

THE MINERAL INDUSTRY OF

ARGENTINA

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The economy of Argentina continued to decline in 2002 as indicated by the 10.9% decrease in the country's gross domestic product (GDP); this was the fourth decrease in as many years. During the year, there was high inflation, a record high budget deficit, high foreign debt, and high unemployment. After being pegged to the U.S. dollar for 10 years, the peso was allowed to float and lost about two-thirds of its value during the year. The GDP was \$110.9 billion¹ (\$235.8 billion in purchasing power parity). Construction, which represented 36% of the GDP, decreased by 33%. Manufacturing decreased by 11%. Mining (including petroleum) and quarrying, which represented 2% of the GDP, decreased by almost 4%. Quarterly economic indicators, however, showed some improvements in the last quarter of the year as reductions slowed down (International Monetary Fund, 2003²; Ministerio de Economía, 2003§).

Government Policies and Programs

Argentina's legal framework for mining was covered by the abstract of the Mining Code, which is the legal framework for investment in Argentina; Mining Investment law No. 24.196; Regulating of Mining Investment (Decree No. 2.686/93); Mining Reorganization law No. 24.224; Federal Mining Agreement law No. 24.228; VAT Funding law No. 24.402; Regulation of law No. 24.402 (Decree No. 779/95); Mining Updating law No. 24.498; Environmental Protection Code for the Mining Industry law No. 24.585; and Royalty law No. 25.161.

Some of the important features of Mining Investment law No. 24.196 include fiscal stability for 30 years, exemption of tariffs on capital goods, double deduction on exploration expenses, and accelerated amortization. The law limits royalties to 3% at the mouth of the mine. Federal Mining Agreement law No. 24.228 began the effort to harmonize the provincial mining procedures, established public bidding for large-scale mining, and formalized the commitment to modernize the mining cadastre. Mining Updating law No. 24.498 eliminated the mining register and reinstated the concession system to the nuclear minerals.

The Mining Code, which was approved by the Argentine Congress on May 21, 1997, regulates the rights, obligations, and procedures for the exploration, exploitation, and use of mineral substances.

In 2000, the Mining Integration Treaty law No. 25.243 between Argentina and Chile was ratified. In 2001, the Government of Argentina approved Decree No. 111, which replaced article 5 of Regulating of Mining Investment (Decree No. 2.686/93) and the regulation document of Mining Investment law No. 24.196 with the purpose of modernizing several technical regulations and addressing new issues that resulted from mining integration with neighboring countries.

Environmental Issues

The Environmental Protection Code for the Mining Industry law No. 24.585, which was enacted on November 21, 1995, provides investors with the appropriate legal framework and requires that each Provincial government create an enforcement authority within its jurisdiction. The law introduces the concept of sustainable development and sponsors a preventive environmental mechanism in the mining sector.

The environmental framework that relates to mining activities was completed with the establishment of Provincial Environmental Management Units. These units are responsible for assisting the Provincial enforcement authority in all aspects that relate to the code, specifically in assessing the environmental impact reports presented and in monitoring mining projects.

Production

Argentina's mineral production was of regional importance. Despite the country's economic situation, it continued to be an important producer of fuel and nonfuel minerals in Latin America. Fuel minerals continued to be very important to Argentina's economy. In Latin America, Argentina was the largest producer of natural gas and the fourth largest producer of crude petroleum (BP p.l.c., 2003, p. 6, 22).

According to U.S. Geological Survey data, it was the third largest producer of primary aluminum in the region, with about 11% of the total. The country was also Latin America's third largest producer of steel and the fourth largest producer of primary iron [direct reduced iron (DRI) and pig iron]. In addition, Argentina was one of nine producers of lead and seven producers of zinc in Latin America. Argentina was also the fourth largest producer of gold and the fifth largest producer of silver in the region.

¹ Where necessary, values have been converted from Argentine pesos to U.S. dollars at the rate of 3.11049 pesos=US\$1.00.

² References that include a section mark (§) are found in the Internet References Cited section.

The value of Argentina's nonfuel mineral production has changed significantly in the past decade. The importance of metal production has increased with large-scale mining since 1998. Almost two-thirds of the mineral production was from large-scale mining companies, and the remainder was from medium- and small-scale mining companies. About 95% of the production was from 12 Provinces. The leading producing Provinces and their most important products were, in decreasing order of value, Catamarca, copper, gold, and lithium; Buenos Aires, crushed stone and limestone; and Santa Cruz, gold and silver. These three Provinces represent 77% of the Argentina's mineral production. About 70% of the production was exported (Agencia de Desarrollo de Inversiones, 2003§).

Trade

Exports of the nonfuel mineral sector have increased significantly since 1991 when the value was only \$10 million. In 2001, the value of Argentina's nonfuel mineral exports reached \$754 million. In 2002, exports of nonfuel minerals, which included portland cement, increased by 31% to \$989 million. Copper concentrate represented 63% of the total nonfuel mineral exports. Gold doré and bullion and nonalloyed aluminum represented 12% each of the total. From January through November, 20% of these exports went to Japan, followed by Germany (15%), the Republic of Korea (12%), and Brazil (11%); the United States received only 4% of Argentina's exports of nonfuel minerals. Imports of nonfuel minerals totaled \$443 million. Alumina and iron ore represented almost 60% of the total (Dirección Nacional de Minería, 2003; Agencia de Desarrollo de Inversiones, 2003§).

