THE MINERAL INDUSTRY OF

RUSSIA

By Richard M. Levine[1]

Russia occupies more than 75% of the territory of the former Soviet Union (FSU), and accordingly is the inheritor of a large percentage of the mineral resources of the FSU. Russia was a large mineral producer, accounting for a large percentage of the Commonwealth of Independent States (CIS) production of a range of mineral products, including aluminum, bauxite, cobalt, coal, diamonds, natural gas, mica, nickel, oil, platinum-group metals, tin, and a host of other metals, industrial minerals, and fuels. Still, significant mineral deposits are located in other republics. For certain minerals, Russia was significantly or entirely dependent on the output of other republics for its mineral supply, particularly metals from Soviet Central Asia, the Caucasus, and Ukraine. For example, Russia had to import almost all of its needs for antimony metal, chromite, manganese ore, metallic mercury, and titanium and zirconium raw materials from other former Soviet republics. For other minerals such as alumina, copper, lead, molybdenum, and zinc, a large percentage of the production came from other former republics. These republics, in turn, were significantly dependent on Russia for a large percentage of their minerals, particularly oil and gas. With the breakup of the U.S.S.R and the disruption of interrepublic trade, Russia experienced shortages of raw material inputs that had been supplied by other former republics.

According to Russia's Statistical Committee, in 1994 gross domestic product (GDP) fell 15% compared with 1993. In 1994 for the first time the Committee reported more than one-half (62%) of the GDP was produced by the non-state sector. Industrial output in 1994 reportedly fell 20.9% compared with 1993. In 1994, reportedly there was a 27% decrease in capital investment compared with 1993. However the real income of the population reportedly increased 14% compared with 1993, but unemployment increased by 28.6% compared with 1993.[2] The fuel sector was the main recipient of foreign investment in 1994, accounting for 77.8% of all foreign investment.[3]

Russia was proceeding with the transformation of its economy, and much of its statistical reporting system was both in disarray and geared toward the former system. Thus, it was difficult to compare the effects of reported decreases in output with other indicators that may show increased efficiency in production, distribution, and consumption.

The domestic demand for nonferrous metals continued to fall, which in a number of cases freed production for export. In 1994, compared with 1990, aluminum consumption had fallen 3.1 times, copper 2.2 times, lead 2.5 times, zinc 2.8 times, molybdenum 3.7 times, titanium 3.2 times, and magnesium 1.8 times. The overall decline in consumption of nonferrous metals in 1994 reportedly was 30% compared with 1993. In 1995, it was projected that there would be an 8.6% fall in nonferrous metals consumption compared with 1994, but it was projected that copper consumption, which had reportedly fallen 40% between 1992 and 1994 would increase slightly in 1995.[4]

According to the Russian Committee for Metallurgy, energy consumption by the metallurgical sector between 1990 and 1994 decreased by 24% while metal production decreased by 40%, thus making each unit of metal more expensive to produce.[5] Also, with the fall in production there had been a reduction in capacity utilization at mineral production enterprises, with capacity utilization at ferrous and nonferrous metallurgical enterprises in 1994 falling to 55% and 73% respectively compared with 65% and 76% in 1993.[6]

Along with the drop in metals production, there had been a dramatic decline in geological exploration, which fell in 1994 reportedly by 24% compared with 1993 and 61% compared with 1991. The main reason for this drop reportedly was a decrease in government financing. Reportedly, 66.8% of the available funds in 1994 were used to explore for oil and gas and 12.4% for precious metals and diamonds; only 2.2% of the funds were spent to explore for ferrous and nonferrous metals.[7]

Government Policies and Programs

The Russian Government drew up a plan for the development of the country's mineral and raw material base and geological services for 1993-95 and continuing to the year 2000. Foreign investors had been interested mainly in developing oil, gas, gold, and diamond deposits, but the Russian Committee for Geology and the Use of Underground Resources (Roskomnnedr) stated that Russia should try to seek investment in other types of mineral deposits by creating a legal base that would give investors more incentives and better protection of their investments.[8]

The breakdown of ties between the former republics and the transition to market economic practices left Russia with shortages of raw materials and mineral products. For some

of these raw materials, such as barite, chromite, feldspar, high-quality china clays, manganese, native sulfur, and titanium raw materials, Russia has known reserves that it could develop, but these reserves generally are not adequate to compensate, at least in the near future, for production from the other former republics.[9]

For the range of other nonfuel minerals, Russia needed investment to modernize and increase production both to compensate for the loss of production from other former republics and to make these industries cost-effective producers and competitors on world markets. Attracting investment to Russia's nonfuel minerals sector would be a crucial element for the future survival and transformation of these industries.

Because of the civil warfare in Chechnya, plans to transport oil from deposits that were to be developed in other countries of the FSU bordering the Caspian Sea through the pipeline network that transverses Chechnya and the North Caucasus in Russia were being reconsidered with plans being formulated for constructing a new route that would bypass Chechnya.[10] If new pipeline routes were to be chosen because of the instability in Chechnya, these new routes could completely bypass Russia, passing instead through Iran and Turkey.[11]

Russia was achieving success in its efforts to participate in oil and gas development and transport in countries of the FSU. For example, Russia was participating with Azerbaijan in the development of offshore resources of the Baku oil shelf in the Caspian Sea and in the development of the Karachaganak gas condensate deposit in Kazakhstan. Russia also succeeded in having one pipeline route from the Tengiz oilfield in Kazakhstan pass through Russia. Turkmenistan, however, was seeking alternate routes to export its natural gas, which would bypass the current routes through Russia and possibly compete with some Russian markets in the Balkans, Central Europe, and Turkey.

Russia also was seeking additional pipeline routes for its hydrocarbon exports after problems arose with existing routes including the Ukrainians diverting a portion of Russia's gas exports to Bulgaria and Turkey for Ukraine's own use in 1994 and Turkey's setting limits on Russian oil exports through the Bosporus. Russia was planning to construct a gas export pipeline from its new major fields on the Yamal Peninsula in West Siberia that would pass through Belarus and Poland and bypass Ukraine.[12]

Environmental Issues

The Russian Minister of Environmental Protection and Natural Resources stated that the environmental situation in Russia was "highly alarming" since 15% of Russia's territory was declared an ecological disaster zone and one-half of the country's arable land reportedly was unsuitable for agriculture. However, he denied that the ecological situation had worsened during the past 3 years. A number of measures were announced to improve monitoring of the environment, including the passage by the Russian Government of a resolution on the establishment of a single state system of environmental monitoring that would be entrusted to the Russian Ministry of Environmental Protection and Natural Resources.[14]

In October 1994 in Russia's Komi Republic in the Usinsk region, an oil spill was reported from a pipeline damaged in February. At first, the leaking oil was contained in an earthenware dike, which then collapsed on October 1 after heavy rains, with the oil subsequently leaking into the Kova and Usa rivers. Both rivers feed the Pechora River, which flows into the Arctic Ocean. Moves were taken to protect the Pechora River from the spill. The dike reportedly was restored on October 4.[15]

According to Russia's ITAR TASS news agency, 14,000 metric tons (mt) of oil polluted over 60 hectares of land in mostly swampy tundra.[16] Between August 1994 and January 1995, according to the Interfax News Agency, 400,000 mt of oil was spilled over the Usinsk region as a result of pipeline breaks and leaks.[17] The World Bank and the European Bank for Reconstruction and Development pledged loans to finance projects to clean up the spills and to construct a new pipeline system.[18]

Russia also revealed that the U.S.S.R. had been disposing of nuclear wastes for three decades by injecting them into the earth under layers of shale and clay, which theoretically would prevent them from reaching the earth's surface. However, this method of waste disposal was not in accord with standards for nuclear safety accepted by most other countries. Almost one-half of the nuclear wastes generated in the FSU and Russia were disposed of in this way. Wastes at one site reportedly had already leaked and spread, although the extent of this spread was not disclosed.

These injections were made directly into the earth rather than into cement mixes or steel liners at three widely dispersed sites at Dmitrovgrad near the Volga River, Tomsk near the Ob River, and Krasnoyarsk on the Yenisey River. The Volga flows into the Caspian Sea and the Ob and Yenisey flow into the Arctic Ocean. Reportedly, scientists believed it may take decades to determine if this method of waste disposal would be benign or have harmful environmental effects. The U.S. Department of Energy was cooperating in an attempt to predict how far and fast the radioactive wastes could spread through aquifers.[19]

Production

In 1994, production fell in most mineral production sectors compared with 1993. Although the usual yearend reporting contained production statistics for only those few mineral commodities that the FSU formerly reported, the June 23-30, 1995, issue of the Interfax Mining and Metals Report (page 12), contained what appeared to be the first official Russian statistical reporting on a number of nonferrous metals since

the 1930's. These reported production statistics for nonferrous metals for the years 1990-94 are reported in table 2. For some commodities, numbers reported in table 2 are different from other officially reported numbers. The numbers used in this report, table 1, have been assessed to be the most authoritative if there are conflicting reported numbers.

Production statistics for 1994 for some other commodities did appear individually, but not in any officially available compendium. These individual reports for production of mineral commodities would sometimes appear as absolute numbers and sometimes only as percentage increases or decreases. In whatever form they did appear, there were often several contradictory reports for the same commodity. Reports on production for individual commodities are included, when available in this report under the descriptive sections which follow for these commodities.

Trade

In 1994, exports were dominated by fuel and energy, which comprised 44.7% of total exports compared with 46.7% in 1993, while ferrous and nonferrous metals and products accounted for 20.2% of total exports in 1994 compared with 16.4% in 1993.[20]

Owing to a number of factors including decreased output in many nonferrous metallurgical sectors that created excess production capacity, Russian metallurgical enterprises used their underutilized metallurgical capacity for toll smelting foreign materials, including aluminum, copper, lead, tin, and zinc.

Trade statistics as well as production statistics for nonferrous and precious metals and gemstones were a state secret in the Soviet Union. Russia, however, was reporting previously secret trade statistics for some of these commodities. These trade statistics are reported, when available by commodity, in the descriptive commodity reviews in this report. As is the case with production statistics, the Russian reporting methods often were not clear. For example, it is often not specified if reported trade of ores and concentrates was reported in gross weight or by metal content or if the trade included or excluded trade with countries of the FSU.

Structure of the Mineral Industry

Privatized companies in 1994 reportedly accounted for more than 90% of iron and steel and nonferrous metals output.[21] Privatization of enterprise was reportedly almost completed in the metallurgical sector as the Chairman of the Russian Metallurgy Committee stated that as of January 1995, 386 of the country's 407 metallurgical enterprises had been turned into joint stock companies or limited liability companies. Only a few metallurgical enterprises, pipe mills, and metalware plants remained state owned.

Privatization generally involved the transformation of enterprises into entities termed joint stock companies through the sale or free issuance of stock in set percentages to workers and management and also, depending on the enterprise, to Government and private inerests.

Commodity Review

Metals

Aluminum.—In 1994, Russia produced 2.67 million metric tons (Mmt) of primary aluminum compared with 2.82 Mmt in 1993.[22] The amount of aluminum toll smelted in 1994 was 1.8 Mmt compared with 1.3 Mmt in 1993.[23] Domestic aluminum consumption was reported to be 470,000 mt in 1994 compared with 631,000 mt in 1993.[24]

At a meeting of major aluminum-producing countries in January 1994, it was agreed in a Memorandum of Understanding that an excess supply of aluminum existed and that the principal response would be commercial decisions developed by companies on an individual basis. Russia agreed to reduce its production by 500,000 mt in 1994, but only as part of a global reduction. It was announced that three Russian smelters, the Novokuznetsk, Uralsk, and Volgograd, had begun production cuts. Russia agreed to begin with a first-stage 300,000 mt reduction.

Although Russia agreed to cut aluminum production by 500,000 mt in 1994 as part of a worldwide effort to deal with the oversupply of aluminum on world markets, Russia had only reduced its production in 1994 by about one-half of this amount because the Russians claimed that the western companies had not made adequate cuts in production. Russia stated that it would not reduce production by the agreed upon 500,000 mt until western producers fulfilled their commitments to reduce production.[25]

In 1994, Russia exported 2.15 Mmt of aluminum and planned to export 2.1 Mmt in 1995, according to the President of the firm Aluminiy, which represented Russia's aluminum smelters.[26] The United States imported 643,000 mt of aluminum from Russia in 1994 and 421,000 mt in 1993.

