

THE MINERAL INDUSTRIES OF CENTRAL AMERICA

BELIZE, COSTA RICA, EL SALVADOR, GUATEMALA, HONDURAS, NICARAGUA, AND PANAMA

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The region of Central America is defined in this chapter to include the countries of Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama. In 2004, the mineral industries across most of this region remained substantially underdeveloped, but mining has traditionally been an important economic activity in most of these countries. Apparent metallic mineralization occurs as follows: the northwestern part of the region contains deposits that are richer in lead and associated more with silver and zinc; the southern and eastern parts of the region contain more copper-rich but lead-poor deposits that may contain associated silver and gold. In 2004, the most common metal mined throughout the region was gold, but the most important deposits being considered for future development were nickel-cobalt laterite deposits in Guatemala and copper porphyry deposits in the southern part of the region, especially in Panama. Exploration results have indicated that successful development of these metallic deposits could result in mine production that would be of significance to the countries of Central and North America and the Caribbean rather than of global significance. During 2004, Central America had limited mineral fuel resources, but exploration for petroleum both onshore and offshore continued (Mining Journal, 2005; U.S. Energy Information Administration, 2005§¹).

The new Dominican Republic–Central America–United States Free Trade Agreement (CAFTA-DR) was signed on August 5, 2004, and is expected to help diversify the economies of the countries that eventually ratify the agreement (including by encouraging greater exploration and production in the region's mineral industries). In 2004, Central America attracted substantial foreign direct investment (FDI) in mineral exploration and exploitation owing to its underexplored terrain and the high annual average prices for most mineral commodities during the year. In most of the countries of Central America, foreign exploration budgets were targeted mainly at discovering deposits of gold and petroleum, but substantial expenditures on exploration for deposits of base metals and other precious metals were also made (Metals Economics Group, 2004; Mining Journal, 2004; Ávila, 2005, p. 19; U.S. Energy Information Administration, 2005§).

In 2004, Central America's small but diverse mining operations produced a variety of metals, industrial minerals, and mineral fuels. The metals sector continued to be limited mostly to the mining of antimony, gold, iron ore, lead, silver, and zinc, as well as the production of steel. Industrial minerals production included cement, clays, gypsum, limestone, marble, pozzolan, pumice, salt, and common sand and gravel. Primary

production of mineral fuels consisted only of petroleum production in Guatemala, but Costa Rica, El Salvador, and Nicaragua produced petroleum refinery products in 2004. On August 3, 2004, Mexico and Venezuela renewed the San José Pact with 11 countries in Central America and the Caribbean, including all 7 countries reviewed in this chapter. By renewing the pact, Mexico and Venezuela agreed that each would continue to supply one-half of a total of 160,000 barrels per day (bbl/d) of crude petroleum to be distributed across all of the recipient countries at prices that amounted to discounts of from 20% to 25% off the average global price in 2004. In July 2004, the President of Mexico expressed the view that Mexico needed to receive greater revenues from its sales of petroleum to Central American countries, and the Government of Venezuela indicated that it would like to extend the agreement to sell discounted petroleum to even more Latin American countries. The San José Pact provides a mechanism for member countries to cooperate in financing socioeconomic development projects and to support trade in other goods and services of the member countries. In 2004, mine production of minerals accounted for a noticeable percentage of the gross domestic products (GDPs) of Guatemala (1%) and Honduras (2%). Central America's combined GDP based on purchasing power parity was about \$183 billion, which was about 5.4% higher than that of 2003 (Ávila, 2005, p. 15; Alexander's Gas & Oil Connections, 2004§; International Monetary Fund, 2005§; U.S. Energy Information Administration, 2005§).

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¹References that include a section mark (§) are found in the Internet References Cited sections.

BELIZE

In 2004, the value of mine and quarry production in Belize increased by about 5.7% compared with that of 2003 mainly owing to an increase in the average annual price of the mineral commodities produced (International Monetary Fund, 2005, p. 38). The country's mineral industry was dominated by the production of industrial minerals, including clays, dolomite, gravel, limestone, marble, marl, and sand for use in the domestic construction sector and for export to nearby markets in the Caribbean region. In 2004, the demand for industrial minerals within the country was increasing as a result of major construction projects, including the Marine Parade Boulevard, the Chalillo hydroelectric dam, and two new casinos. These projects were funded mostly by tax revenue from tourism, which was the leading sector of the Belizean economy. Infrastructure projects and hotels associated with the tourism industry were expected to be primarily responsible for another annual increase in domestic demand for industrial minerals in 2005. As with many small countries that have small domestic markets, exports drove investment decisions, and mine and quarry production accounted for only a negligible amount of the value of total exports and about 0.5% of the total value of the nominal GDP. The agricultural sector also provided some domestic demand for dolomite and other industrial minerals as fertilizers. In 2004, mining and quarrying employed about 400 people, which was a small percentage of the total employment of about 95,900 in the country but was almost two times as many as were employed in the sector in 2002 (Central Bank of Belize, 2005, p. 16-17, 20, 62-63; Geology and Petroleum Department, Belize, 2005§).

In 2004, Boiton Minerals Ltd., which was a private Belizean company that mined a small amount of alluvial gold from the Ceibo Chico Creek area in the Cayo District, sold the insignificant amount of gold produced on the domestic market. Quarries controlled by Belize Minerals Ltd. around Punta Gorda in the Toledo District accounted for almost all the dolomite produced in the country. This dolomite was used primarily as a fertilizer in agriculture and as a buffer in shrimp farms within Belize and was exported to other countries in the Caribbean for similar uses. Belize Minerals was privately owned by Belizean, Danish, and U.S. investors, including the Industrialization Fund for Developing Countries of the Danish Development Bank. Caribbean Investors Limited was a private investment company that controlled quarries around Georgeville, in the Cayo District and produced almost all the limestone in the country. This limestone was reported to be of marble grade and was exported mostly as dimension stone (in tiles) rather than for use in cement production. The other principal domestic producers of industrial minerals used in construction, including aggregates, clays, and sand and gravel, were Belize Aggregates Ltd. and Maheias United Concrete & Supplies Ltd. (both private companies based in Belize City) and the National Sand and Gravel Company (a state-owned company located in Belmopan). These companies mined offshore gravel and sand; beach sand; and clays, gravel, and sand in the interior of the country (Belize Minerals Ltd.,

2005§; Erin Ventures Inc., 2005§; Geology and Petroleum Department, Belize, 2005§).

The country's leading mineral commodity imports were mineral fuels, followed by cement and iron and steel semimanufactures (mostly for construction). In 2003 (which was the last year for which detailed United Nations Commodity Trade data were available for Belize), the country imported 81% of its total imports of mineral fuels from Namibia and 10% from Mexico. The remainder of its imports of mineral fuels came mostly from, in decreasing order of value, Guatemala, El Salvador, and the United States. Belize imported 154,626 metric tons (t) of hydraulic cement for its public construction projects and other apparent cement consumption; of this amount, 113,190 t was from Mexico. Belize also imported virtually all its apparent consumption of metals, including iron and steel. The country's leading supplier of iron and steel semimanufactures was Mexico (mostly rolled products), which accounted for about 32% of Belize's total iron and steel semimanufactures imports, followed by imports of mostly forged iron bars from Trinidad and Tobago (25%) and Namibia (16%). In 2003, the remainder of Belize's total imports of iron and steel semimanufactures was supplied mostly by the United States (15%) and Venezuela (8%). In 2004, imports of minerals per capita were high relative to that of other countries in Central America because Belize had the second-highest per capita GDP based on purchasing power parity in the region (\$7,340) but produced relatively few minerals domestically (International Monetary Fund, 2005, p. 7, 67; 2005§; United Nations Statistics Division, 2006§).

In 2004, the head of the Geology and Petroleum Department (GPD) of the Ministry of Natural Resources, Local Government and the Environment functioned as the Inspector of Petroleum and the Inspector of Mines. In these roles, the GPD head administered the Petroleum Act and the Mines and Minerals Act, which were last revised in 2000 and are codified in chapters 225 and 226, respectively, of the Substantive Laws of Belize. The GPD had responsibility for all matters related to the development of petroleum and mineral resources in Belize (Geology and Petroleum Department, Belize, 2005§).

In 2004, the GPD extended Boiton's exploration license for Ceibo Chico and also issued exploration licenses to Allied International Minerals Ltd., Orion Ltd., and Pan African International Co. Ltd. for the exploration of gold and other precious minerals in the Chiquibul Forest of the Maya Mountains. Boiton, in turn, optioned its exploration rights on Ceibo Chico to Erin Ventures Inc. Through the end of the 2004, exploration companies had discovered trace amounts of copper, lead, and zinc in this area, but made no discoveries of deposits that would be substantial enough for market-scale production of these metals. Exploration for reserves of gypsum to be used in potential domestic production of cement and for other industrial minerals was ongoing during the year. Caribbean Investors Limited tested the grey granite of the Mountain Pine Ridge area for economic feasibility to produce and export this rock as dimension stone (Erin Ventures Inc., 2005§; Geology and Petroleum Department, Belize, 2005§).