Structure of the Mineral Industry

Argentina's highest Government office with responsibility for the mining sector is the Secretaría de Industria, Comercio y Minería. After being part of the Ministerio de la Producción since early 2002, the Secretaría was moved to the newly formed Ministerio de Planificación Federal, Inversión Pública y Servicios in May 2003. The Secretaría is responsible for developing the country's mineral policy, promoting the growth of the mineral sector, and creating the conditions to encourage investment in the area. It also has the authority to carry out norms and legislation relevant to the mineral sector and is the authority with responsibility to negotiate national and international agreements on behalf of the Government. As the Government entity to which the Servicio Geológico Minero Argentino (SEGEMAR) reports, the Secretaría also is responsible for promoting geological and mining studies with the purpose of planning the use of the mineral resources of the country. SEGEMAR, which was formed under National Administration-State Reform-Modification of Present Structure (Decree 660/1996), is charged with managing a variety of geologic programs and services based on scientific studies. Its objectives include the coordination and actualization of Argentina's geologic information, contribution to the discovery of resources, and offering of technical assistance to the small and medium mining sectors (Panorama Minero, 2001).

The Dirección Nacional de Minería reports to the Secretaría de Industria, Comercio y Minería. This agency is responsible for administering Mining Investment law No. 24.196 and its modifications. The Dirección is also charged with coordinating and developing Argentina's short- and long-term strategic mining plans and acting as an advisor to the Secretaría on legal and technical matters that affect the mining sector. It also is responsible for promoting actions to maintain dynamic small and medium mining sectors. The Dirección processes and disseminates all mining statistics.

In addition to the Federal Government, the Provincial governments have offices in charge of mining issues. They are the entities responsible for awarding the mineral concessions in accordance with the Mining Code. They also ensure that the mines are adhering to the environmental protection law and applying Provincial norms.

The mineral industry in the private sector comprises several manufacturing and mining companies, such as Aluminio Argentino S.A.I.C. (ALUAR), Borax Argentina S.A., Cementos Loma Negra C.I.A. S.A., Cerro Vanguardia S.A., Cía. Minera Aguilar S.A., Cía. Minera Tea S.A.M.I.C.A.F., FMC Minera del Altiplano S.A., Minera Alumbra Ltd., Sulfacid S.A.C.I.F. (table 2).

The nature of Argentina's mining sector changed drastically after the new copper and gold producer Minera Alumbra came onstream in the late 1990s. The value of metal production has increased significantly in recent years. Despite Argentina's economic crisis, activity in the study of large-scale metal projects continued in 2002. The Government continued its efforts to increase interest in the sector by offering fiscal incentives and promoting foreign investment. It also focused its efforts by providing assistance to the small and medium mining producers that were at the heart of Argentina's mineral production and by planning to invest in the country's infrastructure.

Commodity Review

Metals

Aluminum.—The sole producer of primary aluminum in Argentina was ALUAR, which had a smelter in Puerto Madryn, Province of Chubut. Production in 2002 increased by almost 8% from the revised 2001 figure to 268,800 metric tons (t); this was 3% higher than the designed output capacity. Sales for the fiscal year ending in June totaled 255,500 t, of which 85% was destined for export (Aluminio Argentino S.A.I.C., 2003§; Ministerio de Economía, 2003§).

Copper, Gold, and Silver.—Mine production of copper in 2002 increased by 6% to 204,027 t. Production of gold also increased by 6% to 32,486 kilograms (kg), but output of silver decreased by 17.6% to 125,868 kg. Almost all copper production was from

Minera Alumbreira Ltd.'s Bajo de la Alumbreira Mine in the Province of Catamarca. Minera Alumbreira also produced more than 70% of Argentina's gold (23,000 kg) (Xstrata plc, 2003§). The second largest gold producer in Argentina was the Cerro Vanguardia S.A.'s open pit mine in the Province of Santa Cruz. Together, these two mines produced about 95% of Argentina's gold. The largest silver producer was Cerro Vanguardia with almost 50% of Argentina's total production. The second largest producer was the Martha Mine in the Province of Santa Cruz with more than 30% of the total.

In 2002, Minera Alumbreira was owned by M.I.M. Holdings Limited (50%), BHP Billiton Plc (25%), and Rio Tinto plc. (25%). In late 2002, however, Xstrata plc began discussions with M.I.M. to acquire the latter (Xstrata plc, 2002). At yearend, no decision had been reached about the acquisition. In January 2003, Rio Tinto signed a letter of intent to sell its 25% interest in Minera Alumbreira to Wheaton River Minerals Ltd., and in March 2003, BHP Billiton announced that it also would sell its 25% interest in Minera Alumbreira to Wheaton River.

