), Rosneft (21.599 Mt), and Slavneft (22.0 Mt). Gazprom, the major gas producer, extracted 12 Mt of oil in 2004 (Interfax Oil & Gas Weekly, 2005a).

The Energy Strategy of Russia for the Period up to 2020 revised previously projected oil production upwards and gas production downwards. Although the previous strategy called for oil production to rise to about 330 Mt in 2010 and to about 350 Mt by 2020, the new strategy called for a moderate-case assumption of oil production to rise to about 440 Mt in 2010 and to fall slightly to about 420 Mt by 2020. The optimistic-case projection in the energy strategy called for oil production to rise to almost 500 Mt by 2010 and to continue to rise to about 530 Mt by 2020. New production in East Siberia and the Russian Far East would account for a large part of the increase as production was projected to remain stable or decrease in the 2004 oil-producing regions (International Energy Agency, 2003§).

Russia reportedly has proven oil reserves of 60 billion barrels (8.2 Gbbl), most of which is located in West Siberia between the Ural Mountains and the Central Siberian Plateau. Approximately 14 Gbbl (1.9 Gt) exist on Sakhalin Island in the far eastern region of the country just north of Japan. In the 1980s, production from reserves in West Siberia made the Soviet Union a major world oil producer with peak production of 12.5 Mbbbl/d (1.7 Mt/d) in 1988. Following the fall of the Soviet Union in 1991, oil production fell precipitously and reached a low of about 6 Mbbbl/d (816,000 t/d), or about one-half of the Soviet-era peak output (U.S. Energy Information Administration, 2005d§).

Russian oil production began its recovery in 1999. Privatization, higher world oil prices, the use of standard Western technology, the rejuvenation of old oilfields, and the 1998 devaluation of the ruble contributed to raising production

levels. Russian Government and other analysts agreed that production was likely to continue to grow, at least in the short term. Oil companies in Russia were applying new upstream techniques to older oilfields and were, therefore, improving production. Private firms had led much of the upstream development in Russia, but as the Government nationalizes these firms, sustaining improvements in exploration and development could be less certain (U.S. Energy Information Administration, 2005d§).

**Uranium.**—To meet its growing demand for uranium, Russia must more than double annual uranium mine output by 2020 to 7,500 t from its 2004 level of 3,300 t, according to OAO TVEL Corporation, which was the country's nuclear fuel corporation that, among its activities, controls all uranium mining enterprises. By 2010, TVEL planned to mine 4,300 t of uranium at its enterprises. Furthermore, TVEL stated that Russia will have to increase uranium production to 12,000 t/yr by 2050. Almost all uranium mining in 2004 took place at the JSC Priargunsky Mining and Chemical Union in Chita oblast, which produced 3,100 t of uranium from the Steltsovsky deposit by open pit mining. A pilot project was underway at Priargunsky to develop in situ underground well leaching of ore. Mining was being developed at the JSC Dalur enterprise in the Kurgan region, which produced 150 t of uranium in 2004 and planned to produce 1,000 t by 2010. Dalur used underground well leaching to mine ore. The JSC Khiagda enterprise was developing a pilot mining operation to mine the Khiagdinskoye deposit in Buryatiya by using underground well leaching. In 2004, Khiagda produced 22 t of uranium; commercial operations were planned to begin in 2005 and eventually to have the capacity to produce 1,000 t/yr of uranium (Interfax Metals & Mining Weekly, 2005g; OAO TVEL Corporation, 2005§).

Given Russia's plans to expand nuclear power and export nuclear fuel, TVEL estimated that Russia's demand for uranium could more than triple from 9,000 t/yr in 2004 to 29,000 t/yr by 2050. TVEL stated that by that time, mining could meet 52% of Russia's total demand for uranium; the use of secondary sources, 31%; and imports, 17%. TVEL said that its estimates were based on the amount of reserves at known uranium fields (Interfax Metals & Mining Weekly, 2005g).

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## TAJIKISTAN

Tajikistan's major mineral-producing enterprise was the Tajik Aluminum smelter (TadAz) in Tursunzade (formerly Regar), which had a design capacity to produce 517,000 t/yr

of aluminum. It was established during the Soviet period and, following independence, was the country's main export earner by providing more than 50% of the country's foreign export earnings. RUSAL was engaged in plans to increase aluminum production in Tajikistan. RUSAL signed an agreement with the Government of Tajikistan in October 2004 that included construction of a new aluminum smelter with a 200,000-t/yr capacity and the installation of two new potlines (each with a 100,000-t/yr capacity) at the Tajik Aluminum Smelter (RUSAL Ltd., 2005§).

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## TURKMENISTAN

Although Turkmenistan produced a wide range of industrial minerals, its major mineral resources were its oil and gas reserves. According to estimates by the Oil & Gas Journal, Turkmenistan ranked 15th in the world in the quantity of its natural gas reserves, which were estimated to be 71 trillion cubic feet (2 trillion cubic meters). In 2004, Turkmenistan extracted 10.051 Mt of oil, which was 0.5% more than the 10.004 Mt it produced in 2003. The country's oil refineries, which included the Seydi refinery, the Turkmenbashi complex of refineries, and the refineries of the State corporation Turkmenneftegaz, processed 6.828 Mt of crude oil in 2004, which was 0.2% more than the 6.804 Mt processed in 2003. In 2005, Turkmenistan planned to export about 45 billion cubic meters of gas to Russia and Ukraine. Of that amount, 36 billion cubic meters will be exported to Ukraine under a contract signed with Naftohaz Ukrainy on January 3, 2005. Turkmenistan's refined oil product exports increased by 24% in 2004 in comparison with those of 2003 (Interfax Oil and Gas Weekly, 2005; U.S. Energy Information Administration, 2005§).

Following independence in 1991, Turkmenistan's gas production decreased dramatically. At that time, Turkmenistan was restricted in accessing gas pipelines that connected Turkmenistan to world markets. The pipelines were owned by Gazprom and routed through Russia. Turkmenistan's incentive to produce natural gas, therefore, was greatly reduced. The country's output decreased throughout the 1990s to about 13 billion cubic meters of gas in 1998 from about 57 billion cubic meters of gas in 1992. In 1999, however, a Turkmen-Russian agreement took effect that enabled Turkmenistan to increase its gas exports. In 2000, the country increased production to 47 billion cubic meters of gas and then to about 59 billion cubic meters of gas in 2004. In 2003, Turkmenistan signed a new agreement with Russia to increase exports substantially to Russia and Ukraine during the next 25 years. An agreement signed with Russia in January 2005 guaranteed that Turkmenistan would initially export about 212 billion cubic feet (6 billion meters) of natural gas to Russia in 2005, which would increase steeply to about 2.4 trillion cubic feet (68 billion cubic meters) in 2007 and to 2.8 trillion cubic feet (79 billion meters) in 2009 and remain at that level through 2028. Turkmenistan also had agreements to supply natural gas to Ukraine and

Uzbekistan and was exporting gas to Iran via the 193.08-km Kopezhe-Kurt Kui pipeline, which was completed in 1997 and did not pass through Russia. Turkmenistan planned to increase its exports to Iran from 180 billion cubic feet (5 billion cubic meters) per year in 2004 to 250 billion cubic feet (7 billion cubic meters) per year in 2005 as a result of Turkmenistan's newly installed gas compressor on the line that increased gas flow (U.S. Energy Information Administration, 2005§). It was unclear as to how Turkmenistan planned to meet its gas exports commitments.

Construction of the Trans-Afghan Pipeline (TAP) was under consideration to export Central Asian natural gas via Afghanistan to Pakistan. The TAP proposal had been shelved, but with the Taliban removed from power in Afghanistan, the idea for the TAP was revived. The TAP pipeline would extend more than 1,600 km to the south from a point in Turkmenistan to Fazilka, India, on the Pakistan-India border. The TAP would have a rated capacity of 1.1 billion cubic feet (30 million cubic meters) per year. Most of this gas would come from Turkmenistan's Dauletabad field, which, according to authorities in Turkmenistan, holds more than 60 trillion cubic feet (1.7 billion cubic meters). If verified, then this field would be the fourth largest in the world. The Governments of the United Kingdom and the United States hired independent firms in 2005 to verify this claim. A feasibility study for the TAP, which was commissioned by the Asian Development Bank, was completed in 2005 (U.S. Energy Information Administration, 2005§).

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## UKRAINE

In 2004, Ukraine continued to be a major world producer of coal, ferroalloys, ilmenite, iron ore, manganese ore, and steel. The country's steel exports were of major importance on world markets. Other major mineral commodity exports were iron ore and ferroalloys.

Ukraine had been a lesser producer of a number of other metallic mineral products, which included alumina, aluminum, cadmium, germanium, secondary lead, magnesium, mercury, nickel, rutile, uranium ore, secondary zinc, zircon, and zirconium, and a large number of industrial minerals, which included dolomite, graphite, kaolin, limestone fluxes, potash, quartz, salt, soda ash, and a variety of building materials.

According to Ukraine's State Mining and Metals Sector Development and Reforms Program to 2011, finished rolled steel production will grow to 33 Mt by 2011 from 30 Mt in 2005; crude steel production, to 40 Mt from 36 Mt; pig iron, to 32 Mt from 29 Mt; commercial iron ore, to 65 Mt from

62 Mt; and steel pipes, to 3 Mt from 2.3 Mt. Titanium sponge production was expected to rise to 12,000 t by 2011 from 6,200 t in 2005. Primary aluminum output would be unchanged at 115,000 t, although secondary aluminum output would increase to 120,000 t from 105,000 t; rolled aluminum output, to 26,000 t from 1,000 t; rolled copper and its alloys output, to 30,000 t from 15,000 t; and copper wire-rod output, to 50,000 t from 30,000 t. The Industrial Policy Ministry, which will oversee the program, has until March 1 each year to report on the results (Interfax Mining and Metals Report, 2004).

Ukraine's uranium extraction volumes will be increased to a level that will allow it to use its own nuclear fuel at all power stations by 2015, according to the draft strategy of developing Ukraine's fuel and energy complex until 2030. The investments necessary for such an increase in uranium extraction from 2005 to 2030 were estimated to be \$4.5 billion. Ukraine will need to attract non-Government investments to develop the uranium industry. The secrecy surrounding Ukraine's uranium facilities, however, has been obstructing the inflow of private investments (Interfax Metals & Mining Weekly, 2005).

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## UZBEKISTAN

Although Uzbekistan was a significant regional producer of a number of mineral commodities, which included nonferrous metals and natural gas, it was a major world producer of two mineral commodities, gold and uranium. Gold production was centered at the Muruntau deposit near the town of Zarafshan, Central Kyzyl Kum; some byproduct gold was produced from nonferrous mining at the Almalyk mining and metallurgical complex. The Muruntau Mine was constructed in the late 1960s by the Soviet Union. The present open pit, mill, and refinery have been processing ore since that time. The mine was the largest gold producer in the Soviet Union and accounted for approximately 30% of its gold production (Interfax Mining and Metals Report, 2004).

The country has four major gold producers—the Navoi Integrated Mining and Metals Combine (NGMK), which was one of the leading gold and uranium producers in Central Asia and Uzbekistan's leading producer; the Navoi and Uzbek-U.S. joint venture Zarafshan-Newmont Joint Venture (JV), which processed ore from the Muruntau deposit; the Almalyk mining and metallurgical complex, which produced byproduct gold from its nonferrous ore mining operations; and the Uzbek-British joint venture Amantaytau Goldfields (Interfax Mining and Metals Report, 2004).

NGMK operated the Muruntau open pit, where it mined most of its gold. Muruntau went onstream in 1967. NGMK gold production has averaged from 57 to 60 t/yr in recent years (Interfax Mining and Metals Report, 2004c).

Navoi also operated two gold recovery plants—the No. 2 hydrometallurgical plant in Zarafshan and the No. 3 hydrometallurgical plant in Uchkuduk. Navoi's own gold production rose by 25% between 1991 and 2003. The company also shared production from the Zarafshan-Newmont joint venture. Navoi has drafted a gold industry development program to 2010 in which gold production was estimated to rise by 20% by 2010 (Interfax Mining and Metals Report, 2004).

In March 2004, the Navoi complex won the rights to the 198-square-kilometer Jamansay goldfield in competition with U.S. major Newmont Mining and Britain's Oxus Mining. The field has estimated reserves of 50 t of gold and is located in the Republic of Karakalpakstan. Navoi did not actually bid at the tender against Newmont and Oxus, but held direct negotiations with the tender commission. The other bids did not meet the tender commission's requirements. Exploration was scheduled to begin in summer 2004 (Interfax Mining and Metals Report, 2004).

The Zarafshan-Newmont joint venture recycled tailings at the Muruntau gold lode. In 1990, a geologist from Newmont became one of the first Westerners to visit the Muruntau Mine. During the visit, he observed that at least 2 Gt of low-grade material from the Muruntau operation had been stockpiled, a substantial amount of which could be considered ore grade. Following Uzbekistan's independence in February 1992, Newmont signed a 50/50 joint-venture agreement with Uzbekistan governmental entities to mine and process a portion of these low-grade stockpiles. The processing plant was officially opened on May 25, 1995. The joint venture initially contracted to process 220 Mt of ore that averaged 1.23 g/t gold and contained 5.1 million troy ounces (158.6 t) of recoverable gold. Zarafshan Newmont employed about 850 people. Ore processing was scheduled through mid-2011. The plant comprised four-stage crushing and screening to produce ore suitable for heap leaching, processing at the Merrill Crowe section of the processing plant, and refining at the adjacent Muruntau refinery (Newmont Mining Corp., 2005§).

The Amantaytau Goldfields (AGF) was owned by Oxus Resources Corp. (50%), the Uzbek Gology Committee (40%), and Navoi (10%). AGF was licensed to mine the Amantaytau deposit, which contains a recoverable 3.2 million troy ounces (99.5 t) of gold and potentially more than 3 million troy ounces (93 t) of additional gold. The joint venture also obtained four smaller lodes to augment Amantaytau. The Vysokovoltnoye

and the Uzunbulak, the two largest of the four, have reserves of 600,000 troy ounces (18.7 t) and 230,000 troy ounces (7.15 t), respectively. The Vysokovoltnoye also contains a significant amount of silver (Interfax Mining and Metals Report, 2004c).

Standard Bank Group and West LB lent AGF \$36 million in May 2003 to build the first stage of a recovery plant at the Amantaytau field. The first stage of the plant was commissioned at the end of 2003 and had the capacity to produce 6.1 t/yr of gold. AGF planned to produce 170,000 troy ounces (5.3 t) of gold in its first year. The company produced 59,689 troy ounces (1.9 t) of gold from January through May 2004 (Interfax Mining and Metals Report, 2004c).

NGMK, and Russia-based Integra Mining, which was a division of Canada's Integra Group, planned to set up a joint venture to process the tailings of the Ingichki tungsten deposit. The Ingichki deposit was mined from 1956 to the end of the 1990s, and its tailings dumps hold about 15 Mt of ore. Uzbekistan does not have a tungsten deposit that is being mined. The Uzbek-Heat-resistant and Refractory Metals Plant imported raw material from Russia to make tungsten products (Interfax Central Asia & Caucasus Business Report, 2005c§).

The venture will produce tungsten concentrate that will be supplied to the Uzbek Heat-resistant and Refractory Metals Plant and exported. NGMK's UzGeotekhliti Institute was working on the feasibility study for the project, which will cost about \$10 million, according to preliminary estimates. Technical parameters for the project will be determined after completion of the study. A funding agreement for the venture could be signed at the end of 2005 or the beginning of 2006 according to UzGeotekhliti (Interfax Central Asia & Caucasus Business Report, 2005§).

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TABLE 1  
COMMONWEALTH OF INDEPENDENT STATES: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons unless otherwise specified)

Country and commodity	2000	2001	2002	2003	2004
<b>ARMENIA</b>					
<b>Metals:</b>					
<b>Aluminum:</b>					
Rolled	294	91	132	140	200
Foil	473	2,699	5,240	5,300	6,000
<b>Copper:</b>					
Concentrate, Cu content	12,234	16,460	16,641	18,000 <sup>c</sup>	17,600 <sup>c</sup>
Blister, smelter	4,000	4,000	6,700	7,500	10,400 <sup>c</sup>
Gold, mine output, Au content kilograms	600	1,900	3,200	1,800	2,100
Molybdenum, concentrate, Mo content	3,820 <sup>r</sup>	2,943	2,884	2,763	3,000 <sup>c</sup>
Rhenium <sup>e</sup> kilograms	700	750	800	1,000	1,000
Silver <sup>e</sup> do.	1,300	3,000	5,500	4,000	4,000
Zinc, concentrate, Zn content	528	745	782	800	650
<b>Industrial minerals:</b>					
Caustic soda	6,200	4,900	3,600	3,600	4,000
Cement thousand metric tons	219	300 <sup>r</sup>	355	384	475
Clays, bentonite, powder	2,807	1,000 <sup>c</sup>	258	642 <sup>c</sup>	700
Diamond, cut thousand carats	NA	186	370	400	320
Gypsum	9,600	12,800	44,900	57,800	65,000
Limestone thousand metric tons	12,800	11,900	12,500	13,000	16,000
Perlite <sup>c</sup>	35,000	35,000	35,000	35,000	35,000
Salt	30,000	30,000 <sup>r,c</sup>	30,300 <sup>r</sup>	31,900 <sup>r</sup>	32,000
<b>AZERBAIJAN<sup>2</sup></b>					
<b>Metals:</b>					
Aluminum, primary and secondary	-- <sup>r</sup>	-- <sup>r</sup>	-- <sup>r</sup>	18,565 <sup>r</sup>	29,537
Alumina thousand metric tons	63 <sup>r</sup>	95 <sup>r</sup>	91	180	232
Alunite do.	23	--	--	--	--
<b>Iron ore, marketable:<sup>c</sup></b>					
Gross weight	--	4,700	400	3,100	19,100
Fe content	--	2,700	230	1,800	11,100
<b>Steel:</b>					
Crude	--	1,605	524	1,531	21,570
Pipes	4,000	2,076	2,545	54,300 <sup>r</sup>	84
Ingots and castings	846	NA	NA	NA	NA
<b>Industrial minerals:</b>					
Bromine <sup>e</sup> thousand kilograms	2,000	2,000	2,000	2,000	2,000
Caustic soda	30,000 <sup>c</sup>	30,000 <sup>c</sup>	30,000	30,000	30,000
Cement	250,700	522,600	847,700	1,012,700 <sup>r</sup>	1,427,000
Gypsum	2,286	1,750	1,039	3,848	884
Iodine <sup>e</sup> kilograms	300,000	300,000	300,000	300,000	300,000
Limestone	NA	577,900	631,500	762,000	800,000
Salt	4,033	3,734	5,380	7,645 <sup>r</sup>	9,234
Sulfuric acid	38,000	9,500	17,000	19,000	19,000
<b>Mineral fuels and related materials:</b>					
Natural gas thousand cubic meters	5,642,400	5,534,600	5,143,700	5,127,700	4,995,400
<b>Petroleum:</b>					
Crude	14,017,000	14,909,100	15,333,500	15,251,300 <sup>r</sup>	15,348,800
Refinery products	NA	NA	6,051,900	6,156,400	6,607,200
<b>BELARUS</b>					
<b>Metals, steel:</b>					
Crude thousand metric tons	1,623	1,611	1,607	1,694	1,920
Rolled do.	1,400	1,400 <sup>r</sup>	1,400 <sup>r</sup>	1,425 <sup>r</sup>	1,580
Pipes	37,947	42,400	76,700	96,200 <sup>r</sup>	108,700
<b>Industrial minerals:</b>					
Cement thousand metric tons	1,847	1,803	2,171	2,472	2,731
Diamond, synthetic <sup>c</sup> thousand carats	25,000	25,000	25,000	25,000	25,000

See footnotes at end of table.