Exploration for petroleum has been ongoing in Belize since the country became an independent member of the British

Commonwealth in 1981. In 2004, high global energy prices had a substantially negative effect on the economy of Belize, and further cutbacks in usage would be difficult (the country had already cut back electricity usage by 2.1% in 2002 compared with that of 1993). Rapidly escalating energy prices encouraged the Government to push for completion of the Chalillo hydropower project by the end of 2005. Given 2004 levels of consumption in the very small domestic market, most of any significant production to result from a commercially viable petroleum discovery or from discovery of an economic mineral deposit was expected to be exported. The GPD reported that Belize Natural Energy Limited, together with investment partners, Aspect Energy LLC and CHx LLC, had discovered petroleum in the Cayo District near the border with Guatemala. Test production of crude petroleum from this well was reported to have begun in 2004 and the field was expected to be available for marketable production sometime in 2007. The country has higher production costs than any other country in Central America, except Costa Rica, however, and has difficulty retaining workers in its existing primary production sectors of the economy, such as agriculture, because jobs in tourism sector are more lucrative. Therefore, it is not clear that Belize could convert any significant mineral discoveries into a thriving mineral industry in the near future (Bott, 1992§; Belize.com Ltd., 2005§; Fischer, 2005§; Geology and Petroleum Department, Belize, 2005§; U.S. Energy Information Administration, 2005§; Ysaguirre, 2005§).

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COSTA RICA

In 1987, a mineral resource assessment for the Republic of Costa Rica was performed by the U.S. Geological Survey (USGS), Costa Rica's Dirección General de Geología, Minas e Hidrocarburos, and the Universidad de Costa Rica; gold was determined to be the most important metallic mineral resource in the country and occurred in underground veins as well as in placer and alluvial deposits. Through 2004, almost none of the areas for further exploration that were identified during the 1987 assessment had been fully explored or developed, and most of Costa Rica's mineral industry development potential remained the same as assessed at that time. Gold and silver have been consistently mined since colonial times in Costa Rica, but new investment in modern gold mining was just beginning to regain political support in 2004 after a Presidential moratorium on oil exploration, open pit mining, and cyanide processing was approved by the Government in May 2002. The 1987 assessment also identified significant metallic occurrences of aluminum, chromium, copper, iron-titanium bearing sands, lead, manganese, and zinc. Since then, at least three copper porphyry deposits with an average grade of between 0.15% and 2% copper content have been discovered (not by the USGS) along with three larger copper sulfide deposits with some associated zinc content. Occurrences of copper and lead-zinc skarns were also evident in the USGS assessment, and many chromite deposits were discovered that were estimated to be too small for economic mining development on an individual basis. Additionally, more than 90 very small deposits of manganese were discovered, and more concealed deposits were estimated to exist. Multiple bauxite (aluminum mineral), placer iron (magnetite), polymetallic (three or more metals), and hot-spring sulfur deposits are also known to exist (U.S. Geological Survey and others, 1987, p.1).

In 2004, the mining sector of the mineral industry of Costa Rica contributed 0.1% of the country's GDP at factor cost, but the value of mine and quarry production in Costa Rica was still 15.8% higher than that of 2003. This was mostly owing to a substantial increase in the annual average prices of most of the mine-produced commodities listed in table 1 for Costa Rica relative to other goods and services produced. In 2004, reserves of limestone and pozzolan that had been identified in the early 1980s were still estimated to be in sufficient abundance to satisfy domestic consumption of 1.2 million metric tons per year (Mt/yr) of cement for the next 100 years. In 2004, Costa Rica had the highest value of per capita consumption for all goods and services in Central America, including consumption of about 300 kilograms per capita of cement. The remainder of domestic production of cement was exported to, in decreasing order of total annual export value, Nicaragua, Guatemala, El Salvador, and Panama (Whitaker, 1983, p. 160; World Cement,

2004, p. 35, 38, 42, 47; Banco Central de Costa Rica, 2005a§, b§; International Monetary Fund, 2005§).

In 2004, the main companies invested in the mineral industry of Costa Rica were CEMEX Costa Rica S.A. based in Mexico and Holcim Costa Rica S.A. based in Switzerland (cement), Glencairn Gold Corporation based in Toronto, Ontario, Canada and Vannessa Ventures Ltd. based in Calgary, Alberta, Canada (gold), Grupo Pujol-Martí based in Costa Rica (steel semimanufactures), and the state-run Refinadora Costarricense de Petróleo S.A. (petroleum refinery products). Laminadora Costarricense S.A. was the leading steel production subsidiary of Grupo Pujol-Martí, and Laminadora's listed steel production capacity was 450,000 t/yr. Prior to 2004, most foreign direct investment (FDI) in the mineral industry had been subject to some expropriation risk (including mine concessions being designated as parks), but the most significant investment risk during the year was owing to policy uncertainty concerning enforcement of the 2002 Presidential moratorium (Mining Journal, 2004; U.S. Commercial Service, 2005, p. 57). Other than mineral raw materials for cement production, salt, and some other industrial minerals used in agriculture (diatomite) and other sectors of the economy (clay for the ceramics industry, for example), Costa Rica imports almost all its apparent mineral consumption. Increased prices of oil and most other mineral commodities in 2004 contributed substantially to slower growth in the country's real GDP (4.2%) compared with that of 2003 (6.5%), and this downward trend was expected to continue through at least 2005 (Economic Commission for Latin America and the Caribbean, 2004, p. 103; International Monetary Fund, 2005§).

The two cement manufacturing multinationals that operated in Costa Rica also controlled most of the country's mine production of aggregates, clays, pozzolan, and sand and gravel, as well as industrial production of lime. In 2004, Holcim Costa Rica owned 1 cement plant, 11 concrete plants, and 4 quarries (including limestone and pozzolan quarries close to its cement plant) in Costa Rica. The cement plant had an annual production capacity of about 800,000 metric tons per year (t/yr) until 2004, when an expansion project was completed to increase the capacity to 1.5 Mt/yr; the plant, however, did not operate at this new capacity for 100% of the year. The modern plant was built with an enhanced system to include a wider variety of inputs into the production process, including the capacity to include ferruginous sand from domestic deposits identified in the 1987 USGS mineral assessment. The plant supplied cement to cover an undeclared proportion of the Nicaraguan market and is located approximately 26 kilometers (km) east of San Jose near the city of Cartago. CEMEX owned and operated the Colorado de Abangares cement plant northwest of San Jose. In 2004, the production capacity at Colorado de Abangares was about 850,000 t/yr, and the plant operated at nearly full capacity for the entire year. CEMEX Costa Rica produced approximately 340,000 t of cement for export from this plant, of which 53% was shipped to Guatemala, 26% to Nicaragua, 13% to El Salvador, and 8% to Panama (World Cement, 2004, p. 35, 38, 42, 47; Holcim Costa Rica S.A., 2005§; CEMEX S.A. de C.V., 2006§). Large-scale production of clays included some kaolin, but the proportion of kaolin

in the total production of clays (common) was not reported. Some small clay deposits were mined by individuals to produce an unreported amount of clay that was used in the domestic ceramics industry. Diatomite was also mined from many small deposits and some of it was used domestically in agricultural production. Salt was produced by evaporation from the Golfo de Nicoya, and the production figures for salt in table 1 reflect an estimate of production set equal to expected domestic consumption because there were almost no exports or imports. Annual domestic production and consumption of salt was last reported in the early 1980s to be about 35,000 t/yr (Whitaker, 1983, p. 160; United Nations Statistics Division, 2005§).

Marketable production of steel semimanufactures in Costa Rica was established in the 1960s through an import-substitution policy that severely restricted imports of these steel products into Costa Rica from outside the Central American Common Market (CACM); the steel semimanufactures sector, however, was still dependent on costly imports of mineral raw materials from countries outside of the CACM. In 2004, high production costs meant a lack of international competitiveness for Costa Rican steel products, and the country produced only enough to serve its own domestic market and to supply a small amount of exports to some other members of the CACM. Capital goods and mineral raw materials were basically tariff free as part of the trade policy to establish this sector, but this meant that steel production was overly capital intensive (given the relative domestic endowment of capital to labor) and exhibited gross excess capacity in 2004. Opening of the U.S. market to Costa Rica's exports of steel semimanufactures through CAFTA-DR would expand the export potential and possibly result in fuller utilization of existing production capacity, but ratification of CAFTA-DR would require the Costa Rican Government to eliminate existing subsidies to the manufacturing sector in the form of tax credits for exports. Production in this sector would still be dependent on a secure supply of imported raw materials, including iron ore, crude steel, scrap, and alloying or coating metals, which all became much more costly in 2004. During the year, Costa Rica actually increased imports of steel semimanufactures to satisfy an increase in apparent consumption, rather than more fully utilize existing domestic production capacity to satisfy domestic demand. This was because the historically high tariffs on imports of steel products and other manufactured goods had been reduced in recent years through World Trade Organization negotiations, and increasing imports of steel semimanufactures was less costly than ramping up domestic production (Whitaker, 1983, p. 158-161; Economic Commission for Latin America and the Caribbean, 2004, p. 103; Mining Journal, 2004; International Iron and Steel Institute, 2005, p. 52, 61, 70, 81, 85, 91; Grupo Pujol-Martí, 2004§).