In 2002, production from Cerro Vanguardia exceeded 8,100 kg (25% of total gold mine production). Ownership of the mine changed in mid-2002 when AngloGold Limited increased its interest in the mine to 92.5% from 46.25% by purchasing the interest held by Pérez Companc S.A. AngloGold expected the mine to be in operation until at least 2012. Cerro Vanguardia is a series of hydrothermal vein deposits with high-grade gold and significant quantities of silver. The mine's final product is doré, which was refined in South Africa and the United Kingdom. The company planned to increase mill capacity to 1 million metric tons per year (Mt/yr) from 900,000 metric tons per year by 2004. Resources at yearend 2001 totaled 74,600 kg (reported as 2.4 million ounces) of gold. The company was encouraged by positive exploration results, which confirmed additional resources of 12,400 kg (reported as 400,000 ounces) of gold. These additional resources and the possibility of a small production by underground methods could extend the mine life (AngloGold Limited, 2002, 2003).

In addition to the production from Bajo de la Alumbreira and Cerro Vanguardia, several gold and silver projects were at various stages of exploration. Barrick Gold Corporation completed a feasibility study of the Veladero gold project in the Province of San Juan in the third quarter of 2002. The study called for two open pits, a two-stage crushing circuit, and a heap-leach pad. Construction cost was estimated to be \$425 million. Barrick reported that production from the project was expected to begin in 2006. Output from the mine was planned to be 16,500 kilograms per year (kg/yr) (reported as 530,000 ounces per year) of gold for the first 10 years of operation. Barrick planned to begin constructing Veladero's access road and camp infrastructure in 2003. The schedule was contingent on receiving the appropriate permits and encountering a suitable economic and political situation. At yearend 2002, Barrick reported Veladero's proven and probable reserves of about 293,000 kg (reported as 9.4 million ounces) of gold (Barrick Gold Corporation, 2003, p. 3, 29, 97).

Barrick also was involved in the Pascua-Lama project on the Argentina-Chile border. The company had postponed development of Pascua-Lama because of low gold and silver prices. After the merger with Homestake Mining Company in 2001, which was Barrick's partner in the Veladero project prior to the merger, and improved gold prices in 2002, however, Barrick decided to proceed with the project. The company expected to complete the feasibility study in 2004, to begin construction in 2005, and to start up production in 2008 (Barrick Gold Corporation, 2003, p. 30).

Exploration continued on the Manantial Espejo silver and gold project in the Province of Santa Cruz. The project measured and indicated resources were 4.39 million metric tons (Mt) with a grade of 264 grams per ton (g/t) silver and 4.51 g/t gold. In March, Black Hawk Mining Inc. sold its 90% interest in Manantial Espejo to its partner Silver Standard Resources Inc. Silver Standard then formed a 50-50 joint venture with Pan American Silver Corp. Under the new joint venture, Pan American Silver and Silver Standard agreed to share exploration costs equally. Silver Standard would manage the exploration phase of the project, and Pan American would manage the feasibility and construction phases of the project. The new partners concentrated their exploration work in the María and the Melissa veins; they planned to conduct a prefeasibility study in 2003 (Silver Standard Resources Inc., 2002a, b).

The Huevos Verdes gold and silver project in the Province of Santa Cruz, which was a joint venture between Mauricio Hochschild & Cia. Ltd. and Minera Andes Inc., received the permits by the government of the Province of Santa Cruz to continue with underground exploration and development of the property. The joint venture submitted the project's environmental impact statement in April. It planned to begin construction of underground galleries to confirm the reserve base for the first quarter of 2003 before proceeding with a decision to begin mine construction. Minera Andes had 12 exploration projects in Argentina; Huevos Verdes was in the most advanced stage of exploration (Minera Andes Inc., 2002).

In April, Coeur d'Alene Mines Corporation acquired Compañía Minera Polimet S.A. from Yamana Resources Inc. Minera Polimet owned the underground Martha silver and gold mine in the Province of Santa Cruz. Ore from the Martha Mine was transported by truck to Coeur d'Alene's Cerro Bayo property in southern Chile for processing. At yearend, the mine had reserves of 165,000 kg (reported as 5.3 million ounces) of silver equivalent, which was almost twice the reserves reported prior to the acquisition. Production from the mine in 2002 was 43,500 kg (reported as 1.4 million ounces) of silver equivalent. Coeur d'Alene's exploration program during the year was concentrated in the Martha vein. With the new resources, the company expected to be able to extend the Mine's life to 2004. In addition, Coeur d'Alene was beginning exploration work on a large area that surrounds the Martha Mine. A number of epithermal veins with high silver and gold mineralization in the surface have been discovered in the area. Coeur d'Alene's plans for 2003 included mapping, sampling, and drilling as many of those veins as possible (Coeur d'Alene Mines Corporation, 2002, 2003).

Iron and Steel.—On June 1, the government of the Province of Río Negro attempted to sell the iron ore and pellet company Hierro Patagónico Rionegrino S.A. in an international public sale. The company, which ceased operating in 1994, had proven reserves of 200 Mt of ore with 54% iron (Metal Bulletin, 2002). The consulting firm assigned to the sale envisaged that the project would require an investment level of \$120 million, which would include the construction of hot-briquette iron mainly for the export market.