TABLE 1--Continued  
COMMONWEALTH OF INDEPENDENT STATES: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons unless otherwise specified)

Country and commodity	2000	2001	2002	2003	2004
<b>BELARUS--Continued</b>					
<b>Industrial minerals--Continued:</b>					
Nitrogen, N content of ammonia	730,000	725,000	799,000	726,000	770,000
Potash, K <sub>2</sub> O equivalent thousand metric tons	3,786	3,700	3,800 <sup>e</sup>	4,230 <sup>e</sup>	4,300 <sup>e</sup>
Salt <sup>3</sup>	309,937	301,000	304,000	300,000 <sup>e</sup>	300,000 <sup>e</sup>
Sulfur <sup>e</sup>	20,000	20,000	25,000	30,000	30,000
Sulfuric acid <sup>e</sup>	584 <sup>4</sup>	600	600	600	600
<b>Mineral fuels and related materials:</b>					
Natural gas million cubic meters	257	255	246	254	250
<b>Peat:</b>					
Horticultural use	191,000	200,000 <sup>e</sup>	200,000	100,000 <sup>e</sup>	100,000 <sup>e</sup>
Fuel use	3,786,000	1,997,000	2,201,000 <sup>r</sup>	1,802,000	1,993,000
Total	3,977,000	2,197,000	2,401,000 <sup>r</sup>	1,902,000	2,093,000
<b>Petroleum:</b>					
Crude thousand metric tons	1,851	1,852	1,846	1,820	1,804
Refined do.	13,528	13,346	15,247	15,774	18,451
<b>GEORGIA</b>					
<b>Metals:</b>					
Copper, mine output, Cu content of concentrate <sup>e</sup>	8,000	8,000	10,000	12,000	12,000
Gold <sup>e</sup> kilograms	2,924 <sup>4</sup>	2,000	2,000	2,000	2,000
<b>Iron and steel:</b>					
<b>Ferroalloys, electric furnace:</b>					
Ferromanganese	600 <sup>r</sup>	100 <sup>r</sup>	-- <sup>r</sup>	-- <sup>r, e</sup>	-- <sup>e</sup>
Silicomanganese <sup>e</sup>	25,000	25,000	25,000	25,000	25,000
Total <sup>e</sup>	25,600 <sup>r</sup>	25,100 <sup>r</sup>	25,000 <sup>r</sup>	25,000 <sup>r</sup>	25,000
<b>Steel:</b>					
Crude	100	--	--	--	--
Finished products, rolled	1,400	--	--	--	--
Lead, mine output, Pb content <sup>e</sup>	200	200 <sup>r</sup>	400	400	400
<b>Manganese ore, marketable:</b>					
Gross weight	63,100	98,400	103,400	173,500 <sup>r</sup>	218,700
Mn content <sup>e</sup>	18,300	28,500	30,000	50,500 <sup>r</sup>	63,600
Silver kilograms	33,884	33,000	33,000 <sup>e</sup>	33,000	33,000
Zinc, mine output, Zn content of concentrate <sup>e</sup>	200	350	400	400	400
<b>Industrial minerals:</b>					
Barite <sup>e</sup>	15,000	15,000	15,000	15,000	15,000
Cement	347,700	335,200	346,800 <sup>r</sup>	424,600	300,000 <sup>e</sup>
Clays, bentonite <sup>e</sup>	7,084 <sup>4</sup>	7,000	7,000 <sup>r</sup>	9,700 <sup>r</sup>	1,800
Nitrogen, N content of ammonia	135,000	60,000	90,000	125,000	130,000 <sup>e</sup>
Zeolites	NA	NA	NA	NA	NA
<b>Mineral fuels and related materials:</b>					
Coal, bituminous	7,300	5,000	8,000	8,000	8,000
Natural gas million cubic meters	79,500	40,200	16,700	17,800	6,100
<b>Petroleum:</b>					
Crude	109,500	98,800	73,900	139,700	97,600
Refined	31,700	11,800	16,100	18,600 <sup>r</sup>	37,500
<b>KAZAKHSTAN</b>					
<b>Metals:</b>					
<b>Aluminum:</b>					
Alumina thousand metric tons	1,217	1,231	1,386	1,419	1,468
Bauxite	3,729,600	3,685,100	4,376,600	4,737,100	4,705,600
Arsenic trioxide <sup>e</sup>	1,500	1,500	1,500	1,500	1,500
Beryllium, metal <sup>e</sup>	-- <sup>r</sup>	-- <sup>r</sup>	-- <sup>r</sup>	-- <sup>r</sup>	--
<b>Bismuth:<sup>e</sup></b>					
Mine output, Bi content	130	252	161	150	150
Metal, refined	55	130	130	130	130

See footnotes at end of table.

TABLE 1--Continued  
COMMONWEALTH OF INDEPENDENT STATES: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons unless otherwise specified)

Country and commodity	2000	2001	2002	2003	2004
KAZAKHSTAN--Continued					
Metals--Continued:					
Cadmium, metal	1,250 <sup>e</sup>	1,250 <sup>e</sup>	1,300	1,351	2,358
Chromite	2,606,600	2,045,700	2,369,400	2,927,500	3,267,000
Cobalt, mine output, Co content <sup>e</sup>	300	300	300	300	300
Copper:					
Mine output, Cu content <sup>e</sup>	430,000	470,100 <sup>4</sup>	490,000	485,000	462,000 <sup>4</sup>
Metal:					
Smelter, undifferentiated	413,859	433,600	446,200	431,930	449,500
Refined, primary	394,722	425,700	453,000	432,901 <sup>r</sup>	495,300
Gallium <sup>c</sup>	25	25	25	25	5
Gold:					
Mine output, Au content kilograms	28,171	25,010	22,402	30,000 <sup>e</sup>	30,000 <sup>e</sup>
Metal, refined do.	11,529	15,226	10,959	9,939	9,576
Iron and steel:					
Iron ore, marketable:					
Gross weight	16,160,000	14,140,000	15,423,000	19,300,000 <sup>r</sup>	20,300,000
Fe content	9,200,000 <sup>e</sup>	8,000,000	8,700,000	10,933,000	11,499,000
Metal:					
Pig iron	4,000,000	3,906,500	4,089,100	4,140,000 <sup>e</sup>	4,400,000
Ferroalloys:					
Ferrochromium	799,762	761,900	835,800	993,000	1,081,000
Ferrochromiumsilicon	55,634	79,800	108,028	98,130	104,800
Ferromanganese	1,075	5,349	2,278	1,931	2,000 <sup>e</sup>
Ferrosilicon	133,269	145,800	127,300	127,300 <sup>r</sup>	103,620
Silicomanganese	102,719	141,200	164,000	178,920	155,300
Other <sup>c</sup>	9,000	9,000	9,000	9,000	9,000
Total	1,101,459	1,143,049	1,246,406	1,408,281 <sup>r</sup>	1,460,000 <sup>e</sup>
Steel:					
Crude	4,770,000	4,691,000	4,868,000	5,066,600	5,371,700
Finished, rolled	3,700,000	3,700,000	3,800,000	3,837,800 <sup>r</sup>	4,039,700
Lead:					
Concentrate, Pb content	40,000	37,700	40,000 <sup>e</sup>	37,500 <sup>r</sup>	33,000
Refined, primary and secondary	185,800	158,700	161,800	133,200 <sup>r</sup>	157,000 <sup>e</sup>
Magnesium, metal, primary <sup>c</sup>	10,380 <sup>4</sup>	16,000	18,000	14,000	18,000
Manganese ore, crude ore:					
Gross weight	1,136,000	1,386,500	1,792,200	2,361,000	2,318,000
Mn content <sup>e</sup>	280,000	350,000	440,000	580,000	580,000
Molybdenum, concentrate, Mo content <sup>c</sup>	215 <sup>4</sup>	225	230	230	230
Rhenium <sup>e</sup> kilograms	8,000 <sup>r</sup>	8,000 <sup>r</sup>	8,000 <sup>r</sup>	8,000 <sup>r</sup>	8,000
Silicon	NA	NA	NA	83,000	88,000
Silver, mine output, Ag content do.	927,100	981,900	892,600	826,500 <sup>r</sup>	707,000
Titanium, sponge	8,280	14,000	14,900 <sup>r</sup>	12,500 <sup>r</sup>	16,500
Vanadium, ores, concentrates, slag, Va content <sup>c</sup>	1,000	1,000	1,000	1,000	1,000
Zinc:					
Mine output, Zn content	325,000	344,300	390,000	395,000	360,000 <sup>e</sup>
Smelter, primary and secondary	262,200	277,100	286,300	279,000 <sup>r</sup>	316,500
Industrial minerals:					
Asbestos, all grades	233,200	271,300	291,100	354,500 <sup>r</sup>	346,500
Barite	NA <sup>r</sup>	NA <sup>r</sup>	NA <sup>r</sup>	219,200 <sup>r</sup>	310,700
Boron <sup>c</sup> thousand metric tons	30	30	30	30	30
Cement	1,175,000	2,029,200	2,129,400	2,581,100 <sup>r</sup>	3,662,000
Clay, kaolin <sup>c</sup>	70,000	70,000	70,000	70,000	70,000
Gypsum	NA	NA	710,700	711,000 <sup>e</sup>	800,000

See footnotes at end of table.

TABLE 1--Continued  
COMMONWEALTH OF INDEPENDENT STATES: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons unless otherwise specified)

Country and commodity	2000	2001	2002	2003	2004	
<b>KAZAKHSTAN--Continued</b>						
<b>Industrial minerals--Continued:</b>						
Phosphate rock:						
Gross weight	33,000	97,000	136,500	168,600 <sup>r</sup>	229,800	
P <sub>2</sub> O <sub>5</sub> content	9,570	28,000	39,600	48,900 <sup>r</sup>	66,700	
Sulfur, byproduct: <sup>c</sup>						
Metallurgy	300,000	310,000	260,000	325,000	325,000	
Natural gas and petroleum	1,200,000	1,400,000	1,600,000	1,600,000	1,650,000	
Total	1,500,000	1,710,000	1,860,000	1,930,000	1,980,000	
<b>Mineral fuels and related materials:</b>						
Coal	74,872,400	79,000,000	70,600,000	84,906,500 <sup>r</sup>	86,875,100	
Natural gas	cubic meters	11,600,000	13,100,000	14,700,000	14,400,000	
Petroleum:						
Crude in:						
Gravimetric units	35,300,000	39,700,000	42,066,700	45,376,300 <sup>r</sup>	50,671,500	
Volumetric units <sup>e</sup>	42-gallon barrels	260,000,000	292,000,000	309,000,000 <sup>r</sup>	373,000,000	
Refinery products	9,198,000	NA	NA	8,750,000 <sup>r, e</sup>	9,390,000	
Uranium, concentrate:						
U content	1,740	2,050	2,800	2,950 <sup>r</sup>	3,320	
U <sub>3</sub> O <sub>8</sub> content	2,052	2,418	3,302	3,479 <sup>r</sup>	3,915	
<b>KYRGYZSTAN</b>						
<b>Metals:</b>						
Antimony:						
Mine output, Sb content <sup>c</sup>	150	150	150	40	20	
Metal and compounds	1,505	1,050	1,504	1,500	1,000	
Gold <sup>c</sup>	kilograms	22,000	24,000	17,000	22,000 <sup>e</sup>	
Mercury:						
Mine output, Hg content <sup>c</sup>	257	300	425	370	488	
Metal	550	579	537	500	500	
Molybdenum, mine output, Hg content <sup>c</sup>	250	250	250	250	250	
Tin, mine output, Sn content <sup>c</sup>	300	300	300	-- <sup>r</sup>	--	
<b>Industrial minerals:</b>						
Cement	500,000	468,900	532,800	757,000 <sup>r</sup>	800,000 <sup>e</sup>	
Fluorspar, concentrate	3,000 <sup>e</sup>	1,175	2,750 <sup>e</sup>	3,973	4,000 <sup>e</sup>	
Kaolin	NA	NA	237,100	381,100	400,000 <sup>e</sup>	
Lime, dead-burned	8,200	9,400	9,300	8,700 <sup>r</sup>	11,200	
Rare earths:						
Concentrate, gross weight	14,900	7,700	700	NA	NA	
Rare earth oxide equivalent:						
Compounds	NA	NA	NA	NA	NA	
Metals	7,736	3,800 <sup>e</sup>	100 <sup>e</sup>	NA	NA	
Other <sup>e</sup>	2,000	2,000	2,000	2,000	NA	
Salt	NA	NA	770	1,100	1,100 <sup>e</sup>	
<b>Mineral fuels and related materials:</b>						
Coal	424,900	477,300	497,500	411,300	454,900	
Natural gas	million cubic meters	32	33	27	29	
Petroleum, crude	thousand metric tons	77,100	75,500	75,500	68,500	73,800
<b>MOLDOVA</b>						
Metals, crude steel	909,000	966,000	514,000	875,000 <sup>e</sup>	1,011,000	
<b>Industrial minerals:</b>						
Cement	222,000	200,000	300,000	255,400 <sup>r</sup>	439,700	
Gypsum	32,100	32,000 <sup>e</sup>	32,000	116,100 <sup>r</sup>	491,000	
Lime	3,100	3,200	3,500	2,880 <sup>r</sup>	1,911	
Sand and gravel	276,400	306,600	300,000	300,000 <sup>e</sup>	300,000 <sup>e</sup>	
Mineral fuels and related materials, peat <sup>e</sup>	475,000	475,000	475,000	475,000	475,000	

See footnotes at end of table.

TABLE 1--Continued  
COMMONWEALTH OF INDEPENDENT STATES: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons unless otherwise specified)

Country and commodity	2000	2001	2002	2003	2004	
<b>RUSSIA</b>						
<b>Metals:</b>						
<b>Aluminum:</b>						
<b>Ore and concentrate:</b>						
Alumina	thousand metric tons	2,850 <sup>e</sup>	3,046	3,131	3,230	3,128
Bauxite		5,274,000	4,955,000	4,586,000	5,442,000	5,500,000 <sup>e</sup>
Nepheline concentrate, 25% to 30%		814,000	960,000	1,022,000	1,014,000	1,000,000 <sup>e</sup>
Metal, smelter, primary		3,245,000	3,300,000 <sup>e</sup>	3,347,413	3,478,057	3,593,000
Antimony, mine output, recoverable Sb content <sup>c</sup>		4,500	4,500	NA	NA	NA
Arsenic, white <sup>c</sup>		1,500	1,500	1,500	1,500	1,500
<b>Bismuth:<sup>e</sup></b>						
Mine output, Bi content		50	50	50	50	50
Metal, refined		10	10	10	10	10
Cadmium, metal, smelter <sup>c</sup>		925 <sup>4</sup>	950	950	950	950
Chromium, chrome ore, marketable		92,000	69,926	74,300	116,455	320,200
<b>Cobalt:<sup>e</sup></b>						
Mine output, recoverable Co content		4,000	4,600	4,600	4,800	4,700
Metal, refined		4,400	5,000	5,100	5,500	5,400
<b>Copper:</b>						
Ore, recoverable Cu content <sup>c</sup>		570,000	600,000	695,000	675,000	675,000
<b>Metal:</b>						
<b>Blister, smelter:<sup>c</sup></b>						
Primary		600,000	650,000	660,000	670,000	662,000
Secondary		220,000	245,000	200,000	170,000 <sup>r</sup>	257,000
Total		820,000	895,000	860,000	840,000 <sup>r</sup>	919,000 <sup>4</sup>
<b>Refined:</b>						
Primary		620,000	650,000	670,000 <sup>e</sup>	670,000	662,000
Secondary		220,000	244,500	200,000 <sup>e</sup>	170,000 <sup>r</sup>	257,000
Total		840,000	894,500	870,000 <sup>e</sup>	840,000 <sup>r</sup>	919,000
<b>Gold:</b>						
Mine output, Au content	kilograms	142,738	152,500	168,411	170,068	169,224
Secondary recovery	do.	NA	NA	2,546	6,835	11,278
<b>Iron and steel:</b>						
<b>Iron ore:</b>						
Gross weight		86,630,000	82,500,000	84,236,400	91,759,800	96,980,000
Fe content, 55% to 63%		50,000,000	48,000,000 <sup>e</sup>	49,000,000	53,000,000 <sup>e</sup>	56,200,000 <sup>e</sup>
<b>Metal:</b>						
Pig iron		44,618,100	44,980,000	46,060,000	48,368,000	50,320,000
Direct-reduced iron		1,920,000	2,510,000	2,910,000	2,900,000	3,100,000 <sup>e</sup>
<b>Ferroalloys:<sup>c</sup></b>						
<b>Blast furnace:</b>						
Ferromanganese		88,000 <sup>r</sup>	55,000 <sup>r</sup>	105,000 <sup>r</sup>	101,000 <sup>r</sup>	108,000
Ferrophosphorus		3,500	3,500	3,500	3,500	3,500
Spiegeleisen		7,000	7,000	7,000	7,000	7,000
<b>Electric furnace:</b>						
Ferrochromium		274,000 <sup>4</sup>	210,600 <sup>4</sup>	210,000 <sup>4</sup>	357,000 <sup>4</sup>	453,700 <sup>4</sup>
Ferrochromiumsilicon		4,500	4,000	4,000	4,000	4,000
Ferronickel		35,000 <sup>4</sup>	30,000 <sup>4</sup>	45,000 <sup>r</sup>	51,000 <sup>r</sup>	53,000
Ferrosilicon		652,000 <sup>4</sup>	707,100 <sup>4</sup>	701,000	760,000	720,000
Ferrovandium		20,500	18,800	15,100	8,000	13,090 <sup>4</sup>
Silicomanganese		122,000	124,000	127,000	83,000	143,000
Silicon metal		65,000 <sup>r</sup>	70,000 <sup>r</sup>	70,000 <sup>r</sup>	85,000 <sup>r</sup>	85,000
Other		19,500	16,200	14,900	22,000	22,000
Total		1,290,000 <sup>r</sup>	1,250,000 <sup>r</sup>	1,300,000 <sup>r</sup>	1,480,000 <sup>r</sup>	1,610,000

See footnotes at end of table.

TABLE 1--Continued  
COMMONWEALTH OF INDEPENDENT STATES: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons unless otherwise specified)

Country and commodity	2000	2001	2002	2003	2004
RUSSIA--Continued					
Metals--Continued:					
Iron and steel--Continued:					
Metal--Continued:					
Steel:					
Crude	59,097,500	59,029,700	59,776,600	62,707,600	65,580,000
Finished, rolled	46,900,000	47,100,000	48,700,000	51,050,000	53,800,000
Pipe	4,385,000	5,409,900	5,115,200	6,102,000	5,990,000
Lead: <sup>c</sup>					
Mine output, recoverable Pb content	13,300 <sup>4</sup>	12,300	19,000 <sup>r</sup>	24,000 <sup>r</sup>	24,000
Metal, refined, primary and secondary	59,000	67,500	60,350 <sup>4</sup>	66,000 <sup>r</sup>	65,000
Magnesium: <sup>c</sup>					
Magnesite	1,000,000	1,000,000	1,000,000	1,200,000	1,200,000
Metal, including secondary	45,000	48,000	50,000	52,000	50,000
Manganese ore: <sup>c</sup>					
Gross weight	115,000	115,000	115,000	115,000	115,000
Mn content	23,000	23,000	23,000	23,000	23,000
Mercury, mine output <sup>c</sup>	50	50	50	50	50
Molybdenum, mine output, Mo content <sup>c</sup>	2,400	2,600	2,900	2,900	2,900
Nickel: <sup>c</sup>					
Mine output, recoverable Ni content	315,000	320,000 <sup>r</sup>	305,000 <sup>r</sup>	310,000 <sup>r</sup>	315,000
Matte, for export	515 <sup>r</sup>	-- <sup>r</sup>	7,783 <sup>r</sup>	3,866 <sup>r</sup>	599
Nickel products:					
Ferronickel, Ni content	7,000	8,000	12,000 <sup>r</sup>	13,500 <sup>r</sup>	14,000
Metal	225,000	230,000	219,000	239,000	243,000
Oxide sinter	14,000	12,000	6,000 <sup>r</sup>	5,000 <sup>r</sup>	5,000
Chemicals	2,000	2,000	2,000	2,500	3,000
Total	248,000	252,000	239,000	260,000	265,000
Platinum-group metals: <sup>c</sup>					
Platinum kilograms	27,000 <sup>r</sup>	27,000 <sup>r</sup>	27,000 <sup>r</sup>	28,000 <sup>r</sup>	28,000
Palladium do.	95,000 <sup>r</sup>	96,000 <sup>r</sup>	96,000 <sup>r</sup>	97,000 <sup>r</sup>	97,000
Other do.	14,100	14,500	14,500	15,000	15,000
Total do.	136,000 <sup>r</sup>	138,000 <sup>r</sup>	138,000 <sup>r</sup>	140,000 <sup>r</sup>	140,000
Rhenium <sup>c</sup> do.	1,100	1,200	1,400	1,400	1,400
Silicon <sup>c</sup>	NA	NA	NA	570,000 <sup>r</sup>	550,000
Silver <sup>c</sup>					
Mine output, Ag content do.	370,000	380,000	800,000 <sup>r</sup>	1,000,000 <sup>r</sup>	1,040,000 <sup>4</sup>
Secondary recovery <sup>c</sup> do.	250	250	250	250	265
Tin: <sup>c</sup>					
Mine output, recoverable Sn content	2,500	2,000	1,300	2,000	2,500
Metal, smelter:					
Primary	4,800	4,569 <sup>4</sup>	4,615 <sup>4</sup>	5,500	5,500
Secondary	500	500	500	500	500
Total	5,300	5,070	5,120	6,000	6,000
Titanium sponge <sup>c</sup>	22,000 <sup>r</sup>	22,000 <sup>r</sup>	22,000 <sup>r</sup>	25,000 <sup>r</sup>	26,000
Tungsten, concentrate, W content <sup>c</sup>	3,500	3,500	3,400	3,900	3,000
Vanadium, metal <sup>c</sup>	7,500 <sup>r</sup>	7,500 <sup>r</sup>	8,000	5,800 <sup>r</sup>	8,000
Zinc: <sup>c</sup>					
Mine output, recoverable Zn content	136,000 <sup>4</sup>	124,000	130,000 <sup>4</sup>	159,000 <sup>r</sup>	179,000
Metal, smelter, primary and secondary	230,000	237,000	244,000	253,000 <sup>r</sup>	240,000
Zirconium, baddeleyite concentrate, averaging 98% ZrO <sub>2</sub> <sup>c</sup>	6,500	6,500	6,500	6,500	6,500
Industrial minerals:					
Asbestos, grades I-VI <sup>c</sup>	750,000	750,000	775,000	878,000 <sup>4</sup>	923,000 <sup>4</sup>
Barite <sup>c</sup>	60,000	60,000	60,000	60,000	60,000
Boron <sup>c</sup> thousand metric tons	1,000	1,000	1,000	1,000	500

See footnotes at end of table.

