

# LATIN AMERICA AND CANADA

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## Introduction

The Western Hemisphere (the Americas) includes, in order of importance, the United States, Canada, and 40 other economies in Latin America, which are covered in the Minerals Yearbook, Volume II—Domestic and Volume III—International, respectively. This area has a total land area of 40.2 million square kilometers, which is almost 27% of the world's land area (149 million square kilometers) and, in 2002, had a population of about 851 million inhabitants, which was about 14% of the world's population of more than 6.2 billion people and \$15 trillion of gross domestic product (GDP) based on purchasing power parity (tables 1, 2; U.S. Central Intelligence Agency, 2003a§<sup>1</sup>-c§; World Bank Group, 2004§).

Canada and several Latin American countries, in particular Brazil, Chile, Mexico, Peru, and Venezuela, are endowed with a wealth of mineral resources that include ferrous and nonferrous metals, a wide variety of industrial minerals, and all forms of fossil fuels. The Americas supply mineral commodities, such as aluminum, alumina, bauxite, copper, diamond, gold, iron ore, lead, manganese, silver, and zinc, and mineral fuels such as coal, oil and gas, and uranium, to the world. For these Latin American countries, the minerals sector was a significant factor in their economies on the basis of earning export revenues, gaining foreign exchange reserves, and offering business opportunities by way of globalization and privatization processes.

Canada, Mexico, and the United States, which were members of the North American Free Trade Agreement (NAFTA), were the largest and wealthiest trading bloc in the world—420 million inhabitants and about \$12 trillion of GDP (tables 1, 2; International Monetary Fund, 2003§; U.S. Central Intelligence Agency, 2003a§, b§; World Bank Group, 2004§). The NAFTA partners were each other's largest trade markets. The largest trading bloc in Latin America was the Mercado Común del Cono Sur (Common Market of the Southern Cone) (MERCOSUR) with more than 245 million people and an economy worth about \$1.9 trillion; the members were Argentina, Brazil, Paraguay, and Uruguay, and the associate members were Bolivia and Chile. The second largest market in Latin America was the Pacto Andino (Andean Pact) with more than 117 inhabitants and about \$750 billion of GDP; the members were Bolivia, Colombia, Ecuador, Peru, and Venezuela. The Central American Common Market had about

35 million people and an economy worth about \$140 billion; the members were Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua. The Caribbean Community (CARICOM) bloc had more than 17 million consumers and about \$131 billion of the GDP; the members included Antigua and Barbuda, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, and Suriname (tables 1, 2; International Monetary Fund, 2003§; U.S. Central Intelligence Agency, 2003a§, b§; World Bank Group, 2004§). Latin America's economic growth, especially that of MERCOSUR, was affected by the following factors: volatility of the international financing market, depressed prices for mineral exports, intensification of the Argentine financial crisis, and civil unrest in Colombia and Venezuela.

## Acknowledgments

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- Argentina—Dirección de Economía Minera y Desarrollo
- Barbados—Ministry of Energy and Public Utilities
- Belize—Geology and Petroleum Department
- Brazil—Departamento Nacional de Produção Mineral
- Canada—Natural Resources Canada
- Chile—Corporación Nacional del Cobre de Chile, (CODELCO) Comisión Chilena de Cobre (Servicio Nacional de Geología y Minería)
- Colombia—Unidad de Planeación Minero Energética
- Dominican Republic—Dirección General de Minería
- Ecuador—Ministerio de Energía y Minas
- El Salvador—Dirección de Hidrocarburos y Minas
- Guatemala—Departamento de Control Minero
- Honduras—Dirección Ejecutiva de Fomento a la Minería
- Jamaica—Mines and Geology Division
- Mexico—Consejo de Recursos Minerales
- Nicaragua—Administración de Recursos Geológicos, Dirección de Minas
- Peru—Ministerio de Energía y Minas
- Trinidad and Tobago—Ministry of Energy & Energy Industries, and
- Venezuela—Dirección de Planificación y Economía Minera.

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

## General Economic Conditions

In 2002, the Americas had a combined purchasing power parity of \$15 trillion, or almost 31.5% of the world's GDP of \$47 trillion (tables 1, 2; International Monetary Fund, 2003§; World Bank Group, 2004§). From 1995 to 2002, the Americas' GDP growth averaged 4.1% per year. During the same period, population growth averaged 2.1% per year. In 2002, the GDP of the Americas' grew by 3.0% compared with 2.8% in 2001. In 2002, Latin Americas' GDP growth slowed because of a slowdown in major markets [the European Union (EU), Japan, and the United States] and the increasing of interest rates by Central Banks in the region to fight inflationary restraints. Inflation remained in the single digits, and currency devaluations helped moderate the downturn in economic growth during the first half of 2002 and continued into 2003 (table 2; Economic Commission for Latin America and the Caribbean, 2003a§; International Monetary Fund, 2003§; World Bank Group, 2004§).

The various sectors of the Brazilian economy recorded diverse rates of growth—minerals, 3.4%; agriculture, 3.0%; services, 2.5%; and industrial, 0.6 % (Departamento Nacional de Produção Mineral, 2003a, p. 1; Ferraz, 2003, p. 1; Banco Central do Brasil, 2003c§). If that positive rate of economic growth in the minerals sector is sustained into 2003 and beyond, then it should continue its expansion as the demand for mineral exports and fabricated steel goods increases. Brazil has become the center of an increasingly rapid process of energy integration in South America owing to the country's gas market, which is in full evolutionary mode with an unsatisfied energy demand and a great potential for growth, and to the dramatic changes in natural gas and power markets because of the increase in cross-border energy investment opportunities, domestic gas consumption, and internationalization of the energy sector undergone by MERCOSUR (Mining Journal, 2002a§).

Brazil will continue to be a strong economy in Latin America and one of the world's most important producers of, in order of importance, metals, industrial minerals, and mineral fuels. Future hydroelectric and thermoelectric powerplants coming onstream during the next decade should ease Brazil's recovery from its 2001 energy crisis.

The new Government's election in Brazil resulted in a weakening of the real as investors feared the impact of its new social program in education, health, and public security (Mining Journal, 2002c). The domestic front was dominated by the uncertainty of the presidential election in the last quarter of 2002, and internationally, the Brazilian economy was affected by the slow growth of its main trading partners, in order of magnitude, the United States, Japan, and the EU; the Wall Street scandals, such as Enron Corp.; and the political upheaval in the Middle East. After the new administration introduced fiscal austerity policies by giving priority to such reforms as the country's complex tax code, trimming the civil service pension system, and continuing the fight against inflation, the real recovered in value. In spite of the international scene, the Argentinian crisis in particular, and the aftermath of the 2001 domestic energy crisis, the Brazilian economy has remained resilient and posted a GDP growth of 1.5% in 2002. As an exporter of mineral commodities, the country was poised to gain

from the continued depreciation of the Brazilian real caused by the financial risks, which, in part, were triggered by the more severe financial crisis in Argentina.

Canada continued on the path of its economic recovery after a decline during most of 2001 and the first half of 2002. Canada was a net exporter of metals, industrial minerals, mineral fuels, uranium, and hydropower. Canada's mineral industry was encouraged by the Federal Government to cooperate with it to improve the permitting process. The goal was to allow exploration and mining companies to comply with the regulatory requirements in a timely and efficient way and at the same time to operate within high environmental and social standards. Progress was being made toward improving the regulatory regime in northern Canada. Government and industry endorsed the concept of a Northern Mines Ministers Conference to be held each year to report on progress, to identify challenges, and to network with all concerned stakeholders to reestablish an attractive investment climate and to reverse any economic difficulties (in particular, those of the Yukon Territory) after having been battered by economic and environmental factors (Excell, 2002; Steele, 2002a, b). If Canada's weakened dollar continues, then presumably this could assist exports, but it could discourage imports of certain necessary commodities, specialized equipment, and professional expertise needed to enhance the Canadian mineral industry.

In 2002, Chile's total exports accounted for about 40% of its GDP, of which copper contributed 34% (U.S. Central Intelligence Agency, 2003a§). Chile was a market-oriented economy with the highest per capita GDP in Latin America, which grew by 2.1% in 2002 and was projected to grow by about 3.1% in 2003 (table 2). Chile and the United States will enter into a bilateral Free Trade Agreement by mid-2003, which will require approval by their respective legislatures.

In 2002, Peru's 4-year-long recession came to an end, which allowed for renewed economic recovery and growth. The energy, mining, and related industries remained very attractive sectors of the Peruvian economy, which with continued capital flow from investors were expected to provide long-term benefits to the country. Investors were implementing an approach to community development and environmental protection that was based on sustainable development principles (Instituto de Ingenieros de Minas del Peru, 2003a, p. 26; b, p. 18).

As a result of NAFTA, Mexico's investment and trade increased and mineral exports diversified to other markets, such as Asia, the EU, and Latin America. December 2002 marked the 10th anniversary of the signing of NAFTA, and trade and investment among Canada, Mexico, and the United States has grown by more than 100%; trilateral trade totaled \$1.7 billion per day. The interactions and attitudes of the three partners, however, will dictate the future trade and integration and scope of their economic relationships. These three countries will be seriously engaged in the effort to forge a free trade agreement of the Americas (FTAA) (Wilson International Center, 2003§).

## Investment Data and Political Risk

In general, investment opportunities for U.S. and foreign companies in Latin America increased between 1991 and 2001 because of the liberalization of the Andean Pact and the

MERCOSUR countries' economies and the privatization of many Latin American infrastructure, mineral, oil and gas, and utilities sectors. By 2002, throughout Latin America, investors were allowed 100% of the mineral industry equity ownership, as a result of privatization or by direct acquisition processes, profits were allowed to be expatriated, and more importantly, restrictions on foreign investments were removed. Latin America's economic growth was characterized by, in order of importance, privatization, joint-venture projects, direct acquisitions, and reduced trade barriers. Privatization and foreign direct investment (FDI) were changing the industrial operating mode in many countries to a privately owned/state-regulated regime from a state-owned/state-operated regime. The establishment of joint ventures, such as in construction and management of infrastructure, energy and mining projects, and deregulated industries (gas, electricity, telecommunications), was a common practice in the region. Foreign investors were attracted to Latin America's open market economies. These changes and the growing awareness of environmental protection led to the establishment of increasingly effective environmental regulations and controls (EERCs) for all Latin American industries. With respect to economic, environmental, and social impacts in the region, the implementation of EERCs, however, will require further consideration of many factors to find a balance between sustainable industrial profitability and environmental protection.

Governments of the Latin American and Caribbean region recognized that privatization and FDI fosters economic growth. Privatization, however, brings lower employment to achieve competitiveness and higher productivity, which often requires compromises from labor. The lure of rights to private ownership in Latin American countries, such as Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guyana, Jamaica, Mexico, Peru, Suriname, and Trinidad and Tobago, attracted great interest in the mineral endowment of those countries. Seeking sources of hard currency for its economy, Cuba increasingly allowed foreign companies to participate in prospecting and exploring, producing, and refining of metals and crude oil (Naciones Unidas, 2002§).

In 2002, FDI inflows to the Latin American and Caribbean region amounted to about \$79.7 billion, which was almost 10% lower than that of 2001 (\$88.5 billion). Investment in the nonfuel mineral mining sector in Argentina decreased to \$267 million from \$371 million in 2001. This was significantly lower than those of 1997 and 1996 when investment totaled \$788 million and \$818 million, respectively, but was almost four times the investment level of 1994. Brazil's share of the region's net FDI inflows decreased to \$16.6 billion in 2002 from \$22.5 billion in 2001 (Banco Central do Brasil, 2003a§; Economic Commission for Latin America and the Caribbean, 2003a§). Other foreign investors in the banking and energy sectors, however, showed confidence in Latin American countries, which supported continued economic growth and investments in new technology well into the next decade. Deferment of major investment decisions was not reported. Even firms that financed with borrowed U.S. dollars, which included Companhia Vale Rio Dolce (CVRD), had the natural hedge provided by their exports. CVRD will invest about \$6 billion in mineral project developments and

acquisitions into 2007. The significance of the investment would be to increase CVRD's market capitalization to \$25 billion from its 2001 level of about \$10 billion and to make it more competitive internationally (Mining Journal, 2002c). The Brazilian economy, however, was affected by the volatility of the international financing market, depressed prices for mineral exports, and the aftermath of the country's power shortage owing to its worst drought in decades. Mexico's FDI was affected by currency appreciation and the moving of some production plants to Asia. FDI inflows to Mexico were 45% lower than those of 2001 (Mining Journal, 2002e). The principal recipients of FDI in the Latin American and Caribbean region were the previously state-owned mineral and energy assets and the finance, service, and telecommunications sectors (Economic Commission for Latin America and the Caribbean, 2003a§, b§).

The International Monetary Fund endorsed Brazil's move to a system of inflation targets and currency devaluation to guide its monetary policy into 2003. This action indicated that the country could reduce its 2002 account deficit of \$35.2 billion to an equivalent of 5.8% of GDP compared with that of 2001, thus helping restore confidence in the Government's economic management and creating conditions for lower interest rates and economic recovery (Banco Central do Brasil, 2003b§).

Brazil's strategic plan continued to be based on macroeconomics, constitutional reviews, and direct sales of assets via mergers and joint ventures to the private sector. The plan was designed to achieve Brazil's goals of promoting and encouraging new capital flows into the economy. Given that its economy was in recovery, however, the currency devaluation and the tough fiscal austerity plan helped restore confidence in the Government's economic management and create favorable conditions for lower interest rates (Economic Commission for Latin America and the Caribbean, 2003c§).

After the steel industry, CVRD, and other sectors of the Brazilian economy, such as energy, services, telecommunications, and transportation, were privatized, consideration turned to crude oil and natural gas opportunities. New projects in the oil and gas sectors were open to mergers and joint ventures among domestic and foreign investors; thus, the Brazilian economy should remain sustainable and competitive within an inclusive globalization and privatization processes into the new century. The new Brazilian Administration recognized the need for fiscal stability and was working with the international financial markets (Mining Journal, 2002c; Pimentel, 2003b).

Investments in the Brazilian mining industry were expected to continue to enhance exploration and mine development activities, particularly in, in order of importance, iron ore, gold, copper, and emeralds. This trend should continue because several corporations were forming consortiums and acquiring exploration properties, mining prospects, and permits particularly for, in order of importance, oil and gas, iron ore, gold, diamond, and base metals.

In Cuba, foreign investment efforts were focused on the search for new markets, competitive technologies, and capital. Agreements on promotion and reciprocal protection of investments were signed between Cuba and 54 countries along with seven other agreements for avoidance of double taxation.

Cuba's principal trading partners were France, Germany, Italy, Russia, and Spain in Europe, which accounted for 47% of Cuba's total commercial exchange; followed by Canada, the Netherlands Antilles, Mexico, and Venezuela in America, which accounted for 37%; and Asia, which accounted for 14% (Investment Promotion Center of the Ministry for Foreign Investment and Economic Cooperation, 2003§).

As of March 2002, the number of joint ventures and economic associations that were operating with foreign capital in Cuba was 403. These associations were in 32 sectors, which included agriculture, mining, petroleum, product assembly, and tourism. Direct foreign investment in Cuba was \$38.9 million in 2001. The United States continued to restrict direct American investment in Cuba (U.S.-Cuba Trade and Economic Council Inc., 2003§).

In 2002, Alcoa World Alumina and Chemicals and the Government of Jamaica agreed to invest \$115 million to expand Alcoa Minerals of Jamaica, Inc. (Jamalco) alumina refinery operations in Clarendon, Jamaica (Alcoa Inc., 2002).

The special financial agreements that allowed Venezuela to sell petroleum to Cuba under preferential conditions collapsed, which left the island about 53,000 barrels per day short of domestic demand. The country's proven crude oil reserves as of January 2002 were estimated to be 750 million barrels, and proven natural gas reserves were about 2,500 billion cubic feet (Caribbean Update, 2002a, b; U.S. Energy Information Administration, 2003b§).

Energy, mining, telecommunications, and related industries remained the most attractive sectors of the Peruvian economy for investment. The continued capital flow from domestic and foreign investors was expected to provide long-term benefits to the country. According to the *Comités de Privatización* of Peru, the privatization process was expected to continue to generate additional investments in every sector of the Peruvian economy, particularly in the mining and energy industries. By 2005, the privatization of Empresa Minera del Centro del Perú (Centromín), Empresa Minera del Perú (Minero Perú), and the banking and energy sectors was expected to continue to improve prospects for the minerals and financial sectors and the thermoelectricity generation industry. In 2002, investments were being used to modernize Peru's industrial infrastructure. Future foreign investments in the minerals sector, mostly in copper, gold, and oil and gas, were projected to be about \$17 billion between 2003 and 2007, which will be the largest committed capital to date, and will contribute significantly to the future of Peru's economic development (Ministerio de Energía y Minas, 2003a, p. 10, 21-25).

In September 2001, Alcoa Inc. of the United States proposed investing more than \$2.0 billion to strengthen the bauxite industry and to increase energy generation in Suriname. Plans included exploiting bauxite from the Bakhuis Mountains in western Suriname, construction of a new smelter, and reactivating the Paranam smelter, which had been shut down in 2000. Alcoa officials noted that the additional energy required could come from the proposed Kabalebo hydroelectric project near W.J. van Blommestein Lake (De Ware Tijd, 2001§).

## Legislation

In 2002, Colombia's Mining and Energy Ministry published its Environmental Mining Guide, which details procedures for mineral exploration, development, production, processing, and mine closure (Business News Americas Ltd., 2002c§). A decree that prohibits all future open pit mining projects in Costa Rica was signed in 2002. The measure could affect three Canadian gold companies that are pursuing projects in the country (Business News Americas Ltd., 2002b§). Legislation that established a system in which companies could purchase exploration and development rights under a single contract and that eliminated a 3% royalty in favor of annual concession fees that started at \$1.00 per hectare was approved in Ecuador during 2002 (Business News Americas Ltd., 2002a§). Bolivia and Peru are reported to be close to signing a mutual mining cooperation agreement similar to the treaty signed by Argentina and Chile in 2001 (Business News Americas Ltd., 2003b§).

The present legal framework for the development and use of mineral resources in Brazil was established by the Federal Constitution of October 5, 1988. On August 15, 1995, the Brazilian Congress approved Constitutional Amendments Nos. 6 and 9, which allow the private sector via privatization, joint ventures, and deregulated investment to participate in, in order of importance, the mining, petroleum, natural gas, coastal and river shipping, transportation, and telecommunications sectors. *Petróleo Brasileiro S.A. (Petrobrás)* continued to enter into joint ventures with foreign investors. *Agencia Nacional do Petróleo* regulates the petroleum industry (Ferraz, 2003; *Petróleo Brasileiro, S.A.*, 2003, p. 7, 14; Pimentel, 2003a, p. 3-5).