In 2004, development of domestic capacity to produce aluminum from domestic deposits of bauxite in the country was revisited owing to the rising price and demand for the metal within the country. In the early 1960s, two large low-grade deposits of bauxite were discovered in the valley of the Rio General and the Valle de Coto Brus, and an exploitation concession was awarded to the Aluminum Corporation of America (ALCOA) by the Government of Costa Rica in 1964. The Government planned to construct a hydroelectric plant as

part of the project, but ALCOA returned the mining concession to the Government in 1976 and the hydroelectric plant was never built (Whitaker, 1983, p. 158-161; Economic Commission for Latin America and the Caribbean, 2004, p. 103).

In 2004, gold (with silver as the main byproduct) remained the only metallic mineral(s) that appeared to have viable economic possibilities for exploitation in the near future in Costa Rica. Two notable gold projects were environmentally approved or in the process of approval before the 2002 moratorium was enacted. At the beginning of 2004, Glencairn Gold Corporation began construction of the Bellavista gold mining project. The company expected to produce at the mine's designed capacity of about 1.9 t/yr of gold by sometime in early 2006 and to continue to produce at this rate for approximately 7 years after that. The company was expected to recover about 560 kilograms (kg) of gold during development of the Bellavista Mine in 2005. At the end of 2004, the Secretaría Técnica Nacional Ambiental (SETENA) delivered a resolution to Vanessa Ventures Ltd. of Calgary, Alberta, Canada, concerning the company's Cerro Crucitas gold project in Costa Rica. This Government resolution directed Vanessa to provide clarification of issues discovered during review of the company's environmental impact statement (EIS) for the property. Vanessa intended to comply with the resolution but also planned to file a request for international arbitration with the International Centre for Settlement of Investment disputes in Washington, DC, and to seek remedies under the Bilateral Investment Treaty between Canada and Costa Rica. By 2004, it was reported that Inversiones Valle Columbia S.A. had halted gold mining from two veins in the Las Juntas mining district and that this concession had been sold to a Costa Rican investment group. The company continued to explore and evaluate six veins at its suspended Chassoul Mine, but it was not able to declare proven reserves for either silver or gold there. Because almost all the country's silver production came from this mine in recent years, it was not clear if there was much, if any, silver production in the country in 2004 (Mining Journal, 2004; Seaward and Coates, 2005; Glencairn Gold Corporation, 2005§; Vanessa Ventures Ltd., 2005§).

In 2002, SETENA rejected the EIS of Harken Energy Corporation to explore target sites for crude petroleum within an area of approximately 1.4 million acres in the North Limon and South Limon back arc basins onshore and offshore Costa Rica. This rejection was in accordance with the new (at the time) Presidential moratorium on such exploration, and this moratorium continued to be applied to deny Harken's reapplications for exploration permits to these sites in 2004. In 1999, Harken began exploration in Costa Rica through its wholly owned subsidiary Global Energy Development Ltd. and first filed the EIS in 2000. In 2004, Harken continued negotiations with the Government of Costa Rica to regain its exploration concession rights to the Limon basins (Harken Energy Corporation, 2004, p. 11-12). Mallon Resources Corp. apparently still owned the rights to explore for natural gas onshore in northeastern Costa Rica, but the company was acquired by Black Hills Corporation in 2003 and neither company has reported any discoveries there in 2004. Refinadora Costarricense de Petróleo S.A. (RECOPE) had a listed

capacity to refine 24,000 barrels (bbl/d) of petroleum in the city of Limon, but manufacturing petroleum refinery products was similar to the steel semimanufactures sector in that its production was dependent on a secure supply of mineral raw material. Unlike the producers in the country's steel sector, however, RECOPE was able to produce closer to its listed capacity with imports of mineral raw material (crude petroleum) at discounted prices in accordance with the San José Pact (U.S. Energy Information Administration, 2005§).

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Major Source of Information

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EL SALVADOR

The mining sector of El Salvador's mineral industry was first established in the late 19th century when several gold mines were started. Mining in the country declined significantly from about 1920 through the early 1930s because gold and silver prices decreased and mineral exploitation costs increased. Mining has not played a prominent role in the Salvadoran economy since at least 1987, although the country has been estimated to have significant deposits of copper, iron ore, lead, limestone, mercury, silver, sulfur, and zinc during various exploration surveys prior to 2004; of these, only limestone was officially reported as mine produced in 2004. The mining law in El Salvador was thoroughly revised in 2001. Many parts of the law that addressed regulating mineral exploration and exploitation activities and enforcement issues were revised again in 2003. In 2004, this law helped support investment in exploration for coal, copper, gold, gypsum, mineral fertilizers, lime, limestone, pozzolan, new sand and gravel quarries, silver, and deposits of other metals and industrial minerals. Besides cement and limestone, El Salvador produced aluminum metal, fertilizer materials, gypsum, salt, and steel (Jacobson and Ehrenthal, 1988§, Dirección de Hidrocarburos y Minas, 2005§).

In 2004, El Salvador's GDP and GDP per capita based on purchasing power parity were ranked fourth among the seven countries in Central America, and both were very close to the regional averages for each measure. The growth rate of 1.5% in the country's real GDP (\$8.1 billion in 2004) was the lowest in the region, however (International Monetary Fund, 2005§). Although mine production of minerals comprised less than 1% of the real GDP in 2004, manufacturing accounted for about 23% and included production of aluminum and steel semimanufactures, crude steel, and petroleum refinery products (Banco Central de Reserva de El Salvador, 2005c§). In 2004, growth of the value of production in the manufacturing sector of El Salvador was 2.4% compared with that of 2003, and the value of mine production grew by 2% during the same timeframe. These annual growth rates were second only to the rate of economic growth in the basic services sector (2.6%) in El Salvador, but a decrease in the value of new construction in the country (-3.1%) almost offset the combined increase the country's GDP accounted for by these two sectors of the economy, which are parts of the mineral industry (Economic Commission for Latin America and the Caribbean, 2004, p. 106).

In 2004, the country's total exports were mostly shipped to the United States (65.4%), Guatemala (11.7%), Honduras (6.3%),

Nicaragua (3.9%), and Costa Rica (3.0%), with some exports going to Germany, Japan, and other countries. Iron and steel, including crude steel, was the leading mineral export of El Salvador, and Guatemala was the leading customer, accounting for 55% of El Salvador's iron and steel exports by weight (at a value of about \$45.4 million). Guatemala accounted for 53.3% of El Salvador's total iron and steel exports by value and was followed by Honduras (18.5%), Nicaragua (10.5%), Costa Rica (8.1%), and the United States (7.8%). El Salvador exported \$62.4 million worth of petroleum refinery products, which ranked these mineral commodities as the country's second most valuable. Guatemala was again El Salvador's leading export destination and imported 42.9% of this total (by value) followed by Honduras (17.5%), Costa Rica (11.9%), Panama (10.4%), Nicaragua (5.7%), and the United States (5.3%). Aluminum metal and semimanufactures were the third ranked mineral export for El Salvador, and Taiwan was the leading importer closely followed by, in order of the value of aluminum imported from El Salvador, Guatemala, the United States, and India. Industrial minerals comprised the next leading mineral export for El Salvador; Nicaragua was the leading customer for a broad category of industrial minerals, which included cement and minerals for making cement, earth and stone, salt, and sulfur, and was followed by Belize, Honduras, and Guatemala. Fertilizer minerals were the last of the major mineral exports for El Salvador, and Honduras was the leading customer, followed by Guatemala (Banco Central de Reserva de El Salvador, 2005a§; Centro de Trámites de Exportación, 2005§).

In 2004, the supply countries for El Salvador's imports, including its imports of mineral commodities, were much more diverse than the foreign markets for its exports. The United States was the largest single-country source for total imports (46.3%), followed by Guatemala (8.1%), Costa Rica (2.8%), Honduras (2.5%), Japan (2.1%), Nicaragua (1.8%), and Germany (1.5%), but other countries combined to account for about 35% of the value of total imports into El Salvador. The overall trade balance was about \$2,974 million, of which the mineral trade balance accounted for about \$867 million. The leading mineral imports, in order of value, were crude petroleum (for further refining and consumption) and crude steel and iron ore (for production of semimanufactures and other products, and for consumption). The mineral fuel trade balance was \$636 million, and the combined iron and steel trade balance was about \$169 million (Banco Central de Reserva de El Salvador, 2005a§; Centro de Trámites de Exportación, 2005§).

CAFTA-DR includes an investment chapter and other chapters that are expected to strengthen the investment climate in El Salvador, including increasing the appeal of the country's mineral sector to foreign investors. In 2004, El Salvador's 1999 National Investment Law granted equal treatment to foreign and domestic investors, which allowed foreign investors to freely establish businesses in the country, for the most part. This investment law required that all underground mineral resources remain under the control of the Government of El Salvador. Foreign investors must then be granted exploration and exploitation rights according to the investment law and in compliance with all mining investment regulations contained in the country's mining law (U.S. Commercial Service, 2005, p. 42-43).