TABLE 1--Continued  
COMMONWEALTH OF INDEPENDENT STATES: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons unless otherwise specified)

Country and commodity	2000	2001	2002	2003	2004
RUSSIA--Continued					
Industrial minerals--Continued:					
Cement, hydraulic	32,400,000	35,300,000	37,700,000	41,000,000	45,600,000
Clays, kaolin concentrate	45,000	45,000 <sup>e</sup>	45,000	45,000 <sup>e</sup>	45,000 <sup>e</sup>
Diamond: <sup>c</sup>					
Gem carats	17,500,000 <sup>r</sup>	17,500,000 <sup>r</sup>	17,400,000 <sup>r</sup>	20,000,000 <sup>r</sup>	21,400,000
Industrial do.	11,700,000 <sup>r</sup>	11,700,000 <sup>r</sup>	11,600,000 <sup>r</sup>	13,000,000 <sup>r</sup>	14,200,000
Synthetic do.	80,000,000	80,000,000	80,000,000	80,000,000	80,000,000
Total do.	109,000,000 <sup>r</sup>	109,000,000 <sup>r</sup>	109,000,000 <sup>r</sup>	113,000,000 <sup>r</sup>	116,000,000
Feldspar <sup>e</sup>	45,000	45,000	45,000	45,000	45,000
Fluorspar, concentrate, 55% to 96.4% CaF <sub>2</sub>	187,600	200,000	169,000	170,000 <sup>e</sup>	170,000 <sup>e</sup>
Gypsum <sup>e</sup>	1,400,000 <sup>r</sup>	1,500,000 <sup>r</sup>	1,600,000 <sup>r</sup>	1,750,000 <sup>r</sup>	2,077,000 <sup>4</sup>
Iodine <sup>e</sup>	300,000	300,000	300,000	300,000	300,000
Lime, industrial and construction <sup>e</sup>	8,000,000	8,000,000	8,000,000	8,000,000	8,200,000 <sup>4</sup>
Lithium minerals, unspecified <sup>e</sup>	2,000	2,000	2,000	2,000	2,200
Mica <sup>e</sup>	100,000	100,000	100,000	100,000	100,000
Nitrogen, N content of ammonia	8,735,000	8,690,000	8,600,000 <sup>e</sup>	9,100,000 <sup>e</sup>	9,800,000 <sup>e</sup>
Phosphate rock: <sup>e</sup>					
Gross weight	11,100,000	10,500,000	10,700,000	11,000,000	11,000,000
P <sub>2</sub> O <sub>5</sub> content:					
Apatite concentrate, 37% to 39.6%	4,152,000 <sup>4</sup>	3,936,000 <sup>4</sup>	4,038,000 <sup>4</sup>	4,121,000 <sup>4</sup>	4,120,000
Sedimentary rock, 19% to 30%	300,000	300,000	300,000	300,000	300,000
Total	4,450,000	4,240,000	4,340,000	4,420,000	4,420,000
Potash, marketable, K <sub>2</sub> O equivalent <sup>e</sup>	3,700,000	4,300,000	4,400,000	4,740,000	5,000,000
Salt, all types <sup>e</sup>	3,200,000	2,800,000 <sup>4</sup>	2,800,000	2,800,000	2,800,000
Soda ash <sup>e</sup>	2,199,000 <sup>4</sup>	2,370,000	2,400,000	2,400,000	2,600,000
Sulfur: <sup>e</sup>					
Native	50,000	50,000	50,000	50,000	50,000
Pyrites	400,000 <sup>r</sup>	320,000 <sup>r</sup>	350,000 <sup>r</sup>	350,000 <sup>r</sup>	300,000
Byproduct:					
Metallurgy	440,000	460,000	500,000	520,000	570,000
Natural gas	4,900,000	5,300,000	5,600,000 <sup>r</sup>	5,800,000 <sup>r</sup>	6,000,000
Total	5,790,000 <sup>r</sup>	6,130,000 <sup>r</sup>	6,500,000 <sup>r</sup>	6,720,000 <sup>r</sup>	6,920,000
Sulfuric acid	8,300,000	8,500,000 <sup>e</sup>	8,600,000	8,700,000	NA
Talc <sup>e</sup>	100,000	100,000	100,000	100,000	100,000
Vermiculite <sup>e</sup>	25,000	25,000	25,000	25,000	25,000
Mineral fuels and related materials:					
Coal:					
Anthracite	15,318,000	15,885,000	14,700,000	15,900,000 <sup>r</sup>	16,000,000
Bituminous	172,060,000	155,721,000	164,520,000	179,800,000 <sup>r</sup>	185,000,000
Lignite	86,200,000	83,000,000	74,200,000	79,000,000	82,000,000
Total	273,578,000	254,606,000	253,420,000	274,700,000 <sup>r</sup>	283,000,000
Coke, 6% moisture content	29,000,000 <sup>e</sup>	29,900,000	30,900,000	32,700,000	33,801,000
Natural gas, marketed million cubic meters	584,000	581,000	595,000	616,450	633,950
Natural gas plant liquids 42-gallon barrels	84,680,000	86,505,000	89,790,000	93,805,500	166,400,000
Oil shale	1,676,000	2,624,000	NA <sup>r</sup>	1,240,000 <sup>r</sup>	1,230,000
Peat, horticultural use and fuel use	2,100,000	2,100,000	2,100,000	2,100,000 <sup>e</sup>	2,100,000 <sup>e</sup>
Petroleum:					
Crude in:					
Gravimetric units	324,000,000	348,000,000	379,000,000	412,377,000	458,808,000
Volumetric units <sup>c</sup> thousand 42-gallon barrels	2,390,000	2,560,000	2,790,000	3,000,000	3,300,000
Refinery products <sup>5</sup>	174,000,000	178,362,300	184,960,000	190,030,000	195,000,000
Uranium:					
U content <sup>e</sup>	2,500 <sup>r</sup>	2,500 <sup>r</sup>	2,900 <sup>r</sup>	3,150 <sup>r</sup>	3,300
U <sub>3</sub> O <sub>8</sub> content	2,948	2,948	3,420	3,715	3,892

See footnotes at end of table.

TABLE 1--Continued  
COMMONWEALTH OF INDEPENDENT STATES: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons unless otherwise specified)

Country and commodity	2000	2001	2002	2003	2004
<b>TAJKISTAN<sup>6</sup></b>					
<b>Metals:</b>					
Aluminum, primary	269,200	289,000	307,589	319,360	358,082
Antimony, Sb content of concentrate <sup>c</sup>	2,000	2,500	3,000	1,800	2,000
Bismuth, mine <sup>e</sup>	5	5	--	--	--
Gold <sup>c</sup> kilograms	2,700	2,700	2,700	2,700	3,000
Lead, Pb content of concentrate <sup>c</sup>	800	800	800	800	800
Mercury, Hg content of concentrate <sup>c</sup>	40	40	20	30	30
Silver, Au content of concentrate kilograms	5,000	5,000	5,000 <sup>r</sup>	5,000 <sup>r</sup>	5,000 <sup>e</sup>
<b>Industrial minerals:</b>					
Cement	50,000	70,000	100,000	166,300 <sup>r</sup>	193,600
Fluorspar <sup>c</sup>	9,000	9,000	9,000	9,000	9,000
Gypsum <sup>c</sup>	35,000	35,000	40,000 <sup>r</sup>	45,000 <sup>r</sup>	50,000
Nitrogen, N content of ammonia <sup>c</sup>	15,000	5,000	30,000 <sup>r</sup>	50,100 <sup>r</sup>	57,200
<b>Mineral fuels and related materials:</b>					
Coal	20,700	20,000	30,000	46,500 <sup>r</sup>	92,200
Natural gas thousand cubic meters	40,000	50,000	30,000	32,800	35,600
Petroleum, crude	20,000	20,000	16,000	17,700	18,600
<b>TURKMENISTAN</b>					
<b>Industrial minerals:</b>					
Bentonite <sup>c</sup>	50,000	50,000	50,000	50,000	50,000
Bentonite powder <sup>c</sup>	250	250	250	250	250
Bischofite <sup>c</sup>	90	100	100	100	100
Bromine <sup>c</sup> kilograms	150,000	150,000	150,000	150,000	150,000
Cement <sup>c</sup>	450,000	450,000	450,000	450,000	450,000
Epsomite	NA	NA	NA	NA	NA
Ferrous bromide, 51% Br <sup>c</sup>	85	85	85	85	85
Gypsum <sup>c</sup>	100,000	100,000	100,000	100,000	100,000
Iodine <sup>c</sup>	200,000	200,000	200,000	200,000 <sup>r</sup>	250,000
Lime <sup>c</sup>	16,000	16,000	16,000	16,000	16,000
Nitrogen, N content of ammonia <sup>c</sup>	75,000	75,000	85,000	85,000	85,000
Salt <sup>c</sup>	215,000	215,000	215,000	215,000	215,000
Sodium sulfate <sup>c</sup>	60,000	60,000	60,000	60,000	60,000
Sulfur <sup>c</sup>	9,000	9,000	9,000	9,000	9,000
<b>Mineral fuels and related materials:</b>					
Natural gas million cubic meters	47,000	46,300	45,000	59,100 <sup>r</sup>	58,570
Petroleum, crude <sup>c</sup>	7,350,000	7,900,000	9,000,000	10,000,000	10,051,000 <sup>4</sup>
<b>UKRAINE</b>					
<b>Metals:</b>					
Alumina	1,360,000 <sup>r</sup>	1,343,000 <sup>r</sup>	1,351,000 <sup>r</sup>	1,434,050 <sup>r</sup>	1,562,170
<b>Aluminum:</b>					
Primary	103,600	106,000	112,459	113,640	113,151
Secondary	128,952	130,000	130,000	130,000	130,000
Total	232,552	236,000	242,459	243,640	243,151
Cadmium, metal <sup>e</sup>	25	25	25	25	25
Germanium <sup>c</sup>	NA	NA	NA	NA	NA
<b>Iron and steel:</b>					
<b>Iron ore, marketable:</b>					
Gross weight	55,883,200	54,650,000	58,900,000	62,497,600	65,540,000
Fe content	30,600,000 <sup>e</sup>	30,000,000 <sup>e</sup>	32,300,000	34,300,000 <sup>e</sup>	36,000,000
<b>Metal:</b>					
Pig iron	25,700,000	26,400,000	27,560,000	29,570,000	31,060,000
<b>Ferrous alloys:</b>					
<b>Blast furnace:<sup>c</sup></b>					
Ferromanganese	85,400	85,000	85,000	85,000	85,000
Spiegeleisen	5,400	5,000	5,000	5,000	5,000

See footnotes at end of table.

TABLE 1--Continued  
COMMONWEALTH OF INDEPENDENT STATES: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons unless otherwise specified)

Country and commodity	2000	2001	2002	2003	2004
UKRAINE--Continued					
Metals--Continued:					
Iron and steel--Continued:					
Metal--Continued:					
Ferroalloys--Continued:					
Electric furnace:					
Ferromanganese	252,679	231,000	250,617	250,000 <sup>c</sup>	375,990
Ferronickel <sup>c</sup>	10,800	41,000	41,000	52,000	78,000
Ferrosilicon	323,417	231,000	250,617	250,000 <sup>c</sup>	248,060
Silicomanganese	684,040	702,389	732,592	740,000 <sup>c</sup>	1,060,000
Other <sup>c</sup>	25,000	25,000	25,000	25,000	25,000
Total	1,386,736	1,320,389	1,389,826	1,407,000	1,877,050
Steel:					
Crude	31,780,000	33,110,000	34,538,000	36,900,000	38,738,000
Finished, rolled	22,500,000	25,300,000	26,400,000	29,160,000	30,160,000
Pipe	1,670,000	1,600,000	1,522,700	2,054,000	2,034,000
Lead, refined, secondary <sup>c</sup>	15,034 <sup>4</sup>	12,000	12,000	7,000 <sup>r</sup>	7,000
Magnesium, primary <sup>c</sup>	3	3	3	3	3
Manganese ore, marketable:					
Gross weight	2,740,600	2,700,100	2,469,900	2,590,900 <sup>r</sup>	2,362,000
Mn content <sup>c</sup>	930,000	930,000	840,000	880,000 <sup>r</sup>	770,000
Mercury	NA	--	NA	-- <sup>r</sup>	--
Nickel, mine output, Ni content of laterite ore <sup>c</sup>	--	1,500	2,000	2,000	2,000
Silicon <sup>c</sup>	NA <sup>r</sup>	NA <sup>r</sup>	NA <sup>r</sup>	163,000 <sup>r</sup>	180,000
Titanium:					
Ilmenite concentrate:					
Gross weight	435,500 <sup>r</sup>	484,500 <sup>r</sup>	512,400 <sup>r</sup>	420,500 <sup>r</sup>	370,000
TiO <sub>2</sub> content, 61% <sup>c</sup>	266,000 <sup>r</sup>	296,000 <sup>r</sup>	313,000 <sup>r</sup>	257,000 <sup>r</sup>	226,000
Rutile concentrate, 95% TiO <sub>2</sub> <sup>c</sup>	58,600	60,000	70,000	60,000	60,000
Metal, sponge <sup>c</sup>	4,000	6,100	6,200	6,934 <sup>4</sup>	7,497 <sup>4</sup>
Zirconium concentrates <sup>c</sup>	30,000	33,600	34,300	35,000	33,000
Industrial minerals:					
Bromine <sup>c</sup>	thousand kilograms	3,000	3,000	3,000	3,000
Cement	5,311,400	5,800,000	7,142,000	8,900,000 <sup>r</sup>	10,635,000
Clays: <sup>c</sup>					
Bentonite	300,000	300,000	300,000	300,000	300,000
Kaolin	225,000	225,000	225,000 <sup>4</sup>	225,000	225,000
Diamond, synthetic <sup>c</sup>	carats	8,000,000	8,000,000	8,000,000	8,000,000
Graphite <sup>c</sup>	7,431 <sup>4</sup>	7,500	7,500	7,500	7,500
Nitrogen, N content of ammonia	3,577,000	3,700,000	3,700,000	3,900,000 <sup>c</sup>	3,900,000 <sup>c</sup>
Potash, K <sub>2</sub> O equivalent <sup>c</sup>	85,000	75,000	60,000	60,000	50,000
Salt, rock <sup>c</sup>	2,286,500 <sup>4</sup>	2,300,000	2,300,000	2,300,000	2,300,000
Soda ash <sup>c</sup>	500,000	650,000	678,000	650,000	650,000
Sulfur, native <sup>c</sup>	88,000	126,000	124,000	142,000	140,000
Mineral fuels and related materials:					
Coal:					
Anthracite	thousand metric tons	17,790	17,700	15,000	14,427 <sup>r</sup>
Bituminous	do.	63,050	63,000	66,400	63,866 <sup>r</sup>
Lignite	do.	1,067	1,000	1,000	950 <sup>r,c</sup>
Total <sup>7</sup>	do.	81,907	81,700	82,400	79,243 <sup>r</sup>
Coke	19,362,600	19,500,000	18,596,000	20,600,000	21,970,000
Natural gas	cubic meters	17,847,100	18,200,000	18,400,000	19,460,000
Peat, horticultural use and fuel use <sup>c</sup>	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000

See footnotes at end of table.

TABLE 1--Continued  
COMMONWEALTH OF INDEPENDENT STATES: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons unless otherwise specified)

Country and commodity	2000	2001	2002	2003	2004	
<b>UKRAINE--Continued</b>						
<b>Mineral fuels and related materials--Continued:</b>						
<b>Petroleum:</b>						
<b>Crude and gas condensate:</b>						
As reported	gravimetric tons	3,692,900	3,700,000	3,720,000	3,975,000	4,179,000
Converted <sup>c</sup>	42-gallon barrels	27,200,000	27,200,000	27,304,800	29,200,000	30,700,000
<b>Refinery products</b>						
		10,424,400	NA	20,000,000	22,000,000	NA
<b>Uranium:</b>						
U content <sup>c</sup>		600 <sup>4</sup>	750	800	900	900
U <sub>3</sub> O <sub>8</sub> content		708	884	943	1,061	1,061
<b>UZBEKISTAN</b>						
<b>Metals:</b>						
<b>Aluminum, secondary</b>						
		1,500	3,000	3,000	3,000	3,000
<b>Copper:<sup>c</sup></b>						
<b>Mine output, Cu content</b>						
		70,000	78,000	80,000	80,000	80,000
<b>Metal:</b>						
<b>Blister, smelter:</b>						
<b>Primary</b>						
		75,000	80,000	75,000	75,000	75,000
<b>Secondary</b>						
		10,000	10,000	--	--	--
<b>Total</b>						
		85,000	90,000	75,000	75,000	75,000
<b>Refined:</b>						
<b>Primary</b>						
		75,000	80,000	75,000	75,000	75,000
<b>Secondary</b>						
		10,000	10,000	--	--	--
<b>Total</b>						
		85,000	90,000	75,000	75,000	75,000
Gold <sup>c</sup>	kilograms	85,000	87,000	90,000 <sup>4</sup>	90,000 <sup>r</sup>	93,000
<b>Molybdenum, mine output, Mo content<sup>c</sup></b>						
		500	500	500	500	500
<b>Silver, mine output<sup>c</sup></b>						
	kilograms	89,900 <sup>4</sup>	80,000	80,000	80,000	80,000
<b>Steel:</b>						
<b>Crude</b>						
		420,000	460,000	450,000 <sup>c</sup>	472,000 <sup>c</sup>	602,166
<b>Rolled</b>						
		400,000	430,000	420,000 <sup>c</sup>	446,521	550,670
<b>Zinc, metal, smelter, primary<sup>c</sup></b>						
		18,000	35,000	30,000	30,000	30,000
<b>Industrial minerals:</b>						
<b>Cement<sup>c</sup></b>						
		3,521,000 <sup>4</sup>	4,000,000	4,000,000	4,000,000	4,000,000
<b>Clays, kaolin<sup>c</sup></b>						
		5,333,000 <sup>4</sup>	5,500,000	5,500,000	5,500,000	5,500,000
<b>Feldspar<sup>c</sup></b>						
		4,300 <sup>4</sup>	4,300	4,300	4,300	4,300
<b>Graphite<sup>c</sup></b>						
		60	60	60	60	60
<b>Iodine<sup>c</sup></b>						
	kilograms	2,000	2,000	2,000	2,000	2,000
<b>Mineral fertilizers</b>						
		800,000	NA	NA	NA	NA
<b>Nitrogen, N content of ammonia</b>						
		810,000	670,000	740,000	815,000 <sup>c</sup>	840,000 <sup>c</sup>
<b>Phosphate rock:<sup>c</sup></b>						
<b>Gross weight</b>						
		150,000	200,000	425,000	430,000	430,000
<b>P<sub>2</sub>O<sub>5</sub> content</b>						
		35,500	47,400	101,000	102,000	102,000
<b>Sulfur, byproduct:<sup>c</sup></b>						
<b>Metallurgy</b>						
		160,000	160,000	170,000	170,000	170,000
<b>Natural gas and petroleum</b>						
		285,000	300,000	350,000	350,000	350,000
<b>Total</b>						
		445,000	460,000	520,000	520,000	520,000
<b>Mineral fuels and related materials:</b>						
<b>Coal</b>						
		2,556,000	2,800,000	2,735,000	1,909,000	2,700,000
<b>Natural gas</b>						
	million cubic meters	55,600	56,350	57,670	57,481	59,864
<b>Petroleum and gas condensate</b>						
		4,650,100	7,176,000	7,198,000	7,134,000	6,580,000
<b>Petroleum refinery products</b>						
		NA	NA	5,500,000	5,807,000	NA
<b>Uranium:</b>						
<b>U content</b>						
		2,350	1,962	1,860	1,589 <sup>r</sup>	2,016
<b>U<sub>3</sub>O<sub>8</sub> content</b>						
		2,771	2,314	2,193	1,874	2,377

<sup>c</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. <sup>r</sup>Revised. NA Not available. -- Zero.