Among the many steps the Government of the Dominican Republic has taken to address the restructuring of the mining industry was the creation of the *Consejo Nacional para el Desarrollo Minero* and *Unidad Corporativa Minera (UCM)* through Decree 613-00 of 2000. The purpose of the UCM was to follow up and serve as an operational collaborator in all mining projects in which the Dominican Government is a participant. The UCM will also arrange for private investments in the mining sector, assist *Rosario Dominicana, S.A.* in the search for strategic partners, and represent the Government's mining rights over the bauxite deposits in Cabo Rojo (Revista Inter-Forum, 2002§; Business News Americas Ltd., 2003a§).

In Jamaica, the National Environment and Planning Agency (NEPA) was created in April 2001. The NEPA was a merger of the Natural Resources Conservation Authority, the Town Planning Department, and the Land Development and Utilization Commission. Among the NEPA's objectives are the integration of Jamaica's environmental, planning, and sustainable development policies and programs.

In 2002, the Government of Trinidad and Tobago implemented new energy policies to attract investors. The policies included the establishment of a standing committee on energy to represent the interests of all energy stakeholders, to oversee the development of a Natural Gas Master Plan that would diversify the country's gas-based economic portfolio, and to ensure the sustainability of gas development. Under consideration was a review of fiscal incentives and tax policies

with regard to ammonia and methanol byproducts, a review of the oil and gas tax regime, the reprioritization of goals in the gas sector, the expansion of liquefied natural gas (LNG) exports, the development of new sites for industrial estates, the consideration of direct sales of natural gas to consumers, and the negotiation with major producers over royalty issues (Oil & Gas Journal, 2002).

Venezuela's new Reglamento General de la Ley de Minas (Decreto No. 1.234) was published in the Gaceta Oficial de la República de Bolivariana de Venezuela on March 9, 2001. It establishes the terms, conditions, and administrative procedures to implement the Mining Law of 1999. A new hydrocarbon law (Decreto No. 1.510) was passed in Venezuela in November 2001, was published in November in the Gaceta Oficial de la República Bolivariana de Venezuela No. 37.323, and became effective on January 1, 2002. Under the decree, all hydrocarbon deposits belong to the Republic of Venezuela, which is in agreement with Article 302 of the Constitution of 1999—all primary hydrocarbon activities are reserved for the Government. Refining and marketing of hydrocarbons (secondary activities) can be performed by the Government and the private sector either jointly or separately. The creation of a mixed enterprise for primary production of hydrocarbons requires the approval of the National Assembly. The Government has the right to 30% of production from any deposit as royalty payment. The rate can be decreased to 20% if the economics of the production are affected by the higher rate. Production royalty from mixed bitumen from the Orinoco Belt can be reduced to 16.67% if the projects are not viable at the 30% rate. In both cases, the higher royalty rate can be reestablished at the discretion of the Government.

## Exploration

Although Latin America maintained its top position as a destination for proposed exploration capital, the 2002 decrease of 22% was based on data compiled by the Metals Economics Group (MEG) (Metals Economics Group, 2002a). By commodity, Latin America was targeted from 26% to 27% of the world gold exploration budget and almost 37% of the budget for base metals. In order of importance, Peru, Brazil, Chile, Mexico, and Argentina were ranked in the MEG's top 10 countries for 2002 exploration on the basis of the amount of the proposed exploration budget. Similarly, an annual survey of executives from leading international mining companies conducted by the Fraser Institute ranked the countries of Brazil, Chile, and Peru as the top three Latin American countries for mineral exploration investment based on their financial attractiveness for investment in 2002 (Fredricksen, 2002§); investment appeal is reportedly based on the geologic potential, property value, ease of doing business, and political stability of the countries.

Despite the significant drop in budgeted exploration expenditures in 2002, those for late-stage gold projects in Latin America increased by almost 48% to \$106.9 million from \$72.4 million in 2001. This suggests that available funds were being spent on larger later stage projects at the expense of smaller

earlier stage projects. The average advanced-stage project size increased to 84 metric tons (t) (2.7 million troy ounces) of contained gold in 2002 compared with 49.8 t (1.6 million troy ounces) of gold in 2001 (Metals Economics Group, 2002b). The MEG reported that 26 Latin American projects each contained a resource of more than 31.1 t (1.0 million troy ounces) of gold.

Based on data compiled by the USGS, Latin American countries with the greatest exploration activity were, in descending order by number of reported sites, Mexico, Argentina, Peru, Chile, and Ecuador. Gold attracted about 65% of total exploration activity, but interest in base metals reached 20%, and silver achieved about 10% of the total. Investment in 2002 was primarily used to define newly discovered resources further (75%) and to conduct feasibility studies of promising deposits (14%).

In spite of continued interest in exploration in Mexico, the country's mining industry remained weak. Mexico's major mining companies reported poor financial returns in light of low metals prices and current currency exchange rates. In 2001, the Cámara Minera de México (Mexican Chamber of Mines) reported that of the 400 small mining and exploration companies operating in Mexico a decade ago, only 70 continued to operate. Investment in exploration in Mexico decreased by 32% to \$463 million in 2002 (Metals & Materials Latin America, 2001).

Barrick Gold Corporation's discovery of the Alto Chicama gold deposit in Peru led to aggressive exploration in the country. Barrick reported that it spent \$35 million in 2002 at Alto Chicama; this included 135,000 meters of drilling. Exploration on Peru's northern border with Ecuador opened up because of the 1998 peace accord between the two nations that removed claims restrictions near the border and recent discoveries in the region (Metals & Materials Latin America, 2002b). Peru has been the focus of greenfield exploration; of AngloGold Limited's 682 exploration targets in Peru, only 2 have reached the drilling stage (Metals & Materials Latin America, 2002a, b).

The border region between Argentina and Chile continued to be heavily explored. Improved gold prices at the end of 2002 may have spurred Barrick to announce the sequential development of its Pascua Lama and Veladero properties, which contain a joint resource of more than 808.7 t (26 million troy ounces) of gold and 21.8 t (700 million troy ounces) of silver (Metals & Materials Latin America, 2002a). Delineation of both deposits will continue. Coeur d'Alene Mines Corporation began production at its Cerro Bayo silver-gold mine in 2002 and acquired the nearby Martha Mine; extensive exploration work in 2002 delineated significant additional gold and silver resources along the border of Argentina and Chile.

Brazilian gold production could increase significantly in the foreseeable future as a byproduct of the growth of Brazilian copper ore production and increased interest by foreign investors in largely unexplored areas. More than 2,000 gold occurrences, which are mostly Precambrian vein deposits and alluvial placers, were known (Departamento Nacional de Produção Mineral, 2003b, p. 101; Ferraz, 2003).

The most attractive geologic exploration targets continued to be the Cordillera and the Precambrian Guyana Shield. The Cordillera, which is the backbone of the Americas, extends

southward through Canada, the United States, Mexico, and Central America to the Andes of South America virtually to Tierra del Fuego. The Guyana Shield comprises northwestern Brazil, southeastern Venezuela, Guyana, Suriname, and French Guiana. Investments into the regional mining industry should continue to enhance exploration and mine development activities in, in order of importance, gold, iron ore, copper, silver, nickel, and emeralds. This trend should continue because several corporations were forming consortiums and acquiring exploration properties, mining prospects, and permits particularly for, in order of importance, gold, silver, nickel, diamond, and base metals (table 3).

Gold exploration was conducted at 15 properties in French Guiana in 2002. Ariane Gold Corporation of Canada explored for gold at the Camp Caiman, the Cipanama, and the Mataroni properties in the northeastern part of the country. Camp Caiman, which is located in northeastern French Guiana, hosts two major mineralized zones, C-88 and Scout. In September 2002, Ariane began a \$2.8 million drilling program at Camp Caiman. At yearend, efforts were still focused on additional metallurgical test work to improve recovery (Guyanor Ressources, 2003; Resource Information Unit, 2003, p. 88). Future exploration activities at Camp Caiman, Cipanama, and Mataroni will include metallurgical studies of the sulfide resources to determine the economics of the ore (Ariane Gold Corp., 2002).

Hardman Resources Ltd. of Australia, through its wholly owned subsidiary Planet Oil Limited, signed a contract to shoot 7,500 kilometers (km) of two-dimensional seismic across its French Guiana offshore permit in 2002. Hardman has held a 95% equity on the exclusive exploration license offshore French Guiana since 2001. Hardman expected to upgrade the permit area to attract larger oil companies to farm-in and fund the drilling phase of exploration (Hardman Resources Ltd., 2002).

Canada-based Guyana Goldfields Inc. completed three exploration campaigns at its Aurora property, which included reconnaissance geological mapping and prospecting, geochemical surveys, trenching, and shallow drilling. Results indicated the presence of at least nine mineralized zones. Drilling at Aurora was scheduled to begin in the second quarter of 2003 (Guyana Goldfields Inc., 2002).

Although economic concentrations of occurrences of palladium and platinum have not yet been found, geochemical surveys performed in Guyana in 1989 had returned highly anomalous palladium values in weathered soils within the Guyana Shield, which suggested possible platinum-palladium-bearing deposits. As a result, Guyana Goldfields acquired four properties in February 2002 for exploration, namely Badidku Mountain and Tantom Hills in southern Guyana and Ireng-Stone Creek and Upper Takatu in central Guyana (Resource Information Unit, 2003, p. 93).

Bauxite exploration remained the focus of mining activities in Suriname. Suriname Aluminum Company Llc. (Suralco) (a subsidiary of Alcoa) (24%) and BHP Billiton's Billiton Maatschappij Suriname NV (76%), which operated the Accaribo Mine and the Lelydorp III deposit, carried out a feasibility study of a Government-owned identified resource in the Bakhuis Mountains. Alcoa and BHP Billiton also planned to explore for bauxite in western Suriname during the year (Resource Information Unit, 2003, p. 123).

The Government of Trinidad and Tobago was debating whether additional LNG trains or new downstream industries should be developed in the country but announced its intention to attract additional investments in petroleum and gas exploration. According to the Ministry of Energy and Energy Industries, natural gas reserves were expected to last about 18 years given the country's usage rate in 2002. Trinidad and Tobago's natural gas reserves have been estimated to be 651.3 billion cubic meters (23 trillion cubic feet) (Central Bank of Trinidad and Tobago, 2003, p. 5).

The MEG reported that budgeted exploration spending in Canada for 2002 would be \$317 million; this would account for more than 18% of the overall worldwide exploration budget (Metals Economics Group, 2002a). As reported by the Canadian Government, exploration budget allocations for 2002 were greatest in Ontario (about 25% of the total Canadian exploration budget), Quebec (22%), Nunavut (14%), British Columbia (9%), and Saskatchewan (8%). Provinces with significant 2001-02 increases included Nova Scotia (111%), Alberta (98%), and British Columbia (54%). Provinces with considerable 2001-02 decreases included New Brunswick (62%), Northwest Territories (56%), and Newfoundland/Labrador (37%). Approximately 72% of the reported Canadian exploration budget was allocated for initial exploration (up to and including the first delineation of a mineral deposit). Budgets of junior companies were expected to increase to \$133 million in 2002 from \$113 million in 2001, and budgets of senior companies were expected to decline to \$186 million in 2002 from \$213 million in 2001 (Natural Resources Canada, 2003c. p. 10).

On the basis of data compiled by the USGS, gold targets accounted for approximately 43% of reported Canadian exploration. The greatest amount of gold activity, which was based on the number of active sites, took place in British Columbia, Ontario, and Quebec. Copper targets accounted for 11%, and nickel targets accounted for about 7% of Canadian activity; copper exploration was focused on British Columbia and Ontario, and nickel exploration was focused on Ontario and Quebec. Diamond exploration activity continued to increase in 2002 and accounted for about 21% of all Canadian exploration targets, mainly in, in order of importance, Nunavut, the Northwest Territories, Ontario, and Quebec. Exploration was encouraged by recent discoveries and renewed interest by De Beers Canada Exploration Inc., which spent 40% of their \$73 million 2002 exploration budget on Canadian diamond projects (table 3). Platinum-group metals (PGM), which are often associated with nickel and copper sulfides primarily in Ontario, were also targeted in 2002 and accounted for about 16% of reported Canadian exploration projects. Approximately 92% of all reported exploration targets was considered to be early-stage sites; this was consistent with Government statistics, which indicated that junior companies were conducting much of the Canadian exploration activity (Northern Miner, 2002b).

In 2002, extensive work was conducted by exploration companies to define further diamond potential at the Gahcho Kue (Kennady Lake) deposit in the Northwest Territories and along the Hope Bay Greenstone Belt in Nunavut. Drilling continued to search for additional nickel-copper and PGM potential at Ferguson Lake in Nunavut and near the McCreeedy West and River Valley deposits in Ontario. Drilling continued

to define the gold potential at Hope Bay and Meadowbank in Nunavut. Construction finally began at the large Voisey's Bay nickel-copper deposit in Newfoundland after being delayed by controversies over environmental, political, and technical issues. Expenditures for exploration and deposit appraisal by mineral commodity sought amounted to \$390 million; of that, \$120 million was allocated for gold (30.8%); diamond, \$110 million (28.2%); base metals, \$95 million (24.4%); and others, \$65 million (16.6%) in 2002 (Natural Resources Canada, 2002§).

The Canadian Government implemented a 3-year exploration investment tax credit in October 2000 to stimulate mineral exploration. Since that time, exploration expenditures have risen modestly. Canada's mining industry has been lobbying for an extension of this legislation, but no decision has yet been announced (Mining Journal, 2002b). In British Columbia, several amendments to the Mines and the Mineral Tenure Acts that would clarify land rights and reduce regulatory burden in the Province have been introduced (Northern Miner, 2002a). The Government of Quebec passed a law offering a 60% tax credit until 2007 on all expenses incurred in mineral exploration (Mining Engineering, 2002). Several exploration projects in Nunavut would benefit from plans to build a 290-km all-weather road that would link the region to a new deepwater port on the Arctic Sea. A feasibility study of the Voisey's Bay project was completed in 2002 (Mining Journal, 2002e). The "Wachiya" Native Title agreement, which was concluded between the Cree Nation and Dianor Resources Inc., will allow the two to partner in diamond exploration activities in Quebec (Skillings Mining Review, 2002).

## Commodity Review

In 2002, the most important mineral commodities produced in Canada, Latin America, and the United States with their shares of world total are listed in table 4. This summary includes a review of potential developments, production, and consumption for leading mineral commodities. In the Americas, the abundant and varied mineral endowment of Latin America and Canada complement the mineral resources and commodity markets of the United States. Interest and investment flows continued to many Latin American countries in spite of the recessionary cycle, slow economic recovery, and lower prices for major mineral exports as discussed in the country chapters in the 2002 Minerals Yearbook. The mineral commodity outlook section data forecasts potential production through 2007 on the basis of augmented ore reserves, planned mine expansion capacities, and new processing facilities. Projects of operating companies, consortia, and/or Governments are listed as indications of their current (2002) plans and are not a USGS prognosis of presumable outcomes.

Estimates for production of major mineral commodities for 2003 and beyond have been based upon supply-side assumptions, such as announced plans for increased production/new capacity construction and bankable feasibility studies. No explicit consideration of any demand-side factors, such as price and economic growth, was made.

## Metals

**Aluminum and Bauxite.**—*Production.*—Latin America's production of bauxite increased to 37.2 million metric tons

(Mt) in 2002 from 37.1 Mt in 2001, which was about 26% of world production (tables 4, 5). Brazil and Jamaica remained the leading producers in Latin America and the third and fourth leading bauxite-producing countries in the world with outputs of 13.2 Mt and 13.1 Mt, respectively (table 5; Plunkert, 2003b).

The Americas' primary aluminum output (7.6 Mt) increased by about 5% compared with that of 2001 (7.2 Mt) and was almost 29% of world production (tables 4, 6). Latin America and Canada contributed with 4.9 Mt, which was an increase of almost 7% compared with that of 2001 (4.6 Mt) (tables 4, 6). Canada (2.709 Mt), the United States (2.707 Mt), and Brazil (1.318 Mt) remained the leading producers of the metal in the Americas (table 4). Canada and the United States were the third and fourth leading aluminum-producing countries in the world with an output of about 2.7 Mt each (table 4; Plunkert, 2003a).

Secondary aluminum-production in Latin America and Canada increased to 661,000 t in 2002 from 614,000 t in 2001. The largest producers of the secondary metal in the region were, in order of importance, Mexico, Brazil, and Canada (table 7).

*Consumption.*—The Americas' share of the world's primary aluminum consumption in 2002 was about 29%. In the Americas, consumption increased to 7.3 Mt of primary aluminum in 2002 from 6.9 Mt in 2001 and decreased from 1998 (7.5 Mt). The United States accounted for almost 75% of total primary aluminum consumption in the Americas followed by Canada (10%), Brazil (8%), and Venezuela (2%) (World Bureau of Metal Statistics, 2003, p. 9).

*Outlook.*—The major development in this sector in the Americas during 2001-02 was the \$1.6 billion of committed investment for expansions of the facilities at Albras-Alumínio Brasileiro, S.A., Alumínio do Norte do Brasil, S.A., and Mineração Rio do Norte in Brazil in the short term, which should help balance the loss of production cutbacks of 1.6 million metric tons per year in smelter capacity in the Western United States. Continued volatility in aluminum prices was expected.

**Copper.**—*Production.*—In 2002, the Americas' mine production of copper decreased from 8.0 Mt in 2001 to 7.7 Mt in 2002 (table 4; Edelstein, 2003). Chile continued to be the leading copper producer in the world, although output decreased by about 6% because of lower market prices (Edelstein, 2003). Peru's output, which increased by about 17% compared with that of 2001, was significant because the Antamina Mine came onstream in mid-2001 (table 8). In 2002, Latin America and Canada produced about 6.6 Mt of copper content in ore (table 8). Chile accounted for more than 58% of the Americas' copper mine production; the United States, 15%; Peru, 11%; Canada, 8%; and Mexico, 4%. The Americas' copper mine production was almost 41% of world production (table 4). In 2002, copper mine production in Latin America and Canada was up by 63% compared with that of 1995 and 117% compared with that of 1990 (table 8).

In 2002, refined copper production decreased by 2.6% in Latin America and Canada. The only metal production increase was registered in Peru (about 3%). Metal output decreases were registered in Brazil (14%), Canada (13%), Chile (1%), and Mexico (0.2%) (table 9). In 2002, Chile accounted for 63% of

the Latin America and Canada refined copper production; Peru, 11.7%; and Canada, 11.4% (table 9).

**Consumption.**—The Americas' consumption of copper decreased to 3.4 Mt in 2002 from 3.8 Mt in 2001 and 4.0 Mt in 1998. In 2002, their share of the world's copper consumption was 22.8%. The United States, which was the dominant consumer in the region, accounted for 68.8%; Mexico, 11%; Canada, 8%; and Brazil, 7% (World Bureau of Metal Statistics, 2003, p. 41).