In a 2003 survey, El Salvador was ranked second only to Chile on the basis of indices that measure progress with Government reforms and fiscal and regulatory responsibility. In 2004, this relatively low ranking for investment risk helped encourage combined FDI flows of about \$3.1 billion into the economy of El Salvador, but only a small proportion of total FDI (significantly less than \$1 million) was invested in the mining sector of the country's mineral industry. More FDI is expected for 2005 in the mining sector, because ratification of CAFTA-DR is expected to increase total FDI flows, especially into sectors that exploit natural resources for which El Salvador can have a comparative advantage over the United States or other Central American countries. In 2004, the companies that made the largest investments in mineral exploration were, in decreasing order of the amount invested, Pacific Rim Mining Corp. of Vancouver, British Columbia, Canada; Intrepid Minerals Corporation of Toronto, Ontario, Canada; and SilverCrest Mines Inc. of Vancouver, British Columbia, Canada (Curtis, 2004, 2005; Banco Central de Reserva de El Salvador, 2005b§; Wilburn, 2005).

At the end of 2004, Pacific Rim was conducting a prefeasibility study for the Minita gold and silver deposit on the company's El Dorado prospect, and the company expected to continue with a drill project in the southern zone of the deposit to better estimate the resource potential for El Dorado in 2005. In 2004, the company encountered lower than expected grades of gold at its La Calera gold exploration project and decided to terminate its option on the property (Pacific Rim Mining Corp., 2005, p. 2, 7). Intrepid focused its exploration efforts on its San Cristobal property in eastern El Salvador, and the company planned to continue exploration in 2005 on the Hormiguero, Oro Nuevo, and Rio Seco prospects within the San Cristobal District. In 2004, SilverCrest joined Pacific Rim and Intrepid as a leading mining development investor in the mineral industry of El Salvador by acquiring the Aldea Zapote silver prospect from Apex Silver Mines Ltd. of Denver, Colorado and Intrepid. Intrepid retained only a royalty arrangement on possible future production out of Aldea Zapote in Metapan, and Apex retained no further interest in the property. SilverCrest planned to complete a prefeasibility study for the Tajado zone of the property by the end of 2005. Intrepid also planned to relinquish its exploration license for the Divisadero gold-silver project in 2005 after its partner in the joint venture, Bema Gold Corporation, obtained poor results in 2004 from exploratory drilling on the property. Intrepid established a new joint venture with Au Martinique Silver Inc. to explore the Cerro Petancol gold-silver property under Au Martinique Silver's Ojo Blanco concession license (Mining Journal, 2004; Curtis, 2005; Intrepid Minerals Corporation, 2005, p. 1, 4-6, 29).

Since the main revision to the mining law in 2001 and through 2004, foreign mining exploration companies have increased the nationwide level of exploration investment every year, mostly in the interest of discovering deposits of gold and silver. At least seven companies were active in exploring for gold and silver in El Salvador, including Brett Resources Inc. and Tournigan Gold Corporation, both of Vancouver, British Columbia, Canada. Brett Resources owned 100% of the mineral rights to El Potosi gold property, which is located 90 km east of San Salvador, and

the company expected to acquire the rights to the Cerro Bonito gold property, which is located a bit further east of San Salvador, in 2005. In 2004, Tournigan conducted surface exploration on El Potosi gold concession to determine its worth before agreeing to acquire it from Brett Resources. In May 2004, Tournigan assigned its rights to purchase the property to Condor Resources Limited of Perth, Australia, which continued the exploration on El Potosi through the end of 2004. Condor planned to initiate drill exploration on the property by the end of 2005 if the results of the surface exploration were favorable (Brett Resources Inc., 2004, p. 20).

In December 2004, Holcim Ltd. of Switzerland completed its acquisition of a majority share (64.2%) of Cemento de El Salvador S.A. (CESSA), which remained the principal producer of cement in El Salvador and shipped cement and mineral raw materials for manufacturing cement to other countries in Central America. In 2004, CESSA operated the Metapan and the Maya cement plants in Santa Ana Department in northeastern El Salvador. These two plants had a combined installed cement production capacity of 1.8 Mt/yr. CESSA quarried limestone near the municipality of Metapan for use in these cement plants (Cemento de El Salvador S.A., 2005§; Holcim Ltd., 2005§). Several deposits of pumice have been discovered in northwestern El Salvador, and a study of the feasibility of beginning a cottage industry to mine pumice for production of insulative refractory ceramics in that region was completed in 2003 (Ogle, 2003§).

Since Guatemala and Panama closed their crude petroleum refineries in 2002, El Salvador has increased its exports of refinery products, especially to neighboring Guatemala. El Salvador also had already signed a bilateral FTA with Mexico by 2004, which helped ensure sufficient flows of crude petroleum into El Salvador for refining, reexporting, and domestic consumption. Very little petroleum is consumed for electricity generation, however, because El Salvador is Central America's leading producer of geothermal energy and about 71% of the country's electricity consumption is provided by domestic thermal sources and hydropower. The remainder of El Salvador's electricity consumption is provided by imports from Guatemala and Honduras. In 2004, Cargill Incorporated of Minneapolis, Minnesota, announced that the company planned to build a small ethanol plant in El Salvador. If constructed, the plant would have a production capacity of about 230,000 cubic meters per year (Page, 2004§; U.S. Energy Information Administration, 2005§).

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Major Source of Information

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GUATEMALA

In 2004, Guatemala's GDP based on purchasing power parity was the highest in Central America and was buoyed by higher annual average prices for petroleum and other minerals. The country's GDP per capita based on purchasing power parity was ranked fourth out of the seven countries in the region, however. In 2004, the growth rate of Guatemala's real GDP was 2.7%, which was the second-lowest rate of economic growth among the seven countries in Central America (only El Salvador's economy grew at a slower rate). Real growth in the mining

sector far surpassed that of the economy as a whole. In 2004, the real value of mine production increased by about 8.9%. The real value of crude petroleum production decreased by about 19%, however, which contributed significantly to lowering the total average growth rate of the Guatemalan economy during the year. Crude petroleum production decreased despite an increase in the annual average price of oil. This was because of decreasing reserves at the country's existing oil fields in the Peten region, and because feasibility testing of two blocks that hold the next most accessible proven reserves was not expected to be completed until sometime in 2005. Mining and quarrying officially employed only 2,278 people in 2003 and not much more than that in 2004. During 2004, many Guatemalans and nongovernmental organizations (NGOs) participated in demonstrations against the Government's promotion of the mining sector (Economic Commission for Latin America and the Caribbean, 2004, p. 107-108; International Monetary Fund, 2005, p. 18, 2005§; Sullivan, 2005; Banco de Guatemala, 2005b§; U.S. Energy Information Administration, 2005§).

The geology of Guatemala is diverse, and many mineral deposits have been discovered, including substantial deposits of antimony, barite, bentonite, cadmium, copper, gold, lead, limestone, marble, nickel, silver, zinc, and sulfur associated with both metal and mineral fuel deposits. Development of these resources has lagged behind expectations because FDI was deterred by the country's 36-year civil war that ended in 1997 and by the mining law that was approved soon thereafter (1998), which provided very few incentives to potential investors and required a 7% royalty payment on revenues from operating mines. A new mining law was drafted on May 22, 2001, and included a mandated reduction in royalty payments to 1% of mining revenues. Such regulations in the new law that pertained to production did not come under much scrutiny until 2004, however, because only a few of the new mining exploration projects that had been encouraged by the 2001 law had entered advanced stages of development by then. In December 2004, the Government considered raising royalties back up to about 3% and indicated that it might stop issuing any new mining exploration or development permits for an indefinite period of time starting at the beginning of 2005. This message followed ongoing antimining protests and requests for tighter mining regulations by NGOs and in-country representatives of the Roman Catholic Church during the latter half of the year. Thus, uncertainty in the status of the new mining law and continuing tensions between locals and "outsiders" (both foreign and domestic) that arose during the war in rural Guatemala, where the most promising mineral deposits are located, meant that FDI in the mining sector was still lower than expected immediately following approval of the new mining law. In accordance with this law and with additional support from the World Bank, some foreign mining companies were attempting to fund community development projects for the local communities that could be affected by the expected mining and exploration activities of these companies. These projects included investing in the provision of health care services, small business development, vocational education, and environmental management capability (Ministry of Energy and Mines, Guatemala, 2001, p. 18, 37; International Finance Corporation, 2004, p. 5-7; Harben, 2005;

Mining Journal, 2005; Sullivan, 2005; U.S. Commercial Service, 2005, p. 59; Kosich, 2004\$).