<sup>1</sup>Table includes data available through October 2005.

TABLE 1--Continued  
COMMONWEALTH OF INDEPENDENT STATES: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

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<sup>2</sup>For some metals, including copper, gold, lead, molybdenum, silver, and zinc, and for a number of industrial minerals that Azerbaijan had produced, there was not sufficient information to derive production estimates or to determine if production had ceased.

<sup>3</sup>Includes byproduct salt from potash production.

<sup>4</sup>Reported figure.

<sup>5</sup>Not distributed by type and therefore not suitable for conversion to volumetric units. Data include all energy and nonenergy products but exclude losses.

<sup>6</sup>Tajikistan produces a number of other mineral commodities not listed in the table for which information is inadequate to derive estimates.

<sup>7</sup>The totals for coal--sum of anthracite, bituminous, lignite--are slightly at variance with other reported total coal production numbers.

TABLE 2  
COMMONWEALTH OF INDEPENDENT STATES: STRUCTURE OF THE MINERAL INDUSTRY IN 2004<sup>1, 2, 3</sup>

(Metric tons unless otherwise specified)

Country and commodity	Major operating companies or deposits	Location or deposit name	Annual capacity <sup>e</sup>
<b>ARMENIA</b>			
Aluminum, rolled and foil	Kanaker aluminum plant	K'anak'err	25,000
Copper:			
Mine output, Cu content	Facilities:		30,000 <sup>4</sup>
	Agarak copper-molybdenum mining and processing complex	Agarak	
	Kapan mining directorate	Kapan	
	Zangezur copper-molybdenum complex mining Kadzharan deposit	Kadzharan	
	Not in operation:		
	Akht'ala mining directorate	Akht'ala	
	Shamlugh mining directorate	Shamlugh	
Blister	Armenian Copper Programme cjsc (ACP)	Alaverdi	15,000
Diamond, cut stones	Aghavni diamond-cutting works	Nor Geghi	NA
Do.	Amma group diamond-cutting works	Artashat	NA
Do.	Andranik diamond-cutting works	Nor Hachyn	NA
Do.	Diamond Company of Armenia (DCA)	Yerevan	NA
Do.	Lori diamond-cutting works	Nor Hachyn	NA
Do.	Lusampor	Melik'gyugh	NA
Do.	Punji diamond-cutting works	Yerevan	NA
Do.	Sapphire diamond-cutting works	Nor Hachyn	NA
Do.	thousand carats Shoghakan gem-cutting plant	do.	120
Gold kilograms	Zod mining complex (mining ceased in 1997)	Zod	2,000
Do.	do. Ararat gold processing-tailings recovery plant	Ararat	1,000
Do.	Megradzor deposit (mining ceased in 1997)	Megradzor	NA
Do.	Lichkvazkoye, Shaumyanskiy Rayon, Sotk-skoye, Terterasarskoye deposits	NA	NA
Iron ore	Hrazdan deposit	Sulagyan Mountains	NA
Molybdenum, mine output, Mo content	Zangezur copper-molybdenum complex, mining Kadzharan deposit	Kadzharan	20,400
Do.	Agarak copper-molybdenum mining and processing complex	Agarak	2,000
Perlite thousand metric tons	Aragats-Perlite mining-beneficiation complex	Aragats deposit	1,110
Zinc, mine output, Zn content	Kapan mining directorate	Kapan	NA
<b>AZERBAIJAN</b>			
Aluminum thousand metric tons	Sumgait smelter	Sumqayit	100 to 150
Alumina	Gyandzha refinery	Ganca	100,000
Alunite ore	Zaglik alunite mining directorate	Zaglik	600,000
Arsenic	NA	Dzhul'finskiy Region	NA
Barite	NA	Khanlarskiy Region	NA
Cement	Karadagly cement plant	Karadagly	1,000,000 <sup>4</sup>
	Tauz cement plant	Tauz Region	
Clay, bentonite	Dash-Salakhlikskoye deposit	Kazakhskiy Region	1,000,000
Copper	Karadaskiy complex	Shamkhorskiy Region	30,000
Copper, byproduct gold and silver	Kedabekskiy Rayon deposit		NA
Copper, gold, iron, lead, sulfur, zinc	Katehskoye, Katsdagskoye, Khikhinskoye deposits	Sheki-Belokanskiy zone, southern Caucasus	NA
Dolomite	NA	Nakhichevan Region	NA
Iodine and bromine	Baku, Karadagly, Neftechala plants	Process oil well brines at plants in Baku, Karadagly Neftechala	NA
Iron ore, marketable	Dashkasan mining directorate	Dashkasan Region	1,400,000
Lead-zinc ore	NA	Ordubadskiy and Norashenskiy Regions	NA
Limestone	NA	Dashkasan Region	NA
Molybdenum	NA	Ordubadskiy Region	NA
Natural gas, processing	Karadagly plant	Near Baku	NA

See footnotes at end of table.

TABLE 2--Continued  
COMMONWEALTH OF INDEPENDENT STATES: STRUCTURE OF THE MINERAL INDUSTRY IN 2004<sup>1, 2, 3</sup>

(Metric tons unless otherwise specified)

Country and commodity		Major operating companies or deposits	Location or deposit name	Annual capacity <sup>e</sup>
<b>AZERBAIJAN--Continued</b>				
<b>Petroleum and natural gas:<sup>5</sup></b>				
Crude petroleum and gas condensate		State Oil Company of Azerbaijan (SOCAR) for natural gas production	Production from 37 onshore deposits, which includes deposits on the Ashperon Peninsula and in the Izhnekurin Valley	3,000,000 <sup>4</sup>
Do.		do.	Production from 17 offshore fields with more than 45% of natural gas produced from the Bakharly field and more than 50% of crude petroleum produced from the Guneshli field	12,000,000 <sup>4</sup>
Do.		Azerbaijan International Operating Company (AIOC) for oil production	Azeri, Chirag-1, Guneshli offshore fields	7,000,000 <sup>4</sup>
Do.		Alov, Araz, Khazar, Kyapaz-Serdar, Osman, Sharg offshore fields	Caspian Sea	NA
Natural gas	million cubic meters	State Oil Company of Azerbaijan (SOCAR) for natural gas production	Production from 37 onshore deposits, which includes deposits on the Ashperon Peninsula and in the Izhnekurin Valley	6,000 <sup>4</sup>
		do.	Production from 17 offshore fields with more than 45% of natural gas produced from the Bakharly field and more than 50% of crude petroleum produced from the Guneshli field	
Do.		NA	Gunesli, Nakhchyvan, Shah-Deniz offshore fields	NA
Petroleum, refined	24-gallon barrels	Azernefteyag (formerly Baku) refinery	Baku	83,950,000 <sup>6</sup>
Do.	do.	Azernefteyagandzhah (formerly Novo-Baku) refinery	do.	77,380,000 <sup>6</sup>
Pyrite poly-metallic		NA	Filizchayskiy deposit	NA
<b>Steel:</b>				
Crude		Azerboru production amalgamation	Sumqayit	800,000
Rolled		do.	do.	700,000
Pipe, tubes		do.	do.	540,000
Stones, facing		Buzgovskiy and Shakhtakhtinskiy deposits	NA	NA
Sulfur pyrites		NA	Khanlarskiy Region	NA
Travertine		NA	Nakhichevan Region	NA
<b>BELARUS</b>				
Cement		Krichevskiy and Volkovysk plants	Mahilyowskaya and Wawkavysk Voblasts'	2,200,000
Diamonds		Kristall plant	Homyel'skaya Voblasts'	NA
Nitrogen, N content of ammonia		Grodno "Azot" Association	Hrodna Region	1,000,000
Peat, fuel use		Production at 37 enterprises producing mainly briquets	All regions of country	5,000,000 <sup>7</sup>
<b>Petroleum:</b>				
Crude		Belarusneft Association	Southeastern part of country	2,000,000
Refined		Mazyr refinery	Mazyr	16,000,000 <sup>8</sup>
Do.		Naftan refinery	Navapolatsk	8,450,000 <sup>8</sup>
Potash, K <sub>2</sub> O equivalent		Belaruskali Association	Salihorsk area	5,000,000
<b>Steel:</b>				
Crude		Belarus electric steelworks	Zhlobin	1,400,000
Pipe		Mahilyow metallurgical works	Mahilyowskaya Voblasts'	80,000
<b>GEORGIA</b>				
<b>Arsenic:</b>				
As content of ore		Lukhumi deposit Tsana deposit	Racha Svanetiya	2,000 <sup>4</sup>
Metal and compounds		Racha mining and chemical plant	Racha	NA
Do.		Tsana mining and chemical plant	Ts'ana	NA
Barite		Chordskoye deposit	Onis Raioni (Onskiy Rayon)	70,000
Do.		NA	Madneuli deposit	NA
Barite-zinc		NA	Kvaisi deposit	NA

See footnotes at end of table.

TABLE 2--Continued  
COMMONWEALTH OF INDEPENDENT STATES: STRUCTURE OF THE MINERAL INDUSTRY IN 2004<sup>1, 2, 3</sup>

(Metric tons unless otherwise specified)

Country and commodity	Major operating companies or deposits	Location or deposit name	Annual capacity <sup>e</sup>
<b>GEORGIA--Continued</b>			
Bentonite	Gumbrskoye and Askanskoye deposits	Gumbra, Askana Regions	200,000 <sup>4</sup>
Cement	Rust'avi cement plant	Rust'avi	1,500,000
Coal	Tkibuli-Shaorskoye, Tkvarchelskoye deposits	Akhalt's'ikhis Raioni, Tqibuli, Tqvrach'eli Regions	300,000 <sup>4</sup>
Copper, Cu content of ore	Madneuli complex	Marneuli Raioni	12,000
Diatomite	Kisatibskoye deposit	K'isat'ibi Region	150,000
<b>Ferrous alloys:</b>			
Ferromanganese	Zestafoni plant	Zestap'onis Raioni	100,000
Silicomanganese	do.	do.	250,000
Manganese sinter	do.	do.	250,000
Gold	Georgian-Austrian joint venture Quartzite	Madneuli deposit	3
<b>Lead-zinc:</b>			
Pb content of ore	Kvaisi deposit	Kvaisi	1,200
Zn content of ore	do.	do.	3,000
Manganese, marketable ore	Chiaturmarganets complex	Chiat'ura-Sach'kheris Raioni field	200,000
<b>Petroleum:</b>			
Crude	About 60 wells accounting for 98% of output	Mirzaani, Sup'sa, Zemo T'etlet'i Regions	200,000 <sup>4</sup>
Refined	Batumi refinery	Bat'umi	NA
Steel, crude	Rust'avi steel mill	Rust'avi	1,400,000
<b>KAZAKHSTAN</b>			
Alumina	Pavlodar aluminum plant	Pavlodar	1,250,000
Arsenic trioxide	Chimkent polymetallic enterprise and other nonferrous metallurgical enterprises	Shymkent	3,500
Asbestos	Dzhetygara complex	Qostanay	1,000,000 <sup>4</sup>
Barite	Chilisay complex	Aqtobe phosphorite basin	300,000 <sup>4</sup>
	Facilities:		
	Karagaylinskiy and Zhayrem mining and beneficiation complexes	Karagayly, Zhayrem deposit	
Bauxite	Tujuk Mine	Almaty	5,000,000
	Achisay polymetallic complex	Kentau Region	
	Turgayskiy and Krasnooktyabrskiy bauxite mining complexes	Central Kazakhstan	
Beryllium, metal	Ul'ba metallurgical plant	Oskemen	NA
Bismuth, metal	Facilities:		70 <sup>4</sup>
	Ust-Kamenogorsk lead-zinc metallurgical plant	Oskemen	
	Leninogorsk lead smelter	Leninogorsk	
Do.	Chimkent refinery	Shymkent	20
Cadmium	do.	do.	10
Do.	Leninogorsk mining-beneficiation complex	Leninogorsk	1,200
<b>Chromite, mine output:</b>			
Cr <sub>2</sub> O <sub>3</sub> content (50%)	Donskoy GOK mining-beneficiation complex	Near Khromtau, Kempirsai Region	5,000,000
Coal	Karaganda Basin	Central and north-central parts 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
<b>Copper:</b>			
Mining, recoverable, Cu content	Irtysk	Ertis Region	10,000
Do.	Leninogorsk	Leninogorsk Region	15,000
Do.	Zyryanovsk mining-beneficiation complexes	Zyryanovsk Region	5,000
<b>Kazakhmys plc:</b>			
Do.	Balkhash mining-metallurgical complex	Zhezkazgan Region	200,000
Do.	East Kazakhstan copper-chemical complex	East Kazakhstan Region	12,000
Do.	Zhezkent mining-metallurgical enterprise	Zhezkent Region	25,000
Do.	Zhezkazgan mining-metallurgical enterprise	Zhezkazgan Region	250,000

See footnotes at end of table.

TABLE 2--Continued  
COMMONWEALTH OF INDEPENDENT STATES: STRUCTURE OF THE MINERAL INDUSTRY IN 2004<sup>1, 2, 3</sup>

(Metric tons unless otherwise specified)

Country and commodity	Major operating companies or deposits	Location or deposit name	Annual capacity <sup>e</sup>
<b>KAZAKHSTAN--Continued</b>			
<b>Copper--Continued:</b>			
<b>Metal:</b>			
Blister	Ust-Kamenogorsk plant	Oskemen	37,100
Do.	Zhezkazgan mining-metallurgical enterprise	Zhezkazgan Region	250,000
Do.	Irtysk smelting and refining complex	Ertis Region	40,000
Do.	Balkhash mining-metallurgical complex	Zhezkazgan Region	110,000
Refined	Zhezkazgan mining-metallurgical enterprise	do.	250,000
Do.	Balkhash mining-metallurgical complex	do.	150,000
Do.	Irtysk smelting and refining complex	Ertis Region	40,000
Do.	Ust-Kamenogorsk plant	Oskemen	6,600
<b>Ferrous alloys:</b>			
<b>Ferrochrome:</b>			
High-carbon 60%	Akt'yubinsk plant	Aqtobe	200,000
Medium-carbon 60%	do.	do.	200,000
Do.	Aksu plant	Aksu	200,000
Ferrosilicon	do.	do.	700,000
Ferrosilicochrome	do.	do.	700,000
Ferrochrome, high-carbon	do.	do.	500,000
Silicomanganese	do.	do.	90,000
Gallium	Pavlodar aluminum plant	Pavlodar	NA
Gold	Byproduct of polymetallic ores and native gold mining	Byproduct gold collocated with nonferrous metals mining	30
<b>Iron and steel:</b>			
Pig iron	Ispat-Karimet Steelworks	Karaganda	5,000,000
Steel, crude	do.	do.	6,300,000
Iron ore, marketable	Lisakovskiy and Sokolovsko-Sarbay mining and metallurgical complexes	Qostanay	25,000,000
<b>Lead:</b>			
Mining, recoverable Pb content of ore	Achisay	Karatau and Kentau Regions	40,000 <sup>4</sup>
Do.	Akchatau	Zhezkazgan Region	10,000
Do.	Irtysk	Oskemen Region	10,000
Do.	Karagayly	Karagayly Region	20,000
Do.	Zhezkent	Semey Region	NA
Do.	Sary-Arkapolimetal	Zhayrang Region	20,000
Do.	East Kazakhstan copper-chemical complex	East Kazakhstan Region	NA
<b>Kazinc subsidiaries:</b>			
Do.	Leninogorsk mining-metallurgical complex	Leninogorsk Region	60,000
Do.	Tekeli lead-zinc mining complex	Taldyqorghan and Tekeli Regions	15,000 <sup>4</sup>
Do.	Zyryanovsk lead-zinc complex	Zyryanovsk Region	20,000
Refined	Ust-Kamenogorsk metallurgical plant	Oskemen	145,000
Do.	Leninogorsk mining-metallurgical complex	Leninogorsk Region	30,000
Do.	Chimkent refinery	Shymkent	160,000
Magnesium, metal	Ust-Kamenogorsk titanium-magnesium plant	Oskemen	20,000
Manganese, crude ore	Atasurda	Atasu	2,550,000 <sup>4</sup>
	Kazakmarganets	Zhezdy	
	Sary-Arkapolimetal	Zhayrang Region	
<b>Molybdenum:</b>			
Mining, recoverable content of ore	Balkhash complex	Kounrad Mine	6,000 <sup>4</sup>
	Karaobinskoye deposit	Karaoba Region	
	Sayak deposit	Sayaq (Sayak) Region	
Metal	Akchatau molybdenum metal plant	Zhezkazgan Region	NA

See footnotes at end of table.

TABLE 2--Continued  
COMMONWEALTH OF INDEPENDENT STATES: STRUCTURE OF THE MINERAL INDUSTRY IN 2004<sup>1, 2, 3</sup>

(Metric tons unless otherwise specified)

Country and commodity	Major operating companies or deposits	Location or deposit name	Annual capacity <sup>e</sup>	
<b>KAZAKHSTAN--Continued</b>				
Natural gas million cubic meters	Aktyubinsk munaigaz Embamunaigaz Hurricane Kumkol Munai Karachaganak field Mangistaumunaigaz Tengizchevroil joint venture  Agip Kazakhstan North Caspian Operating Company (AGIP KCO) Uzenmunaigaz	Aqtobe Emba District Aral Sea Region Northwestern Kazakhstan Mangghyshlaq Peninsula Tengiz deposit Zhanazhol deposit Urikhtau deposit Kashagana offshore field  Uzen deposit	16,000 <sup>4</sup>	
<b>Petroleum:</b>				
Crude	Aktyubinsk munaigaz Embamunaigaz Hurricane Kumkol Munai Karachaganak Integrated Organization (KIO) Mangistaumunaigaz Uzenmunaigaz	Aqtobe Emba District Aral Sea Region Karachaganak field Mangghyshlaq Peninsula Uzen deposit	32,000,000 <sup>4</sup>	
Do.	Alibekmola, Ayrankul, Chinarevskoye, Kozhasay, North Buzachi, Sazankurak, Saztyube, Urikhtau deposits	NA	NA	
Do.	24-gallon barrels per day	Tengizchevroil joint venture	Tengiz deposit (peak production by 2010)	750,000
Do.	do.	Agip Kazakhstan North Caspian Operating Company (AGIP KCO)	Kashagana offshore field	100,000
Refined, crude oil throughput	do.	Atyrau Pavlodar, Shymkent refineries	Atyrau, Pavlodar, Shymkent, respectively	427,000 <sup>4</sup>
Phosphate rock	Chilisay mining directorate Karatau production association	Aqtobe phosphorite basin Shymkent and Zhambyl Regions	10,000,000 <sup>4</sup>	
Rare metals (columbium, indium, selenium, tellurium)	Aktau complex	Aktau	NA	
Do.	Belogorsky rare metals plant	Belogorskiy	NA	
Do.	Chimkent polymetallic plant	Shymkent	NA	
Do.	Ust-Kamenogorsk lead-zinc plant	Oskemen	NA	
Do.	Akchatau mining-beneficiation complex	Zhezkazgan Region	NA	
Rhenium	Balkhash copper mining-metallurgical complex	do.	NA	
Silver, refined	Facilities: Chimkent metallurgical plants Leninogorsk Ust-Kamenogorsk	Shymkent Leninogorsk Zhezkazgan Region	1,000 <sup>4</sup>	
Tantalum	Yermak ferroalloy plant	Aksu	NA	
Tin	Akchatau mining-beneficiation complex	Akzhaik deposit, Zhezkazgan Region	700	
Titanium, metal	Ust-Kamenogorsk titanium-magnesium plant	Oskemen	35,000	
Uranium, U content	Facilities: Prikaspiskiy ore enrichment center Shevchenko Stepnogorsk Taboshara Tselinny chemical complex	Aqtau do. Stepnogorsk Taboshara Stepnogorsk	3,500 <sup>4</sup>	
<b>Zinc:</b>				
Concentrates (Zn content)	Kazakhmys (OJSC) acquisitions: East Kazakhstan copper-chemical complex	East Kazakhstan Region	50,000	
Do.	Zhezkent mining-metallurgical enterprise	Zhezkent Region	25,000	
Do.	Tishinskiy deposit		NA	
Do.	Tekeli lead-zinc mining complex	Taldyqorghhan and Tekeli Regions	30,000 <sup>4</sup>	

See footnotes at end of table.