**Outlook.**—Between 2003 and 2007, the Americas' copper mine production is expected to increase to 8.6 Mt from 7.0 Mt, or almost 23%, owing to startups of future copper ore mines (Sossego in Brazil by 2004 and Voisey's Bay in Canada by 2006), and future expansions and lixiviation of oxide copper ores (Chuquicamata, Escondida, and others in Chile, Antamina, Cerro Verde, Cuajone, Tintaya, and Toquepala in Peru, and others in the region by 2003-04). Alliance Copper Ltd., which was owned by CODELCO and BHP Billiton, was planning to develop a bioleaching process to treat copper concentrates that contain from 2% to 4% arsenic; a prototype plant was expected to begin operations by the second half of 2003 at the Chuquicamata Mine. A similar bioleach technology has been successfully used to treat arsenic-rich gold sulfide ores in Ghana and South Africa.

In 2007, copper ore output could be increased in Chile to about 6.2 Mt, Peru to 910,000 t, and Canada to 670,000 t (table 8). In 2003, the production of refined copper was likely to remain at about the same level as that of 2001 and then to increase by almost 6% in 2005 and by more than 10% from 2003 to 2007 (table 9). In 2003, the Americas' consumption of refined copper was expected to be at about the same level as that of 2002. The largest consumer of refined copper would continue to be the United States followed by Mexico, Canada, and Brazil (World Bureau of Metal Statistics, 2003, p. 41).

**Gold.**—**Production.**—In the Americas, gold mine production fell to 819 t in 2002 from 846 t in 2001 and 865 t in 2000 and increased from 759 t in 1995. In the United States, gold production fell by 11% compared with that of 2001. In 2002, gold output in Latin America and Canada decreased slightly by almost 1% compared with that of 2001. Gold production increased significantly in Ecuador (255.5%) because of the startup of new gold mines in the Loja region, Peru (13.8%), and Honduras (9.0%), but decreased in Brazil (27.0%) and Guyana (4.2%) compared with those of 2001 (table 10). The Americas' share of world gold mine production amounted to 32%; Latin America's, 14.6%; the U.S., 11.7%; Peru's, 6.2%; and Canada's, 5.9% (table 4).

**Outlook.**—Gold mine production in Latin America and Canada decreased by less than 1% in 2002 owing to consolidations and takeovers worldwide but was expected to increase again by 7.4% in 2003 and slightly by 2.5% between 2005 and 2007. Latin American and Canadian combined output is likely to increase to 563 t in 2003, 580 t in 2005, and 609 t in 2007 (table 10). By 2007, gold production is expected to reach 175 t, 165 t, and 55 t in Canada, Peru, and Argentina, respectively (table 10). Output is expected to rise with the development of gold deposits associated with the Veladero Breccia System in Argentina, the Mundo Novo Greenstone Belt

in Brazil, and the Alto Chicama startup in 2006 and increased capacity at the Pierina and the Yanacocha gold mines in Peru.

**Iron and Steel.**—**Production.**—In 2002, the Americas' share of global iron ore, direct-reduced iron (DRI), crude steel, and pig iron production amounted to 32.9%, 31.8%, 17.0%, and 14.2%, respectively (table 4; International Iron and Steel Institute, 2003b§). Production of iron ore in Latin America and Canada increased by 2.2%, and the leading producers were Brazil, Canada, and Venezuela (table 11; Mining Journal, 2002c; Natural Resources Canada, 2003a, b). In 2002, the iron ore produced in Latin America and Canada had a higher iron content (about 65%) and higher tonnage (185 Mt) compared with that of 2001 (181 Mt and less than 65% content), or 2.2% (table 11). Production of pig iron in Latin America and Canada increased to 46.0 Mt in 2002 from 44.5 Mt in 2001, or 3.4%; production increased in Brazil by 6.5% and in Canada by less than 1.0% compared with those of 2001 (table 12). Production of DRI in Latin America and Canada increased to 16.6 Mt in 2002 from 14.9 Mt in 2001; in Mexico, it increased by 24.5%; in Argentina, 13.3%; Venezuela 8.0%; and Trinidad and Tobago, almost 6.0% compared with those of 2001 (table 12). In 2002, the output of crude steel in Latin America and Canada increased by 6.6% (table 13). The United States accounted for 10.6% of the world's crude steel production; Latin America and Canada, 6.4%; Brazil, 3.4%; Canada, 1.9%; and Mexico, 1.6% (table 4).

**Consumption.**—In 2002, the Americas accounted for almost 20% of global steel consumption. The United States consumed 102 Mt of finished steel products in 2002, which was about the same as in 2001 and 1995. From 1995 to 2002, Brazil's consumption of steel products decreased to 16.5 Mt in 2002 from 16.7 Mt in 2001; Canada's consumption increased to 15.8 Mt from 15.2 Mt, and Mexico's, to 13.9 Mt from 13.1 Mt. The demand for steel by other Central American and South American countries decreased to 10.9 Mt in 2002 from 12.0 Mt in 2001 and 11.2 Mt in 1995 (Instituto Brasileiro de Siderurgia, 2003, p. 55; International Iron and Steel Institute, 2002§, 2003a§; Mining Journal, 2002d§).

**Outlook.**—The Americas' crude steel, DRI, and pig iron production are expected to remain flat because China's exports are expected to continue thriving, and the Americas' outputs are likely to account for about 32%, 18%, and 15%, of the world's DRI, steel, and pig iron production, respectively. Apparent consumption of finished steel is expected to decrease by about 1% in 2003 and to increase by 2.5% per year from 2005 to 2007. In 2007, the Americas are likely to account for about 20% of world steel consumption (International Iron and Steel Institute, 2003a§; MEPS (International) Ltd., 2002§, 2003§).

**Lead.**—**Production.**—In 2002, the Americas' lead mine production decreased to 1.03 Mt in 2002 from 1.08 Mt in 2001 and 1.05 Mt in 1995 (table 4). In 2002, the combined lead mine output in Latin American and Canada decreased by 6.8% compared with that of 2001 (table 14). The Americas' production of primary refined lead increased to 2.2 Mt in 2002 from 2.1 Mt in 2001 (World Bureau of Metal Statistics, 2003, p. 80). The combined primary refined lead output in Latin America and Canada decreased by 2.2% compared with that of 2001 (table 15). The United States accounted for 61% of



the Americas' primary refined lead production, although its output fell slightly by almost 1% in 2002; Mexico accounted for 16%. The United States accounted for almost 70% of the Americas' secondary (recycled) refined lead output. In 2002, the production of recycled refined lead in Latin America and Canada increased by 6% compared with that of 2001 (table 16). In 2002, the Americas' share of global lead mine ore production amounted to 35%; primary refined lead, 7%; and secondary refined lead, 39% (table 4; World Bureau of Metal Statistics, 2003, p. 80-81, 83).

*Consumption.*—In 2002, the Americas' refined lead consumption increased slightly by almost 1% compared with that of 2001 and remained at the same level as that of 2000 (2.2 Mt). The Americas' share of the world's refined lead consumption was nearly 33%. The United States accounted for 76% of the Americas' refined lead consumption; Mexico, 12%; and Brazil, 5% (World Bureau of Metal Statistics, 2003, p. 82).

*Outlook.*—Lead mine production in Latin America and Canada is expected to increase by 2% in 2004 and by 1% from 2005 to 2007. By 2007, output in Peru, Canada, and Mexico is likely to reach 320,000 t, 150,000 t, and 145,000 t, respectively (table 14). By 2007, the production of primary and secondary refined lead in Latin America and Canada are expected to increase by almost 17% and 3.4%, respectively (tables 15, 16). The consumption of lead in the Americas is likely to remain unchanged; in the United States, however, consumption in 2003 is expected to be about 7% less than that of 2002 (World Bureau of Metal Statistics, 2003, p. 82).

**Nickel.**—*Production.*—In 2002, the Americas' share of global nickel ore production amounted to almost 32%, and that of refined metal, 25%. Production of nickel ore in Latin America and Canada increased slightly to 410,000 t in 2002 from 408,000 t in 2001; production increased in Venezuela by almost 34% and in Colombia by 10% (table 17). Production decreased as well—Canada (3.4%) and Cuba (1.4%) (table 17). In 2002, the Americas' share of the world's production of refined nickel was almost 25%. Production of metal increased in the Americas by about 9%; the Dominican Republic, 16%; Colombia, 14%; Brazil, 5%; and Canada, 3% (World Bureau of Metal Statistics, 2003, p. 104).

*Consumption.*—The Americas accounted for 12% of the world's refined nickel consumption. Demand for refined nickel in the Americas fell to 143,100 t in 2002 from 186,500 t in 2001. Within the region, the United States, which was the dominant consumer, accounted for nearly 74% of the Americas' nickel demand. For the second consecutive year, the Americas' nickel consumption went down by about 30% because of strong rebound of nickel prices in 2001 and 2002 (World Bureau of Metal Statistics, 2003, p. 105).

*Outlook.*—Changes in refined nickel consumption and the output of nickel ore and refined nickel output in the Americas through 2007 are expected to be modest (World Bureau of Metal Statistics, 2003, p. 103-105).

**Platinum-Group Metals.**—*Production.*—In 2002, the Americas' production of platinum and palladium increased by 19.6% and 14.8%, respectively; these increases were due to PGM production in Sudbury, Ontario, Canada, and expansion

of the Stillwater Mine in Montana, the United States. Canada and the United States were the dominant producers of PGM; Canada accounted for 62% of the production of platinum, and the United States, 52% of the production of palladium. The Americas' share of world palladium output amounted to 8.0%, and that of platinum, 3.8%. In 2002, the combined output of platinum in Latin America and Canada increased by about 3.3% (tables 18, 19). In the Americas, Canada and the United States were the only producers of palladium, which increased by 7.1% compared with those outputs of 2001 (Hilliard, 2003a).

*Consumption.*—Within the region, the United States was the dominant consumer of platinum and palladium. Platinum increased to 105,000 t in 2002 from 84,200 t in 2001, or by almost 25%, and palladium decreased to 75,800 t in 2002 from 160,000 t in 2001, or by almost 53%. This decrease was due to lower demand by the automobile and electronic industries caused by the substitution effect of silver and base metals and increased palladium output by Russia and South Africa, which caused a further reduction of the price to \$330 per troy ounce in September 2002 from \$450 per troy ounce in September 2001. PGM's largest consumers continued to be the catalysts for abatement of air pollution, such as removing carbon monoxide, odors, and organic vapors (Hilliard, 2003a).

*Outlook.*—In 2002, PGM production increased as a result of higher demand for use in autocatalysts in spite of a sagging global economy in the first half of 2002 and a significant decrease in value of production (31%) compared with 2001. This scenario may lead to modest output increases in the foreseeable future. Canada and the United States will continue to be the sole producers of palladium in the Americas by 2007 and contribute nearly 20% of world production. Canada's palladium output could, however, decrease to 13.4 t in 2007 from 13.6 t in 2002, or almost 1.5%, because of the lower grade content in ore. New technology, mostly in fuel cells, might increase consumption for these metals (table 19; Hilliard, 2003a; Natural Resources Canada, 2003a, b; North American Palladium Ltd., 2004).

**Silver.**—*Production.*—In 2002, the Americas' mine production of silver was 10,114 t compared with 10,455 t in 2001 and 8,785 t in 1995 (table 4). In Latin America and Canada, silver output increased in Honduras (13.0%), Bolivia (10.3%), Canada (5.5%), and Peru (0.7%) and decreased in Brazil (28.2%), Argentina (17.6%), Chile (10.4%), and Mexico (0.4%) in 2002 compared with those of 2001 (table 20). U.S. output decreased to 1,420 t in 2002 from 1,740 t in 2001. Mexico, which was the largest producer of silver (2,747 t) in the Americas and in the world, accounted for 27.2%, and Peru (2,687 t), the United States (1,450 t), and Canada (1,344 t) accounted for 26.6%, 14.5%, and 12.3%, respectively, of the Americas' output. The Americas' share of world silver mine production amounted to almost 49.0% (table 4; Hilliard, 2003b).

*Consumption.*—Within the region, the United States, which was the dominant consumer of silver. Consumption decreased to 5,340 t in 2002 from 5,800 t in 2001, or by almost 8%. Silver was consumed in arts and industry (in order of importance, photography, electric and electronics, catalysts, alloys, dentistry, and bearings) (90%), and the remainder was consumed by small companies and artisans for, in order of importance, jewelry, tableware, and coinage (Hilliard, 2003b).

**Outlook.**—After the decrease of 0.6% in 2002, silver mine production in Latin America and Canada is expected to increase by 1.4% in 2003 and 4.0% in 2005 and 8.2% in 2007. Mexico's production is expected to reach 2,800 t in 2003 and 3,000 t in 2007. In the Americas, silver output is also likely to rise; the main producers by 2007 appear to be Mexico and Peru (32% each) and Canada and Chile (14% each) (table 20).

**Tin.—Production.**—The Americas accounted for more than 28% of global tin ore and 20.1% of refined tin production. In 2002, Peru's production of tin ore decreased significantly by 29.1%, and its refined tin output decreased by 6.3%. In the Americas, the major producers of ore and concentrates were, in order of importance, Peru, Bolivia, and Brazil. Refined tin was produced by, in order of importance, Peru, Brazil, and Bolivia (tables 4, 21, 22).

**Consumption.**—In 2002, the Americas' consumption of refined tin was 60,900 t compared with 64,800 t in 2001 and 70,100 t in 1998. The Americas' share of the world's tin consumption was 21.7%. In 2002, the United States accounted for 75% of the Americas' tin consumption, and Brazil, almost 10% (World Bureau of Metal Statistics, 2003, p. 122).

**Outlook.**—The tin smelter and refinery facility, which has a capacity of 40,000 metric tons per year (t/yr) in Ica, Peru, is expected to treat about 40,200 t/yr of tin concentrate from the San Rafael tin mine to produce about 39,200 t/yr of refined tin starting in 2003 (tables 21, 22; Ministerio de Energía y Minas, 2003b, p. 52). The Americas' share of world tin mine and refined tin production is likely to remain about 30% and 20%, respectively, until at least 2007. Refined tin consumption is likely to increase in 2003 owing to higher demand for new uses in nontoxic products (in order of importance, solders, retardant chemicals, and others) in Brazil and the United States (Carlin, 2003; World Bureau of Metal Statistics, 2003, p. 122).

**Titanium.—Production.**—In 2002, the ilmenite output in the Americas increased by about 1.0%. Canada and the United States accounted for 27%. The dominant producers of ilmenite were, in order of importance, Canada, the United States, and Brazil. In 2002, the combined output of ilmenite in Brazil and Canada increased by 5.9% compared with that of 2001 (table 23).

**Consumption.**—In the Americas, Brazil and the United States were the dominant consumers of titanium sponge metal used in airplanes and aerospace applications, respectively. In Brazil, titanium sponge metal consumption increased to 15,000 t in 2002 from 700 t in 2001, or by 114.3%; this increase appears to be the result of augmented trade between Brazil and China. In 2002, the Brazilian aviation group Embraer, S.A. and the bus manufacturer Marcopolo, S.A. opened production projects and investments in Changzhou, Jiangsu Province, China (Departamento Nacional de Produção Mineral, 2003b, p. 121; Latin Trade, 2004). In the United States, titanium sponge metal consumption decreased to 19,000 t in 2002 from 26,200 t in 2001; this decrease was more than 27% and appears to be a consequence of the release of 6,350 t by the Defense National Stockpile Center in 2002 (Gambogi, 2003).

In Brazil, titanium dioxide pigment consumption increased to 177,911 t in 2002 from 174,942 t in 2001; this increase was

about 1.7%. The pigment was used in paint and varnishes (70%), plastics (20%), and others (10%) (Departamento Nacional de Produção Mineral, 2003b, p. 121). In the United States, 1.16 Mt was consumed compared with that of 1.1 Mt in 2001, or about 5.5%. It was used in paint, varnishes, and lacquers, 49%; plastics, 25%; paper, 16%; and others, 10% (Gambogi, 2003).

**Outlook.**—Ilmenite production decreased in value because of a sagging global economy in the second half of 2001 and into 2002, which caused carbides, chemicals, and pigments use to decrease. A reversal of this downturn could lead to output increases in the foreseeable future, particularly for Brazil (table 23; Latin Trade, 2004).

**Tungsten.—Production.**—In 2002, tungsten production in Latin America and Canada increased by more than fivefold. The main producers of tungsten in the Americas were, in order of importance, Canada and Bolivia. Canada was expected to be the dominant producer of tungsten in 2003. In the Americas, Bolivia and Canada will account for 99% of the production of tungsten in the foreseeable future (table 24; Shedd, 2003).

**Consumption.**—Within the region, the United States was the dominant consumer of tungsten. Consumption decreased to 12,900 t in 2002 from 14,500 t in 2001, or by almost 11%. Tungsten was consumed in cemented carbide parts (construction, metalworking, mining, and oil and gas drilling sectors) (62%) and the remainder was consumed in making catalysts, electrodes and electronics, lamp filaments, pigments, and steels and superalloys (Shedd, 2003).

**Outlook.**—Between 2003 and 2007, Canada is likely to become a major producer of tungsten as the CanTung tungsten mine began operating again in 2002 in spite of the sagging global economy in the second half of 2001 and into 2002. Two consumers in the United States and Sweden have contracted to acquire all CanTung's tungsten mine output (Shedd, 2003).

**Zinc.—Production.**—In 2002, the Americas' mine production of zinc remained about the same level as that of 2001. Peru accounted for most of the increase in regional production (15.1%). Canada (11.5%), Argentina (6.0%), and Honduras (4.5%) experienced decreases (table 25). The Americas accounted for almost 41.6% of world zinc mine output and 19% of world refined zinc output. Peru accounted for about 32% of the Americas' zinc mine production; Canada, 24%; and the United States, 20% (table 4; Plachy, 2003). In 2002, production of refined zinc in the Americas increased by 9.3% owing to increasing outputs from Brazil (28%) Canada (20%) and Bolivia (1.0%). Peru's metal zinc output decreased to 173,000 t in 2002 from 201,000 t in 2001 mostly because the zinc concentrate production from the Antamina Mine was shipped to Teck Cominco Limited's Trail metallurgical plant in British Columbia, Canada (table 26; Ministerio de Energía y Minas, 2003b, p. 25-26).

**Consumption.**—In 2002, the Americas' consumption of zinc slab increased to 2.08 Mt from 1.85 Mt in 2001 and 1.98 Mt in 1998. The Americas' share of the world's zinc slab consumption was more than 22%. In 2002, the United States accounted for 63% of the Americas' zinc slab consumption; Brazil, 10%, and

Canada and Mexico, 9% each (World Bureau of Metal Statistics, 2003, p. 130).