In 2004, investment in mining exploration increased to about \$11.3 million compared with about \$5.1 million in 2003. The two leading projects in terms of the size of their exploration budgets, were the Buena Vista nickel project, which was owned by Jaguar Nickel Inc. of Toronto, Ontario, Canada, and the Cerro Blanco gold project, which was owned by Glamis Gold Ltd. of Reno, Nevada. The other notable companies that invested in mineral exploration in 2004 in Guatemala were Goldex Resources Corporation, Radius Gold Inc., and Skye Resources Inc., all of Vancouver, British Columbia, Canada. According to the United Nations' Economic Commission for Latin America and the Caribbean (ECLAC), the revised mining law was designed to encourage investment not only during periods of high prices but through periods of decreases in minerals prices as well. In 2005, ECLAC representatives at a conference of mining ministers of the Americas expressed the view that Guatemala's new mining law was designed to encourage sustainable development by private mining companies through production-sharing agreements with the Government that would be negotiated according to a more transparent process than had traditionally been the case in the country. Further increases in investment in both mineral exploitation and exploration were evident during the first half of 2005 (Ávila, 2005, p. 7, 16, 20; Metals Economics Group, 2005; Mining Journal, 2005; U.S. Commercial Service, 2005, p. 59).

Jaguar Nickel (formerly Chesbar Resources Inc.) focused the company's exploration efforts on two nickel-cobalt laterite properties, Marichaj and Sechol, in eastern Guatemala. Jaguar's joint venture partner in Guatemala was Intrepid Minerals; through their wholly owned subsidiary Minera Mayamerica S.A. (Jaguar, 70%, and Intrepid, 30%), the companies control six nickel exploration licenses in the Buena Vista area. The Buena Vista concession borders on a formerly operating nickel operation, the Exploraciones y Explotaciones Mineras Izabal S.A. (Exmibal) mine and smelter (Mining Journal, 2004, 2005).

In 2004, Skye Resources acquired Inco Ltd.'s 70% share in Exmibal and considered different strategies for restarting the project to produce either ferronickel or an intermediate nickel-cobalt product for sale or export without further processing. Ferronickel production at this site would require reactivation of Exmibal's powerplant and nickel processing plant, which had been closed for 20 years prior to 2004. Skye estimated that it could potentially produce between 13,500 and 24,500 t/yr of nickel after updating and expanding the processing plant, but that this reactivation to produce ferronickel would take long enough to potentially miss out on the current period of higher nickel prices. The lower-cost installation of an atmospheric leaching process that would use sulfuric acid to produce the nickel-cobalt compound was estimated to have the capacity to produce 20,000 t/yr of nickel content much earlier than either of the ferronickel reactivation plans, and the company had already begun a pilot program for initiating and testing this process by the end of the year. The Government continued to own the remaining 30% interest in Exmibal and issued new exploration licenses to Skye to replace the old exploitation licenses issue to Inco. These short-term exploration licenses can be converted

into production licenses if Skye is successful in restarting Exmibal (which Skye renamed the Fenix property at the end of the year). Inco retained about a 14% interest in Skye and the option to increase its share to 17.5% if Skye meets certain production criteria at its Fenix property (Skye Resources Inc., 2004a, b).

Glamis's Marlin gold project is located in the western highlands of Guatemala about 48 km southwest of Huehuetenango and 250 km west-northwest of Guatemala City. Construction of the mining facilities on the Marlin property began in the first quarter of 2004, and the company expected production of about 310 kg in the fourth quarter of 2005. Glamis expected to produce about 7.5 t of gold and about 100 t of silver during the Marlin Mine's first full year of production in 2006. During the mine's expected life of 10 years, Glamis expected to produce about 7.8 t/yr of gold and between 93 and 124 t/yr of silver. On June 30, 2004, Glamis received a \$45 million loan from the International Finance Corporation of the World Bank to help develop the \$261 million Marlin project and provide some mitigation of political risk. In 2004, the Marlin project was being developed as a combination open pit and underground mine, but it has encountered resistance from indigenous organizations and NGOs in Guatemala that increased as construction of the mining facilities began to proceed. The local labor concerns are that the Marlin project may provide only about 160 permanent jobs, while the environmental concerns are centered on widespread perceptions of the harmful effects of open-pit mining on the local water supplies. Although Glamis's major expenditures centered on development of the Marlin project toward production in the near future, the company also conducted further exploration on the Marlin property around the planned mine. In 2004, Glamis focused its greenfield exploration efforts and budget on the Cerro Blanco gold project in southwestern Guatemala near the town of Asuncion Mita, and budgeted about \$4.2 million for further exploration of the Cerro Blanco property in 2005. The company also planned to begin a feasibility study at Cerro Blanco in 2005, but Glamis's focus on this exploration concession has varied from year to year, and it was unclear if the additional funding for the study would be made available (Glamis Gold Ltd., 2005, p. 3, 12, 26, 42; International Finance Corporation, 2004).

In 2004, Radius Gold Inc. of Vancouver, British Columbia, Canada, continued to explore extensively in Guatemala, but by the end of the year had optioned most of the future exploration expenditures on its existing properties to other mining exploration and development companies that operated in the country. Radius optioned the Banderas, Holly, and Cerro T gold projects to Glamis for further exploration and optioned its Tambor gold property in central Guatemala to Fortuna Silver Mines Inc. (named Fortuna Ventures Inc. in 2004) for further exploration. In 2005, neither Glamis nor Fortuna announced any further progress in exploration on any of these properties, although each still had 4 or 5 years to meet the conditions of the option agreements with Radius (Radius Gold Inc., 2005\$). Goldex Resources began exploratory drilling, reconnaissance exploration mapping, and stream sediment, soil, and rock chip sampling at its El Pato gold project, which is located about 110

km east of Guatemala City and just north of Radius's Holly property (Goldex Resource Corporation, 2004).

Gold discoveries were not the only metallic mineral deposits targeted by increased investment in mineral exploration in Guatemala in 2004. Tiomin Resources Inc. of Toronto, Ontario, Canada, signed an option agreement with Motagua Resources S.A. to explore for titanium in western Guatemala and help define the economic potential of a hard-rock deposit that was reported to contain both ilmenite and rutile (Tiomin Resources Inc., 2004). In December 2004, Firestone Ventures Inc. agreed to acquire the Torlon Hill zinc prospect near Huehuetenango (Firestone Ventures Inc., 2004).

Although widespread mineral exploration to verify the extent of much of Guatemala's mineral potential had been mostly lacking since at least the 1960s and really began to pick up only in 2004, the Dirección General de Minería of Guatemala (DIGEMIN) had a long list of metallic and industrial minerals for which deposits had been discovered and further investment in exploration and development was being encouraged. The potential metallic mineral prospects included deposits of the following: antimony, chromium, cobalt, copper, gold, iron ore, lead, manganese, mercury, nickel, silver, titanium, tungsten, uranium, and zinc. The potential industrial minerals included the following: andesite, volcanic ash, basalt, barite, bentonite, coal, common clays, diatomite, dolomite, feldspar, ferruginous clay, fluorite (fluorspar), garnet, graphite, hematite, jade, kaolin, limestone, marble, mica, obsidian, opal and jasper, perlite, pumice, quartz, magnesite, mineral salt, sand and gravel, sandstone, schist, serpentine and gypsum, silica sand, sulfur, and talc (Dirección General de Minería, Guatemala, 2005§).

Of the metals, only antimony, iron ore, lead, and gold were officially thought to have been produced in 2004. Most of the industrial minerals were officially reported to have been produced in 2004, except diatomite, fluorite, garnet, graphite, kaolin, mica, obsidian, quartz, sulfur, and serpentine, although production of some these minerals may have been included in official figures for other industrial minerals (for example, serpentine production may have been included in production of jade). Some production of industrial minerals and metals was mostly for domestic use and was not completely accounted for in official reports concerning mineral production (Dirección General de Minería, Guatemala, 2005§).

In 2004, Cementos Progreso S.A., in which Holcim owned a 20% interest, was the leading producer of cement in Guatemala and operated its La Pedrera plant in Guatemala City and its San Miguel plant in the city of El Progreso Sanarate. In 2003, the two plants had an estimated combined capacity to produce about 1.4 Mt/yr of cement. The country imported considerable amounts of cement in 2004, mostly from CEMEX or Holcim affiliates in other Central American countries, such as Costa Rica and El Salvador. In 2004, Cementos Progreso contracted with a German company to build a new lime hydrating plant to replace the old plant at its San Miguel complex (Secretaría de Integración Económica Centroamericana, 2002; Harben and Harris, 2004; World Cement, 2004a; b, p. 47; Holcim Ltd., 2005, p. 141; Business Week, 2004§; Cementos Progreso S.A., 2005§).