According to the Russian newspaper Izvestiya, (December 21, 1994, page 5) the offshore firm Trans-CIS Commodities Ltd. (TCC) registered in Monte Carlo, controlled large blocks of shares in several large Siberian aluminum smelters, holding 68% of the shares of the Sayansk plant, 50% of the shares of the Bratsk plant, 20% of the shares of the Krasnoyarsk plant, and an unspecified share of the Novokuznetsk plant. According to Izvestiya, TCC was a major trader of aluminum that acted in conjunction with the British firm Trans World Metals, which because of its relationship with TCC, had become the biggest dealer in Russian aluminum. TCC varied its share holdings of aluminum plants according to its needs and used its control to have its plants engage in toll smelting rather than

processing domestically produced alumina.

By engaging in toll smelting, the Russian plants avoided having to pay customs duties on both aluminum exports and imported raw materials. Toll smelting accounted for more than 60% of Russian aluminum production and was leaving Russia's six alumina smelters, which produce about 2 Mmt per year of alumina, without a major portion of their domestic market.[27]

Tolling, according to Izvestiya, had the potential to destroy domestic alumina producers that no longer had an assured market for their output. It posed the threat that Russian aluminum producers would become entirely dependent on foreign alumina suppliers if these tolling arrangements destroyed alumina production capacity in the CIS.

An advantage to the aluminum plants under TCC control, according to Izvestiya was that TCC assumed all expenditures for the procurement of raw material, transport, energy, etc., and was able to make timely payments for these inputs, allowing the aluminum plants to function smoothly. Criticisms of TCC control included not only the monopolistic power of this company, but also the fact that, as traders, they were not interested in reinvesting their profits in plant modernization, environmental controls, or social measures for the work force, unlike foreign aluminum producers if they were allowed to invest in these enterprises.[28]

Russian bauxite producers were experiencing considerable difficulty. The Severoulask bauxite mining company, which produced almost three-fourths of Russia's bauxite, reportedly received a bankruptcy notification in March 1995 from Russia's Federal Bankruptcy Agency. In 1994, Severouralsk reportedly produced 2.7 Mmt of bauxite. A major problem was that the Russian aluminum industry was using imported bauxite rather than that produced at Severouralsk.[29]

Western firms also were investing in Russia's aluminum industry. Germany's VAW Aluminum AG signed an agreement to supply $280 million of equipment and technology over a 4-year period to the Novokuznetsk smelter in Siberia, which, in 1994, reportedly produced 240,000 mt of primary aluminum. Payment to VAW Aluminum would be made from export earnings.[30] One goal of the renovation at Novokuznetsk was to improve pollution controls because pollution was having a serious detrimental effect on the region.[31]

The U.S. firm, Hunter Engineering Co. Inc., reportedly contracted to deliver and install a 170,000 metric-ton-per-year (mt/a) capacity aluminum cold rolling mill at the Krasnoyarsk smelter in East Siberia for the production of aluminum can body and lid stock and other flat-rolled items. The mill was reportedly worth $135 million and includes casters, furnaces, a foil mill, annealing ovens, slitters, and other support equipment.[32]

The French aluminum group, Aluminium Pecheney SA, was selected by the Russian Committee on Metallurgy to formulate proposals for the second stage of modernization of the Bratsk, Krasnoyasrk, and Novokuznetsk smelters in Siberia. The project was to involve the construction of a 250,000 mt/a prebaked anode facility at each plant.[33]

The Reynolds International Co. of the United States reportedly signed an agreement with the Samara Metallurgy Co., which specialized in defense and aerospace industry products, to convert many of the plant's facilities to consumer products.[34] Also, the Sayanal U.S., Italian, and Russian joint venture, producing aluminum foil at the Sayansk aluminum smelter reported commissioning the first stage of its foil and packaging plant; most of the foil was intended for the domestic market.[35]

Norway's Hydro Aluminum, a subsidiary of Norsk Hydro, was planning to conduct renovation and modernization of the Bratsk smelter in Siberia to increase capacity from almost 850,000 mt/a to 950,000 mt/a while also lessening pollution. Plans also called for Hydro Aluminum to upgrade the Sayansk smelter in Siberia.[36]

Regarding the security of investment in the Russian aluminum industry, two issues of major concern arose. One issue involved the Krasnoyarsk aluminum plant in Siberia, which tried to expunge some major shareholders from its list of owners in an action that was eventually declared illegal. The other issue involved the appointment of a new chairman of the State Property Committee in charge of privatization who began issuing statements regarding the advantages of again nationalizing aluminum smelters that had been privatized. This minister was dismissed from his post, but concerns were raised about the security of investments in this sector.[37]

Beryllium.—Beryl for the production of beryllium was mined in the Urals by the Malyshevskoye emerald production association, which produced all of the country's emeralds as well as supplying beryllium for Russia's nuclear complex.[38] Metallic beryllium, however was produced in the FSU only at the Ulbinsky plant in Oskemen (Ust-Kamenogorsk), Kazakhstan.

Cobalt.—There were numerous conflicting reports about cobalt production in 1994 at the Norilsk complex in East Siberia, which produced the majority of the country's cobalt. These reports ranged from a 7% decrease in cobalt output in 1994 compared with 1993 to a 3.2% increase in cobalt output in 1994 compared with 1993, although some figures appeared to refer to mine output and others to metal output.[39]

Reportedly, 80% of Russia's cobalt mine output was produced by the Norilsk mining and metallurgical complex. Russian refined cobalt production capacity was estimated at 8,000 mt. There had been a sharp decrease in cobalt consumption with the fall in defense industry consumption and a significant decrease in cobalt production resulting from the economic problems experienced by the industry. Toll smelting was enabling Russia to use excess capacity that formerly was used to smelt domestic material as well as Cuban material for which shipments had been curtailed.[40]

With the fall in domestic consumption of cobalt in Russia, which apparently far exceeded the decrease in production, Russia had switched from being a net importer to a large net exporter of cobalt.

Copper.—Russia reported to the International Copper Study Group that it produced 502,000 mt of refined copper in 1994 compared with 562,000 mt in 1993 and that it exported 407,500 mt of refined copper in 1994 compared with 317,88 mt in 1993. According to the Interfax Mining and Metals Report (August 18-25, 1995, page 16), Russia produced 22,700 mt of blister copper and 1,300 mt of refined copper by toll smelting in 1994 compared with 52,200 mt of blister copper and 12,300 mt of refined copper toll smelted in 1993.

Copper mining in Russia was centered in three regions, the Norilsk region in East Siberia, the Kola Peninsula, and the Urals. These regions had integrated production cycles with copper smelting and refining facilities. The Norilsk region was by far the largest copper mining region.

Divergent figures for copper production at Norilsk in 1994 were reported with output ranging from a 2.6% increase in 1994 compared with 1993 to a 12.6% decrease, although some figures appeared to refer to mine output and others to metal output.[41] Production at the Norilsk enterprise in 1994 reportedly had fallen to under 300,000 mt from its former peak level of 400,000 mt as the end of the 1980's. Norilsk also was a large copper exporter and reportedly had two-thirds of Russia's copper reserves.[42]

The Krasnouralsk copper smelter in the Urals, which was in the process of privatizing, had changed its name to the Svyatogor smelter. In 1994, reportedly it produced 57,000 mt of blister copper and planned to increase this amount to 60,000 mt in 1995. Very little of the copper from Svyatogor reportedly was exported. Svyatogor received about 20% of its raw materials from nearby deposits while the remaining 80% came from other mining areas in the Urals.[43]

Russia was still receiving copper from the Erdenet deposit in Mongolia with Russia reportedly receiving 97,000 mt of copper in concentrate in 1994. According to a trade agreement signed by the two countries, Russia should continue to receive this level of copper exports from Mongolia in 1995.[44]

Gold.—In 1994, the Russian State Committee for Precious Metals and Stones (Roskomdragmet) reported that the country's gold production was 146.6 mt compared with 149.5 mt in 1993. Of this 146.6 mt, 133.5 mt was mined directly as native gold while the remaining production presumably was gold produced as a byproduct of polymetallic ores or from scrap.[45]

In Russia's Magadan oblast, which had previously been Russia's largest gold producing region, gold production reportedly was 27.4 mt in 1994, which was a 6.2% decrease in production compared with 1993. The gold production association, Severovostokzoloto, which mined gold in Magadan oblast and the Chukotka Autonomous District in the Russian Far East, in 1994 reportedly produced 19.1 mt of gold in Magadan oblast and 2.9 mt in Chukotka, which was respectively a 10.1% decrease and a 16.2% decrease for these regions compared with 1993.

Production in Yakutia, now Russia's largest gold producing region, in 1994 reportedly decreased to 29.7 mt compared with production of 33.4 mt in 1993.[46]

Russia's gold reserves reportedly increased by 100 mt since 1991 to 400 mt in 1994, according to the Deputy Chairman of Roskomdragmet.[47] However, according to the Chairman of Roskomdragmet, Russia's gold reserves as of January 1, 1995 were 321.8 mt including 189 mt deposited with the Central Bank of Russia and 132.8 mt held by Roskomdragmet.[48]

In March 1995, it was announced that the state owned company Severovostokzoloto was being changed into a public stock company, offering preferred and common shares of stock. Management, the employees, and the state each were being allotted a certain percentage of the shares.[49]

The Russian Government announced a plan to extract gold from scrap materials such as electronic scrap. According to the Chairman of Roskomdragmet, the cost of obtaining precious metals from scrap was only one-tenth the cost of mining gold. Scrap reserves are estimated to contain between 200 to 600 mt of gold. In 1993, Russia reportedly extracted only 2 mt of gold from electronic scrap. Roskomdragmet reportedly formed the joint stock company Rostvordragemt for collecting and processing scrap; the new company would develop refining facilities using both domestic and western technologies. Plans called for increasing production from scrap by tenfold as quickly as possible. Among Rostvordragmet's founders reportedly were approximately 40 enterprises involved in extracting precious metals from secondary materials.[50]

Iron and Steel.—In 1994, production of both crude and rolled steel reportedly fell by 16%.[51] Although Russia had a large steel industry, much of it was in need of modernization. Open hearth production, which Russia was planning to phase out, was still the dominant method of production, accounting for about 48% of output. Oxygen converters accounted for 40% of output and electric steel about 12% of output. Electric steel reportedly was produced at 18 steel mills with a total capacity of about 10 million metric tons per year (Mmt/a). A number of the electric steel mills were outmoded and in need of modernization.[52]

In 1994, about 85% of Russia's iron and steel works had been privatized. The Russian Government in 1994 still had 15% state ownership of these privatized plants; workers owned about 45%; and the remainder was owned by outside investors. Foreign ownership, although possible, was not significant.[53]

There were approximately 1.5 million workers in the iron

and steel production sector. It was envisioned that the work force would be greatly reduced as many workers in auxiliary fields, such as health care, teachers, construction workers building employee housing, etc. would be transferred to other agencies.[54]

Kyanite.—Plans were announced to develop the Keiv kyanite deposits on the Kola Peninsula. The region contains 29 explored deposits with known ore reserves reportedly in excess of 3 billion mt. At the largest deposit, the Novaya Shuuruta, with reserves of reportedly over 1 billion mt averaging 41.5% kyanite, specialists reportedly designed equipment to extract kyanite from all types of kyanite ores with the resulting concentrate having a 67.6% kyanite content. Initial development at Novaya Shuuruta was planned using open pit mining. Kyanite development was already underway at the smaller Khizovaarskoye kyanite deposit in the adjacent Karelia region to the south.[55]

Lead and Zinc.—Lead and zinc production reportedly fell in 1994 compared with 1993. In 1994, lead consumption in Russia reportedly was about 81,000 mt and was expected to remain at this level in 1995. Zinc consumption in Russia reportedly was expected to decrease from 86,900 mt in 1994 to 85,000 mt in 1995.[56]

According to the Interfax Mining and Metals Report, (August 18-25, 1995, pages 16-17), Russia toll smelted 8,500 mt of lead and 43,400 mt of zinc in 1994 compared with 6,500 mt of lead and 80,500 mt of zinc in 1993. Based on reported Russian production of lead and zinc as well as the amount of production that was toll smelted, it appeared that for Russia to have consumed the amount of lead and zinc reported, that it must still have imported a large percentage of its lead and zinc from Kazakhstan.

Lithium.—Development was planned by the Kemerovo, Sverdlovsk, and Tomsk oblasts of the Tisul rare metals deposit in the Kuznetsk coal basin to extract lithium, cesium, and germanium. The ore would be beneficiated at Tomsk-7, a once-secret town, and at Pyshma in Tomsk oblast.