**Outlook.**—Peru's zinc mine production is expected to rise to 1.25 Mt in 2003 and to reach 1.55 Mt by 2007. Peru's zinc production would account for more than 43% of the Americas' mine zinc output in 2007. Canada's zinc mine production is expected to increase after a small decline in 2002 (894,000 t) to 1.0 Mt in 2003 and to maintain that level through 2007 because of potential zinc mine closures, such as Nanisivik and Polaris in Nunavut and Ruttan in Manitoba. This production decrease in 2002 was due to low zinc prices in the open market. Zinc mine production in Latin America and Canada is expected to increase by almost 7% in 2003 and about 2% per year from 2005 to 2007. Most of the increase would be attributable to increasing production in Brazil, Mexico, and Peru (table 25). Refining capacity expansion in Peru is likely to increase the Americas' production of refined zinc by about 100,000 t in 2003 owing to expansions in the Cerro Verde, the Cuajone, the Tintaya, and the Toquepala copper mines. Canada's zinc production would account for more than 34% of the Americas' refined zinc output in 2007 owing to shipments of the Antamina Mine's zinc/copper concentrate to Canada (table 26; Ministerio de Energía y Minas, 2003b, p. 16; 2003c, p. 20; Plachy, 2003).

### **Industrial Minerals**

**Diamond.**—*Production.*—The United States is not a major natural diamond producer (Olson, 2003). The Americas' share of world diamond production by volume (6.4 million carats) amounted to about 9.7%. Canada accounted for 78.1% of the Americas' diamond output; Brazil, 17.3%; Guyana, 2.8%; and Venezuela, 1.8% in 2002 (table 27). The Americas' diamond production increased by almost 21.6% from that of 2001, 29.3% from that of 2000, and 381.2% from that of 1995. The increase in production was broadly based on Canada's entrance as a global producer in 1998. Output increased to almost 5 million carats in 2002 from about 2.5 million carats in 2000 and 300,000 carats in 1998 (table 27; Law-West, 2002).

In 2002, the global value of rough diamond production amounted to \$7.9 billion. The Americas accounted for nearly 4% of the global diamond output; of that, Canada accounted for 7%, and Brazil, 2%. In 2002, Canada produced about \$802 million of rough diamond compared with \$650 million in 2001 and \$454 million in 2000 (Law-West, 2002; Natural Resources Canada, 2003a, b).

*Consumption.*—In the Americas, the United States was the dominant consumer of natural diamond. Consumption decreased to 2.2 million carats in 2002 from 2.5 million carats in 2001, which was a 12% decrease. Natural diamond was consumed mostly in jewelry and computer chips and accounted for less than 10% of all industrial diamond use. More than 90% of the industrial diamond market used synthetic industrial diamond (Olson, 2003).

*Outlook.*—The diamond industry is in a period of change in the global economy, which will affect future production of rough diamond in the Americas. The proposed legislation for importing rough and polished diamond into Canada and the United States will impact the global diamond industry as well.

Canada's future diamond production continues to be bright and is likely to increase as the Diavik diamond project comes into full production in 2003; some additional projects are in the planning stage, such as the Snap Lake project, which is expected to begin in 2006, and the Jericho diamond project, which submitted a draft environmental impact statement in 2001. The country will double diamond mine production between 2003 and 2008 and will move from fifth (2002) to third leading producer in the world after Botswana and Russia by 2008 (Law-West, 2002; Ralfe, 2002; Natural Resources Canada, 2003d).

**Phosphate Rock.**—*Production.*—In 2002, the Americas' production of phosphate rock ( $P_2O_5$  content) increased by 11.0%. U.S. output increased by 12.2%, and Brazil's increased by almost 2% compared with that of 2001. The Americas' share of world phosphate rock production amounted to 30.2%. The United States accounted for 82.3% of the Americas' phosphate rock output, and Brazil, 13.4% (table 4). In 2002, phosphate rock production in Latin America and Canada decreased by almost 6% compared with that of 2001. The major producers of phosphate rock in Latin America and Canada were, in order of importance, Brazil and Canada; outputs increased by almost 2% in Brazil and 20% in Canada compared with those of 2001 (table 28).

*Consumption.*—According to the Food and Agricultural Organization of the United Nations (2001, p. 124), world consumption of nitrogen fertilizers would increase by nearly 5% in 2003 on the basis of significant indicators in China, India, and the Americas. Between 2003 and 2006, phosphate fertilizer consumption is expected to increase by about 4% per year. The Americas' consumption of fertilizers is expected to increase by 3% in 2003. The United States continues to be the world's largest producer of phosphate rock and the dominant supplier of diammonium phosphate (Jasinski, 2003).

*Outlook.*—Phosphate rock and fertilizer production is expected to increase in Brazil and the United States. For the period from 2003 to 2007, phosphate rock production in Latin America is expected to increase by more than 15% because of higher fertilizer usage rates in soybean and corn acreage, which could trigger higher U.S. phosphate fertilizer exports to Latin America. The United States will remain as the largest producer and consumer of phosphate rock in the world and the leading producer and supplier of phosphate fertilizer in the Americas and the world (Departamento Nacional de Produção Mineral, 2003b, p. 97; Jasinski, 2003).

### **Mineral Fuels**

**Coal.**—*Production.*—The Americas' share of world coal (anthracite and bituminous) production amounted to 27.2%. In 2002, the Americas' coal production decreased by 3.3%, and U.S. coal output decreased by almost 3.0% (table 4). In Latin America and Canada, production decreased by about 6.4%; Colombia's output decreased by almost 9.0%, Mexico's decreased by 6.6%, Venezuela's increased by 5.3%, and Brazil's remained at about the same level as that of 2001 (table 29). The United States, which was the dominant coal producer in the Americas, accounted for 88.4% of the total coal output; Canada

and Colombia accounted for 5.5% and 4.0%, respectively (BP p.l.c., 2003§).

**Consumption.**—The Americas accounted for about 25.4% of the world's coal consumption. The United States accounted for 23.1% of the world's and almost 91% of the Americas' coal consumption. Canada and Brazil accounted for 5.0% and almost 2.0%, respectively, of the Americas' coal consumption. From 1992 to 2002, the Americas' consumption of coal increased by almost 15% (BP p.l.c., 2003§).

**Outlook.**—In the United States, the U.S. Energy Information Administration (2003a§) is forecasting higher coal consumption because of increased electricity demand; thus, coal production is expected to continue its historical annual growth rate of about 1.3% into 2005 and beyond and at lower costs because of improved coal mine productivity. In Latin America, Colombia is expected to continue to be the leading producer and exporter of coal beyond 2006 (50.0 Mt). Mexico (12.0 Mt), Brazil (8.5 Mt), and Venezuela (8.3 Mt) are expected to be the second, third, and fourth, respectively, leading producers of coal by 2007 (table 29). Brazil probably will continue to be a net importer. Venezuela's coal production will continue to be exported to global markets. Canada's coal production is expected to remain at the 2001 level (70.5 Mt) through 2003 and to increase to 80.0 Mt by 2007 (table 29; Stone and Boyd, 2003).

**Natural Gas.—Production.**—The Americas accounted for 33.1% of world dry natural gas production compared with 34.0% in 2001. In 2002, the United States accounted for 63.1% of the Americas' dry natural gas output; Canada, almost 20.0%; Argentina, 4.4%; Venezuela, 3.7%; and Mexico, 3.5% (table 4). Production of dry natural gas in the Americas decreased by almost 1.5%. It increased in Latin America and Canada by almost 1.0% in 2002 compared with that of 2001 (table 30; BP p.l.c., 2003§).

**Consumption.**—In 2002, the Americas consumed about 35.0% of the world's natural gas. The United States accounted for more than 26% of the world's and 75% of the Americas' natural gas consumption. Canada accounted for more than 9% of the Americas' natural gas consumption; Mexico, almost 5%; Argentina, 3.4%; and Venezuela, 3.1%. The Americas' consumption increased to 888.3 billion cubic meters in 2002 from 862.1 billion cubic meters in 2001. This increase in gas consumption was not in parallel with the supply side, which decreased by almost 2% in 2002 (BP p.l.c., 2003§).

**Outlook.**—In the United States, the U.S. Energy Information Administration (2003a§) is forecasting higher natural gas consumption because of increased electricity demand; thus, natural gas production is expected to continue its historical annual growth rate of about 1.5% into 2005 and beyond. In Latin America and Canada, Canada is expected to continue to be the largest producer and exporter of natural gas between 2003 and 2007. Its market also is expected to be more dynamic and competitive. Mexico is the second leading producer of natural gas and probably will continue to be so between 2003 and 2007. Venezuela's natural gas production will continue to be exported to global markets. Peru's Aguaytia and Camisea gasfields will enter into full production by 2004-05. Canada's gas production is expected to increase through 2007 (172 billion cubic meters)

(table 30; Ministerio de Energía y Minas, 2003b, p. 69; Stone and Boyd, 2003).

**Petroleum.—Production.**—The Americas' share of world crude petroleum production amounted to more than 24%. In 2002, the United States accounted for almost 32.1% of the Americas' crude oil output; Mexico, 17.7%; Venezuela, almost 17.0%; Canada, 13.2%; and Brazil, 8.4% (table 4). In Latin America and Canada and the Americas, production of petroleum increased by less than 2% and 1%, respectively, in 2002 compared with that of 2001 (table 31; BP p.l.c., 2003§).

**Consumption.**—In 2002, the Americas' consumption of petroleum products amounted to 37.1% of world consumption. The United States accounted for 26% of the world's and more than 70% of the Americas' petroleum products consumption. Canada accounted for 7.1% of the Americas' petroleum products consumption; Brazil, 6.6%; and Mexico, 6.4%. The Americas' consumption decreased slightly by less than 1% in 2002 compared with that of 2001 (BP p.l.c., 2003§).

**Outlook.**—The Americas' crude oil consumption grew slightly during 2001 and 2002. In 2002, the Americas' production of petroleum is expected to increase slightly before increasing by 4.2% in 2003 and by 4.3% per year from 2003 to 2007. The U.S. output is likely to increase to 8.7 million barrels per day (Mbbbl/d) in 2005 from 7.7 Mbbbl/d in 2002. Canadian production is expected to increase to 2.7 Mbbbl/d in 2005 from 2.4 Mbbbl/d in 2002 and 2.2 Mbbbl/d in 2001. Production was also expected to increase in Latin America to 11.0 Mbbbl/d in 2005 from 10.2 Mbbbl/d in 2002 (U.S. Energy Information Administration, 2003b§).

**Uranium.—Production.**—In 2002, the Americas' share of world uranium production amounted to 35%. Production of uranium increased by almost 0.2% in 2002 compared with that of 2001 (U.S. Energy Information Administration, 2002). In 2002, Canadian uranium production amounted to a record total of 13,100 t because of increased production from the McArthur River and the McClean Lake Mines in Saskatchewan; this was an increase of less than 1.0% compared with that of 2001. Brazil's uranium production remained about the same level as that of 2001 and 2000 (table 32; Vance, 2003).

**Consumption.**—In 2002, the Americas' consumption of uranium as yellow cake amounted to 57.4% of the world's consumption. The United States accounted for almost 90% of the Americas' uranium consumption; in Argentina and Brazil, use was very inconsequential. The Americas' uranium consumption increased to 54,664 t in 2002 from 47,336 t in 2001; the increase was dependent on imports from, in order of importance, Australia, Russia, Uzbekistan, Kazakhstan, Namibia, and South Africa (U.S. Energy Information Administration, 2003, p. 24).

**Outlook.**—The Americas' uranium consumption has experienced an almost 10% growth during 2001-02. In the Americas, production of uranium is expected to increase slightly or to remain at about the same level between 2003 and 2007. Production in Canada is expected to increase to 14,300 t in 2005 from 13,100 t in 2002 and to remain flat between 2005 and 2007. Production in Brazil is expected to remain flat

between 2003 and 2007 (table 32; U.S. Energy Information Administration, 2002, p. 7).

## Trade Review

Brazil was the largest market and the economic center of MERCOSUR. In 2002, the member countries of MERCOSUR had about 245 million people, which was 27.1% of the Americas' population, and a combined purchasing power parity of \$2.02 trillion, which represented about 78% of South America's total purchasing power parity (tables 1, 2; U.S. Central Intelligence Agency, 2003a§). Brazil accounted for about 71% of MERCOSUR's population and almost 66% of its purchasing power parity. China and most multinational companies considered this growing trade bloc to be extremely important after NAFTA and the EU because of its size and the amount of trade in the region. NAFTA has had its impact on Latin America and the Caribbean Basin trade, which increased to about \$109 billion, or about 58% higher than that of 1991 (\$63 billion). MERCOSUR's impact on Latin American intraregional trade decreased to about \$4.4 billion in 2002 from about \$4.8 billion in 2001. Intra-MERCOSUR trade amounted to \$4.4 billion, and mineral trade amounted to \$1.8 billion. These reductions were due to Argentina's political/economic crisis (Departamento Nacional de Produção Mineral, 2003a, p. 12-16).

In 2002, Brazil sold 17% of its exports to the other MERCOSUR members and 26% to the other countries in Latin America. Total bilateral minerals trade between the major players of MERCOSUR [Brazil (\$1.8 billion) and Argentina (\$1.6 billion)] amounted to \$3.4 billion. Brazilian mineral imports were valued at \$11.3 billion, or 11.0% lower than those of 2001 (\$12.7 billion), and its total mineral exports were valued at \$14.2 billion, or about 17.4% higher than those of 2001 (\$12.1 billion). The values of the principal exports were \$5.0 billion for steel products and \$1.5 billion each for aluminum and iron ore. In addition to petroleum and derivatives (\$5.4 billion), other major mineral imports were natural gas (\$1.1 billion), coal (\$829 million), potash (\$576 million), phosphate rock (\$558 million), copper (\$443 million), salt (\$183 million), titanium (\$142 million), and zinc (\$75 million) (Departamento Nacional de Produção Mineral, 2003b, p. 16; Ferraz, 2003, p. 6).

During the past decade, Brazil-U.S. trade relations grew at an unprecedented rate. U.S. imports were primarily manufactured and semimanufactured Brazilian goods of high aggregate value, such as chemical products and steel, and other commodity exports. In 2002, total trade between Brazil and the United States was \$4.5 billion. Exports increased by 27.5% to \$3.4 billion, and imports decreased by 3.0% to \$1.1 billion. Brazil's mineral trade balance with the United States increased to a surplus of \$2.3 billion from a surplus of \$1.9 billion in 2001. Brazilian exports to Europe and Japan consisted mostly of raw materials that were, in order of importance, iron ore, manganese, marble, and granite, and agricultural commodities (Departamento Nacional de Produção Mineral, 2003a, p. 16).

The excellent infrastructural networks, which included, in order of importance, telecommunications, railroads, highways, and pipelines to Mexico through the United States from

Canada, were a significant factor in the marketing of mineral commodities. MERCOSUR's shares of the total trade with the major economic blocks were 59% within the EU, 42% within NAFTA, and 25% within MERCOSUR (Departamento Nacional de Produção Mineral, 2003a, p. 16). Chile and the United States signed a separate free trade agreement (FTA) that may preclude Chile from joining NAFTA. This FTA will provide greater freedom of mineral trade and, ultimately, greater efficiencies of production. Canada and Chile signed a bilateral trade pact on November 19, 1996. Since 1996, Canadian FDI has increased noticeably in Chile.

During the past 30 or more years, the Latin American countries have entered into trade agreements with each other. Examples include Chile's bilateral FTA with Mexico, the Venezuela-Colombia agreement with the Central American Common Market, Venezuela's agreement with Chile to begin phasing out tariffs by 2006, and a free trade pact among Colombia, Mexico, and Venezuela to phase out tariffs. The Chile-Colombia agreement eliminated tariffs entirely by the end of 2000. In 1993, Argentina and the United States signed a bilateral investment treaty whereby investors received most-favored-nation treatment, a guarantee of free transfer of profits, and access to international arbitration.

The Brazilian Government indicated that MERCOSUR made progress in trade talks with the Andean Pact nations, Mexico, and South Africa. Foreign investors and the Brazilian private sector continued favoring strong ties with MERCOSUR, although trade liberalization was proceeding at a slow pace. The expansion of MERCOSUR has been a strategic objective of Brazil in the planned talks towards an FTAA. In 2002, efforts between MERCOSUR and the Andean Pact nations to create a larger South American Free Trade Area did not produce any visible results. Brazil's second leading trading partner after the United States became China (\$4.1 billion) in 2002. Brazil's wealth of natural resources and China's need for raw materials to fuel its economy may lead to a Brazil-China trade partnership in the future (Latin Trade, 2004).

## Environment

Deforestation continued to be an environmental concern in the Americas. Between 1990 and 2000, forest cover decreased at a rate of 0.1% per year in Central America and North America and 0.4% per year in South America compared with the global rate of 0.2% per year. Haiti had the most rapid deforestation, which was 5.7% per year; Uruguay, 5.0%; Saint Lucia, 4.9%; El Salvador, 4.6%; the Netherlands Antilles, 3.0%; and Belize, 2.3% (Food and Agricultural Organization of the United Nations, 2001, p. 34).

Most of the environmental laws and regulations for each country as they affect mining and mineral processing are addressed in the ensuing chapters in the Latin America and Canada Volume of the Minerals Yearbook for 2002. From the country writeups, there are some typical environmental models in the Guyana Shield, the Cordillera, and the Amazon Rain Forest, which is one of the world's most sensitive ecosystems.

The Brazilian Ministério de Minas e Energia enforces the 1989 decree that prohibits the use of mercury and cyanide

in the mining of gold unless approved by local Brazilian environmental agencies and offers technical assistance to garimpeiros (small-scale independent miners), in particular, on producing gold without affecting the environment. Environmental impacts are expected to be lessened in the future. The Amazon region alone was considered to have possibilities for major undiscovered mineral wealth in addition to the large reserves of, in order of importance, iron ore, manganese, bauxite, gold, copper, and tin. A factor that may have a negative effect on mineral development in the longer term was the concern over biodiversity in the Amazon Rain Forest. Much will depend on the approaches to be used for economic and social development to ensure protection of the environment in a sustainable way.

In Canada, the Provincial and Territorial Governments support and promote mineral exploration and deposit appraisals in their respective jurisdictions with initiatives, such as fiscal incentives, the resolution of land access issues, and the provision of modern geoscientific data that will lead to management of ecological landscapes by employing the concept of conservation diversity (Natural Resources Canada, 2003c, p. 127).

The Peruvian Dirección General de Asuntos Ambientales (DGAA) has the responsibility to address environmental problems that result from energy and mining activities. The sustainable development model for the mining and energy sectors began in 1993 with regulations and procedures for gradual reduction of pollution, which include economic development policies and environmental protection. The mining industry must comply by adjusting its ongoing operations to permissible effluent levels and its new operations by using cleaner technologies. The DGAA evaluates and proposes the environmental regulations for the mining and energy sectors, which include the maximum emission levels that are compatible with the internationally accepted limits set by the United Nations and the World Bank. The mining and oil companies are increasing their efforts to protect the environment, and oil companies, in particular, are under pressure because the number of operations in the Amazon Rain Forest is increasing (Comisión de Promoción de la Inversión Privada, 2003; Ministerio de Energía y Minas, 2003c).