TABLE 2--Continued  
COMMONWEALTH OF INDEPENDENT STATES: STRUCTURE OF THE MINERAL INDUSTRY IN 2004<sup>1, 2, 3</sup>

(Metric tons unless otherwise specified)

Country and commodity	Major operating companies or deposits	Location or deposit name	Annual capacity <sup>e</sup>
<b>KAZAKHSTAN--Continued</b>			
<b>Zinc--Continued:</b>			
Metal	Leninogorsk mining-metallurgical complex	Leninogorsk	107,000 <sup>9</sup>
Do.	Balkhash	Zhezkazgan Region	90,000
Do.	Ust'-Kamenogorsk metallurgical plant	Oskemen	160,000 <sup>9</sup>
<b>KYRGYZSTAN</b>			
<b>Antimony:</b>			
Sb content of ore	Kadamzhai and Khaidarkan complexes	Kadamzhaiskiy Rayon, Khaidarkan Region	2,400 <sup>4</sup>
Ore	Kadamzhai beneficiation plant	Kadamzhai deposit	200,000
Do.	Terek-Sayskiy beneficiation plant	Terek-Sayskiy deposit	60,000
Metal and compounds	Kadamzhai metallurgical facility	Kadamzhaiskiy Rayon	28,000
Cement	Kantskiy cement plant	Kant	1,500,000
Coal	Seven underground mines, five open pits includes deposits: Almalyk, Dzhergalan, Kara-Kiche-Kok-Yangak, Kyzyl-Kiya, Sulyukta, Tashkumyr	Southwestern, central, and northeastern parts of the country	2,200,000 <sup>4</sup>
Fluorspar, concentrate	Khaidarkan mining-metallurgical complex	Khaidarkan deposit	5,000
<b>Gold:</b>			
Au content of ore	Makmalzoloto	Makmal deposit	3
Do.	Kumtor Gold Company	Kumtor deposit	22
Do.	kilograms Solton-Sary Mine	Naryn	500
Do.	Taldybulak Levoberezhny deposit		NA
Au content of ore, open pit	Kyrgyzaltyn-Noroks Mining Company JV	Dzher-Uy deposit	650,000
Au content of ore, underground	do.	do.	350,000
Refined	Kara-Balta refinery	Chuskaya Oblast'	22
<b>Mercury:</b>			
Hg content of ore	Khaidarkan mining-metallurgical complex	Khaidarkan, Chauvi, Chonkoy, Novoye deposits	700 <sup>4</sup>
Metal	do.	do.	1,000
Molybdenum, for nonmetallurgical uses	Molibden Joint Stock Company	Chuskaya Oblast'	NA
Do.	Kara Balta mining-metallurgical complex		
Natural gas	million cubic meters Kyrgyzzmunayzat	Approximately 300 wells; Changyr-Tash, Chigirch Pereval, Izbaskentskoye, Kara-Agach, Mayлуу-Suu, Susahoye, Togap-Beshkenskoye deposits (major)	100 <sup>4</sup>
Petroleum	do.	do.	150,000
<b>Rare earths:</b>			
Concentrates, gross weight	Aktyuzskiy mining directorate	Kutessai II and Aktyuz-Boordu deposits	14,000
Compounds and metals, rare earth oxide equivalent	Kyrgyz chemical and metallurgical plant	Orlovka	8,000
Silver	Kumyshtag deposit	Talasskaya Oblast'	NA
Do.	Karagoyskoye deposit	Oshskaya Oblast'	NA
Tin	Uchkoshkon deposit	Sary-Dzhas field	NA
Do.	Tyanshanolovo mining-beneficiation complex	do.	NA
Do.	Enil'chek JSC mining enterprise	Atdzhaylau deposit	150
Do.	do.	Trudovoye deposit	350
Tungsten	do.	do.	95,600
Do.	Enil'chek JSC mining enterprise	Atdzhaylau deposit	90
Do.	do.	Trudovoye deposit	120
Uranium, processed	Kara-Balta mining-metallurgical complex	Chuskaya Oblast'	1,200
<b>MOLDOVA</b>			
<b>Oil and natural gas:</b>			
Oil	Redeco Moldova oil and gas company	Valeni oil field	100,000
Natural gas	thousand cubic meters do.	Victorovca gas field	5,000
Steel, crude	Moldova Steel Works minimill	Ribnita, Transnistria Region	1,000,000

See footnotes at end of table.

TABLE 2--Continued  
COMMONWEALTH OF INDEPENDENT STATES: STRUCTURE OF THE MINERAL INDUSTRY IN 2004<sup>1, 2, 3</sup>

(Metric tons unless otherwise specified)

Country and commodity	Major operating companies or deposits	Location or deposit name	Annual capacity <sup>e</sup>
RUSSIA			
Alumina	Achinsk	Achinsk in East Siberia	900,000
Do.	Bogoslovsk	Ural'skiye Gory	1,050,000
Do.	Boksitogorsk	European north	200,000
Do.	Nadvoitsy	Nadvoitsy in Karelia	266,000
Do.	Uralsk	Kamensk Region	536,000
Do.	Volkhov	Volkhov, east of St. Petersburg	45,000
Aluminum, primary smelters	Bogoslovsk	Krasnotur'insk	175,000
Do.	Bratsk	Bratsk	950,000
Do.	Irkutsk	Irkutskaya Oblast'	300,000
Do.	Kandalaksha	Kola Peninsula	75,000
Do.	Krasnoyarsk	Krasnoyarskiy Krai	875,000
Do.	Nadvoitsy	Nadvoitsy in Karelia	75,000
Do.	Novokuznetsk	Novokuznetsk	300,000
Do.	Sayansk	Sayanogorsk	425,000
Do.	Uralsk	Kamensk	80,000
Do.	Volgograd	Volgogradskaya Oblast'	175,000
Do.	Volkhov	Volkhov, east of St. Petersburg	20,000
Antimony:			
Sb content of concentrate	Sarylakh deposit	Ust'-Nera Region	6,000 <sup>4</sup>
Do.	Sentachan deposit	Northeastern Sakha (Yakutiya) Republic	NA
Compounds and metals	Ryazsvetmet plant	Ryazanskaya Oblast'	NA
Apatite, concentrate	Khibiny apatite association	Kola Peninsula	15,000,000
Do.	Kovdor iron ore mining association	do.	700,000
Asbestos	Kiyembay	Orenburgskaya Oblast'	500,000
Do.	Tuvaasbest	Tuva Autonomous Region	250,000
Do.	Uralaasbest	Central Urals	1,100,000
Bauxite	North-Urals mining company	Severoural'sk Region	NA
Do.	South-Urals mining company	South Urals	NA
Do.	Severnaya Onega Mine	Northwest Region	800,000
Do.	Komi Aluminum	Sredne-Timan	3,000,000
Boron, boric acid	Bor Association	Maritime Territory	140,000
Do.	Amur River complex	Far East	8,000
Do.	Alga River chemical complex	do.	12,000
Chromite	Saranov complex	Saranovskiy	200,000
Coal	Donets (east) Basin	Rostovskaya Oblast'	30,000,000
Do.	Kansk Achinsk Basin	East Siberia	50,000,000
Do.	thousand metric tons Kuznetsk Basin (Kuzbass)	West Siberia	160,000
Do.	Moscow Basin	Moscow Region	15,000,000
Do.	Neryungri Basin	Sakha (Yakutiya) Republic	15,000,000
Do.	Pechora Basin	Komi Republic	30,000,000
Do.	South Yakutia Basin	Sakha (Yakutiya) Republic	17,000,000
Cobalt:	MMC Noril'sk Nickel	Noril'sk, Kola Peninsula	4,000
Do.	Rezh and Yuzhuralnikel enterprises	South Urals	2,100
Do.	Ufaleynikel company	Chelyabinsk region, Urals	1,900
Do.	Tuva cobalt	Khovu-Aksy, Tuva Autonomous Region	NA
Copper:			
Ore	MMC Noril'sk Nickel	Noril'sk region, Kola Peninsula	14,000,000
Do.	Molodezhnyy, Sibay, Uchali open pits	Urals	NA
Do.	Mednogorsk complex	Aleksandrinskoye deposit	NA
Do.	Gai complex	Letneye deposit	NA
Do.	Rezh nickel plant	Safyanovskoye deposit	NA
Do.	Udokan deposit	Chita Oblast	10,000,000
Cu content of concentrate	Buribai enterprise	Buribay Region	5,000
Do.	Gai complex	Gai region	40,000

See footnotes at end of table.

TABLE 2--Continued  
COMMONWEALTH OF INDEPENDENT STATES: STRUCTURE OF THE MINERAL INDUSTRY IN 2004<sup>1, 2, 3</sup>

(Metric tons unless otherwise specified)

Country and commodity		Major operating companies or deposits	Location or deposit name	Annual capacity <sup>e</sup>
RUSSIA--Continued				
Copper--Continued:				
Cu content of concentrate--Continued		Kirovgrad complex	Kirovgrad Region	12,000
Do.		Krasnoural'skiy complex	Krasnoural'skiy Region	12,000
Do.		Norilsk complex	Noril'sk region, Kola Peninsula	400,000
Do.		Sredneuralsk complex	Ekaterinburg Region	12,000
Do.		Uchali complex	Uchalinskiy Rayon	40,000
Do.		Urap complex	Stavropol'skiy Kray	7,000
Metal		Kirovgrad (smelting)	Kirovgrad	150,000
Do.		Krasnoural'skiy (smelting)	Krasnoural'sk	60,000
Do.		Kyshtym (refining)	Kyshtym	70,000
Do.		Mednogorsk (smelting)	Mednogorsk	40,000
Do.		Noril'sk (smelting and refining)	Noril'sk region	500,000
Do.		Psysh (refining)	Psysh	350,000
Do.		Severonikel (smelting)	Monchegorsk	20,000
Do.		Sredneuralsk (smelting)	Revda	140,000
Diamonds:		Almazy Rossii-Sakha Association (Alrosa) enterprises:	Sakha (Yukutiya) Republic mines:	NA
Gem and industrial	thousand carats	Udachnyy mining and beneficiation	Zarnitsa and Udachnyy	NA
Do.	do.	Mirny mining and beneficiation	Mir and International	NA
Do.	do.	Aikhal mining and beneficiation	Aikhal and Komsomol'skiy	NA
Do.	do.	Anabaraskiy mining and beneficiation	Alluvial mines	NA
Do.	do.	Nyurbinskiy mining and beneficiation	Nyurbinskiy and Botuobinskiy	NA
Do.	do.	Lomonosov	Arkhangel'skaya Oblast'	NA
Feldspar		Kheto-Lanbino and Lupikko deposits	Karelia	NA
Ferroalloys		Kosaya Gora iron works	Kosaya, Gora	200,000
Do.		Kuznetsk ferroalloys plant	Novokuznetsk	400,000
Do.		Lipetsk iron and steel works	Lipetskaya Oblast'	NA
Do.		Serov ferroalloy plant	Serov	NA
Do.		Chelyabinsk electrometallurgical plant	Chelyabinskaya Oblast'	450,000
Do.		Chusovoy iron and steel plant	Chusovoy	NA
Do.		Klyuchevsk ferroalloy plant	Dvurechensk	160,000
Ferronickel		Ufaleynikel company	Chelyabinsk Region, Urals	5,000
Ferrovanadium		Vanadii-Tulachermet	Tula, North Caucasus	NA
Fluorspar		Abagaytuy deposit	Transbaikal	NA
Do.		Usugli mine	do.	NA
Do.		Kyakhtinsky deposit	do.	NA
Do.		Kalanguy mining complex	Chita Region, Transbaikal	NA
Fluorspar--Continued		Yaroslavsky mining-beneficiation complex	Pogranichnoye and Vosnesenskoye deposits, Russian Far East's Maritime (Primor'ye) Region	NA
Gold		kilograms	Mining regions:	200,000 <sup>4</sup>
		Buryat	Buryatiya Republic	
		Irkutsk (Lenzoloto Gold Company)		
		Krasnoyarsk (Polius Gold Company)	Krasnoyarskiy Kray (Olimpiady deposit)	
		Magadan (Omolon Gold Company)	Magadanskaya Oblast'	
		Maritime	Maritime Territory	
		Tuva	Tuva Autonomous Region	
		Yakut-Sakha	Sakha (Yakutiya) Republic	
Iron ore		Kursk Magnetic Anomaly (KMA) containing the following enterprises:		50,000,000 <sup>4</sup>
		Lebedi and Stoilo	Gubkin	
		Mikhailovka	Zheleznogorsk	

See footnotes at end of table.

TABLE 2--Continued  
COMMONWEALTH OF INDEPENDENT STATES: STRUCTURE OF THE MINERAL INDUSTRY IN 2004<sup>1, 2, 3</sup>

(Metric tons unless otherwise specified)

Country and commodity	Major operating companies or deposits	Location or deposit name	Annual capacity <sup>e</sup>
RUSSIA--Continued			
Iron ore--Continued	Northwest containing the following enterprises:		22,000,000 <sup>4</sup>
	Kostomuksha	Kostomuksha	
	Kovdor	Kola Peninsula	
	Olenegorsk	Olenegorsk	
Do.	Siberia containing the following enterprises:		18,000,000 <sup>4</sup>
	East:		
	Korshunovo	Zheleznogorsk	
	Rudnogorsk	Rudnogorsk	
	West:		
	Abakan	Abaza	
	Sheregesh	Sheregesh	
	Tashtagol	Tashtagol	
	Teya	Vershina Tei	
Do.	Urals containing the following enterprises:		22,000,000 <sup>4</sup>
	Akkermanovka	Novotroitsk	
	Bakal	Bakal	
	Goroblagodat	Kushva	
	Kachkanar	Kachkanar	
	Magnitogorsk	Magnitogorsk	
	Peshchanka	Rudnichnyy	
Lead-zinc, recoverable content of ore:			
Lead, recoverable Pb content of ore	Altay mining-benefication complex	Altay mountains Region, South Siberia	2,000
Do.	Dalpolymetal mining-benefication complex	Maritime Territory	20,000
Do.	Nerchinsk polymetallic complex	Chitinskaya Oblast'	7,000
Do.	Sadon lead-zinc complex	Severnaya Osetiya-Alaniya Republic	5,000
Do.	Salair mining-benefication complex	Kemerovo Oblast'	2,000
Zinc, recoverable Zn content of ore	Altay mining-benefication complex	Altay mountains Region, South Siberia	1,000
Do.	Dalpolymetal mining-benefication complex	Maritime Territory	25,000
Do.	Nerchinsk polymetallic complex	Chitinskaya Oblast'	12,500
Do.	Sadon lead-zinc complex	Severnaya Osetiya-Alaniya Republic	14,000
Do.	Salair mining-benefication complex	Kemerovo Oblast'	10,500
Lead, metal	Dalpolymetal lead smelter	Rudnaya in the Maritime District	20,000
Do.	Elektrozinc lead smelter	Vladikavkaz in North Caucasus	30,000
Magnesite	Satka deposit	Chelyabinsk Oblast'	3,800,000
Magnesium, metal (for sale)	Avisma plant	Berezniki	35,000
Do.	Solikamsk plant	Solikamsk	30,000
Mica	Aldan	Sakha (Yakutiya) Republic	NA
Do.	Karel	Karelia	NA
Do.	Kovdor	Kola Peninsula	NA
Do.	Mam	Irkutsk complex	NA
Molybdenum	Dzhida tungsten-molybdenum mine	West Transbaikal	NA
Do.	Sorsk molybdenum mining enterprise	Sorsk Region	NA
Do.	Tymyauz tungsten-molybdenum mine	North Caucasus	NA
Do.	Shakhtaminskoye molybdenum mining enterprise	Chitinskaya Oblast'	NA
Natural gas	million cubic meters	Komi Republic	8,000
Do.	do.	Noril'sk area	5,500
Do.	do.	North Caucasus	6,000
Do.	do.	Sakhalin	2,000
Do.	do.	Tomsk Oblast	500

See footnotes at end of table.

TABLE 2--Continued  
COMMONWEALTH OF INDEPENDENT STATES: STRUCTURE OF THE MINERAL INDUSTRY IN 2004<sup>1, 2, 3</sup>

(Metric tons unless otherwise specified)

Country and commodity		Major operating companies or deposits	Location or deposit name	Annual capacity <sup>e</sup>
RUSSIA--Continued				
Natural gas--Continued	million cubic meters	Tyumen Oblast including:	West Siberia	575,000 <sup>4</sup>
		Medvezhye field		(75,000)
		Urengoi field		(300,000)
		Vyrngapur field		(17,000)
		Yamburg field		(170,000)
Do.	do.	Bovanenko field	Yamal Peninsula	NA
Do.	do.	Pestsovoyy field	Ob-Taz Gulf area	NA
Do.	do.	Zapolyarnyy field	do.	NA
Do.	do.	Shtokmanov field	Barents Sea	NA
Do.	do.	Urals	Ural'skiye Gory	45,000
Do.	do.	Volga	Volga Region	6,000
Do.	do.	Yakut-Sakha	Sakha (Yakutiya) Republic	1,500
Nepheline syenite		Apatite complex	Kola Peninsula	1,500,000
Do.		Kiya-Shaltyr Mine	Goryachegorsk Region, east Siberia	NA
Nickel:				
Ni in ore		MMC Noril'sk Nickel	Noril'sk Region, Kola Peninsula	300,000
Do.		Yuzhuralnikel company	South Urals	3,000
Do.		Ufaleynikel company	Chelyabinsk Region, Urals	17,000
Metal:				
Smelting		MMC Noril'sk Nickel	Noril'sk region	160,000
Do.	do.	do.	Pechenga	50,000
Do.	do.	do.	Monchegorsk	50,000
Refining		do.	Noril'sk region	100,000
Do.	do.	do.	Monchegorsk	140,000
Ni products and Ni in FeNi		Rezh, Ufaleynikel, Yuzhuralnikel enterprises	South Urals	65,000
Oil shale		Leningradslanets Association	Slantsy Region	5,000,000
Petroleum		East Siberia, Tomsk Oblast	Tomskaya Oblast'	11,000,000
Do.		European Russia:		
Do.		Astrakhan	North Caspian Sea basin	700,000
Do.		Bashkortostan	Ural'skiye Gory	28,000,000
Do.		Checheno-Ingush Republic	Southern Caucasus	4,500,000
Do.		Dagestan	North Caucasus	700,000
Do.		Kaliningrad Oblast	Baltic coast	1,800,000
Do.		Komi Republic	Northwest	15,000,000
Do.		Krasnodar Kray	North Caucasus	2,000,000
Do.		Orenburg Oblast	Ural'skiye Gory	13,000,000
Do.		Perm Oblast	do.	12,000,000
Do.		Samara	Volga Region	16,000,000
Do.		Saratov Oblast	do.	1,500,000
Do.		Stavropol Kray	North Caucasus	2,000,000
Do.		Tatarstan	Volga Region	40,000,000
Do.		Udmurt Republic	Ural'skiye Gory	9,000,000
Do.	thousand metric tons	Fields:	Tyumenskaya Oblast', West Siberia	300,000 <sup>4</sup>
		Kogolym		(34,000)
		Krasnoleninskiy		(12,000)
		Langepas		(30,000)
		Megion		(18,000)
		Nizhnevartovsk		(70,000)
		Noyabrsk		(37,000)
		Purneftegaz		(12,000)
		Surgat		(48,000)
		Uray		(8,000)
		Varegan		(10,000)

See footnotes at end of table.