To utilize the lithium, France's Spie Bagtignolles reportedly would be the general contractor for a project to build a storage facility in Novosibirsk at the Novosibirsk chemical concentrate plant, which produced lithium hydride. According to the deputy chief engineer of the Novosibirsk plant, work was slated to begin in April 1995 and end in 1997.

The Novosibirsk plant, according to its deputy chief engineer, had a wealth of experience using lithium hydride to form components used in microelectronics and aircraft construction. The Novosibirsk plant reportedly was one of the main suppliers of Russia's nuclear power industry and exported to 10 countries including the U.S., Japan, and France. The plant was to increase production of lithium hydride once the new storage facility was built.[57]

Magnesium.—Magnesium production in Russian in 1994 compared with 1993 reportedly fell by 18%.[58] At the Avisma firm, Russia's major producer of magnesium and magnesium alloys at Berezniki in the Urals, production or these products reportedly fell 37.8% compared with 1993.[59] Although magnesium production in Russia apparently fell in 1994, the actual extent of the decrease cannot be gauged because of the seemingly contradictory nature of this reporting. In the spring of 1994, U.S. magnesium producers filed an antidumping petition against magnesium from Russia and Ukraine with the U.S. International Trade Commission (USITC) and the U.S. Department of Commerce. In a preliminary ruling, the U.S. Department of Commerce ruled that imports of pure magnesium and magnesium alloy from Russia were being dumped in the United States. In a final determination of the antidumping investigation by the USITC released in April 1995, the USITC determined that industry in the United States was materially injured or threatened with material injury by reason of pure magnesium imports from Russia and a negative determination of injury was made regarding alloy magnesium from Russia. The deposit for Russian magnesium was assessed in a range from 0% to 100.25%, depending on the importer and the producing source.

In spring 1994, the U.S. Government decided to withdraw General System of Preferences (GSP) status for magnesium imports from Russia under the provision that such status may be withdrawn if imports of a product total more than 50% of the value of all U.S. imports of that product; in the case of Russian magnesium, in 1993 it equaled 67.5% of total U.S. imports.[60]

Manganese.—Russia had no domestic manganese ore production. All manganese in the FSU was mined in Georgia, Kazakhstan, and Ukraine. Ukraine was the only FSU source of supply after manganese imports from Georgia declined. Production from Kazakhstan was not of significant magnitude. Ukraine, however, was experiencing its own production problems, and the Ukrainians were demanding near world market prices for their manganese.

To secure its manganese supply, Russia was planning to develop its own manganese mining industry, beginning with the development of deposits in the northern Urals basin where there are eight deposits with reportedly more than 40 Mmt of confirmed manganese reserves averaging 21% to 22% manganese. Other deposits slated for development included the Usin deposit in southwestern Siberia with total reserves of 150 Mmt of ore.

In 1994, development reportedly began at the Usin manganese deposit in the Salairsky mountain range in Siberia by the Nedra Sibiry mining and metallurgical complex. The ore reportedly ranges in grade from 30% to 40% manganese.[61]

Molybdenum.—Molybdenum concentrate production in

Russia, according to apparently official Russian reporting, decreased to 7,730 mt from 10,290 mt in 1993. Molybdenum consumption in 1994 reportedly was 5,100 mt and was expected to decrease 7% to 8% in 1995.[62]

Russia continued to receive shipments of molybdenum from Mongolia from the Erdenet complex developed as a joint U.S.S.R.-Mongolian-CMEA venture. In the 1980's, the U.S.S.R. was receiving more than 1,000 metric tons per year (mt/a) of molybdenum in concentrate from Mongolia; however, in 1994 Russia reportedly received only 612 mt of molybdenum from Erdenet's total exports of molybdenum in concentrate of 2,800 mt.[63] The Russian joint stock company Molybden reportedly began construction of a new ferromolybdenum plant at its Sorsk facility in East Siberia. The new plant reportedly would have a capacity of 11,000 mt/a of product, comprising either ferromolybdenum, oxide, or a combination of the two. Sorsk had produced only molybdenum concentrates with output that reportedly had been 6,000 mt/a of concentrates containing 3,700 mt of molybdenum, although the year for this output was not specified. The majority of the molybdenum concentrates from Sorsk reportedly were shipped to the Chelyabinsk plant in the Urals to produce ferromolybdenum.[64]

Nickel.—Russia reportedly produced 180,000 mt of refined nickel products in 1994, which was a 4% fall in output compared with 1993.[65] Russia reportedly exported 97,600 mt of nickel in 1994.[66] The major producer of nickel ore was the Norilsk complex, which included mining and metallurgical enterprises in East Siberia near the city of Norilsk above the Arctic Circle, on the Kola Peninsula, and in the city of Krasnoyarsk. In June 1994, privatization began of the Norilsk complex.

The Norilsk complex produced about 85% of Russia's nickel output, and the remaining 15% was produced by the Yuzhuralnikel complex in the southern Urals comprised of facilities at Orsk, Ufaley, and Rezh.

The Norilsk complex, according to its management, reportedly increased nickel mine output 3.2% in 1994 compared with 1993. Metal output reportedly increased 1.4%.[67] This report from Norilsk would be contradictory to the report of the Russian Committee for Metallurgy on the decrease in Russian nickel production unless all of the decrease occurred at production facilities in the Urals.

The Finnish company Outokumpu signed a contract in January 1995 to modernize the 15-year-old Nadezhda 2 flash smelter at Norilsk that was built by Outokumpu. The smelter, which had run continuously for 15 years without major repairs, reportedly would be shut down for a 4-month period in mid-1996. The Nadezhda 1 smelter, also built by Outokumpu, would continue operation.[68]

On February 11, 1994, it was reported in the U.S. Federal Register that the restrictions on the importation of and certification requirements for nickel and nickel-bearing materials originating in the U.S.S.R. or its successor states had been lifted. A total ban on imports of unfabricated nickel and nickel-bearing materials into the United States from the U.S.S.R. was imposed in 1983 because Soviet nickel exports could contain Cuban nickel processed in the U.S.S.R. In 1990, the ban was modified so that nickel accompanied by special certification could be imported into the United States. The latest action removed this certification requirement.

Platinum-Group Metals.—At the Norilsk complex in East Siberia, the country's only major platinum-group metals (PGM) producer, a 23.6% decrease in PGM output was reported.[69] Practically all of the FSU's PGM production was a byproduct of nickel and copper mining of mixed sulfide ores at the Norilsk complex. The PGM deposits in the Norilsk region reportedly contained an average of about three parts palladium to one part platinum with the rhodium content ranging from 1% to 11% of the total PGM, depending on the deposit. The few placer deposits being mined, on the other hand, were almost all platinum.[70]

In 1994, the process began to privatize the Norilsk complex, including all of its production units. However, the Krasnoyarsk metallurgical plant in East Siberia that produced all of Russia's PGM attempted initially to seek independence from the Norilsk complex. This move reportedly was motivated, in part, by concerns of regional officials in the Krasnoyarsk Kray that privatization would reduce revenues from the plant.[71] The dispute, however, was settled and Krasnoyarsk again began processing Norilsk material. For a period of time, reportedly, Krasnoyarsk had only been refining secondary material not supplied by Norilsk.[72]

Rare-Earth Metals.—Russia's largest rare-earth metals deposits are the Lovozerskoye and Khibinskoye on the Kola Peninsula. About 10 rare-earth elements were mined from these deposits. Proven reserves at these deposits are reportedly 200,000 mt to 250,000 mt of yttrium group metals; 150,000 mt to 170,000 mt of columbium; 35,000 mt to 40,000 mt of tantalum; and 15,000 mt to 20,000 mt of beryllium.[73]

Plans called for developing the Tisul rare-earth metals deposit in the Kuznetsk coal basin in Kemerovo oblast. The deposit would be developed jointly by representatives from the Kemerovo, Sverdlovsk, and Tomsk oblasts. It was decided that the ore would be beneficiated in Tomsk 7 and at Pyshma in Tomsk oblast.

Silicon.—The Podolsk chemicals and metals plant in the Moscow region, reportedly the FSU's largest producer of single-crystalline silicon for electronics uses, was in need of investment funds. Output in 1994 reportedly was running 20% below the 1990 level. The Podolsk plant reportedly had the capacity to produce 160 mt/a of silicon metal. However, Russian silicon did not conform to the specifications of

western consumers, which reportedly made it difficult for Podolsk to gain a share of world markets. Podolsk was planning to replace much of its equipment and was considering importing equipment to enable it to produce silicon metal that was more competitive on world markets.

The Podolsk plant had been forced to reduce production of semiconductor silicon and had experienced supply problems since the breakup of the Soviet Union with its major supplier of trichlorosilane, the Zaporozhye titanium-magnesium plant in Ukraine.

The Podolsk plant had been exporting silicon and ultra pure indium and antimony. It was reportedly the only producer of highly pure indium and antimony in the FSU. In 1994 plans, called for the Podolsk plant to export more than 80% of its output, with 55% of its exports going to the West and the remainder sent to the Integral association in Belarus, the FSU's largest electronics producer.[74]

Tin.—According to the first reported national tin production statistics from either the FSU or Russia for more than 50 years, Russia produced 10,460 mt of tin in 1994 compared with 13,100 mt in 1993.[75]

The most important tin mining region in the Russian Far East was the area west of the city of Komsomolsk on the Amur River that includes four major lode deposits. These are the Solnechnyy, which is Russia's largest, and the Festival'noye, Pereval'noye, and the Khingan deposits. Other important tin mining districts in the Russian Far East are the Deputatskiy in the Yakut-Sakha Republic, which ranks second in reserves, the Kavalerovo district in the Maritime Kray, the Yul'tin-Pevek district on the Arctic coastline of the Chukchi okrug, and the Kolyma district where mining had practically ceased.

Tin production in Russia had fallen sharply since the breakup of the U.S.S.R. Between 1992-94, according to Interfax Mining and Metals Report, 8 of Russia's 12 tin mines had been shut down owing to high taxes and energy and transport costs.[76] It was not clear, however, from this Interfax report if these were permanent or temporary shutdowns.

Tin producers were finding their arrangements with the Novosibirsk smelter, by far the largest producer of tin metal in the FSU, economically disadvantageous.[77] The Novosibirsk smelter, which had its efforts to privatize thwarted by the Russian Government and had been accused of monopolistic control, was reportedly attempting in summer 1994 to unite Russia's tin mining and metallurgical enterprises into a single financial and industrial group to improve their financial situation.[78] The British firm Anglo-Russian Metals (ARMet Ltd.) reportedly had acquired a 14% interest in the Novosibirsk tin smelter.

Reportedly 20% of the metal produced at Novosibirsk in 1994 was toll smelted. According to Interfax Mining and Metals Report (August 18-25, pages 16-17), Russia toll smelted 1,100 mt of tin in 1994 compared with 800,000 mt in 1993. Tolling partners included ARMet Ltd. and France's Transomin Copper SA., with the remaining production coming from domestically produced concentrates. Except for toll smelted tin, officials at the Novosibirsk tin smelter reported that all metal produced was sent to domestic costumers.[79] The Novosibirsk plant reportedly exported 277,000 mt of tin in 1994 mostly to the United Kingdom and France in conjunction with western firms including ARMet and Transomin. Presumably these reported exports were toll smelted and did not account for the export of all toll smelted tin.

The Novosibirsk smelter was reportedly facing a serious shortage of tin concentrates after one of its major suppliers, the Khrustalnyy plant, decided to end all shipments of tin concentrates to the Russian market. The Novosibirsk smelter in December 1994 reportedly signed a contract with an American firm to ship 500,000 mt of concentrate by the end of the year.[80]

Russia contained about 80% of the reserves and mined more than 90% of the tin in the FSU. Russia also had the only tin smelters at Novosibirsk, Podolsk, and Ryazan. The Russian Far East contained 95% of Russia's known reserves.

Titanium.—Russia had one titanium sponge producing plant, the Avisma plant at Berezniki in the Urals, with an estimated capacity of 35,000 mt/a of sponge. In addition to sponge, Avisma, which was a nonvacuum distillation plant, produced sponge fines graded according to purity and size.[81] In 1994, the Avisma plant reportedly was working at less than 30% capacity and was expected to maintain this production level in 1995.