The Surinamese Government expressed concern about the magnitude of illegal gold mining, especially the impact that it was having on the environment. It noted that the use of mercury by the garimpeiros was damaging the environment and that they needed to be encouraged to shift to legal methods of operations, which were also safer. The National Institute for Environment and Development in Suriname and the Health Ministry were studying ways to stop the consequences of mercury pollution. One project, Mercury-Free Gold Mining, was being financed by the Small Grants Program and Conservation International and being carried out by the Godo-olo Foundation (De Ware Tijd, 2001§).

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TABLE 1  
THE AMERICAS: AREA AND POPULATION<sup>1</sup>

	Area <sup>2</sup> (square kilometers)	Population (millions)
North America:		
Canada	9,984,670 <sup>r</sup>	31.4
Mexico	1,972,550	101
United States	9,629,091	288
Total	21,600,000	420
Central America and the Caribbean:		
Antigua and Barbuda	352 <sup>r</sup>	0.069
Aruba	193	0.07
Bahamas, The	13,940	0.314
Barbados	431	0.269
Belize	22,966	0.253
Bermuda	53	0.060
Costa Rica	51,100	3.94
Cuba	110,860	11.3
Dominica	754	0.072
Dominican Republic	48,730	8.64
El Salvador	21,040	6.52
Grenada	344	0.102
Guadeloupe	1,780	0.436
Guatemala	108,890	12
Haiti	27,750	8.29
Honduras	112,090	6.76
Jamaica	10,991	2.61
Martinique	1,100	0.422
Montserrat	102	0.008
Netherlands Antilles	960	0.22
Nicaragua	129,494	5.34
Panama	78,200 <sup>r</sup>	2.94
Saint Helena	410	0.007
Saint Lucia	616 <sup>r</sup>	0.159
Saint Kitts and Nevis	261 <sup>r</sup>	0.046
Saint Vincent and the Grenadines	389 <sup>r</sup>	0.117
Trinidad and Tobago	5,128 <sup>r</sup>	1.32
Other <sup>3</sup>	10,461	4.05
Total	759,000 <sup>r</sup>	76.3
South America:		
Argentina	2,766,890	37.9
Bolivia	1,098,580	8.7
Brazil	8,511,965	174
Chile	756,950	15.6
Colombia	1,138,910	43.6
Ecuador	283,560	13.1
French Guiana	91,000	0.182
Guyana	214,970	0.772
Paraguay	406,750	5.5
Peru	1,285,220	26.7
Suriname	163,270	0.423
Uruguay	176,220	3.4
Venezuela	912,050	25.1
Total	17,800,000	355
Americas total	40,200,000 <sup>r</sup>	851
World total	149,000,000	6,200
Share of world total	27	14

<sup>r</sup>Revised.

<sup>1</sup>Data updated as of March 1, 2003. Population and totals rounded to no more than three significant digits.

<sup>2</sup>Includes Anguilla, British Virgin Islands, Cayman Islands, Puerto Rico, Turks and Caicos Islands, and U.S. Virgin Islands.

Sources: U.S. Central Intelligence Agency, World Factbook 2002 and 2003; World Bank, World Development Indicators database.

TABLE 2  
THE AMERICAS: GROSS DOMESTIC PRODUCT<sup>1,2</sup>

	GDP per capita	GDP	GDP growth rate (percentage)
North America:			
Canada	31,122	977.235	4.6
Mexico	9,097	918.768	2.7
United States	35,503	10,225.07	3.4
Total	XX	12,100	XX
Central America and the Caribbean:			
Antigua and Barbuda	11,333	0.782	-2.5
Aruba	NA	NA	NA
Bahamas, The	13,201	4.145	1.2
Barbados	13,238	3.561	-3.0
Belize	5,241	1.326	1.2
Bermuda	NA	NA	NA
Costa Rica	8,321	32.786	3.6
Cuba	NA	NA	NA
Dominica	5,222	0.376	2.2
Dominican Republic	6,514	56.277	4.8
El Salvador	3,360	21.905	4.2
Grenada	6,353	0.648	-0.6
Guadeloupe	NA	NA	NA
Guatemala	6,788	56.277	3.5
Haiti	1,343	11.137	1.2
Honduras	2,445	16.526	3.7
Jamaica	4,021	10.457	3.7
Martinique	NA	NA	NA
Montserrat	NA	NA	NA
Netherlands Antilles	14,668	3.227	1.9
Nicaragua	2,390	12.764	2.7
Panama	8,215	24.153	2.4
St. Kitts and Nevis	9,239	0.425	-1.4
Saint Helena	NA	NA	NA
Saint Lucia	6,082	0.967	-2.8
Saint Vincent and the Grenadines	9,640	0.615	2.2
Trinidad and Tobago	5,128	12.725	6.4
Other <sup>3</sup>	NA	NA	NA
Total	XX	271	XX
South America:			
Argentina	8,599	325.918	-15.0
Bolivia	3,204	27.877	2.7
Brazil	7,326	1,274.766	2.7
Chile	14,867	231.929	3.4
Colombia	7,095	309.329	2.4
Ecuador	5,204	68.173	4.8
French Guiana	NA	NA	NA
Guyana	3,947	3.047	2.9
Paraguay	5,672	21.194	3.8
Peru	5,097	136.077	4.7
Suriname	4,898	2.072	2.4
Uruguay	8,486	28.851	-10.1
Venezuela	8,299	208.306	-5.1
Total	XX	2,640	XX
Americas total	XX	15,000	XX
World total	XX	48,300	XX
Share of world total	XX	31	XX

NA Not available. XX Not applicable.

<sup>1</sup>Data updated as of March 1, 2003.

<sup>2</sup>Gross domestic product (GDP) based on purchasing power parity of billions of U.S. dollars. Totals rounded to no more than three significant digits.

<sup>3</sup>Includes Anguilla, British Virgin Islands, Cayman Islands, Puerto Rico, Turks and Caicos Islands, and U.S. Virgin Islands.

Source: International Monetary Fund, World Economic Outlook Database, September 2003.

TABLE 3  
SELECTED SIGNIFICANT LATIN AMERICA AND CANADA EXPLORATION IN 2002<sup>1</sup>

Location	Type <sup>2</sup>	Site	Commodity <sup>3</sup>	Company	Resource	Exploration <sup>4</sup>
Argentina	F	Esquel	Au	Meridian Gold Inc.	3.10Moz Au, 5.45Moz Ag	Extensive drilling.
Do.	D	Veladero	Au, Ag	Barrick Gold Corp.	9.39Moz Au, 112Moz Ag	Extension of resources.
Brazil	F	Onca-Puma	Ni, Co	Canico Resource Corp.	746kt Ni, 24kt Co	Extensive drilling.
Do.	P	Sao Bento	Au	Eldorado Gold Corp.	Data not released	Do.
Canada	E	Afton	Cu, Au	DRC Resources Corp.	743kt Cu, 1.8Moz Au	Do.
Do.	P	Kemess North	do.	Northgate Exploration Ltd.	5.7Moz Au, 1Mt Cu	Do.
Do.	E	Morrison/Heame Hill	do.	Pacific Booker Minerals Inc.	285kt Cu, 419koz Au	Do.
Do.	F	Gahcho Kue (Kennedy Lake)	Diamond	DeBeers Canada Exploration Inc.	30Mt diamond	Extensive work program.
Do.	F	Ferguson Lake	Ni, Cu, PGM	Starfield Resources Inc.	333kt Cu, 208kt Ni, 1.8Moz PGM	Extensive drilling.
Do.	E	Hope Bay	Au	Hope Bay Gold Corp.	4.27Moz Au	Do.
Do.	E	Hope Bay greenstone belt	Diamond	Sherwood Mining Corp.	Data not released	Do.
Do.	F	Meadowbank	Au	Cumberland Resources Ltd.	1.98Moz Au	Do.
Do.	E	Agnew Lake	PGM, Au	Platinum Group Metals Ltd.	Data not released	Do.
Do.	E	Kirkland Lake	Au	Queenston Mining Inc.	1.5Moz Au	Do.
Do.	P	Lac des Iles	PGM, Au	North American Palladium Ltd.	938koz Pd, 56koz Pt, 46koz Au reserve	Do.
Do.	E	McCreedy West area	Ni, Cu, PGM	FNX Mining Co. Inc.	19kt Cu, 24kt Ni	Development drilling.
Do.	P	Red Lake	Au	Goldcorp Inc.	5.2Moz Au	Extensive drilling.
Do.	E	River Valley	PGM, Au	Pacific North West Capital Corp.	1Moz PGM+Au	Do.
Do.	F	Casa Berardi West	Au, Cu	Aurizon Mines Ltd.	1.4Moz Au	Feasibility drilling.
Do.	E	Clearwater	Au	Eastmain Resources Inc.	Data not released	Extensive work program.
Do.	P	Doyon	do.	Cambior Inc.	do.	Extensive drilling.
Do.	P	Sleeping Giant	do.	Aurizon Mines Ltd.	do.	Do.
Do.	F	Fort à la Corne	Diamond	Kensington Resources Ltd.	do.	Extensive work program.
Chile	P	Cerro Bayo	Au, Ag	Coeur d'Alene Mines Corp.	do.	Extensive drilling.
Do.	E	El Morro	Cu, Au	Metallica Resources Inc.	2.8Mt Cu, 7.4Moz Au	Do.
Do.	P	Mansa Mina	Cu	Codelco	7.5Mt Cu	Do.
Colombia	F	Angostura	Au	Greystar Resources Ltd.	Data not released	Do.
French Guiana	E	Camp Caiman	do.	Ariane Gold Corp.	823koz Au	Do.
Guatemala	E	Marlin	Au, Ag	Francisco Gold Corp.	2.53Moz Au, 43.8Moz Ag	Do.
Mexico	F	Dolores	do.	Minefinders Corp. Ltd.	2.45Moz Au, 129.7Moz Ag	Do.
Do.	D	El Sauzal	Au	Glamis Gold Ltd.	2.8Moz Au	Do.
Do.	F	Ocampo Northeast	Au, Ag	Gammon Lake Resources Inc.	1Moz Au, 39.6Moz Ag	Do.
Do.	E	Penasquito	Ag, Au, Pb, Zn	Western Copper Holdings Ltd.	Data not released	Do.
Peru	F	Alto Chicama	Au	Barrick Gold Corp.	7.3Moz Au	Do.

<sup>1</sup>The following abbreviations are used for commodities in the table: Ag--gold; Au--gold; Co--cobalt; Cu--copper; Ni--nickel; Pb--lead; Pd--palladium; PGM--platinum-group metals; PL--platinum; and ZN--zinc. The following abbreviations are used for units of measurement in the table: kt--thousand metric tons; koz--thousand troy ounces; Moz--million troy ounces; and Mt--million metric tons.

<sup>2</sup>D--approved for development; E--active exploration; F--feasibility work ongoing/completed; P--exploration at producing site.

<sup>3</sup>Based on 2002 data reported from various sources, values vary from measured reserves to identified resources. Values have been updated and may differ from previously published data.

<sup>4</sup>Significance of activity defined by either quantity of drilling or investment expenditure.

TABLE 4  
LATIN AMERICA AND CANADA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2002<sup>1,2</sup>

(Thousand metric tons unless otherwise specified)

Country	Metals																					
	Aluminum			Copper,		Gold,			Iron ore,		Iron and steel		Lead, mine		Nickel,		Silver,		Tin, mine		Zinc, mine	
	Bauxite	Metal, primary	Mine output, Cu content	Au content (kilograms)	gross weight	Steel, crude	Pb content	Ni content	Ag content (metric tons)	Sn content (metric tons)	Zn content (metric tons)	Share of world total	Share of world total	Share of world total	Share of world total	Share of world total	Share of world total	Share of world total	Share of world total	Share of world total	Share of world total	Share of world total
Argentina	--	269	204	32,486	--	4,363	12	--	126	--	--	--	--	--	--	--	--	--	--	--	37,325	--
Bolivia	--	--	(2)	11,256	--	--	10	--	450	--	--	15,242	--	--	--	--	--	--	--	--	15,242	--
Brazil	13,189	1,318	31	37,886	212,000	29,604	9	45	33	--	--	14,200 <sup>e</sup>	--	--	--	--	--	--	--	--	14,200 <sup>e</sup>	136,430
Chile	--	--	4,581	38,688	7,269	1,280	3	--	1,210	--	--	--	--	--	--	--	--	--	--	--	36,161	--
Colombia	--	--	2	20,799	688	663	(2) <sup>e</sup>	58	7	--	--	--	--	--	--	--	--	--	--	--	40 <sup>e</sup>	--
Costa Rica	--	--	--	100 <sup>e</sup>	--	--	--	--	(3) <sup>e</sup>	--	--	--	--	--	--	--	--	--	--	--	--	--
Cuba	--	--	1 <sup>e</sup>	1,000 <sup>e</sup>	--	264	--	72	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dominican Republic	--	--	--	--	--	61	--	39	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ecuador	--	--	(3) <sup>e</sup>	2,750	--	67 <sup>e</sup>	(3)	--	2 <sup>e</sup>	--	--	--	--	--	--	--	--	--	--	--	100 <sup>e</sup>	--
El Salvador	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Guatemala	--	--	--	4,500 <sup>e</sup>	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Guyana	1,690	--	--	13,581	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Honduras	--	--	--	4,984	--	--	8	--	53	--	--	--	--	--	--	--	--	--	--	--	46,339	--
Jamaica	13,119	--	--	328	--	--	--	--	(3)	--	--	--	--	--	--	--	--	--	--	--	--	--
Mexico	--	39	330	21,324	9,941	14,051	139	--	2,747	--	--	9	446,104	--	--	--	--	--	--	--	446,104	--
Nicaragua	--	--	--	3,750 <sup>e</sup>	--	--	--	--	3 <sup>e</sup>	--	--	--	--	--	--	--	--	--	--	--	--	--
Panama	--	--	--	1,500 <sup>e</sup>	--	--	--	--	2 <sup>e</sup>	--	--	--	--	--	--	--	--	--	--	--	--	--
Paraguay	--	--	--	--	--	80	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Peru	--	--	843	157,013	4,594	--	298	--	2,687	--	--	38,815	1,221,830	--	--	--	--	--	--	--	--	--
Suriname	4,002	--	--	300 <sup>e</sup>	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Trinidad and Tobago	--	--	--	--	--	839	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Uruguay	--	--	--	2,079	10 <sup>e</sup>	10 <sup>e</sup>	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Venezuela	5,191	605	--	9,465	18,000	4,160	--	18 <sup>e</sup>	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other <sup>4</sup>	--	--	--	2,972	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	37,200	2,200	5,990	364,000	253,000	55,400	480	232	7,320	68,300	2,070,000	26.3%	8.4%	43.8%	14.2%	23.3%	16.3%	18.2%	35.3%	26.3%	24.6%	24.6%
Share of world total	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Canada	--	2,709	600	148,860	30,969	16,300	97	178	1,344	--	--	--	--	--	--	--	--	--	--	--	--	849,399
Share of world total	--	10.4%	4.4%	5.8%	2.9%	1.9%	3.3%	14.0%	6.5%	--	--	--	--	--	--	--	--	--	--	--	--	10.1%
United States	NA	2,710	1,140	298,000	51,600	91,600	451	--	1,450	--	--	--	--	--	--	--	--	--	--	--	--	780,000
Share of world total	NA	10.4%	8.4%	11.6%	4.8%	10.6%	15.4%	4.8%	7.0%	--	--	--	--	--	--	--	--	--	--	--	--	9.3%
Total the Americas	37,200	7,620	7,734	811,000	335,000	163,000	1,030	410	10,100	68,300	3,700,000	26.3%	29.1%	56.6%	31.5%	30.9%	35.0%	32.2%	48.8%	26.3%	24.6%	24.6%
Share of world total	141,000	26,100	13,700	2,570,000	1,080,000	865,000	2,930	1,270	20,700	260,000	8,380,000	26.3%	26.1%	56.6%	31.5%	30.9%	35.0%	32.2%	48.8%	26.3%	24.6%	24.6%
World total	141,000	26,100	13,700	2,570,000	1,080,000	865,000	2,930	1,270	20,700	260,000	8,380,000	26.3%	26.1%	56.6%	31.5%	30.9%	35.0%	32.2%	48.8%	26.3%	24.6%	24.6%

See footnotes at end of table.