The value of Guatemala's exports of crude petroleum accounted for 3.5% of the value of the country's total annual

exports in 2004 compared with about 3.7% in 2003. This was owing to a decrease in the value of production of crude petroleum by about 19% in the country compared with that of 2003. (The quantity produced decreased by about 18% during the same timeframe.) The total value of Guatemala's exports of all other minerals accounted for about 0.4% of the value of the country's total exports compared with about 0.5% in 2003. This was mostly owing to a decrease in the levels of domestic production of some industrial minerals that the country exported more of in 2003 (for example, block marble) and because the increase in the value of total domestic mineral consumption by 11% was basically cancelled out by an increase of 11% in the value of domestic mineral production during the same timeframe. In 2004, the mineral trade deficit was about \$910 million compared with \$737 million in 2003, which was another substantial concern of the Government in pushing for a new mining law. The value of Guatemala's annual mineral exports increased by 12% in 2004 compared with that of 2003, excluding exports of mineral fuels, but the value of the country's annual mineral imports increased by about 21% during the same timeframe. The United States has traditionally been the leading supplier of minerals, excluding mineral fuels, to Guatemala, but it was also the leading importer of minerals from Guatemala in 2004, supplanting the other Central American countries that, combined, had led demand for Guatemala's mineral exports in 2003 (Banco de Guatemala, 2005a§, b§; Dirección General de Hidrocarburos, Guatemala, 2006§).

In 2004, the hydrocarbons law in Guatemala stipulated that underground petroleum deposits are the property of the state, but the most recent revisions were designed to result in a more transparent process for the state to grant joint-venture contracts for exploration. This was similar to recent revisions in the mining law and was expected to encourage increased investment in the mineral fuels sector. In 2002, the suspension of an exploration contract without due process (on environmental grounds) exposed the degree of potential risk present in the mineral fuels sector, but in 2004, investment in exploration for petroleum increased compared with that of 2003. With the latest revisions to the hydrocarbons law apparently serving their purpose, the Government intended to reward this increased investment by opening up two blocks with proven petroleum reserves for bidding on exploitation joint-venture contracts in 2005, as well as two more blocks of unexplored regions for exploration contracts. A subsidiary of Perenco plc of the United Kingdom was the leading producer of crude petroleum in the country. Guatemala has been exporting almost all its petroleum production and importing almost all its refinery products for consumption since Guatemala closed its last refinery in 2002. In 2004, apparent consumption of petroleum refinery products in the country was greater than the requisite production of crude petroleum in Guatemala. The two additional blocks with proven reserves of crude petroleum in the Peten region that were expected to be awarded in 2005 were not expected to enter development until at least sometime in 2006 (U.S. Commercial Service, 2005, p. 59; Perenco plc, 2005§; U.S. Energy Information Administration, 2005§).

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HONDURAS

In Honduras, the nominal value of mine production of metals and industrial minerals increased by about 11.4% in 2004 compared with that of 2003 mostly owing to increases in the annual average prices of mineral commodities. Although the value increased to about \$110 million,² the level of total mine production in Honduras remained about the same in 2004 as in 2003. Some mining firms pulled out of the country amid the Government's cautious approach to approving new mining legislation and increased political uncertainty concerning both the timing of a repeal of a moratorium on new exploration and exploitation licenses, and the amount and timing of an expected increase in the country's mining royalties. On July 16, the Government decided to suspend granting of any new

²Where necessary, values have been converted from Honduran lempiras (L) to U.S. dollars (US\$) at an annual average exchange rate of L18.2=US\$1.00.

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mineral concession licenses until a new mining law can be negotiated that would set out revised conditions for awarding mineral concessions and a higher royalty rate on sales of mine production. The Honduran Congress expected that a new mining law would be voted upon before federal elections in November 2005. In 2004, the mining royalty was officially set at 1%, but the Government reportedly charged an average of about 10% total tax on sales from mining, quarrying, and other natural resource operations. Mineral production in the country also included minor amounts of cadmium, gold, iron oxide, lead, limestone, marble, pumice, rhyolite, salt, silver, and zinc (Doublestar Resources Ltd., 2004; Economic Commission for Latin America and the Caribbean, 2004, p. 110; International Monetary Fund, 2005, p. 13, 23, 56; U.S. Commercial Service, 2005, p. 13; DesLauriers, 2005§).

In 2004, company reports indicated that three metallic mineral mines were in operation in Honduras. El Mochito lead-silver-zinc mine in western Honduras, which was the leading mine in Central America in the 1990s, was owned by Breakwater Resources Inc. of Toronto, Ontario, Canada. In 2004, the company milled less ore at the mine owing to slightly higher operating costs per metric ton milled compared with costs in 2003. This resulted in a decrease in annual production of all three metals mined at El Mochito during the same timeframe. Since the 1980s, the ore from the mine has changed from containing primarily silver (by value) to containing relatively more zinc metal in terms of both value and content. In 2004, Breakwater's investment budget was committed to extending zinc reserves along known ore bodies on El Mochito property and into adjacent properties. Breakwater led all companies in mineral exploration in Honduras according to mineral exploration expenditures budgeted by active mining companies in the country. In 2004, El Mochito Mine produced 41,413 t of zinc in concentrate, 8,877 t of lead, and 48,218 kg of silver (Breakwater Resources Ltd., 2005, p. 11, 19-23; Metals Economics Group, 2005; Annis, 1993§).

Before encountering public resistance to its Marlin Mine in Guatemala, Glamis experienced trouble with antimineral demonstrations at its San Martin Mine in Honduras that prompted the company to invest in more education about mining and other local community development projects. In 2004, Glamis produced 3,177 kg of gold at its San Martin Mine, but production was forecast to be about 2,640 kg in 2005 owing to lower grades being mined there. Mine production was almost all from the Palo Alto pit at San Martin because the Rosa pit was closed to begin environmental reclamation procedures at the site. In 2005, Glamis planned to continue some exploration efforts adjacent to the Rosa pit in an attempt to extend the mine's life (Glamis Gold Ltd., 2005, p. 3, 10-11, 19). The other gold mine that recorded sales in 2004 was the San Andrés Mine, which was located in the municipality of La Union, Department of Copan, and was owned by San Andrés Limited of Belize. In 2004, it was unclear how much of the gold sold by San Andrés was actually mined during the same year. Some of the company's gold sales included gold that was recovered through reclamation operations at the Water Tank Hill pit, where reserves were exhausted in 2003. The East Ledge deposit was discovered in 2002 and mined in 2005, but how much gold

was mine produced there in 2004 is not clear. RNC Gold Inc. of Toronto, Ontario, Canada, acquired San Andrés in 2005 (Harben, 2005; Yamana Gold Inc., 2006, p. 4, 53-55).

In 2004, a number of industrial minerals that included gypsum and marble, which were mostly for export, and salt from the Choluteca District were produced in Honduras. Honduras also had many opal prospects and mines, although the active mining of opal was done almost exclusively by artisanal miners. These miners work mostly as individuals to extract opal from black basalt at the country's largest known opal deposit in Tablon, near Erandique, as well as andesite opals from Las Colinas deposit near Sosoal in the municipality of San Andres, Department of Lempira (Harben, 2005). Domestic limestone was used by the two producers of cement in the country, Cementos del Norte S.A. de C.V. and Lafarge Incehsa S.A. de C.V. Holcim owned a 24.2% interest in the Cementos del Norte plant, which had a production capacity of 600,000 t/yr of cement clinker, and Lafarge S.A. of Paris, France, owned a majority interest in the Piedras Azules cement plant in Comayagua, which had a clinker capacity of 675,000 t/yr (Holcim Ltd, 2005, p. 141; Lafarge S.A., 2005, p. 31). Substantial oil deposits have long been suspected in the Rio Sula valley and offshore along the Caribbean coast, but there was little investment in oil exploration in the country through 2004 (Annis, 1993§; U.S. Energy Information Administration, 2005§).

Dirección Ejecutiva de Fomento a la Minería (DEFOMIN) was responsible for the administration of the mining sector, including controlling the issuance of mineral exploration and exploitation licenses. In 2004, DEFOMIN announced that it planned to revoke an exploration permit that had been issued in 2002 to Compañía Minera Maverick S.A. de C.V., which was a subsidiary of SilverCrest Mines Inc., after Maverick was accused of illegally exploring in the buffer zone of the El Guisayote Reserve near the Montecristo-Trifinio National Park. In addition to the metallic mining companies already mentioned, the other companies with significant mining exploration and development interests in Honduras were Centram Exploration Ltd (formerly named Maya Gold Limited until April 18, 2002), Doublestar Resources Ltd., First Point Minerals Corp., and Gold-Ore Resources Ltd., all of Vancouver, British Columbia, Canada. Among the exploration activities of these companies, the most extensive were those of First Point, which were enabled with funding from BHP Billiton plc through option agreements on mineral properties in El Salvador, Honduras, and Nicaragua. In 2004, First Point explored its Cacamuya epithermal gold-silver deposits, which are located near the town of Filo Lapa, its Cedros lead-silver-zinc property, and the Tule copper-gold porphyry deposit, which is located about 90 km northeast of Tegucigalpa, in Honduras. In 2004, Centram performed surface exploration and reportedly discovered a potential copper-gold porphyry deposit that they named "Los Lirios" and a potential epithermal precious-metals deposit that they named "Rio Rico". Gold-Ore Resources conducted a drilling program in the Guayabillas epithermal gold-silver deposit on the Yuscaran property, which it explored under an option agreement with Breakwater and the United Nations. Doublestar withdrew its applications for the Durazno and the Ajagual concessions and expressed its intention to divest itself of its nine other mining

exploration properties that included its Bejucal epithermal gold property, which was in the most advanced stage of exploration and located near the town of Balfate, Department of Colon, northern Honduras (Mining Journal, 2004, 2005; SilverCrest Mines Inc., 2004; Ávila, 2005, p. 20; Doublestar Resources Ltd., 2005; First Point Minerals Corp., 2005; Harben, 2005; Palencia, 2004§).