Originally, the Provincial government expected to receive all offers by August 2 and to complete a contract by September 30. Despite interest from several companies, however, no offers were made. The president of Hierro Patagónico cited economic and political instability in Argentina as the main reasons why the sale was unsuccessful. The government planned to offer the company for sale again (Rio Negro On Line, 2002§).

Production of pig iron and DRI increased by almost 15% to 3.66 Mt. Production of steel increased by about 6% to 4.36 Mt. The largest steel producer in Argentina was Siderar S.A.I.C. with a production capacity of 2.2 Mt/yr. In 2002, Siderar's production increased by 12.5% to 2.216 Mt. The company had gross earnings of \$37.6 million, which included \$11.7 million from its interest in the Venezuelan producer Siderúrgica del Orinoco C.A. (SIDOR). This was a significant improvement from that of 2001 when Siderar had losses of \$88 million, which included \$42 million from SIDOR. Siderar's domestic shipments decreased by 17% to 742,000 t, but 65% of total shipments of 2.099 Mt, or 1.356 Mt were exported. These exports represented a 35% increase compared with those of 2001. Domestic shipments were one of the lowest levels in the history of the company. Total shipments, however, represented a historic high level. Although Siderar's exports went to 40 countries, those in Europe and Asia were the largest recipients of Argentina's steel products with 39% and 26% of the total, respectively (Siderar S.A.I.C., 2003, p. 1-6).

Argentina's second largest steel producer Acindar Industria Argentina de Aceros, S.A. was forced to delay interest payments to its creditors during the year. The company was affected by the decrease in domestic demand and inflation, which were caused by the severe retraction of the construction sector and the inflation that resulted from currency devaluation. Domestic shipments decreased by about 13%, but excluding semimanufactures, sales decreased by almost 24%. The company met with the creditor at midyear to begin conversations about debt restructuring. Acindar's net losses for the year totaled \$102 million (Acindar Industria Argentina de Aceros S.A., 2002a-c, 2003).

Industrial Minerals

Boron.—Argentina was the leading boron mineral producer in South America (Lyday, 2003§). In 2002, production of crude boron minerals decreased by 15% to 168,992 t from 198,815t in 2001. More than 80% of the production was from the Province of Salta where the largest producer Borax Argentina S.A. (a subsidiary of Rio Tinto Borax of the United Kingdom) had two of its three mines in Argentina. The remainder of the production was from the Province of Jujuy.

In August, Rio Tinto Borax announced that it was constructing a new boric acid plant in Argentina near its refinery in Campo Quijano. The plant would produce boric acid from recycling tailings from the Campo Quijano refinery. The company planned to begin construction of the plant in September 2002 and production of boric acid in 2003. Production from the plant was to meet increasing global demand for boric acid as a result of increased demand for fiberglass and borosilicate glass industries. The cost of the plant was estimated to be \$2.6 million (Rio Tinto Borax, 2002).

Cement.—Argentina's cement production in 2002 was 3.9 Mt, which was a 29% decrease compared with that of 2001. Cement production began to decrease after 1999 when the country's recession began. Since then, cement production declined by 45%. Argentina's economic situation and its effect on the construction sector were the major reasons for the decrease.

Mineral Fuels

Coal.—Production of coal decreased by 64.5% compared with that of 2001. The only producer was Yacimientos Carbonífero Río Turbio S.A. (YCRT) in the Province of Santa Cruz. YCRT was awarded a 10-year concession in 1994 when the mine was privatized. Prior to privatization, the mine had been operated by Yacimientos Carboníferos Fiscales since 1942. In 2002, the Government of Argentina rescinded the concession because YCRT did not meet its responsibilities under the terms of the contract, and the company ceased to operate the mine. YCRT had agreed to produce a minimum of 370,000 t of coal to supply the San Nicolás thermoelectric plant where all its coal was consumed (Auditoría General de la Nación, 2003§).

Natural Gas.—Production of gross natural gas declined slightly in 2002. Production of marketed natural gas declined by 2.8%. Despite the small decrease, Argentina continued to be Latin America's largest producer of natural gas (BP p.l.c., 2003, p. 22). More than 55% of gross production was from the Neuquén Basin in central Argentina. The largest producing company was Repsol-YPF, which had about 31% of the total. The second largest producing company was Total Austral S.A., which had almost 18% of the total (Secretaría de Energía, 2003, p. 8-9).

In November in the Province of Neuquén, a new plant that produced natural gas liquids and the pipeline that connected the plant to Neuba I to Buenos Aires were inaugurated. The installations were constructed by Pioneer Natural Resources S.A. at a cost of \$23 million. The plant, which had the capacity to process 2 million cubic meters of natural gas, doubled Argentina's gas-processing capacity (Ente Nacional Regulador del Gas, 2002a§).

At yearend, the Cruz del Sur natural gas pipeline, which was built to export natural gas from Argentina to Uruguay, was inaugurated. The project was a joint venture of British Gas Group (40%), Pan American Energy de Argentina (30%), Uruguay's Administración Nacional de Combustibles, Alcohol y Portland (20%), and Germany's Wintershall Energía S.A. (10%). The pipeline will allow Argentina to export 2 million cubic meters per day to the city of Montevideo and the Departments of Canelones, Colonia, and San José (Ente Nacional Regulador del Gas, 2002b§).