TABLE 4-- Continued  
LATIN AMERICA AND CANADA: PRODUCTION OF SELECTED COMMODITIES IN 2002<sup>1,2</sup>

(Thousand metric tons unless otherwise specified)

Country	Mineral fuels and related products														
	Industrial minerals					Natural gas					Petroleum				
	Cement, hydraulic	Gypsum	Phosphate rock, P <sub>2</sub> O <sub>5</sub> content	Salt	Coal, all grades	Dry (million cubic meters) <sup>3</sup>	Plant liquids (thousand 42-gallon barrels)	Crude, including condensate (thousand 42-gallon barrels)	Refinery products (thousand 42-gallon barrels)						
Argentina	3,910	445	--	859	70	37,045	18,000 <sup>e</sup>	275,366	180,319						
Bolivia	1,010	--	--	4	--	4,188	6,000 <sup>e</sup>	11,388	13,685						
Brazil	38,027	1,633	1,738	6,109	6,000 <sup>e</sup>	6,630 <sup>e</sup>	5,860 <sup>e</sup>	547,135	586,701						
Chile	3,520 <sup>e</sup>	610	3	3,503	452	1,017	3,500 <sup>e</sup>	2,120 <sup>e</sup>	73,000 <sup>e</sup>						
Colombia	6,604	560 <sup>e</sup>	8	527	39,532	14,631	2,600 <sup>e</sup>	211,007	105,579						
Costa Rica	1,100 <sup>e</sup>	--	--	37 <sup>e</sup>	--	--	--	--	5,500 <sup>e</sup>						
Cuba	1,327	130 <sup>e</sup>	--	180 <sup>e</sup>	--	357	--	17,995	60,000 <sup>e</sup>						
Dominican Republic	3,071	179	--	80	--	--	--	--	11,300 <sup>e</sup>						
Ecuador	3,000	6	--	90	--	93 <sup>e</sup>	603	143,578	53,527						
El Salvador	1 <sup>e</sup>	6	--	715 <sup>e</sup>	--	--	--	--	6,300 <sup>e</sup>						
Guatemala	1,600 <sup>e</sup>	100 <sup>e</sup>	--	50 <sup>e</sup>	--	1 <sup>e</sup>	--	19,000 <sup>e</sup>	7,600 <sup>e</sup>						
Guyana	--	--	--	--	--	--	--	--	--						
Honduras	1,100 <sup>e</sup>	60 <sup>e</sup>	--	25 <sup>e</sup>	--	--	--	--	--						
Jamaica	614	165	--	19 <sup>e</sup>	--	--	--	--	3,600 <sup>e</sup>						
Mexico	31,000	6,740	1	7,802	11,405	30,139	148,920	1,159,642	465,704						
Nicaragua	360 <sup>e</sup>	--	--	28 <sup>e</sup>	--	--	--	--	5,650 <sup>e</sup>						
Panama	760 <sup>e</sup>	--	--	23 <sup>e</sup>	--	--	--	--	--						
Paraguay	650 <sup>e</sup>	4 <sup>e</sup>	--	--	--	--	--	--	--						
Peru	3,980	75	6	279	68 <sup>e</sup>	371	300	34,200	69,697						
Suriname	65	--	--	--	--	--	--	--	2,610 <sup>e</sup>						
Trinidad and Tobago	744	--	--	--	--	17,777	8,505	4,500	2,700 <sup>e</sup>						
Uruguay	1,000 <sup>e</sup>	1,130 <sup>e</sup>	--	--	--	--	--	47,684	53,422						
Venezuela	7,000	10 <sup>e</sup>	114	350 <sup>e</sup>	8,097	31,512	68,825	1,105,793	11,100 <sup>e</sup>						
Other <sup>4</sup>	1,100	--	--	1,649	--	29	--	391	457,017						
Total	112,000	11,900	1,870	22,300	65,600	144,000	263,000	3,580,000	2,360,000						
Share of world total	6.3%	11.2%	4.4%	11.2%	1.4%	5.6%	17.6%	13.2%	8.3%						
Canada	13,200	8,847	380	12,313	66,822	169,320	68,800	863,972	645,000						
Share of world total	0.7%	8.4%	0.9%	6.2%	1.4%	6.6%	4.6%	3.2%	2.3%						
United States	91,300	15,700	10,700	40,300	992,000	538,000	NA	2,100,000	6,300,000						
Share of world total	5.2%	14.8%	25.0%	20.3%	20.6%	21.0%	NA	7.7%	22.2%						
Total the Americas	216,000	36,400	13,000	75,000	1,130,000	852,000	332,000	6,540,000	9,310,000						
Share of world total	12.2%	34.3%	30.2%	37.7%	23.4%	33.1%	22.2%	24.2%	32.7%						
World total	1,770,000	106,000	42,900	199,000	4,820,000	2,570,000	1,490,000	27,100,000	28,400,000						

<sup>e</sup>Estimated; estimated data, U.S. data, and world totals are rounded to no more than three significant digits. NA Not available. -- Zero or zero percent.

<sup>1</sup>Totals may not add due to independent rounding. Percentages are calculated on unrounded data. Table includes data available as of October 2004.

<sup>2</sup>Data may differ from those in historical commodity tables or in country chapters because of the date of preparation.

<sup>3</sup>Based on data from U.S. Energy Information Administration. May differ from those in natural gas summary table and chapter commodity tables.

<sup>4</sup>Includes Aruba, Barbados, Belize, French Guiana, Guadeloupe, Haiti, Martinique, and the Netherlands Antilles.

TABLE 5  
LATIN AMERICA AND CANADA: HISTORIC AND PROJECTED BAUXITE PRODUCTION, 1990-2007<sup>1</sup>

(Thousand metric tons)

Country	1990	1995	2000	2001	2002	2003 <sup>c</sup>	2005 <sup>c</sup>	2007 <sup>c</sup>
Brazil	9,680	10,200	13,800 <sup>r</sup>	13,800 <sup>r</sup>	13,200 <sup>r</sup>	13,500	13,800	14,000
Guyana	1,420	2,020	2,470	1,950	1,690 <sup>r</sup>	1,500	1,500	1,500
Jamaica	10,900	10,900	11,100	12,400	13,100 <sup>r</sup>	13,500 <sup>r</sup>	13,500 <sup>r</sup>	13,500 <sup>r</sup>
Suriname	3,280	3,530	3,610 <sup>r</sup>	4,390 <sup>r</sup>	4,000 <sup>r</sup>	4,500	4,500	4,500
Venezuela	771	5,020	4,360	4,590 <sup>r</sup>	5,190 <sup>r</sup>	5,200	5,500 <sup>r</sup>	5,500 <sup>r</sup>
Other	85	--	--	--	--	--	--	--
Total	26,100 <sup>r</sup>	31,700 <sup>r</sup>	35,300 <sup>r</sup>	37,100	37,200	38,000 <sup>r</sup>	39,000 <sup>r</sup>	39,000 <sup>r</sup>

<sup>c</sup>Estimated. <sup>r</sup>Revised. -- Negligible or no production.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 6  
LATIN AMERICA AND CANADA: HISTORIC AND PROJECTED PRIMARY ALUMINUM PRODUCTION, 1990-2007<sup>1</sup>

(Thousand metric tons)

Country	1990	1995	2000	2001	2002	2003 <sup>c</sup>	2005 <sup>c</sup>	2007 <sup>c</sup>
Argentina	166	186	262	248 <sup>r</sup>	269 <sup>r</sup>	260 <sup>r</sup>	260 <sup>r</sup>	260
Brazil	931	1,180	1,280 <sup>r</sup>	1,140 <sup>r</sup>	1,320 <sup>r</sup>	1,350	1,350	1,350
Canada	1,570	2,170	2,370	2,580	2,710	2,800	3,000	3,000
Mexico	68	10	61 <sup>r</sup>	52 <sup>r</sup>	39 <sup>r</sup>	-- <sup>r</sup>	-- <sup>r</sup>	--
Suriname	32	28	--	--	--	--	--	--
Venezuela	590	630	569	571 <sup>r</sup>	605 <sup>r</sup>	601	620	630
Total	3,360 <sup>r</sup>	4,200	4,540	4,590	4,940 <sup>r</sup>	5,000	5,200	5,200

<sup>c</sup>Estimated. <sup>r</sup>Revised. -- Negligible or no production.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 7  
LATIN AMERICA AND CANADA: HISTORIC AND PROJECTED SECONDARY ALUMINUM PRODUCTION, 1990-2007<sup>1</sup>

(Thousand metric tons)

Country	1990	1995	2000	2001	2002	2003 <sup>c</sup>	2005 <sup>c</sup>	2007 <sup>c</sup>
Argentina	6	10	16	16	16	16	16	16
Brazil	60	92	210	200	215	220	220	220
Canada	83	NA	148	180	180	200	200	200
Mexico	60	129	287	218	250	300	300	300
Total	210	230	660	610	660	740	740	740

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

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 8  
LATIN AMERICA AND CANADA: HISTORIC AND PROJECTED COPPER MINE PRODUCTION, 1990-2007<sup>1</sup>

(Cu content in thousand metric tons)

Country	1990	1995	2000	2001	2002	2003 <sup>c</sup>	2005 <sup>c</sup>	2007 <sup>c</sup>
Argentina	--	--	145	192	204 <sup>r</sup>	200 <sup>r</sup>	200 <sup>r</sup>	200 <sup>r</sup>
Brazil	36	49	32	30	31 <sup>r</sup>	35	170	175
Canada	794	726	634	634	600	630 <sup>r</sup>	630 <sup>r</sup>	670 <sup>r</sup>
Chile	1,590	2,490	4,600 <sup>r</sup>	4,740 <sup>r</sup>	4,580	4,900 <sup>r</sup>	5,550 <sup>r</sup>	6,200 <sup>r</sup>
Mexico	294	335 <sup>r</sup>	365	367	330 <sup>r</sup>	350	400	400
Peru	318	444	554	722	843 <sup>r</sup>	875	910	910
Other	--	--	--	3	5	5	5	5
Total	3,030	4,040 <sup>r</sup>	6,330	6,690	6,590	7,000 <sup>r</sup>	7,900	8,600 <sup>r</sup>

<sup>c</sup>Estimated. <sup>r</sup>Revised. -- Negligible or no production.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 9  
LATIN AMERICA AND CANADA: HISTORIC AND PROJECTED REFINED COPPER PRODUCTION, 1990-2007<sup>1</sup>

(Thousand metric tons)

Country	1990	1995	2000	2001	2002	2003 <sup>c</sup>	2005 <sup>c</sup>	2007 <sup>c</sup>
Argentina <sup>2</sup>	11	16	16	16	16	16	16	16
Brazil	199	219	233	248	213	250	275	300
Canada	516	614 <sup>r</sup>	613 <sup>r</sup>	611 <sup>r</sup>	520 <sup>r</sup>	525 <sup>r</sup>	625 <sup>r</sup>	675 <sup>r</sup>
Chile <sup>3</sup>	1,190	1,490	2,670	2,880	2,850	2,900	3,010 <sup>r</sup>	3,110 <sup>r</sup>
Mexico	153	212	411	424	423 <sup>r</sup>	420	420	420
Peru <sup>3</sup>	318	444	468 <sup>r</sup>	517 <sup>r</sup>	533 <sup>r</sup>	540	570	600
Total	2,390 <sup>r</sup>	3,000 <sup>r</sup>	4,410 <sup>r</sup>	4,700 <sup>r</sup>	4,560 <sup>r</sup>	4,700 <sup>r</sup>	4,900 <sup>r</sup>	5,100

<sup>c</sup>Estimated. <sup>r</sup>Revised.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Secondary only.

<sup>3</sup>Primary only.

TABLE 10  
LATIN AMERICA AND CANADA: HISTORIC AND PROJECTED GOLD MINE PRODUCTION, 1990-2007<sup>1</sup>

(Au content in kilograms)

Country	1990	1995	2000	2001	2002	2003 <sup>c</sup>	2005 <sup>c</sup>	2007 <sup>c</sup>
Argentina	1,200	837	26,000	30,600 <sup>r</sup>	32,500 <sup>r</sup>	35,000	45,000	55,000
Belize	1	5	7	1	1	2	4	6
Bolivia	5,200	14,400	12,000	12,400	11,300 <sup>r</sup>	12,000 <sup>r</sup>	12,200 <sup>r</sup>	12,400 <sup>r</sup>
Brazil	102,000	63,300	50,400	51,900 <sup>r</sup>	37,900 <sup>r</sup>	45,600 <sup>r</sup>	54,900 <sup>r</sup>	63,600 <sup>r</sup>
Canada	169,000	152,000	156,000	159,000 <sup>r</sup>	149,000 <sup>r</sup>	159,000 <sup>r</sup>	171,000 <sup>r</sup>	187,000 <sup>r</sup>
Chile	27,500	44,600	54,100 <sup>r</sup>	42,700	38,700 <sup>r</sup>	40,000	41,000	42,000
Colombia	29,400	21,100	37,000	21,800	20,800 <sup>r</sup>	21,000	23,000	25,000
Costa Rica	460	400	51	100	100	150	200	300
Cuba	--	184	1,000	1,000	1,000	1,000	1,000	1,000
Dominican Republic	4,350	3,280	--	--	--	--	--	--
Ecuador	10,100	7,410	2,870	3,010	2,750	10,500	11,000	11,000
French Guiana	870	3,000	3,470	3,970	2,970	3,300	3,300	6,000
Guatemala	62	30	4,500	4,500	4,500	4,550	4,600	4,700
Guyana	1,500	9,010	13,500	14,200	13,600 <sup>r</sup>	10,000	4,000 <sup>r</sup>	4,000 <sup>r</sup>
Honduras	156	111	878	4,570	4,980	5,000	5,100	5,200
Jamaica	--	--	--	214	328	300	300	300
Mexico	9,680	20,300	26,400	23,500	21,300 <sup>r</sup>	25,000	26,000	26,000
Nicaragua	1,200	1,320	3,670	3,750	3,750	3,800	3,900	4,000
Panama	85	1,100	1,500	1,500	1,500	1,550	1,600	1,650
Peru	10,400	56,000	133,000 <sup>r</sup>	138,000 <sup>r</sup>	157,000 <sup>r</sup>	160,000 <sup>r</sup>	160,000	165,000
Paraguay	--	900	2,180	2,080	2,080	2,150	2,200	2,300
Suriname	30	300	300	300	300	300	300	300
Venezuela	7,700	7,260	7,330	9,080	9,470 <sup>r</sup>	11,000	13,000	15,000
Total	381,000 <sup>r</sup>	407,000 <sup>r</sup>	536,000 <sup>r</sup>	528,000 <sup>r</sup>	516,000 <sup>r</sup>	550,000 <sup>r</sup>	580,000 <sup>r</sup>	630,000 <sup>r</sup>

<sup>c</sup>Estimated. <sup>r</sup>Revised. -- Negligible or no production.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 11  
LATIN AMERICA AND CANADA: HISTORIC AND PROJECTED IRON CONTENT PRODUCTION, 1990-2007<sup>1</sup>

(Thousand metric tons)

Country	Iron content	1990	1995	2000	2001	2002	2003 <sup>e</sup>	2005 <sup>e</sup>	2007 <sup>e</sup>
Argentina	63%	680	--	--	--	--	--	--	--
Bolivia	68%	80	--	--	--	--	--	--	--
Brazil	66%	100,000	113,000	141,000 <sup>r</sup>	139,000 <sup>r</sup>	140,000 <sup>r</sup>	140,000 <sup>r</sup>	140,000 <sup>r</sup>	140,000 <sup>r</sup>
Canada	64%	22,000	24,600	22,700	17,200 <sup>r</sup>	19,800 <sup>r</sup>	20,000 <sup>r</sup>	25,000 <sup>r</sup>	25,000 <sup>r</sup>
Chile	62%	5,040	5,200	5,460	5,440 <sup>r</sup>	4,400 <sup>r</sup>	4,800 <sup>r</sup>	5,100 <sup>r</sup>	5,100 <sup>r</sup>
Colombia	55%	283	300	363	363	410	410	410	410
Cuba	NA	--	--	--	--	--	(2)	(2)	(2)
Guatemala	65%	4	1	11	10	10	10	10	10
Mexico	60%	7,110	5,630	6,890	5,270 <sup>r</sup>	5,970 <sup>r</sup>	6,000 <sup>r</sup>	6,500 <sup>r</sup>	6,500 <sup>r</sup>
Peru	68%	2,150	3,950	2,810 <sup>r</sup>	3,090 <sup>r</sup>	3,110 <sup>r</sup>	3,000 <sup>r</sup>	3,000 <sup>r</sup>	3,000 <sup>r</sup>
Uruguay	65%	3	3	4	6	6	6	6	6
Venezuela	65%	13,100	12,600	11,100	10,800 <sup>r</sup>	11,500 <sup>r</sup>	11,300	11,300	11,300
Total	XX	150,000	165,000	190,000 <sup>r</sup>	181,000 <sup>r</sup>	185,000 <sup>r</sup>	190,000 <sup>r</sup>	190,000 <sup>r</sup>	190,000 <sup>r</sup>

<sup>e</sup>Estimated. NA Not available. XX Not applicable. <sup>r</sup>Revised. -- Negligible or no production.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Less than 1/2 unit.

TABLE 12  
LATIN AMERICA AND CANADA: HISTORIC AND PROJECTED PIG IRON AND DIRECT-REDUCED IRON PRODUCTION, 1990-2007<sup>1</sup>

(Thousand metric tons)

Country	1990	1995	2000	2001	2002	2003 <sup>e</sup>	2005 <sup>e</sup>	2007 <sup>e</sup>
Argentina:								
Pig iron	1,930	1,570	2,190	1,910	1,910	2,000	2,000	2,000
Direct-reduced iron	1,040	1,330	1,420	1,280	1,450	1,500	1,500	1,500
Brazil:								
Pig iron	21,100	25,100	27,700	27,800	29,600	30,000	30,000	30,000
Direct-reduced iron	260	288	418	400	400	410	410	410
Canada:								
Pig iron	7,350	8,460	8,900	8,780	8,800	9,000	9,000	9,000
Direct-reduced iron	730	1,010	920	920	920	940	940	940
Chile	675	855	1,024	897	964	1,000	1,000	1,000
Colombia	323	282	285	319	309	300	300	300
Mexico:								
Pig iron	3,670	4,140	4,860	4,360	4,000	4,100	4,100	4,100
Direct-reduced iron	2,530	3,700	5,590	3,670	4,570	4,600	4,600	4,600
Paraguay	61	103	82	72	88	85	85	85
Peru:								
Pig iron	93	247	327	330	330	330	330	330
Direct-reduced iron	29	3	80	80	80	80	80	80
Trinidad and Tobago <sup>2</sup>	697	1,040	1,530	2,190	2,320	2,300	2,300	2,300
Venezuela: <sup>2</sup>								
Pig iron	314	--	--	--	--	--	--	--
Direct-reduced iron	3,130	5,100	6,400	6,380	6,890	7,000	7,000	7,000
Total	43,900	53,200	61,700	59,400	62,600	64,000	64,000	64,000

<sup>e</sup>Estimated. -- Negligible or no production.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Direct-reduced iron.



TABLE 13  
LATIN AMERICA AND CANADA: HISTORIC AND PROJECTED CRUDE STEEL PRODUCTION, 1990-2007<sup>1</sup>

(Thousand metric tons)

Country	1990	1995	2000	2001	2002	2003 <sup>e</sup>	2005 <sup>e</sup>	2007 <sup>e</sup>
Argentina	3,640	3,620	4,470	4,110	4,360 <sup>r</sup>	4,400 <sup>r</sup>	4,400 <sup>r</sup>	4,400 <sup>r</sup>
Brazil	20,600	25,100	27,900	26,700	29,600 <sup>r</sup>	30,000 <sup>r</sup>	30,000 <sup>r</sup>	30,000 <sup>r</sup>
Canada	12,300	14,400	15,900 <sup>r</sup>	16,300 <sup>r</sup>	16,300 <sup>r</sup>	17,000	17,000	17,000
Chile	800	1,010	1,300	1,250	1,280 <sup>r</sup>	1,300	1,300	1,300
Colombia	703	792	660	637	663 <sup>r</sup>	650	650	650
Cuba	270	207	327 <sup>r</sup>	270 <sup>r</sup>	264 <sup>r</sup>	300	300	300
Dominican Republic	36	--	36	33	61	60	60	60
Ecuador	20	35	58	60	67	65	65	67
Jamaica	24	25	--	--	--	--	--	--
Mexico	8,710	12,100	15,700	13,300	14,100 <sup>r</sup>	14,000	14,000	14,000
Paraguay	48	96	77 <sup>r</sup>	67 <sup>e</sup>	80 <sup>r</sup>	80 <sup>r</sup>	80 <sup>r</sup>	80 <sup>r</sup>
Peru <sup>2</sup>	284	515	510	510	510 <sup>r</sup>	510 <sup>r</sup>	510 <sup>r</sup>	510 <sup>r</sup>
Trinidad and Tobago	631	738	723 <sup>r</sup>	668	817 <sup>r</sup>	800 <sup>r</sup>	800 <sup>r</sup>	800 <sup>r</sup>
Uruguay	38	40	38	31	35	35	38	40
Venezuela	2,680	3,630	3,840	3,810 <sup>r</sup>	4,160 <sup>r</sup>	4,200 <sup>r</sup>	4,000	4,200 <sup>r</sup>
Total	50,800 <sup>r</sup>	62,300 <sup>r</sup>	71,500	67,700 <sup>r</sup>	72,300	73,000	73,000 <sup>r</sup>	73,000 <sup>r</sup>

<sup>e</sup>Estimated. <sup>r</sup>Revised. -- Negligible or no production.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Ingots and castings.