TABLE 2--Continued  
COMMONWEALTH OF INDEPENDENT STATES: STRUCTURE OF THE MINERAL INDUSTRY IN 2004<sup>1, 2, 3</sup>

(Metric tons unless otherwise specified)

Country and commodity	Major operating companies or deposits	Location or deposit name	Annual capacity <sup>e</sup>
RUSSIA--Continued			
Petroleum--Continued	Sakhalin Island	Sakhalin Island	2,500,000
Phosphate rock	Kingisepp complex	Leningradskaya Oblast'	NA
Do.	Lopatino, Yegorevsk deposits	Moscow Oblast'	NA
Do.	Polpinskoye deposit	Bryanskaya Oblast'	NA
Do.	Verkhnekamsk deposit	Ural'skiye Gory	NA
Phosphate rock, apatite concentrate	Khibiny Apatit Association	Kola Peninsula	12,000,000
Do.	Kovdor iron mining complex	do.	700,000
Platinum-group metals:			
Ore, PGM content	MMC Noril'sk Nickel	Noril'sk region	150
Do.	AO Koryakgeoldobycha, Amur Prospectors	Placer deposits (mostly platinum), Urals; Siberia; Russian Far East	10 <sup>4</sup>
Metals	Krasnoyarsk Nonferrous Metals Plant (Krastsvetmet)	Krasnoyarskiy Kray	NA
Do.	Ekaterinburgskiy plant (EZOTsM)	Ekaterinburg	NA
Do.	Priobsk plant	Priobsk	NA
Potash, K <sub>2</sub> O equivalent	Uralkaliy	Verkhnekamsk deposit	3,000,000
Do.	Silvinit	Solikamsk-Berezniki regions, Ural'skiye Gory	2,000,000
Silver	Dukat Mine, cobyproduct and byproduct of gold and nonferrous metals mining	Magadanskaya Oblast'	1,000
Soda ash	Achinsk plant	East Siberia	595
Do.	do.	East Siberia	595
Do.	Berezniki plant	Ural'skiye Gory	1,080
Do.	Pikalevo plant	Leningradskaya Oblast'	200
Do.	Sterlitamak plant	Sterlitamak	2,135
Do.	Volkhov plant	Leningradskaya Oblast'	20
Steel, crude	Amurstal	Komsomol'sk-na-Amure	1,600,000
Do.	Asha	Asha	450,000
Do.	Beloretsk	Bashkirskoye	380,000
Do.	Chusovoy	Chusovoy	570,000
Do.	Elektrostal	Moscow	314,000
Do.	Gorky	Nizhniy Novgorod	78,000
Do.	Gur'yevsk	Gur'yevsk	160,000
Do.	Karaganda	Karaganda	6,300,000
Do.	Lipetsk	Lipetskaya Oblast'	9,900,000
Do.	Lys'va	Lys'va	350,000
Do.	Magnitogorsk	Magnitogorsk	16,200,000
Do.	Mechel (Chelyabinsk)	Chelyabinskaya Oblast'	7,000,000
Do.	Nizhniy Tagil	Nizhniy Tagil	8,000,000
Do.	Nizhniy Sergi	Nizhniye Sergi	300,000
Do.	Nosta (Orsk-Kahlilovo)	Novotroitsk in Orenburgskaya Oblast'	4,600,000
Do.	Novosibirsk	Novosibirskaya Oblast'	1,100,000
Do.	Omutninsk	Omutninsk	210,000
Do.	Oskol Electric Steel	Stary Oskol	2,500,000
Do.	Petrovsk-Zabaykal'skiy	Petrovsk-Zabaykal'skiy	426,000
Do.	Revda	Revda	281,000
Do.	Salda	Sverdlovskaya Oblast'	1,900
Do.	Serov A.K.	Serov	1,000,000
Do.	Serp i Molot	Moscow	70,000
Do.	Severskiy	Polevskoy in Sverdlovskaya Oblast'	825,000
Do.	Severstal (Cherepovets)	Cherepovets	14,000,000
Do.	Sibelektrostal	Krasnoyarskiy Kray	110,000
Do.	Sulin	Sulin	280,000
Do.	Taganrog	Taganrog	925,000
Do.	Tulachermet Scientific and Industrial Assoc.	Tula	18,400

See footnotes at end of table.

TABLE 2--Continued  
COMMONWEALTH OF INDEPENDENT STATES: STRUCTURE OF THE MINERAL INDUSTRY IN 2004<sup>1, 2, 3</sup>

(Metric tons unless otherwise specified)

Country and commodity	Major operating companies or deposits	Location or deposit name	Annual capacity <sup>e</sup>
<u>RUSSIA--Continued</u>			
Steel, crude--Continued	Verkh-Isetskiy	Ekatrinenburg	132,000
Do.	Volgograd	Volgogradskaya Oblast'	2,000,000
Do.	Vyksa	Vyksa	540,000
Do.	West Siberian	Novokuznetsk	6,900,000
Do.	Zlatoust	Zlatoust in Chelyabinskaya Oblast'	1,200,000
Do.	Kuznetsk	Novokuznetsk	4,700,000
Talc	Onotsk deposit	Irkutskaya Oblast'	NA
Do.	Kirgiteysk deposit	Krasnoyarskiy Kray	NA
Do.	Miass deposit	Chelyabinskaya Oblast'	NA
Do.	Shabrovsk deposit	Sverdlovskaya Oblast'	NA
Tin:	<u>Novosibirsk mining-beneficiation complexes:</u>		
Ore	Khinganskoye olovo (Jewish Autonomous District)	Khabarovskiy Kray	NA
Do.	Dalolovo	Solnechnyy deposit, Primor'ye	NA
Do.	Deputatskiy (Sakhaolovo)	Sakha (Yakutiya) Republic	NA
Do.	Vostokolovo	Russian Far East	NA
Do.	Iultin mining-beneficiation complex	Magadanskaya Oblast'	NA
Do.	Khrustalnyy mining-beneficiation complex	Maritime Territory	NA
Do.	Pevek mining-beneficiation complex	Magadanskaya Oblast'	NA
Metal	Novosibirsk smelter	Novosibirskaya Oblast'	NA
Do.	Podol'sk smelter	Podol'sk	NA
Do.	Ryazan smelter	Ryazanskaya Oblast'	NA
Titanium:			
Sponge	Avisma Titanium-Magnesium complex	Berezniki	40,000
Metal	Moscow plant	Moscow	NA
Do.	Podol'sk plant	Podol'sk	NA
Do.	Verknyaya Salda Metallurgical Production Association (VSMPO)	Sverdlovskaya Oblast', Urals	NA
Tungsten:			
W content of concentrates	Antonovogorsk	East Transbaikal	NA
Do.	Balkan	Northeast of Magnitogorsk, Ural'skiye Gory	NA
Do.	Belukha	East Transbaikal	NA
Do.	Bom-Grokhom	West Transbaikal	NA
Do.	Dzhida	do.	NA
Do.	Iultin	Magadanskaya Oblast'	NA
Do.	Lermontov	Russian Far East	NA
Do.	Solnechnyy	Southern Khabarovskiy Kray	NA
Do.	Tymyauz tungsten-molybdenum mining and processing complex	Kabardino-Balkariya, North Caucasus	NA
Do.	Primorsky	Russian Far East	NA
Do.	Aginskoye deposit	Sakha (Yakutiya) Republic	NA
Do.	Kti-Teberdaskoye deposit	North Caucasus	NA
Metal, tungsten anhydride	Gidrometallurg plant	Nal'chik, North Caucasus	NA
Uranium, U content	Priargunsky mining and chemical enterprise	Krasnokamensk	3,000
Vanadium:			
Ore	Kachkanar iron mining complex	Ural'skiye Gory	NA
Metal	Chusovoy and Nizhniy Tagil plants	do.	17,000
Pentoxide	Vanadii-Tulachermet	Tula, North Caucasus	NA
Zinc:			
Zn content of ore	Bashkir copper-zinc complex	Sibai in southern Urals	5,000
Do.	Buribai copper-zinc mining complex	Buribai in southern Urals	1,500
Do.	Gai copper-zinc mining-beneficiation complex	Gai in southern Urals	25,000
Do.	Kirovgrad copper enterprise	Kirovgrad in central Urals	1,200
Do.	Sredneuralsk copper complex	Revda in central Urals	5,000

See footnotes at end of table.

TABLE 2--Continued  
COMMONWEALTH OF INDEPENDENT STATES: STRUCTURE OF THE MINERAL INDUSTRY IN 2004<sup>1, 2, 3</sup>

(Metric tons unless otherwise specified)

Country and commodity	Major operating companies or deposits	Location or deposit name	Annual capacity <sup>e</sup>
RUSSIA--Continued			
Zinc--Continued:			
Zn content of ore	Uchali copper-zinc mining-beneficiation complex	Uchalinskiy Rayon in southern Urals	90,000
Metal	Chelyabinsk electrolytic zinc plant	Chelyabinskaya Oblast'	200,000
Do.	Elektrozink plant	Vladikavkaz in North Caucasus	100,000
TAJKISTAN			
Aluminum	Tajik aluminum plant (TadAZ)	Tursunzade	517,000
Antimony, ore	Anzob mining-beneficiation complex	Dzhizhikrutskoye Sb-Hg deposit	700,000
Antimony, metal	Isfara hydrometallurgical plant	Isfara	500
Arsenic	Mosrif deposit	NA	NA
Bismuth	Leninabad mining-beneficiation complex	Yuzhno-Yangikanskiy deposit	25
Do.	Isfara hydrometallurgical plant	Isfara	500
Bismuth, copper, fluor spar, gold, silver, zinc (ore processing)	Adrasman mining-beneficiation complex	Kanimansurskoye deposit (mining ceased in 1997)	650,000 <sup>4</sup>
Boron	Ak-Arkhar deposit	Badakhshan Region	NA
Coal	Isfara hydrometallurgical plant	Isfara	300,000
Do.	Shurab brown coal deposit	Shurab Region	NA
Do.	Fan-Yagnob hard coal deposits	Pyandzh Region	50,000
Copper-lead-zinc	Leninabad mining-beneficiation complex	Yuzhno-Yangikanskiy deposit	2,500
Dolomite	Yavan electrochemical complex	Pashkharvoskoye deposit	NA
Fluor spar, concentrate	Takob mining-beneficiation complex	Takob and Krasnye Kholmy deposits	60,000 <sup>4</sup>
Gold, in ore	kilograms Tajikzoloto mining-beneficiation complex, Pamir Artel	Darvazy, Rankul placer deposits, placers in central and southern parts of country	5,000 <sup>4</sup>
Do.	do. Zerafshan Gold Company	Dzhilau, Taror deposits, Sughd Oblast'	2,500 <sup>4</sup>
Do.	do. Darvaz joint venture	Yak-Suyskoye deposit, Khatlonskaya Oblast'	2,000
Do.	do. Aprelevka joint venture	Aprelevka deposit	200
Gold, ore processing	do. Vostokredmet refinery	Chkalovsk	NA
Do.	Kansayskaya factory	Aprelevka, Burgunda, Kyzyl-Chek, Shkol'noye deposits	165,000 <sup>4</sup>
Lead-zinc	Kansayskoye mining complex	Kara-Mazar Region	NA
Do.	Altyn-Topkan mining directorate	Altyn-Topkan deposit (mining ceased in 1997)	NA
Do.	do.	Pay Bulak deposit (mining ceased in 1997)	NA
Do.	Adrasman mining-beneficiation complex	NA	NA
Do.	Takaelyyskiy metallurgical complex	NA	NA
Limestone	Dushanbe cement complex	Kharangonskoye deposit	NA
Loam	do.	Varzobskoye Ushchel'ye deposit	NA
Marble	Dashtak deposit	Darvaz region	NA
Do.	Jilikul deposit	Pendzhikent region	NA
Do.	Dal'yan Bolo deposit	Shakhristanskiy region	NA
Mercury	Anzob mining-beneficiation complex	Dzhizhikrutskoye deposit	150
Natural gas and petroleum:			
Natural gas	thousand cubic meters	Sixteen oil-gas deposits under exploration, which includes Ayritanskoye, Madaniyatskoye, and Ravatskoye	Fergana depression 200,000 <sup>4</sup>
Petroleum		Beshtentyakskoye, Kichik-Belskoye, Shaambary, Uzunkhorskoye deposits	Southern Tajik depression 200,000 <sup>4</sup>
Salt		Yavan electrochemical complex	Tut-Bulakskoye deposit NA
Do.		Voseyskiy plant	Khodzha-Muminskoye deposit NA
Do.		Ashtskiy plant	Kamyshkurganskoye deposit NA
Do.		Khoja-Sartez, Samanchi, Tanabchi deposits	NA NA
Silver		Adrasman mining-beneficiation complex	Bolshoy Kanimansur deposit 15,000
Strontium		Chaltash, Chikultan, Daudyr deposits	Khatlon Region 180,000
Tin-tungsten		Tafkon deposit	NA
Tungsten ore		Maykhura deposit	95 km of Dushanbe, central Tajikistan 150,000

See footnotes at end of table.

TABLE 2--Continued  
COMMONWEALTH OF INDEPENDENT STATES: STRUCTURE OF THE MINERAL INDUSTRY IN 2004<sup>1, 2, 3</sup>

(Metric tons unless otherwise specified)

Country and commodity	Major operating companies or deposits	Location or deposit name	Annual capacity <sup>e</sup>	
TAJKISTAN--Continued				
Uranium, U content	Adrasman, Maylisu, Taboshar, Usugai deposits	Kara-Mazar Region, northern Tajikistan	NA	
Do.	Vostokredmet plant	Chkalovsk	NA	
Vanadium, pentoxide	do.	do.	350,000	
TURKMENISTAN				
Ammonia	thousand metric tons	Maryzoat Association	Mary Region	400,000 <sup>9</sup>
Argillite	cubic meters	Keramzit plant	Yagmanskoye deposit	200,000 <sup>9</sup>
Barite-witherite		Arpaklenskiy mining enterprise	Arpaklen deposit	10,000 <sup>9</sup>
Do.		Kumytash deposit and other deposits	NA	NA
Bischofite, epsomite, Galauer's salt, sea salt		Karabogazsulfate Association	Kara-Bogaz-Gol Lagoon, off the Caspian Sea	NA
Bromine		Cheleken plant	Cheleken Region	4,740 <sup>9</sup>
Do.		Nebitdag plant	Vyshka, Stantsiya	2,370 <sup>9</sup>
Cement, from:				
Bench gravel and loam		Bezmeinskiy cement plant	Bezmeinskoye deposit	1,400,000
Limestone and clay		Kugitangskoye deposit	NA	NA
Limestone and marl		Gingol'skoye deposit	NA	NA
Clays:				
Bentonite		Oglanly Mine	Oglanly Region	100,000 <sup>9</sup>
Kaolin		Ashkhabad glass plant	Kyzylkainskoye deposit	80,000
Do.		Tuarkyrskoye deposit	250 kilometers southeast of Turkmenbashi	NA
Coal, oxidized		do.	do.	NA
Dolomite		Ashkhabad glass plant	Kelyatinskoye deposit	6,000
Gypsum		IA Turkmenmineral	Mukry, Tagorin deposits	300,000 <sup>9</sup>
Do.		Wastes from Gaurdak sulfur deposit	Gaurdak, Gora	400,000 <sup>9</sup>
Do.		Krasnovodsk Aylagy (anhydride) deposit	9 kilometers east of Turkmenbashi	160,000 <sup>9</sup>
Iodine		Cheleken plant	Cheleken Region	355 <sup>9</sup>
Do.		Nebitdag plant	Vyshka, Stantsiya	255
Limestone		Gaurdak deposit	4 kilometers northeast of Gaurdak	NA
Do.		Kara-Dzhumalaskoye deposit	60 kilometers from Gaurdak	NA
Limestone, for facing materials		Charshanginskoye, Gaurdakskoye, Geok-Tepinskoye, Kaylyu, Krasnovodsk Aylagy (tuff and granite), Tyuzmergenskoye deposits	NA	NA
Do.	cubic meters	Tagarinskoye deposit	8 kilometers from Gaurdak	1,000
Limestone, for filing stone	cubic meters	Aeropot deposit	21 kilometers northeast of Turkmenbashi	2,000 <sup>9</sup>
Do.	do.	Bekdashskoye deposit	200 kilometers north of Turkmenbashi	5,000 <sup>9</sup>
Do.	do.	Dostlukskoye deposit	230 kilometers southeast of Turkmenabat	2,000 <sup>9</sup>
Do.	do.	Mukrinskoye deposit	60 kilometers southwest of Gaurdak	25,000 <sup>9</sup>
Natural gas	million cubic meters	Achakskoye, Dauletabad, Donmez, Gygyrlinskoye, North and South Naipskiye, West Shatlykyskiye, Yashlar deposits	Onshore in eastern and southwestern parts of country and offshore in Caspian Sea; Amu-Dar'ya and Murgab Basins; Dashoguzskiy, Lebapskiy, Maryyskiy deposits	90,000 <sup>4</sup>
Natural pigment		Bakhchesu/Cheshme/Gadyn deposit	28 kilometers southwest of Serdar	NA
Ozokerite		Cheleken mining enterprise		NA
Petroleum:				
Crude		Barsa-Gelmesskoye, Burunskoye, Cheleken, Gograndagskoye, Kamyshldzhinskoye, Korturtepinskoye, Kum Dag, Kuydzhikskoye, Okaremskoye deposits	Onshore in southwestern part of country and offshore in the Caspian Sea	5,500,000 <sup>4</sup>
Refined	24-gallon barrels per day	Chardzhouskiy Rayon refinery	Seydi, Chardzhouskiy Rayon	120,500
Do.	do.	Turkmenbashi refinery	Turkmenbashi	116,500
Potash (sylvinitic, carnallite)		Karlyuk deposit (experimental mine closed 1998)	25 kilometers from Gaurdak	NA
Do.		Karabil'skoye deposit	17 kilometers south of Gaurdak	NA

See footnotes at end of table.

TABLE 2--Continued  
COMMONWEALTH OF INDEPENDENT STATES: STRUCTURE OF THE MINERAL INDUSTRY IN 2004<sup>1, 2, 3</sup>

(Metric tons unless otherwise specified)

Country and commodity		Major operating companies or deposits	Location or deposit name	Annual capacity <sup>e</sup>
<b>TURKMENISTAN--Continued</b>				
Quartz sand		Annauskoye, Babadurmazskoye, Bakhardenskoye deposits		NA
Rock salt		Gaurdak deposit	8 kilometers from Gaurdak	15,000
Do.		Khodzhaguymaskoye deposit	4 kilometers west of Gaurdak	NA
Do.		Kugitangskoye deposit	75 kilometers from Gaurdak	2,000
Do.		Uzun-Kudukskoye deposit	20 kilometers from Gaurdak	2,000
Salt		Kuulinskoye deposit	40 kilometers north of Turkmenbashi	650,000
Sand and gravel	cubic meters	Dushakoye deposit	NA	1,150,000 <sup>9</sup>
Do.	do.	Kala-I-Morskoye deposit	NA	925,000 <sup>9</sup>
Do.	do.	Kernayskoye deposit	NA	36,000 <sup>9</sup>
Do.	do.	Kubatayskoye deposit	NA	740,000 <sup>9</sup>
Do.	cubic meters	Ufrinskoye deposit	NA	900,000 <sup>9</sup>
Sodium sulfate		Karabogazsulfate Association	Bekdash, Kara-Bogaz Lagoon (off Caspian Sea)	400,000 <sup>9</sup>
Strontium (celesite)		Arikskoye deposit (mining ceased 1992)	Near Gaurdak	NA
Do.		Shakhtaminskoye deposit	do.	NA
Sulfur		IA Turkmenmineral	Gora deposit	340,000 <sup>9</sup>
Do.		Gaurdak plant	Gaurdak deposit (mining ceased 1997)	500,000
Do.		Darvaza, Segli-Kar, Kara-Kum sulfur plants	Kara-kum deposit (mining ceased 1962)	NA
Do.		Kugitangskoye deposit	75 kilometers from Gaurdak	NA
<b>UKRAINE</b>				
Alumina		Mykolayiv refinery	Mykolayivs'ka Oblast'	1,200,000
Do.		Zaporozh'ye (Dneprovsk) refinery	Zaporiz'ka Oblast'	245,000
Aluminum, primary		Zaporozh'ye (Dneprovsk) smelter	do.	120,000
<b>Coal:</b>				
Hard	thousand metric tons	Donets coal basin with about 225 mines produces more than 90% of Ukraine's coal	Dnipropetrovs'ka, Donets'ka, Luhans'ka Oblasts'	130,000 <sup>4</sup>
Do.		Lviv-Volynskiy Basin produces remainder from 18 mines	Western Ukraine	6,000,000 <sup>4</sup>
Brown		Dneprovskoye Basin	Central Ukraine	7,000,000
<b>Ferroalloys:</b>				
Ferrochrome		Zaporozh'ye plant	Zaporiz'ka Oblast'	NA
Ferromanganese		do.	do.	NA
Do.		Nikopol' ferroalloys plant	Nikopol'	250,000
Ferromanganese, blast furnace		Konstantinovskiy metallurgical plant	NA	NA
Do.		Kramatorskiy metallurgical plant (production ended in 1999)	NA	NA
Manganese metal		Zaporozh'ye plant	Zaporiz'ka Oblast'	NA
Ferrosilicon		Nikopol' ferroalloys plant	Nikopol'	200,000
Do.		Stakhanov plant	Luhans'ka Oblast'	NA
Silicomanganese		do.	do.	1,200,000
Do.		Zaporozh'ye plant	Zaporiz'ka Oblast'	160,000
Do.		Nikopol' ferroalloys plant	Nikopol'	NA
Graphite		Zavalyevskiy graphite complex	Zavalyevskiy deposit	40,000
<b>Iron ore:</b>				
Underground mining		Krivbassruda production association with 16 mines	Kryvyi Rih Basin	15,000,000 <sup>4</sup>
Do.		Ekspluatatsionnaya Mine of the Zaporizhzhskiy iron ore complex	do.	3,500,000
Open pit mining		Inguletskiy, Kamysh-Burunskiy, Novokrivorozhskiy, Poltaviskiy, Severnyy, Tsentralnyy, Yuzhniy mining-beneficiation complex	Kryvyi Rih Basin	90,000,000 <sup>4</sup>
Kaolin		Prosyanovskoye mining-beneficiation complex	Dnipropetrovs'ka Oblast'	NA

See footnotes at end of table.