Petroleum.—Argentina was Latin America's fourth largest producer of crude petroleum after Mexico, Venezuela, and Brazil (BP p.l.c., 2003, p. 6). Production in 2002 decreased by about 3%. Neuquén was the leading producing Province with 33% of the total, and Chubut was the second with about 22% (Secretaría de Energía, 2003, p. 1).

By far, the largest producing company was Repsol-YPF with 45% of the output. The second and third largest producers were Pecom Energía S.A. and Pan American Energy with 10.9% and 10.8% of the production, respectively (Secretaría de Energía, 2003, p. 2, 3, 6).

References Cited

- Acindar Industria Argentina de Aceros S.A., 2002a, Company quarterly report ending in June: Buenos Aires, Argentina, Acindar Industria Argentina de Aceros S.A., August 26, 6 p.
- Acindar Industria Argentina de Aceros S.A., 2002b, Company quarterly report ending in March: Buenos Aires, Argentina, Acindar Industria Argentina de Aceros S.A., May 27, 7 p.
- Acindar Industria Argentina de Aceros S.A., 2002c, Company quarterly report ending in September: Buenos Aires, Argentina, Acindar Industria Argentina de Aceros S.A., November 8, 5 p.
- Acindar Industria Argentina de Aceros S.A., 2003, Company quarterly report ending in December: Buenos Aires, Argentina, Acindar Industria Argentina de Aceros S.A., March 11, 7 p.
- AngloGold Limited, 2002, AngloGold acquires an additional 46.25% in Cerro Vanguardia: Johannesburg, South Africa, AngloGold Limited press release, July 30, 2 p.
- AngloGold Limited, 2003, Company report for the quarter and year ended December 31, 2002: Johannesburg, South Africa, AngloGold Limited, January, 59 p.
- Barrick Gold Corporation, 2003, Company annual report: Toronto, Ontario, Canada, Barrick Gold Corporation, March, 106 p.
- BP p.l.c., 2003, BP statistical review of world energy 2003: London, United Kingdom, BP p.l.c. June, 40 p.
- Coeur d'Alene Mines Corporation, 2002, Coeur completes acquisition of high-grade Martha silver mine and other highly prospective precious metals properties in Argentina: Coeur d'Alene, Idaho, Coeur d'Alene Mines Corporation press release, April 2, 2 p.
- Coeur d'Alene Mines Corporation, 2003, Coeur reports results from its properties and continued exploration success at its Martha Mine in Argentina: Coeur d'Alene, Idaho, Coeur d'Alene Mines Corporation press release, February 19, 3 p.
- Dirección Nacional de Minería, 2003, Exportaciones e importaciones de sustancias minerales y productos derivados año 2002 [Exports and imports of mineral substances and their products year 2002]: Buenos Aires, Argentina, April, independently paginated.
- Metal Bulletin, 2002, Argentinian iron ore mine put up for sale: Metal Bulletin, no. 8691, July 15, p. 15.
- Minera Andes Inc., 2002, Underground exploration approved—Huevos Verdes gold/silver project moves ahead: Spokane, Washington, Minera Andes Inc. press release, September 12, 2 p.
- Panorama Minero, 2001, El organismo científico nacional al servicio de la industria minera [The national scientific organization at the service of the mining industry: Panorama Minero, no. 256, January, p. 14-22.
- Rio Tinto Borax, 2002, Borax to build new boric acid plant in Argentina: Valencia, California, Rio Tinto Borax press release, August 20, 2 p.
- Siderar S.A.I.C., 2003, Company annual report: Buenos Aires, Argentina, Siderar S.A.I.C., March, 71 p.
- Secretaría de Energía, 2003, Boletín mensual de combustibles [Monthly fuel bulletin]: Secretaría de Energía, January, 13 p.
- Silver Standard Resources Inc., 2002a, Silver Standard acquires remaining interest in Manantial Espejo, sells 50% to Pan American Silver Corp.: Vancouver, British Columbia, Canada, Silver Standard Resources Inc. press release, March 27, 1 p.
- Silver Standard Resources Inc., 2002b, Silver Standard and Pan American Silver announce high grade drill intercepts at Manantial Espejo in Argentina: Vancouver, British Columbia, Canada, Silver Standard Resources Inc. press release, November 25, 2 p.
- Xstrata plc, 2002, Early stage discussions confirmed: London, United Kingdom, November 20, 1 p.