About 90% of the CIS's titanium mill products reportedly were produced by the Verkhnaya Sada plant in Russia with an estimated capacity of 100,000 mt/a of mill products. Large Russian exports were the result of the dramatic fall in domestic consumption by the defense industry, which used to produce, among other things, titanium hulled submarines.[82] In 1994, Russia engaged in large exports of titanium sponge with a great increase in exports to the United States. The low prices for Russian titanium sponge exports resulted in sponge producers and fabricators purchasing this metal. The Boeing Co. of Seattle, Washington, reported that it had qualified the Verkhnaya Sada metallurgical plant, Russia's largest manufacturer of titanium mill products, as a supplier of titanium for airframes.[83] The titanium sponge for the mill products for Boeing was to be produced by the Avisma plant. Avisma in 1994 reportedly produced 10,000 mt of sponge and exported about 9,000 mt of titanium sponge to western markets.[84] Avsima's main domestic consumer, the Verkkhnaya Sada plant in Russia, reportedly, was unable to pay for sponge from Avisma and primarily used titanium from state stockpiles.[85]

The negative impact of increased exports of titanium products in 1993-94 on titanium prices raised concerns among U.S. and world producers.[86] Increased FSU titanium

sponge exports to Europe in 1994 were reported as well as the initiation of FSU exports to Japan. FSU exports of both titanium sponge and mill products were considered a contributing factor to the oversupply of titanium on world markets, which led to the closure of titanium production capacities in the United States and other countries.

In 1994, according to the chairman of the Russian Metallurgical Committee, Russia exported 3,500 mt of rolled titanium compared with 1,700 mt in 1993; in 1995, he projected Russia would export 4,500 mt of rolled titanium. Domestic consumers of rolled titanium reportedly consumed 6,000 mt in 1994 and were projected to consume 7,200 mt in 1995; the 1994 rolled titanium consumption was far below the 1993 level of 15,700 mt. Output of rolled titanium in 1994 was reportedly only 30% of the 1989 level.[87]

Issues regarding the production and sale of titanium within the entire CIS were addressed by the association of titanium producers, Titan, that was established in 1991 in was then the U.S.S.R.[88]

Russia had been receiving its titanium raw materials from Ukraine and had a program to develop its own titanium raw material resources to alleviate this dependency. A Russian-Singapore joint venture, Marina, together with the Baikal-Amur Mainline Railroad (BAM) and a business association from the village of Tynda in the BAM region, began the development of titanium raw material reserves in the vicinity of the BAM railroad.[89]

The Uraltitan-93 company established to develop the Medvedskoye ilmenite deposit near the towns of Kusa and Zlatoust in the Urals began development in April 1994; the complex reportedly would have a final design capacity to mine and process 5.5 Mmt/a of ore to produce 80,000 mt/a of concentrate.[90]

Tungsten.—According to apparently the first officially reported tungsten production statistics in more than 50 years, (Interfax Mining and Metals Report, June 23-30, 1995, page 12), Russia produced 6,580 mt of tungsten concentrate in 1994 compared with 12,860 mt in 1993. It was not specified, however, if these production numbers referred to the gross weight of the concentrate, the tungsten trioxide content, the tungsten content, or to some other measure.

Tungsten consumption reportedly was 4,300 mt in 1994 and was expected to drop 7% to 8% in 1995.[91] It was not, however, specified if this consumption figure was for tungsten concentrate, tungsten trioxide, or pure tungsten.

Russia reportedly had six enterprises producing tungsten concentrates. The Tyrnyauz tungsten-molybdenum mining complex in the North Caucasus was Russia's main tungsten producer. The majority of the output from Tyrny-Auz was processed into ammonium paratungstate (APT) and oxide at the Nalchik plant in the North Caucasus.[92]

Tyrny Auz reportedly had idle capacity for much of 1994 both owing to a federal program to reduce metal output and also because of economic problems. In 1994, Tyrny Auz reportedly had almost no tungsten exports compared with 1993 when Tyrny Auz exported about 40% of its output.[93] Nevertheless, Russia reportedly had large stocks of tungsten metal totaling several thousand metric tons that it was reportedly seeking to export in 1994.[94]

Russia was considering reducing capacities at its tungsten mining enterprises owing to the decline in the economies of the CIS countries and to economic problems in the tungsten industry. Mining apparently had stopped at the Lermontov deposit in Primorye in the Russia Far East, which had produced about 15% of Russia's tungsten output.[95]

Vanadium.—Uncertainties concerning the quantity of Russian vanadium exports to world markets were a source of concern. Russia had an estimated capacity to produce 17,000 mt of vanadium with 1994 production estimated at less than 10,000 mt.[96]

In 1994, the U.S. International Trade Commission in a preliminary determination stated that the U.S. ferrovanadium industry was facing injury from imports from Russia.[97]

Zirconium.—Russia's Kovdor iron ore mining and enrichment complex on the Kola Peninsula entered into a joint venture with the Norwegian company DM Trading to construct a plant to process baddeleyite concentrate near the Norwegian city of Navrik.[98] A discovery was reported of a zircon-ilmenite sands deposit near the town of Tara in Omsk oblast in Siberia. Reportedly, mineral reserves are large enough to supply Russia and also to export. This deposit was reportedly the richest in Russia, and the first test batch of zircon-ilmenite concentrate had been obtained and analyzed.[99]

A feasibility study was being conducted for the development of a mining and beneficiation complex for exploiting titanium-zirconium deposits in the Gagino and Lukoyanov districts of the Nizhny Novgorod region. The complex reportedly was projected to have a design capacity to produce 37,100 mt of zirconium, 12,000 mt of rutile, and 200,000 mt of ilmenite per year with initial output planned in 1998.[100]

Industrial Minerals

Barite.—Russia was planning to solicit foreign investment for development of the Khoilinskoye barite deposit with reserves estimated at 10 Mmt with an 84% barite content. Barite production at Khoilinskoye was projected to reach 160,000 mt/a by 1999. The feasibility study envisaged exporting about 55% of the barite output.[101]

Boron.—The Primorskiy Industrial Association Bor, with a design capacity of about 140,000 mt/a of boric acid, mined all of the boron raw material and had been producing about 85% of the boric acid in the FSU. There were two other smaller boron production enterprises in Russia; the Amur

River complex with a reported capacity of 8,000 mt/a of boric acid and the Alga River Chemical complex with a capacity of 12,000 mt/a of boric acid. However, by 1994, these two complexes accounted for only about 5% of boric acid output.

The Bor association produced 11 types of boron-related chemicals with boric acid, boric anhydride, calcium borate, and datolite concentrate the major products. In 1994, the Bor association apparently was operating at less than 70% of its design capacity and was experiencing serious financial problems.

Diamond.—In 1994, diamond output reportedly increased by 7% compared with 1993, according to the President of Almazy-Rossii-Sakha, Russia's main diamond-producing firm. Almazy-Rossii-Sakha's goals for 1995 included completing development of the Yubeleyny diamond mine near the Arctic Circle and commissioning the new Botubobinskaya diamond pipe that had been discovered in March 1994.

Russia for the first time reported statistics on exports of uncut diamonds in the journal Foreign Trade (Number 1-2, 1995, page 43), published by the Ministry of Foreign Economic Relations of the Russian Federation. It was reported in this journal by the Russian State Committee for Statistics that in 1994 Russia exported 21,585,700 carats of uncut diamonds valued at $2,178,700,000 and, in 1993, 11,303,000 carats of uncut diamonds valued at $1,417,100,000. Although for 1994 this was a 91% increase in the amount of uncut stones exported compared with 1993, it was only a 53% increase in their value. In 1994, uncut diamonds accounted for 4.5% of total export earnings compared with 3.2% in 1993. In 1994, Russia continued to sell 95% of its gem diamond output through De Beers Central Selling Organization (CSO). Russia retained 5% of its output to sell freely.

Emeralds.—Russian emerald mines were in the Ural Mountains region and under the administration of the Malyshevskoye mining administration. The Ural Emerald underground mine (Izumrudniye kopi Urala) in Sverdlovsk oblast, a subsidiary of the Malyshevskoye mining administration, reportedly had been producing about 95% of Russia's emerald output, or about 700 kilograms (kg) per year, which is reportedly equal to about 3.7 million carats.[102] The Uralkvartzsamotsvety division, another subsidiary of the Malyshevskoye mining administration, had been producing the remaining 5% of the country's emeralds at a nearby open pit at the Malyshevskoye deposit and at the Krupskaya deposits.[103] The Malyshevskoye mining administration was also a major producer of beryllium ores.

Production from the Urals emerald mines in 1994 was reportedly projected to be 3.7 million carats of emeralds.[104]

Fluorspar.—In 1994, Russia continued to import fluorspar from its joint venture in Mongolia, which was formed during the Soviet period. In 1994, Russia reportedly imported 88,000 mt of flotation fluorspar concentrate and 17,000 mt of lumpy fluorite ore from Mongolia.[105]

Mica.—Mica production in Russia reportedly was 129,000 mt in 1993, although the type of mica was not specified106;[106] this was the first reported FSU mica production number since mica output for decades had not been published. Russia contained practically of the FSU mica reserves. Mica was produced at four mining and beneficiation complexes in Russia, the Mamslyuda complex in the Mama-Chuya mica district of Irkutsk oblast, the Karelslyuda muscovite complex in Karelia, the Kovdor muscovite and phlogopite complex on the Kola Peninsula, and the Aldan phlogopite complex in Yakutia.

Phosphate.—During the 1980's, the Apatit complex on the Kola Peninsula was mining 60 Mmt/a of ore and producing between 19 and 20 Mmt/a of apatite concentrate with a phosphorus pentoxide (P_2O_5) content of more than 39%. More than 3 Mmt/a of concentrate was exported. Since the breakup of the U.S.S.R., however, there had been a precipitous drop in apatite concentrate production with production falling about 60% compared with peak 1980's levels and exports decreasing by more than two-thirds. In May 1994, production reportedly was halted as the Apatit complex ran out of money. The Russian Government still was a part owner of the Apatit complex which employed close to 20,000 persons.[107]

Potash.—Russia reportedly produced 2.5 Mmt of potash in 1994, which was a decrease in output from 1993 when Russia reportedly produced 2.6 Mmt. In 1994, Russia's potash exports reportedly increased by almost 30% to more than 1.9 Mmt compared with almost 1.5 Mmt in 1993. Russia's large and increasing exports were caused, in part, by the inability of domestic agricultural producers to pay for potash.

Potash was produced by the Uralkaliy and Silvinit enterprises in the Perm region of the Urals that mine the Verkhnekamsk deposit. Reserves at Verkhnekamsk were reportedly adequate for another 100 years of potash mining. Potash was mined underground at a depth of 250 to 500 meters (m).

Russia's potash consumption had fallen considerably and potash imports from Belarus had practically ceased. The large drop in domestic potash consumption was attributed to economic problems in the agricultural sector, which lacked the funds to purchase potash. There was considerable concern about the long-term detrimental effects of potash deprivation on the soil.

Uralkaliy signed a contract with France's Societe Commerciale des Potasses for technical assistance aimed at helping Uralkaliy make the transition to a market economy

and also to help solve the problem of low domestic demand in Russia and falling demand in major potash consuming countries, such as Ukraine, that Russia had supplied. Furthermore, aid also was needed to improve the potash warehousing and distribution systems.[108]

Mineral Fuels

Coal.—Russia reportedly produced 271 Mmt of coal in 1994, 261.2 Mmt of which reportedly was produced by the Russian State Coal Corporation (Rosugol), which administered almost all Russian coal mines. Of this 261.2 Mmt, open pit mining accounted for 148.9 Mmt and underground mining 112.3 Mmt. Production in 1994 in Russia's largest coal producing region, the Kuznetsk basin (Kuzbas), reportedly was 93.7 Mmt. The amount produced by Rosugol in 1994 was less than that produced in 1993. The General Director of Rosugol attributed most of the production decline to a lack of investment as total investment in the coal industry, including expenditure on social and other nonproduction facilities, which in 1994 was only 40% of the 1993 level.[109]

In 1994, Russia began shutting down 14 of 46 open pits it was planning to close; in 1995, it was planned to continue shutting down another 22 open pits.[110] The closures were part of a program to close about 80 coal mines by the year 2000 that would entail the loss of about 450,000 jobs. In 1994, 47,000 jobs reportedly were lost and the job loss figure for 1995 was projected to be 72,000.[111] Plans called for Russia to have privatized 80% of its coal industry by yearend 1994, according to the head of the state coal company Rosugol. Strategic groups, such as research institutes, exploration groups, and mine rescue teams, were expected to remain under state control.[112]

Russia reportedly exported 17.5 Mmt of coal outside the CIS in 1994 compared with 20.2 Mmt of exports in 1993. Additional exports to countries of the FSU were projected to be about 5 Mmt. The Kuznetsk basin in Siberia accounted for most of Russia's exports to the West. Ukraine, the second largest coal producer in the FSU, was a major importer of Russian coal for its steel industry.[113]

Russia was planning to expand its own coal mining equipment manufacturing industry to overcome Russia's shortage of equipment; the country planned to convert defense plants into manufacturing this type of equipment, which had been concentrated in Ukraine.[114]

Priorities for the Russian coal industry included developing environmentally clean methods of coal production, introducing technology in coal preparation plants to produce cleaner and more calorific fuels, and improving the efficiency of coal utilization. The coal industry reportedly needed to renovate and reequip existing mines and beneficiation plants and to develop new large-scale mines using advanced mining technology.