TABLE 2--Continued  
COMMONWEALTH OF INDEPENDENT STATES: STRUCTURE OF THE MINERAL INDUSTRY IN 2004<sup>1, 2, 3</sup>

(Metric tons unless otherwise specified)

Country and commodity	Major operating companies or deposits	Location or deposit name	Annual capacity <sup>e</sup>
UKRAINE--Continued			
Lead, secondary	Ukrtsink plant	Kostyantynivka	70,000
Magnesium	Zaporozh'ye plant	Zaporiz'ka Oblast'	10,000
Do.	Magnii concern	Kalush	18,000
Manganese:			
Ore, marketable	Marganets, Ordzhonikdze mining-beneficiation complexes	Nikopol' basin	6,000,000 <sup>4</sup>
	Tavrisheskiy complex (under development)	Bol'shoy Tokmak basin	
Metal	Zaporozhye plant	Zaporiz'ka Oblast'	40,000
Sinter	Nikopol' ferroalloys plant	Nikopol	3,000,000
Mercury	Nikitovskiy mining-metallurgical complex	Donets'ka Oblast'	120
Nickel, Ni content in FeNi	Pobuzhskiy mining-beneficiation complex, comprising three open pit mines and smelter	Pobugskoye Basin	7,000 <sup>4</sup>
Potash, K <sub>2</sub> O equivalent	Khlorvinil production association, Stebnik potash plant	Pricarpathian Region	300,000
Steel, crude			
Donets'k acquisitions and (co-)owners:			
Industrial Union of Donbas (IUD):			
Do.	Alchevs'k steel mill	Alchevs'k	4,500,000
Do.	Azovstal' steel mill	Mariupol'	4,000,000
Do.	Donets'k steel mill	Donets'ka Oblast'	1,300,000
Do.	Dnepropetrovsk pipe plant	NA	NA
Do.	Khartsyzsk pipe plant	NA	NA
Do.	Danko: Yenakiyevskiy steel mill	NA	1,200,000
Do.	Privat Bank:		
	Dnepropetrovsk pipe plant	NA	1,230,000
Do.	Zaporozh'ye rolling mill	Zaporiz'ka Oblast'	2,300,000
Do.	Dneprovskiy steel mill	Dniprodzerzhyns'k	3,850,000
Do.	do.	Dnipropetrovs'ka Oblast'	1,900,000
Do.	Konstantnovskiy steel mill	NA	NA
Do.	Dneprospetsstal	Zaporiz'ka Oblast'	1,400,000
Do.	Il'yich plant	Mariupol'	7,300,000
Do.	Kirov plant	Makeyevka	4,000,000
Do.	Kryvy Rih plant	Kryvy Rih	10,650,000
Do.	Interpipe group:		
	Nizhnedneprovskiy pipe plant	NA	NA
Do.	Nikopol' pipe plant	NA	NA
Sulfur	Sera production association	Rozdol mining complex mines: Rozdol, Soroks, Zhdidalchev deposits Yarvorov complex mines: Nemirov-Yazov deposits in Livivs'ka and Kyiv's'ka Oblasts'	1,500,000 <sup>4</sup>
Titanium:			
Ileemite concentrate	Irshanskiy mining-beneficiation complex Vol'nogorsk state mining-metallurgical complex Verkhnedneprovskiy mining-metallurgical complex	Irsha Valley Dnipropetrovs'k Region Verkhnedneprovsk Region	600,000 <sup>4</sup>
Rutile	do.	do.	60,000
Do.	Vol'nogorsk state mining-metallurgical complex	Dnipropetrovs'k Region	NA
Sponge	Zaporozh'ye titanium-magnesium plant	Zaporiz'ka Oblast'	20,000
Uranium	Zheltye Vody complex	Northern part of Kryvy Rih Basin	NA
Zinc, secondary	Ukrtsink plant	Kostyantynivka	25,000
Zirconium:			
Ore, zircon	Verkhnedneprovskiy mining-metallurgical complex	Verkhnedneprovsk Region	100,000

See footnotes at end of table.

TABLE 2--Continued  
COMMONWEALTH OF INDEPENDENT STATES: STRUCTURE OF THE MINERAL INDUSTRY IN 2004<sup>1, 2, 3</sup>

(Metric tons unless otherwise specified)

Country and commodity	Major operating companies or deposits	Location or deposit name	Annual capacity <sup>e</sup>
<b>UKRAINE--Continued</b>			
<b>Zirconium--Continued:</b>			
Ore, zircon	Vol'nogorsk state mining-metallurgical complex	Dnipropetrovs'k Region	NA
Metal and compounds	Pridneprovskiy chemical plant	Dnipropetrovs'ka Oblast'	NA
Do.	Kharkiv physical-technical institute	Kharkivs'ka Oblast'	NA
<b>UZBEKISTAN</b>			
Bismuth	Ustarassay deposit (depleted)	Chotqol and Kuraminskiy Khrebet Regions	NA
Cesium, lithium, rubidium	Shava-Say deposit	NA	NA
<b>Clays:</b>			
Bentonite	Arab-Dasht and Khaudag deposits	NA	NA
Kaolin	Angren deposit	Angren Region	8,000,000
Coal	Central Asian Coal Association (mining):		
	Angren brown coal deposit	Angren Region	6,000,000
Do.	Baysunskoye and Shargunskoye deposits	Surkhandarya Region	1,000,000 <sup>4</sup>
<b>Copper:</b>			
Mine output, Cu content	Almalyk mining-metallurgical complex	Dalne, Kalmakkyrgan, Sary-Cheku deposits	100,000 <sup>4</sup>
Metal	Almalyk refinery	Olmalik	130,000
Diamond	Karashok and Kok-Say deposits	Nawoiy District	NA
Feldspar	Karichasayskoye and other deposits	Deposits in Samarqand and Toshkent Wiloyati Regions; Karakalpakstan (Kara-Kalpakskaya ASSR)	120,000 <sup>4</sup>
<b>Fertilizers</b>			
Do.	Ammophos production association	Olmalik	NA
Do.	Azot production association	Farghona	NA
Do.	Elektrokhimprom production association	Chirchiq	NA
Do.	Kokand superphosphate plant	Qo'qon	NA
Do.	Naviazot production association	Nawoiy Wiloyati	NA
Do.	Samarkand chemicals plant	Samarqand	NA
Fluorspar	Agata-Chibargata, Aurakhmat, Kengutan, Kyzylbaur, Naugarzan, Nugisken deposits	East of Toshkent Wiloyati	150,000
Do.	Syrpatash deposit	Namanganskaya Oblast'	NA
Gold	kilograms Adzhi-Bugutty, Amantaytau, Balpantau, Bulutkan, Donguz-Tau, Muruntau, Taurbay deposits	Kyzylkum Region	85,000 <sup>4</sup>
Do.	Navoi Integrated Mining and Metals complex	Muruntau deposit	50
Do.	Kochbulak and Kyzyl-Al'ma-Say deposits	Tashkentskaya Oblast'	NA
Do.	Almalyk mining and metallurgical complex	Dalne, Kalmakkyrgan, Sary-Cheku deposits	NA
Graphite	Tadzhi-Kazgan deposit	Navoiyskaya Oblast'	NA
Iron ore	Syurenata deposit	Tashkentskaya Oblast'	NA
Lead, mine output, Pb content	Almalyk mining-metallurgical complex; Altyn-Topkan and Uchkulach deposits	Uchkulach deposit in Toshkent Wiloyati; Altyn-Topkan deposit in Kurama mountain range in Tajikistan (in March 1999, Altyn-Topkan transferred to control of Tajikistan)	40,000 <sup>4</sup>
Manganese	Dautashkoye deposit	Kashkadar'inskaya Oblast'	40,000
<b>Molybdenum:</b>			
Mine output, Mo content	Almalyk mining-metallurgical complex; Kalmakyr, Sarycheku deposits	Toshkent Wiloyati	900 <sup>4</sup>
Metal	Uzbek refinery and hard metals plant	Chirchiq	NA
Natural gas liquids	million cubic meters Mubarek gas processing plant	Mubarak	28,000
Do.	Shurtan gas-chemical complex	Shurtan-Say deposit, Kashkad'ya Region	137,000
<b>Petroleum and natural gas:</b>			
Natural gas	million cubic meters More than 160 oil and gas deposits; 92 deposits under exploration:	Bukhoro-Khiwa, Sukhandarya Oblast, southwest Gissarak, and Ustyurtskiy Regions and Farghona Valley	
	Gazli, Kandym, Khauzak, Kokdumalak, Pamuk, Shurtan-Say deposits (major)	Amu-Dar'ya Basin; Mubarek area	70,000 <sup>4</sup>

See footnotes at end of table.

TABLE 2--Continued  
COMMONWEALTH OF INDEPENDENT STATES: STRUCTURE OF THE MINERAL INDUSTRY IN 2004<sup>1,2,3</sup>

(Metric tons unless otherwise specified)

Country and commodity	Major operating companies or deposits	Location or deposit name	Annual capacity <sup>c</sup>
UZBEKISTAN--Continued			
Petroleum and natural gas--Continued:			
Natural gas	Itera/Lukoil (Russia), Uzbekneftegaz JSC	Kan-Dam field	NA
Natural gas condensate	Trinity Energy (United Kingdom)	Ustyurt Plato Region	NA
Petroleum:			
Crude	Kokdumalak and Mingbulak deposits (major)	NA	9,000,000 <sup>4</sup>
Refinery products	Fergana oil refinery	Farghona Region	8,800,000
Do.	Bukhara oil refinery	Bukhoro	2,500,000
Phosphate	Kyzyl Kum complex	Dzheroy-Sardarin Moroccan type, Karaktay, Severnyy Dzhetymtau deposits	NA
Polyethylene	Shurtan gas-chemical complex	Shurtan-Say deposit, Kashkad'ya Region	125,000
Potash	Tyubegatan deposit	Southern Uzbekistan	NA
Silver	Kosmanachi, Okzhetpes, Vysokovoltnoye deposits	Namanganskaya Oblast'	NA
Steel, crude	Bekabad steel mill	Bekabad	1,100,000
Sulfur	Mubarek gas processing plant complex	Muborak	2,000,000
Tungsten:			
Mine output, W content	Koytash deposit Ingichka, Lyangar deposits Ugat deposit	Northeastern Uzbekistan Zirabulak Mountains Northern Uzbekistan	1,200 <sup>4</sup>
Mine output, WO <sub>3</sub> content (0.49%)	Sautbay wolframite deposit	Kyzylkum Region	NA
Metal	Uzbek refractory and hard metals plant	Chirchiq	NA
Uranium, U content	Naviyot mining-metallurgical complex	Navoiy Region	3,000
Vermiculite	square meters Tebin-Bulak deposit		25,000

<sup>c</sup>Estimated. NA Not available.

<sup>1</sup>Table includes data and information available through December 2005.

<sup>2</sup>Estimated data are rounded to no more than three significant digits.

<sup>3</sup>Many location names have changed since the breakup of the Soviet Union. Many enterprises, however, are still named or commonly referred to based on the former location name, which accounts for discrepancies in the names of enterprises and that of locations.

<sup>4</sup>Capacity estimates are totals for all enterprises that produce that commodity.

<sup>5</sup>For a listing of production-sharing agreements for oil and gas development, refer to the USACC Investment Guide to Azerbaijan 2001, United States-Azerbaijan Chamber of Commerce (USACC), Washington, DC.

<sup>6</sup>Capacity for crude petroleum distillation.

<sup>7</sup>Total peat for fuel use production.

<sup>8</sup>Crude throughput.

<sup>9</sup>Reported figure.

TABLE 3  
OWNERSHIP PROFILE OF SELECTED MAJOR MINERAL COMPANIES IN THE COMMONWEALTH OF INDEPENDENT STATES<sup>1</sup>

Country	Company	Commodity	Ownership	Properties
Armenia	Zangezur Copper-Molybdenum Complex <sup>2</sup>	Copper, iron ore, molybdenum	Germany's Cronimet, 60%; Yerevan's Pure Iron, 15%; Armenian Molybdenum (AMP), 12.5%; Zangezur Mining, 12.5%	Kadzharan copper-molybdenum complex and Charentsavan iron smelter works <sup>3</sup>
Azerbaijan	State Oil Company of Azerbaijan (SOCAR) <sup>5</sup>	Oil and gas	Government of Azerbaijan, 100%	<p>Pipeline production sharing agreements--Baku-Tbilisi-Ceyhan (BTC) pipeline and Southern Caucasus Pipeline (SCP)<sup>5</sup></p> <p>Offshore production sharing agreements--Azer-Chirag-Deepwater Gunashli (SOCAR, 10%), Shah Deniz SOCAR, 10%), Lankoran-Talysh Deniz (SOCAR, 25%), Yalama D-222 [SOCAR, 20%], Absheron (SOCAR, 50%), Oguz (SOCAR, 50%), Nakhchivan (SOCAR, 50%), Kurdasi-Araz-Kirgan Daniz (SOCAR, 50%), Inam (SOCAR, 50%), Araz-Alov-Sharg (SOCAR, 40%), Atashgah (SOCAR, 50%), Lerik-Jenab-Savalan-Dalga (SOCAR, 50%), Zafar-Mashal (SOCAR, 50%)</p> <p>Onshore production sharing agreements--Kalamaddin-Mishovdagh (SOCAR, 15%), Anshad Petrol (SOCAR, 51%), AzGeroil (SOCAR, 51%), Southwest Gobustan (SOCAR, 20%), Zyk-Govsany (SOCAR, 50%), Kursangi-Garabakhli (SOCAR, 50%), Muradkhanli-Jafarli-Zardab (SOCAR, 50%), Padar-Kharami (SOCAR, 15%), Shirvanoil (SOCAR, 49%)<sup>6</sup></p>
Belarus	Production Amalgamation Belaruskali <sup>7</sup>	Potash mineral fertilizers and potassium	Republic of Belarus (Belarusian State Oil and Chemistry Concern), 100%	<p>Mines--Starobinski potash, Krasnoslobodsky potash, No. 1, Bere-zovsky</p> <p>Soligorsk potassium industrial complex</p>
Kazakhstan	Kazakhmys plc <sup>9</sup>	Brass, coal, copper, gold, silver, zinc	Samsung Heavy Industries, 42.4%; Government of Republic of Kazakhstan, 35%; individuals, 22.6%	<p>Mines--Artyemyevskoe, Nikolaevskoe, East Saryoba, Taskura, North, Kosmurun, Akbastau, Abyz, Boschekul, Artyom</p> <p>Projects--Aktogay project (Balkhash area), Zhaman-Aybat (Zhezkazgan complex)</p> <p>Concentrators--Nikolaevskoe and Karagayly (East region)</p> <p>Other--Zhezkazganmunai OJSC [open joint-stock company] (Kazakhmys plc's share, 63.3%), Kaznergokable JSC (Kazakhmys plc's share, 9.7%), Borly, Karaganda, MKM copper fabrication plant (Germany)<sup>11</sup></p>
Do.	Kazatomprom <sup>12</sup>	Beryllium, niobium, tantalum, uranium	Government of Republic of Kazakhstan, 100%	<p>Joint ventures (JV)--Inkal, Katko, Zarechnoye, Ukraine-Kazakhstan-Russia (UKR) TVs, Ulba-China Co. Ltd</p> <p>Facilities--Volkovgeology, Ulba metallurgical plant, MAEK-Kazatomprom, Stepnogorski mining and chemical complex, Kazatomprom-Demeu social company, Institute of High Technologies, Geotechnical Training Center, Kazakhstan Nuclear University</p>

See footnotes at end of table.

TABLE 3--Continued  
OWNERSHIP PROFILE OF SELECTED MAJOR MINERAL COMPANIES IN THE COMMONWEALTH OF INDEPENDENT STATES<sup>1</sup>

Country	Company	Commodity	Ownership	Properties
Kazakhstan-- Continued	Kazkhrom <sup>13</sup>	Chromium and ferrochromium	Legal entities, 59.06%; Government of Republic of Kazakhstan, 31.37%; individuals, 9.57% <sup>14</sup>	Mines--Donskoy (Aktyubinsk region), Poiskovy open pit, Imeni 10-letiya Nezavisimosti Kaza-khstana (formerly Tsentralnaya), Molodezhnaya Plants--Ferrokhrom ferroalloys works (Aktyubinsk), Aksu ferroalloys plant (Pavlodar region)
Do.	Kazzinc JSC <sup>15</sup>	Copper, gold, lead, zinc	Glencore International AG (Switzerland), 99% <sup>16, 17</sup>	Project--Shubinskoe polymetallic-cop- per mine Complexes--Ust-Kamenogorsk lead- zinc complex; Zyryanovsk lead-zinc complex; Ridder copper/gold/lead/zinc complex Bukhtarma hydroelectric power station
Kyrgyzstan	Kumtor Gold Company <sup>18</sup> (formerly Kumtor Operating Company, which was owned by Cameco Corporation) <sup>19</sup>	Gold	Centerra Gold (Canada), 100%	Kumtor gold deposit (Tien Shan mountain range)
Russia	Alrosa Company Limited <sup>21</sup>	Diamond, gemstones, precious metals	Russian Federation: Ministry for Property Relations of the Russian Federation, 37%; Republic of Sakha (Yakutia): Ministry for Ma- nagement of the State-owned Pro- perty of the Republic of Sakha (Yakutia), 32%; employees of en- terprises and organizations of the diamond industry, as well as other individuals, 23%; administrations of the districts (Ulus) of the Republic of Sakha (Yakutiya) on whose territories the Company operates, 8%	Mines--Aikhal GOK, Anabar GOK, Mirny GOK, Nurba GOK, Uda- chny GOK Other activities--United Selling Or- ganization (sorting), Brillanty (polishing)
Do.	Evrax Group <sup>22</sup>	Coal, iron, steel, vanadium, limestone, dunite, natural stone	Crosland-Evrax beneficial shareholders and management, 91.7%; free float, 8.3% <sup>23</sup>	Deposits--Gusevogorskoe iron ore- vanadium deposit, Gurevsky, Teisky, Denisovsky coal field, Rapsadskaya (coal) Ore mining and processing plants--Vy- sokogorsky GOK (iron ore, limestone, dunite, natural stone), Kachkanarsky GOK (iron ore, vanadium), Yuzhkuz- bassugol (coking coal), NeryungriUgol (coal) Evraxruda (Evrax Ore) mining and ore enrichment enterprises--Tashtagol- skoye, Kazskoye, Sheregeshkoye, Gurevsky, Abagurskaya, Anakanskoye, Anakanskoye, Teisky, Irbinskoye Iron and steel plants--Nizhny Tagil, (Sverdlovsk region), West-Siberian (Kemerovo region), Novokuznetsk (Kemerovo region) Other holdings--Nakhodka sea port, Vitkovice steel (Czech Republic), Cor- ber JV, Chiatura manganese plant [joint venture with Zestafoni ferroalloy plant] and Vartikhe hydro power plant (Georgia)

See footnotes at end of table.