Internet References Cited

- Agencia de Desarrollo de Inversiones, 2003, Análisis de la minería en Argentina [Analysis of mining in Argentina], accessed June 27, 2003, at URL http://www.inversiones.gov.ar/esp/publicaciones/mineria_analisis.pdf.
- Aluminio Argentino S.A.I.C., 2003, Sales, accessed June 27, 2003, via URL <http://www.aluar.com.ar>.
- Auditoría General de la Nación, 2003 (February 3), Yacimientos Carboníferos Río Turbio, accessed July 25, 2003, at URL <http://www.agn.gov.ar/body-noticias-03-02-03.htm>.
- Ente Nacional Regulador del Gas, 2002a, Nueva planta de procesamiento de GLP en Neuquén [New gas liquids processing plant in Neuquén], accessed July 3, 2003, via URL <http://www.enargas.gov/Main.htm>.
- Ente Nacional Regulador del Gas, 2002b, Se inauguró el gasoducto Cruz del Sur [The Cruz del Sur gas pipeline was inaugurated], accessed July 3, 2003, via URL <http://www.enargas.gov/Main.htm>.
- International Monetary Fund, 2003, The world economic database, accessed June 25, 2003, at URL <http://www.imf.org/external/pubs/ft/weo/2003/01/data>.
- Lyday, P.A., 2003, Boron, in Metals and minerals, U.S. Geological Survey Minerals Yearbook 2001, v. I, accessed January 20, 2004, at URL <http://minerals.usgs.gov/minerals/pubs/commodity/boron/boromyb02.pdf>.
- Ministerio de Economía, 2003 (March 3), Macroeconomic statistics, accessed June 25, 2003, via URL http://www.mecon.gov.ar/peconomica/basehome/infoeco_ing.html.
- Rio Negro On Line, 2002 (September 5), El titular de Hiparsa cree que la empresa tiene futuro [The head of Hiparsa believes that the company has a future], accessed June 25, 2003, at URL <http://www.rionegro.com.ar/arch200209/r05j24.html>.
- Xstrata plc, 2003 (July 2), Xstrata copper, accessed July 2, 2003, at URL http://www.xstrata.ch/prod_copper.php.

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TABLE 1
ARGENTINA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity	1998	1999	2000	2001	2002	
METALS						
Aluminum:						
Primary	186,702	206,400	261,900 ^r	247,700 ^r	268,800	
Secondary ^c	16,000	16,000	16,000	16,000	16,000	
Cadmium concentrate:						
Gross weight	145	140	137	160	153	
Cd content	34	--	--	34	--	
Copper:						
Mine output, Cu content	170,273	210,126	145,197	191,677 ^r	204,027	
Refined ^c	16,000	16,000	16,000	16,000	16,000	
Gold, mine output, Au content	20,400	38,515	25,954	30,630	32,486	
Iron and steel:						
Metal:						
Pig iron	thousand tons	2,122	1,985	2,188	1,909	1,910
Sponge iron (direct reduction)	do.	1,538	989	1,420	1,280	1,450
Total	do.	3,660	2,974	3,608	3,189	3,660
Ferroalloys, electric furnace:						
Ferromanganese		5,016	-- ^r	-- ^r	--	--
Ferrosilicomanganese		25,388	-- ^r	4,900 ^r	5,150 ^r	5,000
Ferrosilicon		11,245	2,568	2,500	2,740 ^r	2,700
Total		41,649	2,568 ^r	7,400 ^r	7,890 ^r	7,700
Steel, crude	thousand tons	4,210 ^r	3,793 ^r	4,472 ^r	4,107	4,363
Semimanufactures ²	do.	4,155 ^r	3,788 ^r	4,174	3,858 ^r	3,828
Lead:						
Mine output, Pb content		15,004	15,256	14,115	12,334	12,011
Smelter, primary ^c		14,150	14,200	14,200	14,200	14,200
Refined:						
Primary		300	500	8,665	9,473	10,567
Secondary		30,057	25,195	27,000 ^r	25,960 ^r	31,000
Total		30,357	25,695	35,665 ^r	34,473	41,567
Silver, mine output, Ag content	kilograms	35,768	73,785	78,271 ^r	152,802	125,868
Uranium, mine output, U ₃ O ₈ content	do.	7,000	4,000	--	--	--
Zinc:						
Mine output, Zn content		35,560	34,192	34,858	39,703	37,325
Metal, smelter:						
Primary		38,677	40,223	36,359	39,727	38,699
Secondary		3,100 ^e	3,220	2,910	3,180	3,098
Total		41,777	43,443	39,269	42,907	41,797
INDUSTRIAL MINERALS						
Asbestos		309	259	254	210 ^r	178
Barite		1,833	4,365	5,472 ^r	3,536 ^r	3,005
Boron materials, crude		276,811	245,450	512,624 ^r	198,815 ^r	168,992
Cement, hydraulic	thousand tons	7,092 ^r	7,187	6,114 ^r	5,545 ^r	3,910
Clays:						
Bentonite		131,320	128,809	123,092 ^r	104,335 ^r	88,685
Common		2,142,976	2,294,857	2,374,294 ^r	1,585,834 ^r	1,580,010
Foundry earth ^c		100,000	100,000	100,000	100,000	100,000
Fuller's earth (decolorizing clay) ^c		1,500	1,500	1,500	1,500	1,500
Kaolin		46,832	52,665	34,023 ^r	42,659 ^r	36,259
Diatomite		25,430	34,056	17,663 ^r	27,585 ^r	23,447
Feldspar		42,468	62,926	59,466 ^r	62,119 ^r	57,801
Fluorspar		61,468	12,704	11,200	9,075 ^r	7,715
Gypsum, crude		650,356	647,001	582,337 ^r	524,071 ^r	445,461

See footnotes at end of table.