Natural Gas.—According to the Russian State Statistical Committee, natural gas production in Russia in 1994 decreased by 1.5% to 581.02 billion cubic meters (m^3).[115] However, according to the CIS Statistics Committee, natural gas production in Russia in 1994 decreased 2% to 607 billion m^3.[116] According to the Russian State Statistical Committee, Russia exported 109 billion m^3 of natural gas outside the CIS in 1994 compared with 96 billion m^3 in 1993. In addition, Russia reportedly exported 78 billion m^3 of natural gas to CIS countries, about the same level as in 1993.

The Gazprom concern, which controlled practically all natural gas production in Russia, was offering shares to investors.[117] The Government reportedly retained 40% of the shares with Gazprom, its workers, and indigenous peoples from the regions obtaining shares. Reportedly 10% of the shares were to be sold to foreign investors at a later date. However, there were problems in Gazprom's pricing and marketing of these shares to foreign investors that were keeping foreigners from investing.[118]

Nuclear Power.—The generation of power at nuclear powerplants in Russia in 1994 reportedly decreased by 18% compared with 1993.[119] In 1994, reportedly there was a total of 127 accidents at nuclear powerplants, which was 32 fewer compared with 1993. During the year, reportedly capacity utilization at nuclear powerplants fell to 52%. A shortage of funds had halted the program for the replacement of old power units as well as the construction of new ones.[120]

In a contract that aroused controversy in the West, Russia agreed to cooperate with Iran in constructing a 1-million-kilowatt water cooled nuclear reactor in Iran and to train Iranian personnel in the use of such reactors in Russia. According to Russia's Ministry of Atomic Power, the nuclear reactor that Russia was to build in Iran could not be used for military purposes because it would not be capable of generating weapons grade plutonium. Western countries, including the United States, however, opposed this agreement, believing that it would aid Iran in developing a nuclear weapons program.[121]

Petroleum.—Oil production reportedly fell in 1994 to 315.7 Mmt, according to the Russian State Statistical Committee. This figure included all crude oil production from Russian companies and joint ventures and excluded any production from Chechnya.

Refineries in 1994 reportedly processed 176.7 Mmt of crude oil which was reportedly 15.2% less than in 1993. This figure, however, did not include the refinery output of joint ventures.[122]

A number of western firms were seeking to participate in oil development in Russia in areas that included West Siberia, the Komi Republic, and the Russian Far East. Of major interest in 1994 was acquiring development rights on Sakhalin Island in the Russian Far East.[123]

In 1994, there were four major projects involving foreign investment in the oil sector. These were the Sakhalin-1 project comprised of the U.S.-based Exxon Corp. and the Japanese firm Sodeco; Sakhalin-2 comprised of the U.S.-based Marathon Co. and McDermott, Japan's Mitsui Ltd. and Mitsubishi Ltd., and the Anglo-Dutch firm Shell; Sakhalin-3 comprised of Exxon Corp., Mobil Corp., and Texaco of the United States; and the Timano-Pechorskiy project comprised Texaco, Exxon Corp., and Amoco Corp. of the United States, and Norway's Norsk Hydro. Only the Sakhalin-2 agreement had actually been concluded and provided for investments of $8 billion.[124]

The Russian Government had restructured the Russian oil industry by placing most of the state enterprises under the control of a large holding company Rosneft comprised of three holding companies called Lukoil, Yukos, and Surgutneftgas.

Lukoil had been one of the major participants in foreign joint ventures and had attained a 10% share in an agreement Azerbaijan had made with a consortium of foreign companies for the development of offshore oilfields in the Caspian Sea. Besides the deal in Azerbaijan, Lukoil reportedly was investing in joint ventures in Egypt and Tunisia. It aslo had signed a contract with the Swiss engineering company Asea Brown Boveri to construct a refinery near the port of Novorossiysk to process crude oil both for the domestic market and for export. Lukoil, which produced about 15% of Russia's oil output, was further investing in a network of gasoline stations in Russia. Lukoil, as part of Russia's privatization program, had been selling shares both domestically and to foreign investors. The Russian Government, however, planned to hold 45% of Lukoil's shares for at least a 3-year period.[125]

At the beginning of 1995, it was announced that Russia had removed all quotas on oil exports. This decision reportedly would enable Russia to increase its exports to world markets where prices reportedly were three times higher than on the domestic market. The lifting of the export restrictions, it was stated, also would force a rise in domestic prices to prevent a massive export of Russian oil. It was expected that domestic oil prices would rise to at least one-half of the world level, which would make the domestic market competitive given the transportation costs and export duties for exporting oil. It was hoped that this rise in domestic energy prices, in turn, would help provide clearer market signals regarding energy costs as a component of the cost of production.[126] According to a statement by the Russian Minister for Foreign Economic Relations, domestic prices for oil and petroleum products at yearend 1994 were at only 30% of the world level.[127]

Despite this decree, it was reported in the Financial Times, (London, February 4-5, 1995, page 2), that Western oil companies and economists feared that the old restrictions were being perpetuated under the guise of the new decree enacted under International Monetary Fund (IMF) pressure to liberalize oil trade to receive an IMF loan. The newly created commissions, according to the Financial Times report, would be granting access to export pipelines that had limited capacity, and thus the commissions could ensure, as under the old system, set amounts for domestic consumers and determine the amount to be exported.[128]

Reportedly, the Russian oil industry was comprised of 840 oilfields with 148,000 oil wells, 48,300 km of main oil pipeline, and 28 oil refineries that could refine more than 300 Mmt per year of oil. The oil industry and its auxiliary services employed about 900,000 people.[129]

At existing production areas, reserves reportedly were being depleted; reserves in the Volga basin and Urals were 68% depleted; in the Caucasus, 83% depleted; and in the Komi Republic, 48% depleted. In West Siberia, which has 73% of recoverable reserves, reserves averaged 40% depletion at operating fields. The accessibility and quality of the remaining reserves in West Siberia were less than at fields under exploitation with the remaining reserves often in small, deep fields in rock with low permeability and complex structures.[130]

Uranium.—With the dissolution of the U.S.S.R., the major agreement governing cooperation between the countries of the FSU in the area of nuclear power and materials was the Agreement on the Basic Principles of Cooperation in the Peaceful Use of Nuclear Energy signed in Minsk on June 26, 1992. Lithuania, which has a nuclear powerplant, was also cooperating with Russia. Russia's nuclear industry was not self-sufficient; some of the key elements for its nuclear industry were now outside its borders including the production of beryllium at the Ulbinsky plant in Oskemen, Kazakhstan, and the production of zirconium, hafnium, and ion exchange resins in Ukraine.

Russia's Ministry of Atomic Energy (Minatom) administered a complex with a complete cycle for work in all stages of nuclear fuel production. Minatom employed approximately 1 million people. Russia reportedly has one-third of the uranium reserves of the FSU. Uranium in Russia was mined by the Priargunskiy mining and processing complex near Krasnokamensk in Chita oblast, East Siberia, with a capacity to produce approximately 4,000 mt/a of uranium (U content).

Besides mining uranium, about 600 mt of natural uranium equivalent also was recovered from processing spent fuel from powerplants, while an additional amount was made available from spent fuel from plutonium production and from processing wastes at beneficiation plants. Plants for the conversion of uranium into uranium hexaflouride were located at the same sites as uranium concentration plants in Verkhniy Kamsk, near Yekatarinburg in the Urals, and Angarsk, 30 kilometers (km) north of Irkutsk in East Siberia. Other concentration plants existed at Tomsk and Krasnoyarsk in East Siberia. The Tomsk-7 and Krasnoyark-6 plants processed fuel from three operational reactors that

produced plutonium. Reactor fuel production in Russia occurred at a chemical concentrate plant in Novosibirsk, East Siberia and a machine building plant at Elektrostal about 30 km east of Moscow. A significant portion of the fuel pellets used to produce reactor fuel at these plants was obtained from the Ulbinskiy metallurgical plant in Oskemen, Kazakhstan.[131]

The existence of the Chepetskiy machine building plant was revealed in the city of Glazov in Udmurtiya on the Chepets River. It was reportedly a unique plant for refining uranium, whose existence was a closely kept secret in the U.S.S.R. with the plant only being designated by a post office box number. The plant, along with producing uranium for the nuclear power industry, produced uranium for military purposes. In addition, the plant produced calcium used in metallurgy, zirconium, and rare metals.[132] Russia reportedly had enough uranium stockpiled to run its power plants for another 50 years, according to the First Deputy Minister of Atomic Energy. Therefore, the Deputy Minister stated Russia would not have to be concerned that production was falling at its only uranium mine at the Priargunskiy mining and chemical complex in Chita oblast. The Priargunsky complex extracted ore and processed it, producing about 3,000 mt/a of uranium. This uranium could be exported because of the available supplies from the large stockpiles.[133]

The first reported export statistics for Russian uranium were published in the Interfax News Agency Mining and Metals Report (June 23-30, 1995, page 13). According to this data from the Russian State Statistics Committee, Russia in 1994 exported 6,691 mt of natural uranium valued at $143,841,000.

In March 1994, the U.S. Department of Commerce announced a new agreement applying to Russian uranium shipments whereby imports of Russian uranium must be matched in equal portions with newly produced U.S. uranium, and any given sale would be made up of equal amounts of Russian and U.S. material. This agreement was an amendment to the 1992 U.S.-Russian antidumping suspension agreement and replaced the price-linked import quota system.[134]

Reserves

Russia used the Soviet reserve classification system, which was not comparable to that used in the United States, and data on reserves for the majority of minerals were a state secret. For a detailed explanation of the Soviet reserve classification system, refer to the Mineral Industry of Russia chapter, pages 287-289 in the 1993 Bureau of Mines Minerals Yearbook, Volume III, Mineral Industries of Europe and Central Eurasia.

Infrastructure

Russia faces the problem of depleting older deposits in areas with developed infrastructure while new deposits are in remote eastern and northern areas with severe climates and lack of infrastructure. The country has no cross-country road system and practically no developed road networks in most of the northern and northeastern portions of the country. Furthermore, most of the entire rail network is concentrated in the western part of the country. There are only two rail lines traversing the eastern part of the country, the trans-Siberian and the BAM, with the BAM only partially operational and lacking connecting lines to areas of potential mineral development. Air transportation plays a vital role in passenger and industrial transport owing to the vast distances and the lack of other transport means.

In some eastern and northern parts of the country, the Russians rely on a combination of road, rail, river, and sea for minerals transport. The Soviets had developed a number of deposits depending primarily on air transport for freighting supplies and shipping minerals. For oil and gas, the Soviets had developed extensive pipeline networks that are now in great need of expensive maintenance and repair.

Outlook

The Russian mineral industry was in a state of transition toward adopting market economy criteria for mineral production, including freeing prices, introducing private ownership, and encouraging foreign investment. Although further along these roads than most of the other former republics of the U.S.S.R., Russia was still making the legal and institutional changes needed for this transition.

A significant percentage of Russia's mineral production was dependent on either raw material supplies, processing facilities, or equipment from other countries of the FSU. These countries, in turn, were dependent on Russia for a major portion of their mineral supplies. Economic and political transitions in these new countries, as they occur, could determine the future quantity and terms of trade between these new countries in a large number of mineral commodities.

In the area of foreign investment, Russia was still developing and implementing its policies and regulations regarding foreign investment in mineral development. The pace of foreign investment would greatly depend on the formation of policies, laws, and institutions that would secure the rights of foreign investors. Russia, with adequate investment, had the potential to greatly increase mineral output, but this would depend on the development of a more secure investment environment.

---

[1]Text prepared Aug. 1995.

[2]Summary of World Broadcasts, British Broadcasting Corp., Reading England, SOV-95-001, p. 40, Interfax in English, 1434 gmt, Jan. 17, 1995.