The mining sector went from being a leading contributor to the economy of Honduras in the late 1800s to accounting for only about 2% of the country's real GDP annually from 1990 through 2004. In 2004, the country's GDP based on purchasing power parity was ranked fifth in Central America, and the growth rate of the country's real GDP from 2003 to 2004 was tied for second-highest in the region at 4.6%. In 2004, the Honduran GDP per capita based on purchasing power parity was ranked a distant sixth out of seven Central American countries. Since the 1980s and through 2004, ores that contained cadmium, gold, lead, silver, and zinc were mined in Honduras and exported in crude form for further processing mostly in Europe and the United States (Ávila, 2005, p. 15; International Monetary Fund, 2005, p. 13; 2005§; Annis, 1993§; Palencia, 2004§).

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NICARAGUA

In 2004, the real value of Nicaragua's mine production grew by 5.2% compared with that of 2003, and the real value of the mining sector's output had grown by an annual average of 5.1% since 2000. In 2004, this real growth in the sector was estimated to have contributed about 0.1% to the total annual growth rate of 5.1% in the country's real GDP, but mining still contributed slightly less than 1% of the real GDP. Nonfuel mineral exports accounted for about 6% of total exports, which were dominated by exports of agricultural and food products (about 75% of total exports). Manufactured products from imported raw materials accounted for the remainder of total exports. In 2004, mining contributed less than 1% to Nicaragua's real GDP of about \$1.9 billion,³ and mine production of gold was the most significant (in terms of value) metallic mineral produced. Small amounts of copper, lead, and tungsten have also been mined in Nicaragua in the past, and the country was estimated to have unexploited reserves of antimony, tungsten, molybdenum, and phosphates. Nicaragua has also exported small amounts of silver in years when prices have supported mining and exporting the ore. Nicaragua also has deposits of industrial minerals, which included calcium, bentonite, dimension stone, gypsum, kaolin, limestone, pumice, and zeolites. In 2004, Nicaragua's GDP based on purchasing power parity outranked only that of Belize in Central America, and Nicaragua's GDP per capita was the

³Where necessary, values have been converted from Nicaraguan cordobas (C\$) to U.S. dollars (US\$) at an annual average exchange rate of C\$15.9=US\$1.00.

lowest ranked in the region (Economic Commission for Latin America and the Caribbean, 2004, p. 114-115; International Monetary Fund, 2004, p. 31; 2006, p. 6; 2005§; Luftman, 2004, p. 3).

In 2004, Glencairn Gold Corp. owned a 95% interest in the small El Limon gold mine north of Leon, and a 5% ownership interest was held by Inversiones Mineras S.A. (IMISA), which was a holding company that represented unionized mine workers in Nicaragua. About 1,500 kg of gold was produced at El Limon underground mine, which is located approximately 100 km north of the capital city of Managua within Nicaragua's traditional "Mining Triangle" in the northwestern part of the country. Although El Limón Mine has been in continuous operation since 1941, Glencairn reported that it was able to extend the expected mine life to 5 years beyond 2004 through an investment of about \$6.2 million in exploration and modernization during the year (Glencairn Gold Corporation, 2005, p. 4-5, 26).

In June, RNC Gold acquired La Libertad open pit gold mine and heap leaching operation from Central American Mine Holdings Limited in Belize. La Libertad Mine is located 170 km east of Managua in the La Libertad-Santo Domingo Region of the Chontales Department in Central Nicaragua. During 2004, RNC invested in exploration and modernization of La Libertad Mine, including paying \$230,000 to a local miners' cooperative for the rights to exploit the Santo Domingo ore body, which is located adjacent to the existing mine and within La Libertad concession property. All the Nicaraguan mine workers that worked in the region were also members of IMISA, which had owned a partial interest in La Libertad Mine from 1994 to 1996 through Minera Nicaragüense S.A. (MINISA), which was a joint venture between IMISA and Greenstone Resources Ltd.. These mine workers included those involved in small-scale mining operations and cooperatives and individual miners that were currently mining in the area or whose families had mined in the area since British companies conducted mining operations at La Libertad from 1900 through 1935. These small-scale miners are called *güiriseros* in Nicaragua and employed old stamp mills and *arrastras* for processing ore, as well as mercury amalgamation techniques to recover gold at least as late as 1994. In 1996, Greenstone acquired IMISA's interest in MINISA, but MINISA was subsequently acquired by Central American Mine Holdings in 2000. At this time, MINISA was renamed Desarrollo Minero de Nicaragua S.A. In 2004, IMISA received a royalty on net smelter returns equal to 2% of the total production of gold and silver from La Libertad exploitation concession, which its members have been entitled to a share of since 1996 and were expected to be entitled to until an undetermined future time. In addition to this indirect royalty payment, RNC agreed to pay an additional \$130,000 directly to the specific small-scale mining cooperative that formerly worked the Santo Domingo deposit as soon as production is achieved from the ore body within La Libertad concession (RNC Gold Inc., 2005, p. 1-4, 9, 14; Yamana Gold Inc., 2006, p. 66, 68).

In June, RNC also purchased the remaining 20% interest in its 80% owned Bonanza gold mine from Hemco de Nicaragua, S.A. de C.V. The Bonanza Mine was operated by Hemco throughout

the year and was sometimes referred to as the Hemco mine. This mine, which is predominantly an underground mine but with a small, supplemental open pit operation adjacent to it, has been in operation since the 1940s. In 2004, RNC was trying to extend the mine life by conducting surface exploration in an attempt to discover a bulk tonnage gold deposit about 2 miles north of the Bonanza Mine but still within the Hemco concession and by investing in modernization of the mine, precipitate plant, and milling facility on the Hemco property. RNC also purchased additional ore for milling from *güiriseros* that operate near the mine, which is located in northeastern Nicaragua. For 2005, RNC budgeted \$2 million for exploration and drilling on La Libertad and the Hemco concessions (Ellis, 2005, RNC Gold Inc., 2005, p. 1-4, 9, 14; Yamana Gold Inc., 2006, p. 66, 68).

In 2004, the companies that invested most significantly in mineral exploration in the country, other than RNC and Glencairn, were First Point Minerals, Gold-Ore Resources, and Radius Gold. First Point invested about \$700,000 in exploration on its Rio Luna epithermal gold property, which is located 10 km north of the town of Boaco. The company accomplished this with financial and other assistance from BHP Billiton through their exploration joint venture that was initiated in 2003. Gold-Ore's investment consisted of purchasing a temporary right to explore Glencairn's Tatascame gold property in the northern portion of La India gold district and completing some mapping, sampling, and trenching there. La India area is located 140 km northwest of Managua and 45 km east of El Limón Mine. In June 2004, Glencairn agreed to award Gold-Ore with a permanent 51% share of Tatascame by the end of June 2006 if Gold-Ore succeeds in investing \$400,000 in exploration on the property. Radius invested about \$650,000 in exploration on its Nicaraguan concessions, and the company expanded its land holdings around El Pavon exploration concession near the town of Waslala in central Nicaragua after discovering the Natividad epithermal gold deposit there in mid-2003. In September 2004, Radius optioned the exploration rights to Meridian Gold Inc. for further exploration of Natividad that began in April 2005 (First Point Minerals Corp., 2005; Gold-Ore Resources Ltd., 2005; Radius Gold Inc., 2005, p. 1-4).

Corporación Nicaragüense de Minas was responsible for the administration of the mining sector, including controlling permits for mineral exploration and exploitation. The latest revision to the country's mining law was in 2001, and it allowed permission for both exploration and exploitation on mining properties as the result of the Government granting a single right to a concession, rather than requiring companies to apply for two separate concessions on the same property. The revision also allowed for no limits to the amount of terrain that a single company can hold, but implemented a schedule of property taxes that increases by the number of years each individual hectare is held by the same company. Mining concessions in Nicaragua could also be divided, rented out, or mortgaged. Nicaragua's foreign investment law guaranteed 100% repatriation of profits and the repatriation of capital after 3 years of investment by a foreign mining company. Nicaragua's export promotion law allowed duty free imports of machinery, spare parts, raw materials, and semifinished goods that are required

for the production of exports, including mineral exports, and exemption from the general sales tax for those domestic components used to generate exports (Radius Gold Inc., 2005§).