TABLE 1--Continued
 ARGENTINA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity	1998	1999	2000	2001	2002
INDUSTRIAL MINERALS--Continued					
Lithium: ^{r,3}					
Carbonate	6,000	1,592	2,161	--	906
Chloride	2,500	2,794	5,182	4,512	4,729
Mica	3,480	3,097	4,665 ^r	2,772 ^r	2,357
Nitrogen, N content of ammonia	86,300	87,700	189,800	596,600	616,700
Perlite	21,495	21,008	17,521	17,016 ^r	14,464
Phosphates, Thomas slag ^{e,4}	50	50	50	50	50
Pumice	18,000	17,662	15,512 ^r	14,306 ^r	12,160
Salt	871,748	1,263,423	1,348,514 ^r	1,010,319 ^r	858,773
Sand and gravel:					
Sand:					
Construction	15,291,886	18,567,501 ^r	12,450,441 ^r	12,783,726 ^r	15,039,676
Silica sand (glass sand)	461,505	262,640	495,903 ^r	212,738 ^r	180,829
Gravel	6,000,000	6,962,668	5,967,771 ^r	5,639,761 ^r	4,793,800
Stone:					
Basalt	1,800,000 ^e	1,024,534 ^r	363,277 ^r	829,873 ^r	705,391
Calcareous:					
Calcite, nonoptical	31,304	42,509 ^r	34,024 ^r	34,909 ^r	29,672
Calcium carbonate, chalk ^e	20,000	30,000	30,000	30,000	30,000
Dolomite	536,667	715,273	744,041 ^r	579,372 ^r	492,465
Limestone	13,077,985	12,626,797 ^r	10,605,739 ^r	10,227,706 ^r	8,693,550
Marble, onyx, travertine	305,374	247,040	218,800	199,858 ^r	170,087
Flagstone	171,884	85,520	199,135 ^r	69,271 ^r	58,880
Granite:					
In blocks	56,724	68,350	48,605 ^r	55,364 ^r	47,059
Crushed	11,509,002	11,554,211	10,360,967 ^r	9,358,916 ^r	7,955,075
Quartz, crushed	49,704	98,368	78,024 ^r	76,279 ^r	64,837
Quartzite, crushed	436,084	400,000	776,011 ^r	324,000 ^r	275,400
Rhodochrosite	15	23	17 ^r	19 ^r	16
Gemstones (agate, amethyst, apolo, tourmaline, etc.) kilograms	13,500	7,030 ^r	19,058 ^r	5,698 ^r	4,844
Sandstone ^e	200	200	200	200	200
Serpentine, crushed	165,372	171,050 ^r	143,000 ^r	138,551 ^r	117,767
Shell, marl	173,601	176,180	272,728 ^r	142,706 ^r	121,300
Tuff, (tosca) thousand tons	6,300	2,455	4,940 ^r	1,989 ^r	1,690
Strontium minerals, celestite	2,146	2,141	4,656 ^r	1,734 ^r	1,474
Sulfates, natural:					
Magnesium (epsomite)	750	6,900	6,900 ^r	5,589 ^r	4,751
Sodium (mirabilite)	4,992	6,879	10,446 ^r	5,572 ^r	4,736
Talc and related materials:					
Pyrophyllite	3,480	3,400	3,877 ^r	2,754 ^r	2,341
Steatite ^e	300	300	300	300	300
Talc	14,585	10,542	6,730 ^r	7,267 ^r	6,177
Total	18,365	14,242	10,907 ^r	10,321 ^r	8,818
Vermiculite	903	2,800	-- ^r	1,450 ^r	1,232
Zeolite	90 ^e	150	-- ^r	122 ^r	103
MINERAL FUELS AND RELATED MATERIALS					
Asphalt and bitumen:					
Natural (asphaltite)	1,917	60	50 ^r	49 ^r	41
Byproduct of refinery	826,368	743,125	532,922	393,681	318,290
Coal, bituminous thousand tons	300	354	246 ^r	197 ^r	70
Coke, all types, including breeze do.	1,433	1,482	1,496	1,556	1,582
Gas, natural:					
Gross million cubic meters	38,723	42,418	44,870	45,910 ^r	45,770
Marketed do.	33,130	34,559	37,412	37,145 ^r	36,117
Natural gas liquids thousand 42-gallon barrels	16,100 ^e	16,300 ^e	18,200	18,000	18,000 ^e
Peat, agricultural (turba)	9,652	10,542	10,159 ^r	8,539 ^r	7,258

See footnotes at end of table.