TABLE 3--Continued  
OWNERSHIP PROFILE OF SELECTED MAJOR MINERAL COMPANIES IN THE COMMONWEALTH OF INDEPENDENT STATES<sup>1</sup>

Country	Company	Commodity	Ownership	Properties
Russia-- Continued	Gazprom <sup>24</sup>	Gas and oil	Government of Russian Federation, 51%; foreign partners control 49%--Wintershall AG (Germany), Eni s.p.a. (Italy) Osterreichische Mineralölverwaltung Aktiengesellschaft (OMV) [Austria], Fortum (Finland), Ruhrgas AG (Germany), Verbundnets Gas AG (Germany), Gaz de France, N.V. Nederlandse Gasunie <sup>24, 25</sup>	Sixty-six subsidiaries (100% Gazprom ownership), forty-two subsidiaries (more than 50% but less than 100% Gazprom ownership), fifty-two subsidiaries (up to 50% Gazprom ownership) Major projects--Zapolyarnoye gas field (Yamal-Nenets Autonomous region), Blue Stream pipeline (or Russia-Turkey pipeline), North European gas pipeline (NEGP)
Do.	Lukoil <sup>26</sup>	Gas and oil	Free float, 60%; Lukoil top managers and employees, 20.58%; ConocoPhillips, 12.6%; other, 6.82% <sup>27, 28, 29</sup>	Subsidiaries--oil and gas production (46); petrochemicals (5); oil and gas refining (10); petroleum products marketing (73); banking, financial activities, other services (198) International projects in: [Azerbaijan] offshore production sharing agreements--Azer-Chirag-Deepwater Gunashli (10%), Shah Deniz (10%), Yalama D-222 (80%), Kurdashi-Araz-Kirgan Daniz (25%) and onshore production sharing agreement--Kykch Govsany (50%); [Kazakhstan] Karachagansk (15%), Kumkol (50%), Tub-Karagan (50%), Atash (50%), Tengiz (2.7%); [Uzbekistan] Khandym-Khauzak-Shady (90%); [Egypt] Meleya (24%), WEEM block (50%), North-Eastern Geysum (100%), Western Geysum (100%); [Cloumbia] Condor block (70%); [Iraq] Western Kurna-2 (68.5%); [Saudi Arabia] Riyadh (80%); [Iran] Anaran (25%) Pipeline production sharing agreements--(CPC) Caspian Pipeline Consortium [Kazakhstan], Kumkol-Aryskum-Djusali pipeline [Kazakhstan] Oil terminals--Varandey, Vysotsk Island, Ilinka, Izhevskoye <sup>6, 26</sup>
Do.	JSC Noril'sk Nickel Mining and Metallurgical Company (MMC) <sup>30</sup>	Cobalt, copper, nickel, precious metals, silver	Noril'sk Mining Company, 100% (of shares transferred from RAO Noril'sk Nickel February 2001)	Main operating divisions: [Polar Division]--(Mines) Zapolyarny, Mayak, Komsomolski, Oktyabrski, Skalisty, Taimyrski, Medvezhi Ruchey, (Enrichment) Noril'sk enrichment plant, sintering plant, Talnakh enrichment plant; (Metallurgy) Copper plant, Nadezhda metallurgical plant, Nickel plant, Metallurgical workshop [Kola Mining and Metallurgical Company]--Severonickel Metallurgical Combine, Pechenganickel Mining and Metallurgical Combine

See footnotes at end of table.

TABLE 3--Continued  
 OWNERSHIP PROFILE OF SELECTED MAJOR MINERAL COMPANIES IN THE COMMONWEALTH OF INDEPENDENT STATES<sup>1</sup>

Country	Company	Commodity	Ownership	Properties
Russia-- Continued	JSC Noril'sk Nickel Mining and Metallurgical Company (MMC)--Continued <sup>30</sup>	Cobalt, copper, nickel, precious metals, silver	Noril'sk Mining Company, 100% (of shares transferred from RAO Noril'sk Nickel February 2001)	[Others]--Polvus (Olimpiada, Tyradin, Blagodatny gold deposits), Dudinka sea port, Gipronickel, Noril'sk Nickel Europe (London, United Kingdom), Noril'sk Nickel USA (Pennsylvania), Noril'sk Nickel Asia Ltd. (Hong Kong China), Metal Trade Overseas (Zug, Switzerland) Aquisitions--OJSC Krasnoyarskenergo (25.5%), OJSC Kolenergo (24.8%), OJSC Noril'sk gazprom (29.4%), OJSC Pervenets (26%), LLC Kwartseveye tekhnologii (38.3%), OJSC Arkhangelsk sea port (53.1%), OJSC Lenzoloto (50.5%), OJSC Matrosov mine (38%), CJSC Tonoda (100%), Stillwater Mining Company (Montana, United States) [50.5%]
Do.	Novosibirsk Tin complex (NOK) <sup>32</sup>	Aluminum, antimony, bismuth, zinc, lead, tin	Novosibirsk Integrated Tin Works (NOK) Holding, 100%	Khingansky Tin Company (Jewish autonomous region), JSC Dalolovo, Deputatskolovo (Sakha Yakutiya Republic), Vostokolovo (Kharbarovsk territory), OJSC Tyan-Shanolovo (Kyrgyzstan) <sup>33, 34</sup>
Do.	Rosneft <sup>35</sup>	Gas and oil	Government of Russian Federation, 100%	Gas and oil fields in: [Siberia area] Kharampurskoe, Kynsko-Chaselsky Vankor, Priobsky, Malo-Balyksky, Mamontovsky, Prirazlomny (Khanty-Mansijsk Autonomous District); [Far East area] Sakhalin-1, Sakhalin-3 Veninsky sector, Sakhalin-4 (Zapadno-Shmidtovsky sector), Sakhalin-5 (Kaygansko-Vasyukansky sector), West Kamchatka Shelf Development, Komsomolsk refinery; [North-West area] Timan-Pechora, Ardalinsky, Komi Republic and Nenets Autonomous District deposits; [South area] Kuba region, North Caucasus region, Krasnodar and Stavropol territories, Chechen Republic, Republic of Dagestan
Do.	RUSAL <sup>36</sup>	Alumina, aluminum, bauxite	Basic Element (BasEl, formerly Sibirsky Aluminum), 100% [prior to 2003, Sibirsky Aluminum and Sibneft each had 50% share in RUSAL] <sup>37</sup>	Refineries--Achinsk Alumina, Nikoayev alumina, Boksitogorsk alumina (RUSAL Boksitogorsk), Friguia Alumina (Guinea) Smelters--Novokuznetsk, Sayanogorsk, Krasnoyarsk, Bratsk Other--ROSTAR, ARMENAL, VAMI Russian Aluminum and Magnesium R&D Institute, Dmitrov metallurgical plant, Compagnie de Bauxite de Kindia (CBK) bauxite complex [Guinea], (QAL) Queensland Alumina Limited (Australia) [20%], Samara and Belaya Kalitva metallurgical plants Project--Komi Aluminum (bauxite, alumina, aluminum)

See footnotes at end of table.

TABLE 3--Continued  
OWNERSHIP PROFILE OF SELECTED MAJOR MINERAL COMPANIES IN THE COMMONWEALTH OF INDEPENDENT STATES<sup>1</sup>

Country	Company	Commodity	Ownership	Properties
Russia-- Continued	JSC Severstal <sup>38</sup>	Coal, coke, iron ore, steel, niobium	Severstal's Chairman, 82.75%; Severstal's management and employees, 10.75% (including 1.36% held by members of Severstal Board of Directors other than Chairman); institutional investors, 6.5% <sup>39</sup>	JSC Severstal metallurgical division-- Cherepovets Iron and Steel Works, JSC ChSPZ Cherepovets Steel and Wire Plant, ZAO Seversgal JSC Severstal-resource mining division-- JSC Olkon Olenegorsk Ore-concentrating Plant (Murmansk region), JSC Karelian Pellet (Karelia republic), JSC Kuzbass-Coal (Kemerovo region), JSC Stalmag, Northern Niobium LLC JSC Severstal-Auto automotive division-- JSC UAZ Ulyanovsky Automobile plant, JSC ZMZ Zavolzhsy Enine Plant SeverstalTrans transport company-- Kolomna Locomotive Plant; Tuapse, Taganrog, Eastern sea ports Projects--JV Seversgal (galvanized automotive sheet production), JV United Metallurgical Company (OMK)-Severstal [production of large diameter pipe, having diameter up to 1,420 millimeters, length up to 18.3 meters, and three-layer coating], Polymeric Coatings Shop, JV (ALS) Air Liquide-Severstal (air separation products generation) <sup>38, 40</sup> Acquisition--Lucchini steel company (Italy), 60%; Rouge Steel, 100% <sup>40, 41</sup>
Do.	SUAL Group <sup>42</sup>	Alumina, aluminum, bauxite, silicon	OAQ SUAL Holding, 100%	Mines--North-Ural Bauxite Mine (SUBR), Novo-Kalinskaya mine, Timan bauxite mine Refineries--Bogoslovsky Aluminum, Pikalevo Alumina, Ural Aluminum, Zaporozhye Aluminum complex Primary aluminum smelters--Bogoslovsky Aluminum, Irkutsk Aluminum, Kandalaksha Aluminum, Nadvoitsey Aluminum, Ural Aluminum, Volgograd Aluminum, Volkhov Aluminum, Zaporozhye Aluminum Silicon operations--Cheremshansk Quartzite mine, Irkutsk Silicon, Ural Silicon Other operations--Ural aluminum foil, Irkutsk Powder Metallurgy, Kamensk-Uralsky Metallurgical (semi-finished products)
Do.	TNK-BP (Tymen Oil Co., Sidanco, British Petroleum Company) <sup>43</sup>	Gas and oil	British Petroleum Company, 50%; Alfa Group and Access Industries and Renova (AAR), 50%	Oil production companies--Samotlorneftegaz, Yugraneft, TNK-Nizhnevartovsk, Nizhnevartovsk NP, Varyeganneftegaz, JV Varyeganneft (50%), Tyumenneftegaz, TNK-Nyagan, Novosibirskneftegaz, Orenburgneft, Orenburggeologia, Saratovneftegaz, Saratov-Burenie, Udmurtneft, TNK field

See footnotes at end of table.

TABLE 3--Continued  
 OWNERSHIP PROFILE OF SELECTED MAJOR MINERAL COMPANIES IN THE COMMONWEALTH OF INDEPENDENT STATES<sup>1</sup>

Country	Company	Commodity	Ownership	Properties
Russia-- Continued	TNK-BP (Tymen Oil Co., Sidanco, British Petroleum Company <sup>43</sup> )	Gas and oil	British Petroleum Company, 50%; Alfa Group and Access Industries and Renova (AAR), 50%	Gas production companies--Samotlorneftegaz, Yugraneft, TNK-Nizhnevevartovsk, Nizhnevartovsk NP, Varyeganeftgaz, Tyumenneftegaz, TNK-Nyagan, Novosibirskneftegaz, Orenburgneft, Orenburgeologia, Saratovneftegaz, Udmurtneft, TNK field <sup>40</sup> Azerbaijan offshore production-sharing agreements--Azeri-Chirag-Deepwater Gunashli (BP operator 34.1%); Shah Deniz (BP operator 25.5%); Inam (BP operator 25%); Araz-Alov-Sharg (BP operator 15%) <sup>6</sup>
Do.	JSC TVEL <sup>44</sup>	Uranium, zirconium, lithium, calcium	Government of Russian Federation, 100% <sup>45</sup>	Mineral mining enterprises--JSC Priargunsky Mining and Chemical Production Association, JSC Dalur, JSC Khigda, JSC Zab GOK, JSC Malyshevskoye Ore Mining Association Production enterprises--JSC Mashinostroitelny Zavod (Elektrostal), JSC Chpetsk Mechanical Plant (Glazov), Novosibirsk Chemical Concentrates Plant (Novosibirsk)
Do.	Ural Mining and Metallurgical Combine (UGMK) <sup>46</sup>	Aluminum, brass, bronze, copper, gold, lead, palladium, phosphate, platinum, selenium, silver, sulfur, tellurium, zinc	Ural Mining and Metallurgical Combine (UGMK) Holding, 100%	Smelter and plants--JSC Sredneuralskiy copper smelter, JSC Kirovskiy non-ferrous metals treatment plant, Alchevskiy metallurgical plant, Dnepropetrovskiy metallurgical and tube plant, Donetsk metal rolling plant, Kamatorsk metallurgical plant Complexes--JSC Mednogorskiy copper-sulfur complex, Karabash copper smelting complex Joint-stock companies and joint venture--JSC Uralelectromed, JSC A.K. Serov, JSC Svyatogor, JSC Uralelectromed-Vtortsvetmet, JSC Sibcable (Tomsk), JSC Gayskiy GOK (Orenburg region), JSC Radiator (Orenburg region), JSC Safyanovskayamed, JSC Kirovogradskaya metallurgical company, JV Katur-Invest, JSC Bogoslovskoye mine administration <sup>47, 48</sup>
Do.	VSMPO-Avisma <sup>49</sup>	Aluminum, magnesium, titanium (sponge and milled products)	VSMPO's CEO, 32.3%; VSMPO's chairman, 32.3%; SUAL and Renova, 13.4%; in free float, 12%; VSMPO's employees, 10%	Enterprises--Verkhnyaya Salda Metallurgical works (milled products), Bezniki Titanium-Magnesium works (titanium sponge) Facilities--melting, press forging, flat-rolling, bar-rolling, tube-making Subsidiaries--Tirus (Germany, Switzerland, United Kingdom, United States), NF&M International (United States) 2003 joint venture with Allegheny Technologies Incorporated to form Uniti LLC (United States) <sup>50</sup>

See footnotes at end of table.

TABLE 3--Continued  
OWNERSHIP PROFILE OF SELECTED MAJOR MINERAL COMPANIES IN THE COMMONWEALTH OF INDEPENDENT STATES<sup>1</sup>

Country	Company	Commodity	Ownership	Properties
Russia-- Continued	Yukos (Yuganskneftegas-KulbyshevnefteOrgSintez) <sup>51</sup>	Gas and oil	Group Menatep, 60.5%; ADR holders, 12.8%; individual and institutional shareholders, 10.6%; Veteran Petroleum Trust, 10%; Russian Federation Treasury shares, 3.6%; shares available to back UBS exchangeable bonds, 2.5%	Yurubcheno-Takhomskoye and West Malobalykskoe natural gas fields (East Siberia) Crude oil and gas condensate production subsidiaries--Yuganskneftegas (Siberia), Samaraneftegas (European Russia), Tomskneft (East Siberia), other [West Malobalykskoye, Tomsk Petroleum and Gas, licensed territories of Yukos Oil Company, Arctic Gas Company (natural gas), East Siberian Oil and Gas Company (VSNK), Urengoil Inc., Skhaneftegaz, Geoilbent, Rospan International (natural gas)] Angarsk Petrochemical Company (East Siberia), Luginetskoye Gas Compressor Station Acquisitions--Transpetrol (Slovakia, Yukos 49%), Mazeikiu Nafta refinery (Lithuania, Yukos 53.7%), Fedorovsky Block (Kazakhstan, Yukos 77.5%) Projects--Russia-China Pipeline (with Transneft and China National Petroleum Corporation), Eastern Europe's Druzhba-Adria pipeline to Omisalj (Croatia), Murmansk-West Siberian pipeline, Caspian Oil Company joint venture with Lukoil and Gazprom, Shatsky Ridge (Black Sea) joint venture with TotalFinaElf, West Malobalykskoe field joint venture with MOL (Hungarian Oil and Gas Company)
Ukraine	UkrRudProm JSC <sup>52</sup>	Iron ore, dolomite, sand, macadam	Government of Ukraine, 100% (2005 controversy over privatization of Ukrprom and Krivorozhstal; but Severstal Group interested in buying both companies) <sup>53,54</sup>	Krivbassruda (Krivorozhsky State Iron Ore Mining and Enrichment Plant), Dokuchaevsky Flux-Dolomite Plant, Novotroitskoye mine, Balaklava mine, Krivbassvzryvprom Company, Severniy GOK (50% + 1 share), Inguletskiy GOK (50% + 1 share), Tsentralniy GOK (50% + 1 share), Sukhaya Balka GOK (25.1%), Yuzhniy GOK (25.78%) <sup>55</sup>
Uzbekistan	Navoi Integrated Mining and Metallurgical Combine <sup>56</sup>	Gold and uranium	Government of Republic of Uzbekistan, 100%	Kyzylkumredmetzoloto, Surgaly uranium mine and quarry Gold deposits--Muruntau gold mine (Kyzylkum Desert, Navoi region), Kokpatas and Daugistau gold lodes (Central Kyzylkum), Uchkuduk mine, Kyzylmasai and Kochbulak gold fields (Tashkent region), Amantaytau mine, Daugyztau lode (Kyzylkum Desert), Zarmitan and Guzumsai gold fields (Samarkand region)

See footnotes at end of table.

TABLE 3--Continued

OWNERSHIP PROFILE OF SELECTED MAJOR MINERAL COMPANIES IN THE COMMONWEALTH OF INDEPENDENT STATES<sup>1</sup>

Country	Company	Commodity	Ownership	Properties
Uzbekistan-- Continued	Navoi Integrated Mining and Metallurgical Combine <sup>56</sup>	Gold and uranium	Government of Republic of Uzbekistan, 100%	Gold joint ventures--Navoi MMC, Newmont Mining (Denver, USA), and State Committee for Geology and Mineral Resources (SCGMR) [to extract gold tailings from Muruntau mine and develop Kyzylmasai and Kochbulak gold fields]; Navoi MMC, SCGMR, and Lonhro (replaced by Oxus Resources) [to develop Daugyztau lode and Amantaytau gold field] <sup>56, 57</sup> Uranium (underground leaching) deposits-- Uchkuduk (decommissioned in 1975-89), Nurabad (decommissioned in 1982-90), Zarafshan (mined in 1979-90), Durmyan tailings dump containing uranium, radium, and polonium (1964-present) <sup>58</sup>

NA Not available.

<sup>1</sup>Ownership information obtained from company Web site except where otherwise noted.

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<sup>17</sup>Securities Lists of KASE, Shareholders Kazzinc JSC (February 2005), accessed January 5, 2006, at URL <http://www.kase.kz/eng/emitters/kzzn23.asp>.

<sup>18</sup>Centerra Gold, Operations: Kumtor, accessed January 3, 2006, at URL <http://www.centerragold.com/properties/kumtor>.

<sup>19</sup>Central Asia Gold Limited, Kumtor Mne, accessed January 3, 2006, at URL [http://www.cagl.com.au/co\\_kumtormine.html](http://www.cagl.com.au/co_kumtormine.html).

<sup>20</sup>CCDA (Canadian Diamond Drilling Association), accessed January 3, 2006, at URL [http://www.canadiandrilling.com/resources\\_job\\_want\\_ads.html](http://www.canadiandrilling.com/resources_job_want_ads.html).

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TABLE 4  
PRODUCTION OF KUMTOR GOLD MINE IN KYRGYZSTAN, 1997-2004

		1997	1998	1999	2000	2001	2002	2003	2004
Ore:									
Mined	thousand metric tons	5,017	5,349	8,054	6,518	5,606	5,141	4,634	3,303
Milled	do.	4,023	5,254	5,298	5,498	5,470	5,611	5,631	5,654
Mill feed grade	grams per metric ton	5.55	4.77	4.49	4.65	5.15	3.71	4.54	4.40
Recovery	percent	73.3	78.5	79.4	81.5	83.1	78.1	82.6	82.1
Gold recovered	thousand troy ounces	502	646	610	670	753	529	678	657

Source: Centerra Gold, 2004 Annual Report, p. 11.

TABLE 5  
ESTIMATED GOLD RESERVES AND RESOURCE OF KUMTOR GOLD MINE IN KYRGYZSTAN<sup>1</sup>

Reserves and resources	Metric tons (thousand)	Grade (grams per metric ton)	Contained gold	
			(thousand troy ounces)	(metric tons)
Reserves:				
Proven	20,087	3.3	2,099	65.3
Probable	10,902	3.3	1,150	35.8
Total	30,989	3.3	3,249	101.1
Resources:				
Measured	9,395	3.3	997	31.0
Indicated	8,195	3.5	917	28.5
Total	17,590	3.4	1,914	59.5
Inferred	9,976	4.5	1,448	45.0

<sup>1</sup>As of December 31, 2004.

Source: Centerra Gold, 2004 Annual Report, p. 11.