[3]Rossiyskaya gazeta, Moscow, Jan. 21, 1995, p. 4; Izvestiya, Moscow, Jan.

24, 1994, p. 6.
[4]Interfax Mining and Metals Report, Jan. 6-13, 1995, pp. 12-13.
[5]Infomine, London, Feb. 8, 1995, p. 2.
[6]Work cited in footnote 3.
[7]Interfax Mining and Metals Report, Feb. 10-17, 1995, p. 16.
[8]Summary of World Broadcasts, British Broadcasting Corp., Reading England, p. WD/1, Dec. 24, 1993, ITAR-TASS in English, Dec. 14, 1993.
[9]Interfax Mining and Metals Report, Denver, CO, Dec. 3-10, 1993, pp. 11-12.
[10]Izvestiya, Moscow, Dec. 23, 1994, p. 3.
[11]Argumenty i Fakty, Moscow, No. 5, Feb. 1995, p. 7.
[12]Moskovskiye Novosti, Moscow, No. 64, Dec. 18-25, 1994, p. 30.
[13]Interfax Business Report, Denver, CO, Jan. 16, 1995, p. 5.
[14]Rossiyskiye Vesti, Moscow, Nov. 30, 1993, p. 2.
[15]New York Times, New York, NY, Oct. 26, 1994.
[16]Foreign Broadcast Information Service, U.S. Government publication, Washington, DC. SOV-95-032, Feb. 16, 1995, ITAR-TASS in English, 0924 gmt, Feb. 16, 1995.
[17]———. Feb. 21, 1995, p. 34, Interfax, in English, 1145 gmt, Feb. 21 1995.
[18]Interfax Business Report, Denver, CO, Mar. 1, 1995, pp. 5-6.
[19]New York Times, New York, NY, Nov. 21, 1994, pp. 1-A8.
[20]Interfax Statistical Report, Denver, CO, Feb. 10-17, 1995, p. 27.
[21]Interfax Mining and Metals Report, Denver, CO, Feb. 17-24,1995, p. 2.
[22]Aluminum MOU Working Group, Mar. 9, 1995.
[23]Interfax Business Report, Denver, CO, Dec. 22, 1994, pp. 3-4.
[24]Work cited in footnote 23.
[25]Interfax Business Report, Denver, CO, Nov. 16, 1994, p. 5.
[26]———. Dec. 22, 1994, pp. 3-4.
[27]Interfax Mining and Metals Report, Denver, CO, July 29-Aug. 5, 1994, p. 8.
[28]Izvestiya, Moscow, Dec. 21, 1994, p. 5.
[29]Interfax Business Report, Denver, CO, Mar. 3, 1995, p. 8.
[30]———. Dec. 9, 1994, p. 8.
[31]———. Oct. 28, 1994, p. 6.
[32]American Metal Market, New York, NY, Oct. 14, 1994, p. 2.
[33]———. July 20, 1994, p. 2.
[34]Interfax Mining and Metals Report, Denver, CO, Nov. 18-25, 1994, p. 7.
[35]———. July 22-29, 1994, p. 9.
[36]———. Feb. 3-10, 1995, p. 8.
[37]———. Jan. 20-27, 1995, p. 3. Summary of World Broadcasts, British Broadcasting Corp., Reading, England, SU W/0363, p. WB/1, Dec. 16, 1995.
[38]Interfax Mining and Metals Report, Denver, CO, Nov. 11-18, 1994, p. 6.
[39]See Interfax Business Report, Denver, CO, Jan. 5, 1995, p. 3. Interfax Mining and Metals Report, Denver, CO, Dec. 30, 1994-Jan. 6, 1995, p. 7 Summary of World Broadcasts, British Broadcasting Corp., Reading, England, SU W/0368, p. WD/12, Jan. 27, 1995, Interfax News Agency, Moscow, in English, 1651 gmt. Jan. 24, 1995.
[40]Mining Journal, London, Sept. 17, 1993, p. 299.
[41]Infomine, London, Feb. 1, 1995, p. 1.
[42]Reuters, Sept. 28, 1994.
[43]Interfax Business Report, Denver, CO, Apr. 5, 1995, p. 6.
[44]Interfax Mining and Metals Report, Denver, CO, Feb. 17-24, 1995, p. 2.
[45]———. Jan. 6-13, 1995, p. 3.
[46]———. pp. 3-4.
[47]———. Dec. 30, 1994-Jan. 6, 1995, p. 4.
[48]———. Feb. 2-10, 1995, p. 5.
[49]Interfax Business Report, Denver, CO, Mar. 30, 1995, p. 5.
[50]American Metal Market, New York, NY, July 25, 1994, p. 8.
[51]Infomine, London, Feb. 29, 1995, p. 4.
[52]Metal Bulletin Monthly, London, Oct. 1994, p. 23.
[53]Work cited in footnote 52.
[54]American Metal Market, New York, NY, July 7, 1994, pp. 1-7.
[55]Work cited in footnote 54, p. 10.
[56]Interfax Mining and Metals Report, Denver, CO, Jan. 6-13, 1995, p. 13.
[57]Interfax Business Report, Denver, CO, Mar. 30, 1955, p. 5.
[58]Infomine, London, Feb. 29, 1995, p. 3, source: Russian Committee of Metallurgy.
[59]———. Mar. 22, 1995, p. 2.
[60]———. Apr. 6, 1994, p. 16.
[61]———. Feb. 8, 1995, p. 3.
[62]Interfax Mining and Metals Report, Denver, CO, Jan. 6-13, 1995, p. 13.
[63]———. Mar. 10-17, 1995, p. 16.
[64]Metal Bulletin, London, May 12, 1994, p. 13.
[65]Infomine, London, Feb. 29, 1995, p. 3, source: Russian Committee of Metallurgy.
[66]———. Feb. 1, 1995, p. 4.
[67]Interfax Business Report, Denver, CO, Jan. 5, 1995, p. 3.
[68]American Metal Market, New York, NY, Jan. 19, 1995, p. 2.
[69]Work cited in footnote 67.
[70]Interfax Mining and Metals Report, Denver, CO, Oct. 8-15, 1993, pp. 7-8.
[71]———. Oct. 8-15, 1993, pp. 7-8.
[72]American Metal Market, New York, NY, Aug. 8, 1994, p. 5.
[73]Interfax Mining and Metals Report, Denver, CO, Nov. 18-25, 1994, p. 16.
[74]———. Aug. 26-Sept. 2, 1994, pp. 7-8.
[75]———. June 23-30, 1995, p. 12.
[76]Interfax Mining and Metals Report, Denver, CO, July 15-22, 1994, p. 10.
[77]———. June 17-24, 1994, p. 8.
[78]———. July 15-22, 1994, p. 10. ———. May 27-June 3, 1994, pp. 18-19.
[79]Interfax Business Reports, Feb. 27, 1995, p. 5.
[80]Interfax Mining and Metals Report, Denver, CO, Jan. 6-13, 1995, p. 7.
[81]American Metal Market, New York, NY, Sept. 30, 1994, Titanium supplement, pp. 1-15A.
[82]Work cited in footnote 81.
[83]Work cited in footnote 82.
[84]Infomine, London, Apr. 5, 1995, p. 3.
[85]Work cited in footnote 81.
[86]American Metal Market, New York, NY, Feb. 17, 1994, p. 2.
[87]Interfax Mining and Metals Report, New York, NY, Jan. 20-27, 1995, p. 12.
[88]Work cited in footnote 87.
[89]Interfax Business Report, Denver, CO, Apr. 15, 1994, p. 6.
[90]———. May 6, 1994, p. 9.
[91]Interfax Mining Report, Denver, CO, Jan. 6-13, 1995, p. 13.
[92]Metal Bulletin, New York, NY. Aug. 16, 1993, p. 10.
[93]Interfax Mining and Metals Report, Denver, CO, Feb. 24-Mar. 3, 1995, p. 13.
[94]Interfax Business Report, Denver, CO, Feb. 25, 1993, p. 5.
[95]Work cited in footnote 94.
[96]Metal Bulletin, London, Jan. 24, 1994, p. 11.
[97]American Metal Market, New York, NY, July 14, 1994, p. 16.
[98]Interfax Mining and Metals Report, Denver, CO, Sept. 3-19, 1993, p. 11.
[99]Foreign Broadcast Information Service, U.S. Govt. publication, Washington, DC, Jan. 14, 1994, p. WD14, Russia's Radio Moscow, in Russian, 1000 gmt, Jan. 4, 1994.
[100]Interfax Mining and Metals Report, Denver, CO, June 3-10, 1994, p. 15.
[101]———. Nov.19-26, 1993, p. 5.
[102]———. July 29-Aug. 5, 1994, p. 5.
[103]Work cited in footnote 102.
[104]Interfax Mining and Metals Report, Denver, CO, Nov. 11-18, 1994, p. 6.
[105]———. Mar. 10-17, 1995, p. 17.
[106]U.S. Bureau of Mines Minerals Questionnaire, Russia, 1993.
[107]Interfax Mining and Metals Report, Denver, CO, Sept. 30-Oct. 7, 1994, p. 8.
[108]Phosphorus and Potassium, London, No. 192. July-Aug. 1994.
[109]Interfax Mining and Metals Report, Denver, CO, Jan. 6-13, 1995, p. 3 ———. Jan. 13-20, 1995, pp. 12-13.
[110]See works cited in footnote 109.
[111]Summary of World Broadcasts, U.S. Government publication, Washington, DC, SUW/ 0367, p. WD/6, Jan. 20, 1995, Interfax News Agency, Moscow, in Russian, 0848 gmt, Jan. 17, 1995.
[112]Mining Journal, London, Aug. 8, 1994, p. 19.
[113]Interfax Business Report, Denver, CO, Dec. 7, 1994, p. 5.
[114]Interfax Mining and Metals Report, Denver, CO, Sept. 30-Oct. 7, 1994, p. 14.
[115]Interfax Business Report, Denver, CO, Jan. 16, 1995, p. 2.
[116]———. Feb. 7, 1995, p. 5.
[117]———. Mar. 1, 1995, p. 6.
[118]Wall Street Journal, New York, NY, Apr. 3, 1995, p. A10.
[119]Foreign Broadcast Information Service, U.S. Government publication, Washington, DC, SOV-95-038, Feb. 27, 1995, p. 15, ITAR-TASS in English, 1329 gmt, Feb. 25, 1995.
[120]Segodnya, Moscow, Jan. 12, 1995, p. 9.
[121]Foreign Broadcast Information Service, U.S. Government publication, Washington, DC, SOV-95-033, Feb. 17, 1995, p. 6, ITAR-TASS World Service in Russian, 0958 gmt, Feb. 16, 1995.
[122]Interfax Business Report, Denver, CO, Jan. 16, 1995, p. 2.
[123]Interfax Petroleum Report, Denver, CO, Feb. 18-25, 1994, p. 12.

[124]Moscow News, No. 46, Nov. 18-24, 1994, p. 7.

[125]New York Times, New York, NY, Oct. 22, 1994, pp. D1-5.

[126]Foreign Broadcast Information Service, U.S. Government publication, Washington, DC, SOV-95-001, Jan. 17, 1995, p. 48. ITAR-TASS in English, 1303 gmt, Jan. 13, 1995.

[127]Delovoy Mir, Moscow, Jan. 5, 1995, pp. 1-7.

[128]Summary of World Broadcasts, British Broadcasting Corp., Reading, England, SUW/0356, p. WD/3, Jan. 6, 1995, World Service, Moscow, in English, 1754 gmt, Dec. 22, 1994.

[129]Interfax Business Report, Denver, CO, Jan. 27, 1994.

[130]Foreign Broadcast Information Service, U.S.Government publication, Washington, D.C., Mar. 23, p. 60. Tyumenskaya Pravda, Feb. 10, 1994, p. 1.

[131]Joint Publication Research Service Report, UST-94-033, Science and Technology, Central Eurasia, U.S. Government publication, Washington, DC, Dec. 9, 1994, pp. 4-14, Yadernyy Toplivnyy Tsikl v byvshem SSR i v Rossii: Struktura, vozmozhnosti, perpektivy, (Nuclear Fuel Cycle in the former U.S.S.R. and in Russia: Structure, Possibilities, Prospects) by Oleg Bukharin for the Assotsiatsiya sodeystviya Nerasprostraneniya (Association for the Support of Nonproliferation) Moscow, 1993, pp. 1-23.