TABLE 1--Continued
 ARGENTINA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity	1998	1999	2000	2001	2002	
MINERAL FUELS AND RELATED MATERIALS--Continued						
Petroleum:						
Crude	thousand 42-gallon barrels	309,128	292,521	280,944	284,204 ^r	275,366
Refinery products:						
Liquefied petroleum gas	do.	19,472 ^r	21,125 ^r	22,903 ^r	23,913 ^r	12,208
Motor gasoline	do.	67,359	70,299	64,853	59,655	50,389
Aviation gasoline	do.	12,705	686	107	10,000 ^e	--
Jet fuel	do.	11,449	12,496	12,153	10,580	10,286
Kerosene	do.	1,138	1,055	667	570	305
Distillate fuel oil	do.	79,216	80,501	77,874	77,321	71,061
Residual fuel oil	do.	11,587	11,806	10,628	12,149	11,727
Lubricants	do.	1,574	1,311	2,141	2,246	2,275
Other	do.	18,981	19,232	19,146	22,171	27,438
Refinery fuel and losses	do.	4,003	5,432	5,039	5,050	5,370
Total	do.	219,478 ^r	213,079 ^r	205,433 ^r	212,555 ^{r,e}	180,319

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

¹Table includes data available through June 2003.

²Hot-rolled semimanufactures only; excludes castings and cold-rolled semimanufactures produced from imported hot-rolled semimanufactures.

³New information was available from Argentine sources that prompted major revisions in how lithium production was reported.

⁴Thomas slag production was estimated from the Thomas crude steel reported in La Siderurgia Argentina annual, which is published by the Instituto Argentino de Siderurgia.

TABLE 2
ARGENTINA: STRUCTURE OF THE MINERAL INDUSTRY IN 2002

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum		Aluminio Argentino S.A.I.C. (Government, 52.1%; private, 47.9%)	Puerto Madryn, Chubut Province	260.
Boron		Borax Argentina S.A. (Rio Tinto Borax, 100%)	El Porvenir Mine and plant, Jujuy Province; Sije and Tincalayu Mines and plants, Campo Quijano refinery, Salta Province	615. ¹
Do.		Procesadora de Boratos S.A. (Ferro Corp., U.S.A.; JEM Resources, Canada).	Loma Blanca, Jujuy and plant at Papalá	36.
Do.		Ulex S.A. (private, 100%)	Pastos Grandes, Salta Province	2. ¹
Do.		Norquímica S.A.	Salta Province	5 boric acid.
Cement		Cementos Loma Negra C.I.A. S.A. (private, 100%)	Buenos Aires, Córdoba, Corrientes, Salta, San Juan, Mendoza, and Jujuy Provinces	6,000.
Do.		Juan Minetti S.A. (Holcin Ltd., 100%)		1,700.
Coal		Yacimientos Carbonífero Río Turbio S.A. (private, 100%)	Río Turbio, Santa Cruz Province	210.
Copper and gold ²		Minera Alumbreira Ltd. (M.I.M. Holdings Ltd. of Australia, 50%; Rio Tinto plc., 25%; BHP Billiton Plc, 25%)	Bajo de La Alumbreira Mine, Belén Department, Catamarca Province	180 Cu, 20,000 Au.
Gold and silver	kilograms	Cerro Vanguardia S.A. (AngloGold Limited, 92.5%, Government of Santa Cruz Province, 7.5%)	Cerro Vanguardia Mine, Santa Cruz Province	100,000 Ag, 10,000 Au.
Do.		Yacimientos Mineros de Agua de Dionisio (Government, 100%)	Farallón Negro, Hualfín, and Belén, Catamarca Province	4,600 Au, 50,000 Ag.
Do.		Small mines (private, 100%)	Various in Jujuy Province	5,000 Ag.
Lead, silver, and zinc ²		Cía. Minera Aguilar S.A. (owned by Cía. Minera del Sur) (private, 100%)	Estación Tres Cruces, El Aguilar, Jujuy Province	49,800 Ag, 24 Pb.
Lead and silver refinery ²		do.	Refinería Aguilar, Palpalá Industrial Park, Jujuy Province	15 Pb, 18,000 Ag.
Natural gas	million cubic meters	Transportadora de Gas del Sur, S.A. and Transportadora de Gas del Norte (private, 100%)	Neuquén, Santa Cruz, Tierra del Fuego, Salta, and Río Negro Provinces	46,000.
Petroleum	million barrels	Repsol-YPF	Chubut, Santa Cruz, Neuquén, Río Negro, Mendoza, Salta, Tierra del Fuego, Jujuy, La Pampa, and Formosa Provinces	366.
Steel		Siderar S.A.I.C. (Techint Group, 53%; Inversora Siderúrgica Argentina, S.A., 11%; Usiminas, 5%; Companhia Vale do Rio Doce, 5%)	7 kilometers from San Nicolás de los Arroyos, Buenos Aires Province	2,200 steel, 1,100 pig iron.
Do.		Acindar Industria Argentina de Aceros S.A. (private, 100%)	Plant Nos.1 and 3, Buenos Aires Province; Plant No. 2, near Río Paraná, Santa Fe Province	1,500 steel. 1,000 DRI. ³
Do.		Siderca S.A.I.C. (Techint Group)	Buenos Aires Province	900. 670 DRI. ³
Uranium (ore)		Empresa Nuclear Mendoza (subsidiary of Nucleoeléctrica Argentina S.A.)	Sierra Pintada, San Rafael, Mendoza Province	160.
Zinc refinery		Cía. Sulfacido S.A.C.I. and Cía Minera Aguilar S.A.	Near Rosario on the Paraná River, Santa Fe Province	40.

¹Crude minerals.

²Gold data reported in kilograms.

³Iron produced by direct reduction.