TABLE 14  
LATIN AMERICA AND CANADA: HISTORIC AND PROJECTED LEAD MINE PRODUCTION, 1990-2007<sup>1</sup>

(Pb content in metric tons)

Country	1990	1995	2000	2001	2002	2003 <sup>e</sup>	2005 <sup>e</sup>	2007 <sup>e</sup>
Argentina	23,400	10,500	14,100	12,300	12,000 <sup>r</sup>	12,100 <sup>r</sup>	12,000 <sup>r</sup>	12,000 <sup>r</sup>
Bolivia	19,900	20,400	9,500	8,900	9,900 <sup>r</sup>	9,900 <sup>r</sup>	9,900 <sup>r</sup>	9,900 <sup>r</sup>
Brazil	9,300	11,600	8,800 <sup>r</sup>	9,800 <sup>r</sup>	9,300 <sup>r</sup>	10,000	10,500	11,000
Canada	241,000	211,000	149,000	154,000 <sup>r</sup>	97,200 <sup>r</sup>	150,000 <sup>r</sup>	150,000 <sup>r</sup>	150,000 <sup>r</sup>
Chile	1,120	944	785	1,190	2,900 <sup>r</sup>	2,000 <sup>r</sup>	2,000 <sup>r</sup>	2,000 <sup>r</sup>
Colombia	331	300	226	220	220	250	250	250
Ecuador	200	200	200	200	220	220	220	220
Honduras	5,790	2,620	4,800 <sup>r</sup>	6,750 <sup>r</sup>	8,130 <sup>r</sup>	8,000 <sup>r</sup>	8,050 <sup>r</sup>	8,100 <sup>r</sup>
Mexico	187,000	164,000	138,000	136,000	139,000 <sup>r</sup>	140,000	143,000	145,000
Peru	188,000	238,000	271,000	290,000	298,000 <sup>r</sup>	310,000	315,000	320,000
Total	676,000	660,000	596,000	619,000	577,000 <sup>r</sup>	640,000	650,000 <sup>r</sup>	660,000 <sup>r</sup>

<sup>e</sup>Estimated. <sup>r</sup>Revised.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 15  
LATIN AMERICA AND CANADA: HISTORIC AND PROJECTED PRIMARY REFINED LEAD PRODUCTION, 1990-2007<sup>1</sup>

(Metric tons)

Country	1990	1995	2000	2001	2002	2003 <sup>c</sup>	2005 <sup>c</sup>	2007 <sup>c</sup>
Argentina	5,500	2,430	8,700	9,500	10,600 <sup>r</sup>	11,000	11,500	12,000
Brazil	30,200	14,000	--	--	--	--	--	--
Canada	87,200	178,000	159,000 <sup>r</sup>	127,000 <sup>r</sup>	134,000 <sup>r</sup>	152,000 <sup>r</sup>	155,000 <sup>r</sup>	155,000 <sup>r</sup>
Mexico	167,000	166,000	143,000	144,000	128,000 <sup>r</sup>	150,000	155,000	160,000
Peru	69,300	221,000	116,000 <sup>r</sup>	121,000 <sup>r</sup>	120,000 <sup>r</sup>	120,000 <sup>r</sup>	125,000 <sup>r</sup>	130,000 <sup>r</sup>
Total	359,000	581,000	427,000 <sup>r</sup>	402,000 <sup>r</sup>	393,000 <sup>r</sup>	430,000 <sup>r</sup>	447,000 <sup>r</sup>	460,000 <sup>r</sup>

<sup>c</sup>Estimated. <sup>r</sup>Revised. -- Negligible or no production.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 16  
LATIN AMERICA AND CANADA: HISTORIC AND PROJECTED SECONDARY REFINED LEAD PRODUCTION, 1990-2007<sup>1</sup>

(Metric tons)

Country	1990	1995	2000	2001	2002	2003 <sup>c</sup>	2005 <sup>c</sup>	2007 <sup>c</sup>
Argentina	14,600	26,300	27,000	26,000 <sup>r</sup>	31,000 <sup>r</sup>	25,000 <sup>r</sup>	33,000 <sup>r</sup>	35,000 <sup>r</sup>
Brazil	45,300	65,000	50,000	47,000	50,000 <sup>r</sup>	50,000 <sup>r</sup>	50,000 <sup>r</sup>	50,000 <sup>r</sup>
Canada	96,500	103,000	125,000 <sup>r</sup>	104,000 <sup>r</sup>	117,000 <sup>r</sup>	120,000 <sup>r</sup>	120,000 <sup>r</sup>	120,000 <sup>r</sup>
Colombia	3,500	8,000	12,000	10,000	10,000	10,000	10,000	10,000
Mexico	65,000	10,000	110,000 <sup>r</sup>	110,000 <sup>r</sup>	110,000 <sup>r</sup>	110,000 <sup>r</sup>	110,000 <sup>r</sup>	110,000 <sup>r</sup>
Venezuela	14,000	16,000	30,000	30,000 <sup>r</sup>	30,000 <sup>r</sup>	30,000 <sup>r</sup>	30,000 <sup>r</sup>	30,000 <sup>r</sup>
Total	239,000	228,000	354,000 <sup>r</sup>	327,000 <sup>r</sup>	348,000 <sup>r</sup>	350,000 <sup>r</sup>	350,000 <sup>r</sup>	360,000 <sup>r</sup>

<sup>c</sup>Estimated. <sup>r</sup>Revised.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 17  
LATIN AMERICA AND CANADA: HISTORIC AND PROJECTED NICKEL MINE PRODUCTION, 1990-2007<sup>1</sup>

(Ni content in metric tons)

Country	1990	1995	2000	2001	2002	2003 <sup>c</sup>	2005 <sup>c</sup>	2007 <sup>c</sup>
Brazil	22,800 <sup>r</sup>	29,100 <sup>r</sup>	45,300	45,300	45,300	25,000	28,000	30,000
Canada	196,000 <sup>r</sup>	182,000 <sup>r</sup>	191,000	184,300 <sup>r</sup>	178,000 <sup>r</sup>	190,000	190,000	200,000
Colombia	22,400	24,200	59,000	53,000	58,200 <sup>r</sup>	55,000	55,000	55,000
Cuba	30,400 <sup>r</sup>	41,000	67,800	72,600 <sup>r</sup>	71,600 <sup>r</sup>	75,000	75,000	75,000
Dominican Republic	28,700 <sup>r,2</sup>	46,500 <sup>r</sup>	39,900	39,100 <sup>r</sup>	38,900 <sup>r</sup>	39,000 <sup>r</sup>	39,000 <sup>r</sup>	39,000 <sup>r</sup>
Venezuela	--	--	2,540 <sup>r</sup>	13,600 <sup>r</sup>	18,200 <sup>r</sup>	22,000 <sup>r</sup>	22,000	22,000 <sup>r</sup>
Total	300,000 <sup>r</sup>	323,000 <sup>r</sup>	406,000	408,000 <sup>r</sup>	410,000 <sup>r</sup>	410,000 <sup>r</sup>	410,000 <sup>r</sup>	420,000 <sup>r</sup>

<sup>c</sup>Estimated. <sup>r</sup>Revised. -- Negligible or no production.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Nickel content of ferronickel.

TABLE 18  
LATIN AMERICA AND CANADA: HISTORIC AND PROJECTED PLATINUM MINE PRODUCTION, 1990-2007<sup>1</sup>

(Metal content in kilograms)

Country	1990	1995	2000	2001	2002	2003 <sup>c</sup>	2005 <sup>c</sup>	2007 <sup>c</sup>
Brazil	--	--	--	--	--	--	--	1,000
Canada	5,000	7,000	6,200 <sup>r</sup>	8,000 <sup>r</sup>	8,300 <sup>r</sup>	8,600 <sup>r</sup>	8,600 <sup>r</sup>	8,600 <sup>r</sup>
Colombia	1,600	973	339	674	661 <sup>r</sup>	700	700	700
Total	6,600	7,970	6,540 <sup>r</sup>	8,670 <sup>r</sup>	8,960 <sup>r</sup>	9,300 <sup>r</sup>	9,300 <sup>r</sup>	10,000 <sup>r</sup>

<sup>c</sup>Estimated. <sup>r</sup>Revised. -- Negligible or no production.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 19  
LATIN AMERICA AND CANADA: HISTORIC AND PROJECTED PALLADIUM MINE PRODUCTION, 1990-2007<sup>1</sup>

(Metal content in kilograms)

Country	1990	1995	2000	2001	2002	2003 <sup>c</sup>	2005 <sup>c</sup>	2007 <sup>c</sup>
Brazil	--	--	--	--	--	--	--	1,000
Canada	6,200	8,900	9,900 <sup>r</sup>	12,700 <sup>r</sup>	13,600 <sup>r</sup>	13,400 <sup>r</sup>	13,400 <sup>r</sup>	13,400 <sup>r</sup>
Total	6,200	8,900	9,900 <sup>r</sup>	12,700 <sup>r</sup>	13,600 <sup>r</sup>	13,400 <sup>r</sup>	13,400 <sup>r</sup>	14,000 <sup>r</sup>

<sup>c</sup>Estimated. <sup>r</sup>Revised. -- Negligible or no production.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 20  
LATIN AMERICA AND CANADA: HISTORIC AND PROJECTED SILVER MINE PRODUCTION, 1990-2007<sup>1</sup>

(Ag content in kilograms)

Country	1990	1995	2000	2001	2002	2003 <sup>c</sup>	2005 <sup>c</sup>	2007 <sup>c</sup>
Argentina	82,700	47,800	78,300	153,000	126,000	136,000 <sup>r</sup>	150,000 <sup>r</sup>	150,000 <sup>r</sup>
Bolivia	311,000	425,000	434,000	408,000	450,000 <sup>r</sup>	460,000 <sup>r</sup>	470,000 <sup>r</sup>	480,000 <sup>r</sup>
Brazil	171,000	49,800	41,000	46,000 <sup>r</sup>	33,000 <sup>r</sup>	30,000 <sup>r</sup>	30,000 <sup>r</sup>	30,000 <sup>r</sup>
Canada	1,500,000	1,290,000	1,210,000	1,270,000 <sup>r</sup>	1,340,000 <sup>r</sup>	1,300,000	1,300,000	1,300,000
Chile	665,000	1,040,000	1,240,000	1,350,000	1,210,000 <sup>r</sup>	1,250,000 <sup>r</sup>	1,300,000	1,350,000
Colombia	6,590	5,900	7,970	7,240	6,990 <sup>r</sup>	7,300	7,400	7,500
Dominican Republic	21,600	21,100	--	--	--	--	--	--
Ecuador	60	--	2,000	2,000	2,000	2,000	2,100	2,150
Honduras	31,100	34,700	32,000	46,800 <sup>r</sup>	52,900 <sup>r</sup>	53,000 <sup>r</sup>	54,000 <sup>r</sup>	54,000 <sup>r</sup>
Jamaica	--	--	--	95	174	200	200	200
Mexico	2,420,000	2,320,000	2,620,000	2,760,000	2,750,000	2,800,000	2,900,000	3,000,000
Nicaragua	1,100	2,400	1,570 <sup>r</sup>	2,500 <sup>r</sup>	2,500 <sup>r</sup>	2,500 <sup>r</sup>	2,550 <sup>r</sup>	2,600 <sup>r</sup>
Panama	41	175	2,000	2,000	2,000	2,000	2,050	2,100
Peru	1,760,000	1,930,000	2,440,000	2,670,000	2,690,000	2,750,000	2,800,000	3,000,000
Total	6,970,000 <sup>r</sup>	7,170,000 <sup>r</sup>	8,110,000	8,720,000	8,670,000 <sup>r</sup>	8,800,000 <sup>r</sup>	9,000,000 <sup>r</sup>	9,400,000 <sup>r</sup>

<sup>c</sup>Estimated. <sup>r</sup>Revised. -- Negligible or no production.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 21  
LATIN AMERICA AND CANADA: HISTORIC AND PROJECTED TIN MINE PRODUCTION, 1990-2007<sup>1</sup>

(Sn content in metric tons)

Country	1990	1995	2000	2001	2002	2003 <sup>e</sup>	2005 <sup>e</sup>	2007 <sup>e</sup>
Argentina	123 <sup>r</sup>	--	--	--	--	--	--	--
Bolivia	17,300	14,000	12,500 <sup>r</sup>	12,300 <sup>r</sup>	15,200 <sup>r</sup>	15,300 <sup>r</sup>	15,400 <sup>r</sup>	15,400 <sup>r</sup>
Brazil	37,600 <sup>r</sup>	17,300 <sup>r</sup>	13,800	14,200	14,200 <sup>r</sup>	14,000	14,000	14,000
Canada	2,830	--	--	--	--	--	--	--
Mexico	5 <sup>r</sup>	1 <sup>r</sup>	4 <sup>r</sup>	8 <sup>r</sup>	9 <sup>r</sup>	10 <sup>r</sup>	10 <sup>r</sup>	10 <sup>r</sup>
Peru	5,130 <sup>r</sup>	22,300 <sup>r</sup>	70,900	69,700	38,800 <sup>r</sup>	40,200 <sup>r</sup>	40,200 <sup>r</sup>	40,200 <sup>r</sup>
Total	63,000 <sup>r</sup>	53,600 <sup>r</sup>	97,200	96,200 <sup>r</sup>	68,200 <sup>r</sup>	70,000 <sup>r</sup>	70,000 <sup>r</sup>	70,000 <sup>r</sup>

<sup>e</sup>Estimated. <sup>r</sup>Revised. -- Negligible or no production.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 22  
LATIN AMERICA AND CANADA: HISTORIC AND PROJECTED TIN METAL PRODUCTION, 1990-2007<sup>1</sup>

(Metric tons)

Country	1990	1995	2000	2001	2002	2003 <sup>e</sup>	2005 <sup>e</sup>	2007 <sup>e</sup>
Argentina	180 <sup>r</sup>	100	--	--	--	--	--	--
Bolivia	12,600	17,800	9,400	11,300 <sup>r</sup>	10,900 <sup>r</sup>	10,900 <sup>r</sup>	11,000 <sup>r</sup>	11,000 <sup>r</sup>
Brazil	37,600 <sup>r</sup>	17,000 <sup>r</sup>	14,100	14,000	11,700	12,000	12,000	12,000
Canada	200 <sup>r</sup>	--	--	--	--	--	--	--
Mexico	5,000 <sup>r</sup>	400 <sup>r</sup>	1,200	1,100 <sup>r</sup>	1,760 <sup>r</sup>	1,500 <sup>r</sup>	1,500 <sup>r</sup>	1,500 <sup>r</sup>
Peru	4,910 <sup>r</sup>	-- <sup>r</sup>	37,400	38,200	35,800	39,200 <sup>r</sup>	39,200 <sup>r</sup>	39,200
Total	60,500 <sup>r</sup>	35,300 <sup>r</sup>	62,100	64,600 <sup>r</sup>	60,200 <sup>r</sup>	64,000 <sup>r</sup>	64,000 <sup>r</sup>	64,000 <sup>r</sup>

<sup>e</sup>Estimated. <sup>r</sup>Revised. -- Negligible or no production.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 23  
LATIN AMERICA AND CANADA: HISTORIC AND PROJECTED ILMENITE MINE PRODUCTION, 1990-2007<sup>1</sup>

(TiO<sub>2</sub> content in metric tons)

Country	1990	1995	2000	2001	2002	2003 <sup>e</sup>	2005 <sup>e</sup>	2007 <sup>e</sup>
Brazil	14,100 <sup>r</sup>	102,000 <sup>r</sup>	123,000	111,000 <sup>r</sup>	174,000 <sup>r</sup>	175,000 <sup>r</sup>	175,000 <sup>r</sup>	175,000 <sup>r</sup>
Canada	760,000	815,000	950,000	950,000	950,000	950,000	950,000	950,000
Total	774,000 <sup>r</sup>	917,000 <sup>r</sup>	1,070,000	1,060,000 <sup>r</sup>	1,120,000 <sup>r</sup>	1,100,000 <sup>r</sup>	1,100,000 <sup>r</sup>	1,100,000 <sup>r</sup>

<sup>e</sup>Estimated. <sup>r</sup>Revised.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 24  
LATIN AMERICA AND CANADA: HISTORIC AND PROJECTED TUNGSTEN METAL PRODUCTION, 1990-2007<sup>1</sup>

(Metric tons)

Country	1990	1995	2000	2001	2002	2003 <sup>e</sup>	2005 <sup>e</sup>	2007 <sup>e</sup>
Argentina	6 <sup>r</sup>	--	--	--	--	--	--	--
Bolivia	1,010	655	382	533 <sup>r</sup>	400 <sup>r</sup>	450 <sup>r</sup>	500	500
Brazil	316 <sup>r</sup>	171 <sup>r</sup>	18 <sup>r</sup>	22 <sup>r</sup>	24 <sup>r</sup>	20	20	20
Canada	--	--	--	--	2,500	3,000 <sup>r</sup>	3,000 <sup>r</sup>	3,000 <sup>r</sup>
Mexico	183	287 <sup>r</sup>	--	--	--	--	--	--
Peru	1,540	728	--	--	--	--	--	--
Total	3,060 <sup>r</sup>	1,840 <sup>r</sup>	400	555 <sup>r</sup>	2,920 <sup>r</sup>	3,500 <sup>r</sup>	3,500 <sup>r</sup>	3,500 <sup>r</sup>

<sup>e</sup>Estimated. <sup>r</sup>Revised. -- Negligible or no production.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 25  
LATIN AMERICA AND CANADA: HISTORIC AND PROJECTED ZINC MINE PRODUCTION, 1990-2007<sup>1</sup>

(Zn content in metric tons)