[132]Foreign Broadcast Information Service, U.S. Government publication, Washington, DC, SOV-95-045, Mar. 8, 1995, p. 39, Moscow, Russian Television Network, 0920 gmt, Feb. 20, 1995.

[133]Interfax Mining and Metals Report, Denver, CO, Dec. 16-30, 1994, p.13.Literaturnaya gazeta, Moscow, No, 5, Feb. 2, 1994, p. 13.

[134]American Metal Market, New York, NY, Mar. 21, 1994, p. 4. Summary of World Broadcasts, British Broadcasting Corp., Reading, England, SU W/0368, p. WD/12, Jan. 27, 1995, Interfax News Agency, Moscow, in English, 1651 gmt. Jan. 24, 1995.

TABLE 1
RUSSIA: ESTIMATED PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Thousand metric tons unless otherwise specified)

Commodity		1992	1993	1994
METALS				
Aluminum:				
Ore and concentrate:				
Bauxite, 26% to 57% alumina		4,580 3/	4,260 3/	3,000
Nepheline concentrate, 25% to 30%		1,500	1,390 3/	1,300
Alumina		2,718 3/		
Metal, smelter: Primary 3/		2,730	2,820	2,669
Antimony: Mine output, SB content	tons	10,000	8,000	7,000
Arsenic, white	do.	2,500	2,000	1,500
Beryllium: Beryl, cobbed, 10% to 20% BeO	do.	1,100	800	800
Bismuth: Mine output, Bi content	do.	5	4	4
Cadmium metal, smelter	do.	800	700	600
Chromium: Chrome ore, marketable	do.	121,000	121,000 r/ 3/	100,000
Cobalt:				
Mine output, recoverable Co content	do.	4,000	3,300	3,300
Metal, refinery	do.	4,500	4,000	4,000
Copper:				
Ore: Cu content, recoverable		600	500	400
Metal:				
Blister:				
Primary		660	570	520
Secondary		50	40	40
Refined:				
Primary 3/		656	573	519
Secondary		50	40	30
Gold, mine output, Au content	thousand kilograms	146	150	147
Iron and steel:				
Iron ore, 55% to 63% Fe 3/		82,100	76,100	73,300
Metal:				
Pig iron and blast-furnace ferroalloys:				
Pig iron for steelmaking 3/		46,000	41,000	36,100
Ferromanganese		200	150	125
Electric furnace ferroalloys		1,100	1,000	800
Crude steel 3/		67,000	58,000	48,800
Finished rolled steel 3/		46,800	43,000	35,800
Lead:				
Mine output, recoverable Pb content		30	40	30
Metal, smelter:				
Primary 3/		24	32	21
Secondary		15	15	10
Magnesium metal, primary		40	30	25
Mercury metal, including secondary	tons	70	60	50
Molybdenum	do.	10,800	10,300	7,700
Nickel:				
Mine output, recoverable Ni content	do.	280,000	243,000	240,000
Nickel, products 3/	do.	243,000	189,000	180,000
Platinum-group metals:				
Platinum	do.	28	20	15
Palladium	do.	70	50	40
Others	do.	6	4	3
Silver metal including secondary	do.	800	700	700
Tin:				
Mine output, recoverable Sn content	do.	16,000	14,000	11,000
Metal, smelter:				
Primary 3/	do.	15,200	13,100	10,500
Secondary	do.	1,500	1,000	800
Total	do.	16,700	14,100	11,300
Titanium, metal	do.	25,000	17,000	10,000
Tungsten concentrate, W content	do.	13,000	10,000	5,000
Vanadium metal	do.	11,000	10,000	10,000

See footnotes at end of table.

TABLE 1--Continued
RUSSIA: ESTIMATED PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Thousand metric tons unless otherwise specified)

Commodity		1992	1993	1994
METALS--Continued				
Zinc:				
Mine output, recoverable Zn content		150	170	120
Metal:				
Primary 3/		110	123	94
Secondary		30	30	30
INDUSTRIAL MINERALS				
Asbestos, grades I-VI		1,300	870 3/	615 3/
Barite		NA	NA	NA
Cement, hydraulic 3/		64,000	50,000	37,200
Clays: Kaolin including china clay		NA	NA	NA
Corundum, natural		NA	NA	NA
Diamond:				
Gem	thousand carats	9,000	8,000	8,600
Industrial	do.	9,000	8,000	8,600
Total		18,000	16,000	17,200
Diatomite		NA	NA	NA
Feldspar		100	70	50
Fluorspar				
Fluorspar: Concentrate 55% to 96.4% CaF_2		100	70	50
Graphite		15	10	8
Gypsum		1,800	1,500	1,200
Lime, dead-burned		NA	NA	NA
Lithium minerals, not further specified		NA	NA	NA
Magnesite: Marketable product		1,100	800	600
Mica		150	129 3/	100
Nitrogen: N content of ammonia		9,000	8,200	7,500
Phosphate rock:				
Apatite: Concentrate, 37% to 39.6% P_2O_5		11,000	9,000	8,000
Sedimentary rock, 19% to 30% P_2O_5		500	400	300
Total		11,500	9,400	8,300
Potash: K_2O equivalent		3,500	2,600	2,000
Pyrite, gross weight		NA	NA	NA
Salt, all types		3,500	2,200 3/	2,200 3/
Sodium compounds, n.e.s.:				
Carbonate		2,700	2,000	1,600 3/
Sulfate:				
Natural		NA	NA	NA
Manufactured		NA	NA	NA
Sulfur:				
Frasch		NA	NA	NA
Other native		100	80	60
S content of pyrite		NA	NA	NA
Byproducts:				
Of metallurgy		250	200	150
Of natural gas		1,800	1,800	1,600
Of petroleum		NA	NA	NA
Total		NA	NA	NA
Sulfuric acid		10,000	8,200	6,340 3/
Talc		150,000	132,000 3/	100,000
Vermiculite		60	50	40
MINERAL FUELS AND RELATED MATERIALS				
Coal:				
Bituminous		210,400	175,000	170,000
Lignite and brown coal		127,000	100,000	101,000
Total 4/		337,000 3/	304,000	271,000 3/
Coke: 6% moisture content		31,000	27,600	25,400 3/
Gas, natural, marketed: As reported 3/	million cubic meters	640,000	617,000	607,000
Oil shale		4,000	3,000	2,000
Peat:				
Agricultural use		NA	NA	NA
Fuel use		7,000	6,000	6,000

See footnotes at end of table.

TABLE 1--Continued
RUSSIA: ESTIMATED PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Thousand metric tons unless otherwise specified)

Commodity		1992	1993	1994
MINERAL FUELS AND RELATED MATERIALS--Continued				
Petroleum:				
Crude:				
As reported, gravimetric units 2/		395,000	357,000	316,000
Converted, volumetric units	thousand 42-gallon barrels	2,900,000	2,600,000	2,300,000
Refinery products 5/		300,000	270,000	240,000

NA Not available.
1/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.
2/ Table includes data available through Aug. 31, 1995.
3/ Reported in Russian sources.
4/ Run-of-mine coal.
5/ Not distributed by type and therefore not suitable for conversion to volumetric units. Data include all energy and nonenergy products but exclude losses.

TABLE 2
RUSSIA: REPORTED PRODUCTION OF NONFERROUS METALS, 1990-94 1/

(Thousand metric tons)

Commodity	1990	1991	1992	1993	1994
Aluminum, primary	2,920	2,730	2,730	2,700	2,670
Copper, refined (primary)	794	694	656	573	519
Lead	44	31	24	32	21
Molybdenum concentrate	14	12	11	10	8
Nickel	324	284	245	188	180
Tin (primary)	19	19	15	13	10
Tungsten concentrate	25	22	16	13	7
Zinc	185	163	110	123	94

1/ Information appears exactly as reported. No explanations were provided concerning the types of lead, nickel, tin, or zinc or whether the concentrates are being reported by gross weight or metal content.

Source: Interfax Mining and Metals Report, Denver Colorado, June 23-30, 1995, p. 12.

TABLE 3
RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY FOR 1994

(Metric tons unless otherwise specified)

Commodity	Major operating facilities	Location	Annual capacity /e
Alumina	Achinsk	Achinsk in East Siberia	900,000.
Do.	Bogoslovsk	Urals	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:		
Do.	Volkhov	Volkhov, east of St. Petersburg	20,000.
Do.	Uralsk	Kamensk	70,000.
Do.	Bogoslovsk	Krasnoturinsk	162,000.
Do.	Novokuznetsk	Novokuznetsk	284,000.
Do.	Kandalaksha	Kola Peninsula	62,500.
Do.	Nadvoitsy	Nadvoitsy in Karelia	68,000.
Do.	Volgograd	Volgograd	168,000.
Do.	Irkutsk	Sherekov, near Irkutsk	262,000.
Do.	Krasnoyarsk	Krasnoyarsk	755,000.
Do.	Bratsk	Bratsk	843,800.
Do.	Sayansk	Sayanogorsk	274,000.
Apatite, concentrate	Khibiny apatit association	Kola Peninsula	15,000,000.
Do.	Kovdor iron ore mining association	do.	700,000.
Asbestos	Kiyembay	Orenburg Oblast	500,000.
Do.	Tuvaasbest	Tuva Republic	250,000.
Do.	Uralasbest	Central Urals	1,100,000.
Bauxite	North-Urals mining company	Severouralsk region	NA.
Do.	South-Urals mining company	South Urals region	NA.
Do.	Severnaya Onega mine	Northwest region	800,000.
Boron	Bor Association	Maritime region	140,000 (boric acid).
Do.	Amur River complex	Far East	8,000 (boric acid).
Do.	Alga River Chemical Complex	do.	12,000 (boric acid).
Chromite	Saranov complex	Saranov	200,000.
Coal	Basins:		
Do.	Donets (east)	Rostov Oblast	30,000,000.
Do.	Kansk Achinsk	East Siberia	50,000,000.
Do.	Kuznetsk	West Siberia	160,000,000.
Do.	Moscow	Moscow region	15,000,000.
Do.	Neryungri	Yakut-Sakha Republic	15,000,000.
Do.	Pechora	Komi Republic	30,000,000.
Do.	South Yakutia	Yakut-Sakha Republic	17,000,000.
Copper, mining and beneficiation complexes (Cu content of concentrates)	Buribai Enterprise	Buribai region	5,000.
Do.	Gai Complex	Gai region	40,000.
Do.	Kirovgrad Complex	Kirovgrad region	12,000.
Do.	Krasnouralsk Complex	Krasnouralsk region	12,000.
Do.	Norilsk Complex	Norilsk region	400,000.
Do.	Sredneuralsk Complex	Ekatrinenburg region	12,000.
Do.	Uchali Complex	Uchali region	40,000.
Do.	Urap Complex	Stavropol region	7,000.
Copper, metal (smelting and refining complexes)	Kirovgrad (smelting)	Kirovgrad	150,000.
Do.	Krasnouralsk (smelting)	Krasnouralsk	60,000.
Do.	Kyshtym (refining)	Kyshtym	40,000.
Do.	Norilsk (smelting and refining)	Norilsk	350,000.
Do.	Pyshma (refining)	Pyshma	350,000.
Do.	Severonikel (smelting)	Monchegorsk	20,000.
Do.	Sredneuralsk (smelting)	Revda	140,000.
Diamonds	Yakutalmaz association	Aykhal, Mirnyy, Udachnaya areas of Yakut-Sakha republic	10,000 gem, 10,000 industrial.
Feldspar	Deposits:		
Do.	Lupikko	Karelia	NA.
Do.	Kheto-Lanbino	do.	NA.
Ferroalloys	Kosaya Gora Iron Works	Kosaya Gora	200,000.
Do.	Kuznetsk ferroallloy plant	Novokuznetsk	400,000.

See footnotes at end of table.

TABLE 3--Continued
RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY FOR 1994

(Metric tons unless otherwise specified)

Commodity	Major operating facilities	Location	Annual capacity /e
Ferroalloys--Continued:			
Do.	Lipetsk Iron and steel works	Lipetsk	NA.
Do.	Serov ferroalloy plant	Serov	NA.
Do.	Tulachermet Scientific and Industrial Association	Tula	NA.
Do.	Chelyabinsk Electrometallurgical plant	Chelyabinsk	350,000.
Do.	Chusovoy Iron and steel plant	Chusovoy	NA.
Do.	Klyuchevsk ferroalloy plant	Dvurechinsk	160,000.
Fluorspar	Mining and beneficiation complexes:		
Do.	Abagaytuy	Transbaikal	NA.
Do.	Kalanguy	do.	NA.
Do.	Kyakhtinsky	do.	NA.
Do.	Usugli	do.	NA.
Do.	Yaroslavsky	Far East	NA.
Gold	Gold mining regions:		
Do.	Yakut-Sakha	Yakut-Sakha Republic	200,000 total.
Do.	Buryat	Buryat Republic	
Do.	Magadan	Magadan oblast	
Do.	Krasnoyarsk	Krasnoyarsk region	
Do.	Maritime	Maritime region	
Do.	Tuva	Tuva Republic	
Iron ore	Mining areas:		
Do.	Kursk Magnetic Anomaly (KMA) containing following enterprises:		50,000,000 total KMA.
Do.	Mikhailovka	Zheleznogorsk	
Do.	Lebedi	Gubkin	
Do.	Stoilo	do.	
Do.	Northwest containing following enterprises:		
Do.	Olenogorsk	Olenogorsk	22,000,000 total.
Do.	Kostomuksha	Kostomuksha	Northwest.
Do.	Kovdor	Kola Peninsula	
Do.	Siberia (east) containing the following mining enterprises:		
Do.	Korshunovo	Zheleznogorsk	
Do.	Rudnogorsk	Rudnogorsk	18,000,000 total.
Do.	Siberia (west) including the following mining enterprises:		Siberia (east and west).
Do.	Abakan	Abaza	
Do.	Sheregesh	Sheregesh	
Do.	Tashtagol	Tashtagol	
Do.	Teya	Vershina Tei	
Do.	Urals containing following mining enterprises:		
Do.	Akkermanovka	Novotroitsk	
Do.	Bakal	Bakal	
Do.	Goroblagodat	Kushva	22,000,000 total .
Do.	Kachkanar	Kachkanar	Urals.
Do.	Magnitogorsk	Magnitogorsk	
Do.	Peshchanka	Rudnichny	
Lead-zinc (recoverable metal content of ore)	Mining complexes:		
Do.	Altay mining and beneficiation complex	Altay mountains region, South Siberia	2,000 lead, 1,000 zinc.
Do.	Dalpolymetal mining and beneficiation complex	Maritime region	20,000 lead, 25,000 zinc.
Do.	Nerchinsk polymetallic complex	Chita Oblast	7,000 lead, 12,500 zinc.
Do.	Sadon lead-zinc complex	Severo-Ossetiya	5,000 lead, 14,000 zinc.
Do.	Salair mining and beneficiation complex	Kemerovo Oblast	2,000 lead, 10,500 zinc.
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	Berezniki plant	Berezniki	60,000 total.
Do.	Solikamsk plant	Solikamsk	(Both locations).
Mica	Mining complexes:		
Do.	Aldan	Yakut-Sakha Republic	NA.
Do.	Karel	Karelia	NA.
Do.	Kovdor	Kola Peninsula	NA.

See footnotes at end of table.

TABLE 3--Continued
RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY FOR 1994

(Metric tons unless otherwise specified)

Commodity	Major operating facilities	Location	Annual capacity /e
Mica--Continued:	Mining complexes--Continued:		
Do.	Mam	Irkutsk complex	NA.
Molybdenum, mining enteprise	Dzhida tungsten-molybdenum mine	West Transbaikal	NA.
Do.	Sorsk molybdenum mining enterprise	Sorsk region	NA.
Do.	Tyrny-Auz tungsten-molybdenum mining enterprise	North Caucasus	NA.
Do.	Shakhtaminskoye molybdenum mining enterprise	Chita Oblast	NA.
Natural gas	Regions:		
Do.	Komi Republic	Komi Republic	8.0.
Do.	Norilsk area	Norilsk area	5.5.
Do.	North Caucasus	North Caucasus	6.0.
Do.	Sakhalin	Far East	2.0.
Do.	Tomsk Oblast	West Siberia	0.5.
Do.	Tyumen Oblast including:	do.	575.
Do.	Medvezhye field	do.	75.
Do.	Urengoi field	do.	300.
Do.	Vyrngapur field	do.	17.
Do.	Yamburg field	do.	170.
Do.	Urals	Urals	45.
Do.	Volga	Volga region	6.
Do.	Yakut-Sakha	Yakut-Sakha Republic	1.5.
Nepheline syenite	Apatite complex	Kola Peninsula	1,500,000.
Do.	Kiya-Shaltyr mine	Goryachegorsk region, east Siberia	NA.
Nickel, mining enterprise (Ni in ore)	Norilsk Nickel association	Norilsk region and Kola Peninsula	300,000.
Do.	Yuzhuralnikel association	Southern Urals	20,000.
Nickel, metal (smelting and refining complexes)	Norilsk Nikel (smelting and refining)	Norilsk	160,000 (smelting), 100,000 (refining).
Do.	do.	Pechenga	50,000 (smelting).
Do.	do.	Monchegorsk	50,000 (smelting), 140,000 (refining).
Do.	Yuzhuralnikel associatiohn (smelting and refining)	Southern Urals	60,000 (smelting), 50,000 (refining).
Platinum-group metals:			
Ore	Norilsk Nikel association	Norilsk region	
Metals	Krasnoyarsk refinery of Norilsk Nikel association	Krasnoyarsk	130 (total metal).
Potash, K_2O	Uralkaliy	Verknekamsk deposit	3,000,000.
Do.	Silvinit	Solikamsk-Berezniki region of Urals	2,000,000.
Petroleum	Producing regions:		
Do.	European Russia:		
Do.	Astrakhan	Northern Caspian Sea Basin	700,000.
Do.	Bashkortostan	Urals	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	Urals	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	Urals	9,000,000.
Do.	East Siberia: Tomsk Oblast	Tomsk Oblast	11,000,000.
Do.	West Siberia:		
Do.	Tyumen Oblast:	Tyumen Oblast	300,000,000.
Do.	Kogolym field	do.	34,000,000.
Do.	Krasnoleninskiy field	do.	12,000,000.
Do.	Langepas field	do.	30,000,000.
Do.	Megion field	do.	18,000,000.
Do.	Nizhnevartovsk field	do.	70,000,000.

See footnotes at end of table.

TABLE 3--Continued
RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY FOR 1994

(Metric tons unless otherwise specified)

Commodity	Major operating facilities	Location	Annual capacity /e
Petroleum--Continued:	West Siberia--Continued:		
Do.	Tyumen Oblast--Continued:	Tyumen Oblast--Continued	
Do.	Noyabrsk field	do.	37,000,000.
Do.	Purneftegaz field	do.	12,000,000.
Do.	Surgut field	do.	48,000,000.
Do.	Uray field	do.	8,000,000.
Do.	Varegan field	do.	10,000,000.
Do.	Sakhalin Island	Sakhalin Island	2,500,000.
Soda ash	Sterlitamak plant	Sterlitamak	NA.
Do.	Mikhaylovskiy plant	Siberia	NA.
Do.	Pikalevo plant	Leningrad Oblast	NA.
Steel, crude	Amurstal	Komsomolsk na Amur	1,600,000.
Do.	Asha	Asha	450,000.
Do.	Beloretsk	Bashkir Republic	380,000.
Do.	Chelyabinsk	Chelyabinsk	7,000,000.
Do.	Cherepovets	Cherepovets	14,000,000.
Do.	Chusovoy	Chusovoy	570,000.
Do.	Elektrostal	Moscow	314,000.
Do.	Gorky	Nizhniy-Novgorod	78,000.
Do.	Guryevsk	Guryevsk	160,000.
Do.	Karaganda	Karaganda	6,300,000.
Do.	Kuznetsk	Novokuznetsk	4,700,000.
Do.	Lipetsk	Lipetsk	9,900,000.
Do.	Lysva	Lysva	350,000.
Do.	Magnitogorsk	Magnitogorsk	16,200,000.
Do.	Nizhniy Tagil	Nizhniy Tagil	8,000,000.
Do.	Nizhniy Sergi	Nizhniy Sergi	300,000.
Do.	Novosibirsk	Novosibirsk	1,100,000.
Do.	Omutninsk	Omutninsk	210,000.
Do.	Orsko-Khalilovo	Novotroitsk in Orenburg Oblast	4,600,000.
Do.	Oskol Electric Steel	Stary Oskol	1,450,000.
Do.	Petrovsk-Zabaikalskiy	Petrovsk-Zabaikalskiy	426,000.
Do.	Revda	Revda	281,000.
Do.	Salda	Sverdlovsk Oblast	1,900.
Do.	Serov A.K.	Serov	1,000,000.
Do.	Serp i Molot	Moscow	70,000.
Do.	Severskiy	Polevskoy in Sverdlovsk Oblast	825,000.
Do.	Sibelektrostal	Krasnoyarsk	110,000.
Do.	Sulin	Sulin	280,000.
Do.	Taganrog	Taganrog	925,000.
Do.	Tulachermet-Scientific and Industrial Association	Tula	18,400.
Do.	Verkh-Isetskiy	Ekatrinenburg	132,000.
Do.	Volgograd	Volgograd	2,000,000.
Do.	Vyksa	Vyksa	540,000.
Do.	West Siberian	Novokuznetsk	6,900,000.
Do.	Zlatoust	Zlatoust in Chelyabinsk Oblast	1,200,000.
Talc	Deposits:		
Do.	Onotsk	Irkutsk Oblast	NA.
Do.	Kirgiteysk	Krasnoyarsk Kray	NA.
Do.	Miass	Chelyabinsk Oblast	NA.
Do.	Shabrovsk	Sverdlovsk Oblast	NA.
Tin, mining and beneficiation complexes	Khingan	Khabarovsk Kray	NA.
Do.	Solnechnyy	do.	NA.
Do.	Iultin	Magadan Oblast	NA.
Do.	Khrustalnyy	Maritime region	NA.
Do.	Deputatskiy	Yakut-Sakha Republic	NA.
Tin, smelters	Novosibirsk	Novosibirsk	NA.
Do.	Podolsk	Podolsk	NA.
Do.	Ryazan	Ryazan	NA.
Titanium, metal	Berezniki plant	Berezniki	35,000.
Do.	Moscow plant	Moscow	NA.
Do.	Podolsk plant	Podolsk	NA.

See footnotes at end of table.

TABLE 3--Continued
RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY FOR 1994

(Metric tons unless otherwise specified)

Commodity	Major operating facilities	Location	Annual capacity /e
Tungsten, mining and beneficiation complexes (W content of concentrates)	Antonovogorsk	East Transbaikal	80.
Do.	Balkan	Urals, northeast of Magnitogorsk	40.
Do.	Belukha	East Transbaikal	60.
Do.	Bom-Gorkhom	West Transbaikal	85.
Do.	Dzhida	do.	750.
Do.	Iultin	Magadan Oblast	175.
Do.	Solnechnyy	Southern Khabarovsk region	40.
Do.	Tyrny-Auz	North Caucasus	3,000.
Do.	Vostok-2	Maritime region	1,200.
Tungsten, metal	Nalchik plant	Caucasus	NA.
Vanadium, ore	Kachkanar iron ore mining complex	Urals	NA.
Vanadium, metallurgical processing facilities	Chusovoy plant	do.	17,000 total metal.
Do.	Nizhniy Tagil plant	do.	
Zinc (non associated with lead), metal content of ore	Bashkir copper-sulfur complex	Sibai in southern Urals	5,000.
Do.	Buribai copper-zinc mining complex	Buribai in southern Urals	1,500.
Do.	Gai copper-zinc mining and 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.
Do.	Uchali copper-zinc mining and beneficiation complex	Uchali in southern Urals	90,000.
Zinc, metal	Chelyabinsk electrolytic zinc plant	Chelyabinsk	190,000.
Do.	Elektrozink plant	Vladikavkaz in North Caucasus	100,000.

e/Estimated. NA Not available.

TABLE 4
RUSSIA: ESTIMATED RESERVES OF MAJOR MINERAL COMMODITIES FOR 1994

(Thousand metric tons unless otherwise specified)

Commodity		Quantity
Antimony		3,000
Asbestos		100,000
Bauxite		250,000
Cobalt		135
Copper		20,000
Diamond, industrial	million carats	35
Fluorspar		60,000
Iron ore	million metric tons	55,000
Lead		3,000
Magnesite		585,000
Manganese		15,000
Molybdenum		250
Nickel		6,300
Peat		160,000,000
Phosphate rock, marketable		240,000
Platinum-group metals	metric tons	2,000
Potash (K_2O equivalent)		3,000,000
Silver		17
Tin		265
Tungsten		230
Vanadium		5,000
Zinc		4,000