Country	1990	1995	2000	2001	2002	2003 <sup>e</sup>	2005 <sup>e</sup>	2007 <sup>e</sup>
Argentina	38,700	32,100	34,900 <sup>r</sup>	39,700	37,300 <sup>r</sup>	29,800 <sup>r</sup>	35,000 <sup>r</sup>	35,000 <sup>r</sup>
Bolivia	104,000	146,000	149,000	141,000	142,000	142,000	143,000 <sup>r</sup>	143,000 <sup>r</sup>
Brazil	158,000	189,000	100,000	111,000 <sup>r</sup>	136,000 <sup>r</sup>	200,000	250,000	300,000
Canada	1,200,000	1,120,000	1,000,000 <sup>r</sup>	1,010,000	894,000 <sup>r</sup>	1,000,000	1,000,000	1,000,000
Chile	25,100	35,400	31,400	32,800	36,200 <sup>r</sup>	36,200 <sup>3</sup>	36,300 <sup>r</sup>	36,300 <sup>r</sup>
Colombia	356	--	42	40	40	40	40	40
Ecuador	100	100	100	100	100	100	100	100
Honduras	29,600	27,100	31,200 <sup>r</sup>	48,500	46,300 <sup>r</sup>	46,500 <sup>r</sup>	46,600 <sup>r</sup>	46,700 <sup>r</sup>
Mexico	307,000	364,000	393,000	429,000 <sup>r</sup>	446,000 <sup>r</sup>	460,000 <sup>r</sup>	475,000 <sup>r</sup>	475,000 <sup>r</sup>
Peru	598,000	692,000	910,000	1,060,000	1,220,000	1,250,000	1,400,000	1,550,000
Total	2,460,000	2,610,000	2,650,000 <sup>r</sup>	2,870,000 <sup>r</sup>	2,960,000 <sup>r</sup>	3,200,000	3,400,000	3,600,000

<sup>e</sup>Estimated. <sup>r</sup>Revised. -- Negligible or no production.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 26  
LATIN AMERICA AND CANADA: HISTORIC AND PROJECTED ZINC METAL PRODUCTION, 1990-2007<sup>1</sup>

(Metric tons)

Country	1990	1995	2000	2001	2002	2003 <sup>e</sup>	2005 <sup>e</sup>	2007 <sup>e</sup>
Argentina	31,500	35,800	39,300 <sup>r</sup>	42,900 <sup>r</sup>	41,800 <sup>r</sup>	44,500 <sup>r</sup>	40,000	40,000
Brazil	154,000 <sup>r</sup>	206,000 <sup>r</sup>	199,000 <sup>r</sup>	200,000 <sup>r</sup>	256,000 <sup>r</sup>	380,000	475,000	570,000
Canada	592,000	720,000	780,000	661,000 <sup>r</sup>	793,000 <sup>r</sup>	700,000	700,000	700,000
Mexico <sup>2</sup>	199,000	223,000	235,000	304,000	302,000 <sup>r</sup>	310,000 <sup>r</sup>	310,000 <sup>r</sup>	310,000 <sup>r</sup>
Peru <sup>2</sup>	121,000 <sup>r</sup>	159,000	200,000	201,000 <sup>r</sup>	173,000	220,000	250,000	280,000
Total	1,100,000 <sup>r</sup>	1,340,000 <sup>r</sup>	1,450,000 <sup>r</sup>	1,410,000 <sup>r</sup>	1,570,000 <sup>r</sup>	1,700,000 <sup>r</sup>	1,800,000 <sup>r</sup>	1,900,000 <sup>r</sup>

<sup>e</sup>Estimated. <sup>r</sup>Revised.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Primary only.

TABLE 27  
LATIN AMERICA AND CANADA: HISTORIC AND PROJECTED DIAMOND MINE PRODUCTION, 1990-2007<sup>1</sup>

(Thousand carats)

Country	1990	1995	2000	2001	2002	2003 <sup>e</sup>	2005 <sup>e</sup>	2007 <sup>e</sup>
Brazil	1,540	1,280 <sup>r</sup>	1,600 <sup>r</sup>	1,300 <sup>r</sup>	1,100 <sup>r</sup>	1,100 <sup>r</sup>	1,300 <sup>r</sup>	1,500 <sup>r</sup>
Canada	--	--	2,530 <sup>r</sup>	3,720 <sup>r</sup>	4,980 <sup>r</sup>	8,000 <sup>r</sup>	9,500 <sup>r</sup>	11,000 <sup>r</sup>
Guyana	18 <sup>r</sup>	52 <sup>r</sup>	82	179	248 <sup>r</sup>	180	180	180
Venezuela	333 <sup>r</sup>	296 <sup>r</sup>	110 <sup>r</sup>	42 <sup>r</sup>	107 <sup>r</sup>	110 <sup>r</sup>	125 <sup>r</sup>	150 <sup>r</sup>
Total	1,890 <sup>r</sup>	1,630 <sup>r</sup>	4,320 <sup>r</sup>	5,240 <sup>r</sup>	6,440 <sup>r</sup>	9,400 <sup>r</sup>	11,000 <sup>r</sup>	13,000 <sup>r</sup>

<sup>e</sup>Estimated. <sup>r</sup>Revised. -- Negligible or no production.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 28  
LATIN AMERICA AND CANADA: HISTORIC AND PROJECTED PHOSPHATE ROCK PRODUCTION, 1990-2007<sup>1</sup>

(P<sub>2</sub>O<sub>5</sub> content in thousand metric tons)

Country	1990	1995	2000	2001	2002	2003 <sup>e</sup>	2005 <sup>e</sup>	2007 <sup>e</sup>
Brazil	625	1,360	1,690	1,710	1,740	1,990 <sup>r</sup>	2,000 <sup>r</sup>	2,000 <sup>r</sup>
Canada <sup>2</sup>	NA	NA	NA	300	380 <sup>r</sup>	380 <sup>r</sup>	380 <sup>r</sup>	380 <sup>r</sup>
Chile	4 <sup>r</sup>	3 <sup>r</sup>	4 <sup>r</sup>	4 <sup>r</sup>	3 <sup>r</sup>	3 <sup>r</sup>	3 <sup>r</sup>	3 <sup>r</sup>
Colombia	10	10	8	8	8	8	8	8
El Salvador	-- <sup>r</sup>	-- <sup>r</sup>	-- <sup>r</sup>	-- <sup>r</sup>	-- <sup>r</sup>	-- <sup>r</sup>	-- <sup>r</sup>	-- <sup>r</sup>
Mexico	187 <sup>r</sup>	187 <sup>r</sup>	316 <sup>r</sup>	236 <sup>r</sup>	1 <sup>r</sup>	-- <sup>r</sup>	100 <sup>r</sup>	100
Peru	47 <sup>r</sup>	89 <sup>r</sup>	6 <sup>r</sup>	5 <sup>r</sup>	6 <sup>r</sup>	4	6	6
Venezuela	34 <sup>r</sup>	23 <sup>r</sup>	105 <sup>r</sup>	114 <sup>r</sup>	114 <sup>r</sup>	110 <sup>r</sup>	110 <sup>r</sup>	110 <sup>r</sup>
Total	907 <sup>r</sup>	1,670 <sup>r</sup>	2,130 <sup>r</sup>	2,380 <sup>r</sup>	2,250 <sup>r</sup>	2,500 <sup>r</sup>	2,600 <sup>r</sup>	2,600 <sup>r</sup>

<sup>e</sup>Estimated. NA Not available. -- Negligible or no production. <sup>r</sup>Revised.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Natural Resources Canada and U.S. Geological Survey Minerals Yearbook Volume I.

TABLE 29  
LATIN AMERICA AND CANADA: HISTORIC AND PROJECTED MARKETABLE COAL PRODUCTION, 1990-2007<sup>1</sup>

(Thousand metric tons)

Country	1990	1995	2000	2001	2002	2003 <sup>e</sup>	2005 <sup>e</sup>	2007 <sup>e</sup>
Argentina	270 <sup>r</sup>	305 <sup>r</sup>	246 <sup>r</sup>	197 <sup>r</sup>	70 <sup>r</sup>	-- <sup>r</sup>	-- <sup>r</sup>	-- <sup>r</sup>
Brazil	4,170 <sup>r</sup>	2,780 <sup>r</sup>	6,000 <sup>r</sup>	6,000 <sup>r</sup>	6,000 <sup>r</sup>	6,100	8,500 <sup>r</sup>	8,500 <sup>r</sup>
Canada	68,300	75,000	69,200	70,400	66,800 <sup>r</sup>	70,500	76,000 <sup>r</sup>	80,000
Chile	2,730 <sup>r</sup>	1,490	509	578 <sup>r</sup>	452 <sup>r</sup>	460 <sup>r</sup>	500 <sup>r</sup>	550 <sup>r</sup>
Colombia	20,400	26,000	38,100	43,400	39,500 <sup>r</sup>	40,000 <sup>r</sup>	45,000 <sup>r</sup>	50,000
Mexico <sup>2</sup>	10,000	11,200	14,300	12,200 <sup>r</sup>	11,400 <sup>r</sup>	12,000	12,000	12,000
Peru	175	80	60	65	68 <sup>r</sup>	100	100	100
Venezuela	2,190	4,260	7,910 <sup>r</sup>	7,690 <sup>r</sup>	8,100 <sup>r</sup>	8,100 <sup>r</sup>	8,200 <sup>r</sup>	8,300 <sup>r</sup>
Total	108,000 <sup>r</sup>	121,000 <sup>r</sup>	136,000	141,000	132,000 <sup>r</sup>	140,000 <sup>r</sup>	150,000	160,000

<sup>e</sup>Estimated. -- Negligible or no production. <sup>r</sup>Revised.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Run of mine.

TABLE 30  
LATIN AMERICA AND CANADA: HISTORIC AND PROJECTED DRY NATURAL GAS PRODUCTION, 1990-2007<sup>1</sup>

(Million cubic meters)

Country	1990	1995	2000	2001	2002	2003 <sup>c</sup>	2005 <sup>c</sup>	2007 <sup>c</sup>
Argentina	18,100 <sup>r</sup>	27,000	37,400 <sup>r</sup>	37,100 <sup>r</sup>	36,200 <sup>r</sup>	37,000 <sup>r</sup>	38,000 <sup>r</sup>	40,000 <sup>r</sup>
Barbados	15	15	15	16	14	15	15	15
Bolivia	2,200 <sup>r</sup>	3,360 <sup>r</sup>	3,400 <sup>r</sup>	4,870 <sup>r</sup>	2,900 <sup>r</sup>	3,100 <sup>r</sup>	3,400 <sup>r</sup>	3,600 <sup>r</sup>
Brazil	6,500 <sup>r</sup>	6,700 <sup>r</sup>	9,500 <sup>r</sup>	12,100 <sup>r</sup>	14,300 <sup>r</sup>	15,500 <sup>r</sup>	17,200 <sup>r</sup>	19,000 <sup>r</sup>
Canada	98,800 <sup>r</sup>	148,000 <sup>r</sup>	166,000 <sup>r</sup>	171,000 <sup>r</sup>	171,000 <sup>r</sup>	172,000 <sup>r</sup>	172,000 <sup>r</sup>	172,000 <sup>r</sup>
Chile	2,120 <sup>r</sup>	1,860 <sup>r</sup>	1,900 <sup>r</sup>	1,900 <sup>r</sup>	1,800 <sup>r</sup>	1,900 <sup>r</sup>	2,000 <sup>r</sup>	2,100 <sup>r</sup>
Colombia	5,600	7,700	6,000 <sup>r</sup>	6,210 <sup>r</sup>	6,230 <sup>r</sup>	6,100 <sup>r</sup>	6,200 <sup>r</sup>	6,300 <sup>r</sup>
Cuba	4 <sup>r</sup>	4 <sup>r</sup>	574 <sup>r</sup>	595 <sup>r</sup>	585 <sup>r</sup>	590 <sup>r</sup>	590 <sup>r</sup>	590 <sup>r</sup>
Ecuador	100 <sup>r</sup>	119 <sup>r</sup>	113 <sup>r</sup>	115 <sup>r</sup>	120 <sup>r</sup>	125 <sup>r</sup>	150 <sup>r</sup>	175 <sup>r</sup>
Guatemala	1,000	1,250	60 <sup>r</sup>	60 <sup>r</sup>	60 <sup>r</sup>	60 <sup>r</sup>	60 <sup>r</sup>	60 <sup>r</sup>
Mexico	34,100 <sup>r</sup>	30,000 <sup>r</sup>	28,800 <sup>r</sup>	29,000 <sup>r</sup>	30,100 <sup>r</sup>	32,000 <sup>r</sup>	37,000 <sup>r</sup>	43,000 <sup>r</sup>
Peru	280 <sup>r</sup>	267 <sup>r</sup>	277 <sup>r</sup>	277 <sup>r</sup>	371 <sup>r</sup>	500 <sup>r</sup>	1,000 <sup>r</sup>	1,000 <sup>r</sup>
Trinidad and Tobago	3,750 <sup>r</sup>	6,120 <sup>r</sup>	14,200	15,200 <sup>r</sup>	17,800 <sup>r</sup>	18,000 <sup>r</sup>	18,000 <sup>r</sup>	18,000 <sup>r</sup>
Venezuela	15,600 <sup>r</sup>	32,100 <sup>r</sup>	27,800 <sup>r</sup>	29,600 <sup>r</sup>	28,400 <sup>r</sup>	29,000 <sup>r</sup>	30,000 <sup>r</sup>	32,000 <sup>r</sup>
Total	188,000 <sup>r</sup>	264,000 <sup>r</sup>	296,000 <sup>r</sup>	308,000 <sup>r</sup>	310,000 <sup>r</sup>	320,000 <sup>r</sup>	330,000 <sup>r</sup>	340,000 <sup>r</sup>

<sup>c</sup>Estimated. <sup>r</sup>Revised.

<sup>1</sup>Dry or marketed gas. Data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 31  
LATIN AMERICA AND CANADA: HISTORIC AND PROJECTED PETROLEUM AND CONDENSATE PRODUCTION, 1990-2007<sup>1</sup>

(Thousand 42-gallon barrels)

Country	1990	1995	2000	2001	2002	2003 <sup>c</sup>	2005 <sup>c</sup>	2007 <sup>c</sup>
Argentina	176,000	261,000 <sup>r</sup>	281,000	284,000	275,000 <sup>r</sup>	280,000 <sup>r</sup>	280,000 <sup>r</sup>	285,000 <sup>r</sup>
Barbados	454	475	560	464	391	400	400	400
Bolivia	7,640	10,200 <sup>r</sup>	10,100 <sup>r</sup>	11,400	11,300 <sup>r</sup>	11,500 <sup>r</sup>	12,000 <sup>r</sup>	12,000 <sup>r</sup>
Brazil	238,000 <sup>r</sup>	252,000 <sup>r</sup>	464,000 <sup>r</sup>	488,000	547,000 <sup>r</sup>	630,000 <sup>r</sup>	695,000 <sup>r</sup>	695,000 <sup>r</sup>
Canada <sup>2</sup>	567,000 <sup>r</sup>	662,000 <sup>r</sup>	804,000 <sup>r</sup>	817,000	864,000 <sup>r</sup>	900,000 <sup>r</sup>	990,000 <sup>r</sup>	990,000 <sup>r</sup>
Chile	7,160	4,020 <sup>r</sup>	2,050 <sup>r</sup>	2,430 <sup>r</sup>	2,120 <sup>r</sup>	2,500 <sup>r</sup>	2,600 <sup>r</sup>	2,700 <sup>r</sup>
Colombia	160,000	213,000 <sup>r</sup>	251,000 <sup>r</sup>	220,000	211,000 <sup>r</sup>	210,000 <sup>r</sup>	220,000 <sup>r</sup>	230,000 <sup>r</sup>
Cuba	4,980 <sup>r</sup>	10,200	17,400 <sup>r</sup>	18,600 <sup>r</sup>	18,000 <sup>r</sup>	18,000 <sup>r</sup>	18,000 <sup>r</sup>	18,000 <sup>r</sup>
Ecuador	104,000	143,000 <sup>r</sup>	146,000	149,000 <sup>r</sup>	143,000 <sup>r</sup>	145,000 <sup>r</sup>	150,000 <sup>r</sup>	155,000 <sup>r</sup>
Guatemala	1,440	8,420 <sup>r</sup>	7,570 <sup>r</sup>	21,000 <sup>r</sup>	19,000 <sup>r</sup>	20,000	21,000 <sup>r</sup>	22,000 <sup>r</sup>
Mexico	932,000	1,120,000	1,260,000	1,300,000 <sup>r</sup>	1,310,000 <sup>r</sup>	1,350,000	1,375,000 <sup>r</sup>	1,380,000 <sup>r</sup>
Peru	47,100	44,400 <sup>r</sup>	36,300 <sup>r</sup>	35,000 <sup>r</sup>	34,200 <sup>r</sup>	35,000 <sup>r</sup>	40,000	40,000
Suriname	--	1,500 <sup>r</sup>	4,500 <sup>r</sup>	4,700 <sup>r</sup>	4,500 <sup>r</sup>	4,500 <sup>r</sup>	4,500 <sup>r</sup>	4,500 <sup>r</sup>
Trinidad and Tobago	56,000	51,800	43,600 <sup>r</sup>	41,400 <sup>r</sup>	47,700 <sup>r</sup>	48,000 <sup>r</sup>	48,000 <sup>r</sup>	48,000 <sup>r</sup>
Venezuela	770,000	1,020,000 <sup>r</sup>	1,150,000 <sup>r</sup>	1,120,000	1,110,000 <sup>r</sup>	1,100,000	1,150,000 <sup>r</sup>	1,200,000 <sup>r</sup>
Total	3,070,000 <sup>r</sup>	3,800,000 <sup>r</sup>	4,480,000 <sup>r</sup>	4,510,000 <sup>r</sup>	4,600,000 <sup>r</sup>	4,800,000 <sup>r</sup>	5,000,000 <sup>r</sup>	5,100,000 <sup>r</sup>

<sup>c</sup>Estimated. <sup>r</sup>Revised. -- Negligible or no production.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Includes synthetic crude.

TABLE 32  
 LATIN AMERICA AND CANADA: HISTORIC AND PROJECTED URANIUM PRODUCTION, 1990-2007<sup>1</sup>

(Metal content in metric tons)

Country	1990	1995	2000	2001	2002	2003 <sup>e</sup>	2005 <sup>e</sup>	2007 <sup>e</sup>
Argentina	1	58	--	--	--	--	--	--
Brazil	--	--	20 <sup>2</sup>	20	20	20	20	20
Canada	8,730	10,500 <sup>r</sup>	10,700 <sup>r</sup>	13,000 <sup>r</sup>	13,100 <sup>r</sup>	13,000 <sup>r</sup>	14,300 <sup>r</sup>	14,300 <sup>r</sup>
Total	8,730	10,600 <sup>r</sup>	10,700 <sup>r</sup>	13,000 <sup>r</sup>	13,100 <sup>r</sup>	13,000 <sup>r</sup>	14,300 <sup>r</sup>	14,300 <sup>r</sup>

<sup>e</sup>Estimated. <sup>r</sup>Revised. -- Negligible or no production.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Anuário Mineral Brasileiro 2001.