In 2004, Holcim de Nicaragua S.A. operated one grinding plant and employed 80 people. Its cement production capacity was about 300,000 t/yr, but it produced only about 250,000 t during the year. In 2004, cement consumption in the country increased to 700,000 t/yr compared with about 600,000 t/yr in 2003, and Holcim supplemented its Nicaraguan production with imports of cement from its plant in neighboring Costa Rica. In January 2001, CEMEX S.A. de C.V. started operations in Nicaragua through a 25-year lease agreement signed with the Nicaraguan Government under which the company operated a cement plant, Compañía Nacional Productora de Cemento S.A. This plant was renamed San Rafael del Sur and had a listed production capacity of 470,000 t/yr. In 2004, the San Rafael del Sur Plant produced only about 350,000 t of cement, however; CEMEX continued efforts to modernize the plant, which included installation of an electrostatic filter to reduce emissions. CEMEX imported about 40,000 t of cement from another of its plants in Costa Rica to increase the company's total supply for Nicaraguan consumption. The San Rafael del Sur Plant is located 45 km from Managua (World Cement, 2004, p. 38, 47-48; Holcim Ltd., 2005, p. 32, 139, 146; CEMEX S.A. de C.V., 2005, p. 39; 2006§).

In 2006, the Government's Instituto Nicaragüense de Energía (INE) reported that Nicaragua produced about 6,145,000 barrels (bbl) of petroleum refinery products, imported 4,040,000 bbl of mineral fuels, and exported 277,000 bbl of mineral fuels in 2004. (Exports consisted mostly of asphalt and some petrochemicals.) Total consumption was reported to be about 9,700,000 bbl of mineral fuels during the year, but how the approximate 200,000 bbl of additional mineral fuels was supplied to obtain this level of consumption during the year was not reported. In 2004, Exxon Mobil Corp. owned the country's only refinery in Managua, which received its inputs of crude petroleum via a 40-km pipeline from the company's offshore transfer facility at Puerto Sandino. The Managua refinery was operated by ExxonMobil's wholly owned subsidiary Esso Standard Oil, S.A. Limited (ESSO) and had a listed production capacity of 20,000 bbl/d. ESSO accounted for 71% of the country's total imports of mineral fuels, including crude petroleum and petroleum refinery products. ESSO, Shell de Nicaragua S.A., and Texaco Caribbean Inc. combined to account for about 81% of the distribution and sales of mineral fuels for consumption during the year. From 1990 until 2003, Venezuela supplied 70% of the refinery's crude petroleum, but this supply flow was disrupted in 2003 owing to a strike in Venezuela. The refinery proved, however, that it could process a wide range of crude petroleum types and Nicaragua's supply of refinery products was not substantially interrupted as it mostly replaced the expected flow from Venezuela with more imports of crude petroleum from Mexico. During 2004, further delays in the supply of crude petroleum from Venezuela took place, and Nicaragua had difficulty satisfying its requirements for discounted oil from the countries that are signatories to the San José Pact. Therefore, Nicaragua experienced some intermittent shortages and higher prices of its imports of crude petroleum

as it found alternative suppliers to meet the country's demand for mineral fuels during the year (Luftman, 2003; Exxon Mobil Corporation, 2005, p. 74; Instituto Nicaragüense de Energía, 2006, p. 11, 14).

In 2004, Nicaragua did not produce crude petroleum or natural gas, but three U.S. companies were expected to begin exploration sometime in 2005. In March 2004, the Government granted Industrias Oklahoma Nicaragua S.A. an exploration concession that extended from about 40 km west of Managua to the Pacific coast and down the coast through Rivas Department in the southwestern part of the country to the border with Costa Rica. In September 2004, the Government also awarded a 4,000-km² offshore exploration concession in the Caribbean Sea to MKJ Exploraciones S.A. of Metairie, Louisiana, as well as a 4,000-km² concession and a 3,000-km² concession in the Caribbean Sea to Infinity Energy Resources Inc. of Chanute, Kansas (Luftman, 2004, p. 4; Business News Americas, 2004§; U.S. Energy Information Administration, 2005§).

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Major Sources of Information

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PANAMA

In 2004, the Republic of Panama's marketable mine production was estimated to consist of the extraction of some clays, gravel, limestone, salt, and sand despite the variety of mineral deposits and the potential of copper production in the country. The cement plants in the country were also estimated to have produced some lime during the year. The contribution of mine production to the real GDP was negligible. In 2004, the real GDP was \$13.1 billion and grew by 7.6% compared with that of 2003. The mainstay of the Panamanian economy was the country's control of the Panama Canal. In 2004, shipments of crude petroleum and petroleum refinery products accounted for about 12% of total commerce through the Canal (bidirectional), and about 70% of these shipments were transported in the direction of the Pacific Ocean from the Atlantic Ocean. In 2004, Panama did not produce any mineral fuels and closed its only crude petroleum refinery in 2002. The country's GDP per capita based on purchasing power parity ranked third in Central America, and the country was the leading consumer of petroleum products in the region (Economic Commission for Latin America and the Caribbean, 2004, p. 116-117; Ellis, 2005;

International Monetary Fund, 2005§; U.S. Energy Information Administration, 2005§).

By December 31, 2004, CEMEX completed acquisition of a 99.3% ownership interest in Cemento Bayano S.A. from the Government. Cemento Bayano operated one plant with a cement production capacity of approximately 400,000 t/yr and at least one quarry near the plant to supply aggregates for its production operations; the plant was located in Calzada just north of Panama City in the Province of Panama. During 2004, CEMEX also imported approximately 30,000 t of cement from its plant in Costa Rica to help supply the Panamanian market. Cemento Panamá S.A. was co-owned by Cementos del Caribe S.A. (50%) and Holcim (50%), and operated one grinding plant with a cement production capacity of about 700,000 t/yr; the plant was located in Quebrancha, Province of Panama. Holcim planned to increase processing efficiencies at the plant to obtain a production capacity of 1 Mt/yr in 2005. In 2004, Panama's apparent consumption of cement increased to about 1 Mt compared with about 900,000 t in 2003 (World Cement, 2004, p. 47; CEMEX S.A. de C.V., 2005, p. 39; Holcim Ltd., 2005, p. 32, 77, 146).

In 2004, the major companies that invested in mineral exploration and development were Calais Resources Inc. of Nederland, Colorado; Inmet Mining Corporation of Toronto, Ontario, Canada; Petaquilla Minerals Ltd. of Vancouver, British Columbia, Canada; RNC Gold Inc., and Teck Cominco Limited of Vancouver, British Columbia, Canada. Minera Petaquilla S.A. was a joint venture between Petaquilla Minerals (52%) and Inmet (48%), but Teck funded almost all of Petaquilla Minerals' share of the exploration and development costs on the copper-gold porphyry deposit located on the Caribbean coast approximately 100 km west of the Panama Canal. In January 1998, a feasibility study for the Minera Petaquilla project was completed for Teck, but the shareholders in Minera Petaquilla planned to revise and update the study to more accurately reflect current prices and technological advances by sometime in 2006. Minera Petaquilla expected that all the data required for project financing considerations would become available by the end of 2006. In 2004, Teck contributed a majority of the funding for the Petaquilla project to maintain its right to acquire 50% of Petaquilla Minerals' ownership interest after the property enters production (potentially a 26% interest in Minera Petaquilla, when production begins). In 2004, Petaquilla Minerals directly invested only about \$34,000 in exploration, mostly for exploration of the Molejon epithermal gold deposit, which is located within the Minera Petaquilla joint-venture property. For 2005, Petaquilla Minerals budgeted about \$230,000 for exploration on the Minera Petaquilla property, but the expected allocation of the exploration expenditures between Molejon and Petaquilla was not clear. At the end of 2004, Petaquilla Minerals decided to increase its exploration in 2005 because Teck and Inmet agreed to transfer their rights to the Molejon gold deposit to Petaquilla Minerals. Teck and Inmet retained rights to only 1% through 5% of royalty payments on future production from gold deposits located on the Molejon property, depending on the price of gold at the time of production. At the end of 2004, Teck and Inmet also decided to review any further investment in the Petaquilla concession; Inmet and

Petaquilla Minerals granted Teck a year's reprieve from funding the Minera Petaquilla project, starting in April 2005 (Mining Journal, 2005; Petaquilla Minerals Ltd., 2006, p. 11-13).

On February 28, 2003, Calais Resources Inc. entered into a purchase option agreement that required the company to spend \$250,000 on exploration for hard rock deposits and an additional \$250,000 on exploration for placer deposits by September 24, 2004, on its concessions in the Faja de Oro District. The company completed its obligation regarding the hard rock exploration and obtained a 10-year lease to further develop the hard rock deposits on its concessions in this area. The company did not fulfill its obligations for exploration on the placer deposits, and was offering to divest itself of its rights to the placer deposits. Negotiations concerning Calais' rights to both types of exploration concessions in the district continued through the end of the year because the company was still seeking additional financing to continue exploration there. Calais' Faja de Oro concessions are located in the northern portion of Veraguas Province approximately 160 km due west of Panama City (Calais Resources Inc., 2004, p. 2-3, 7, 9, 33). RNC Gold invested \$175,000 in exploration at its Cerro Quema gold concession as part of about \$1 million that was transferred to further develop a mine and begin mine construction there in 2005. Cerro Quema is planned as an open pit mine and heap-leach operation, to be located on the Azuero Peninsula in Los Santos Province of southwestern Panama about 190 km southwest of Panama City; RNC Gold expected to begin production at Cerro Quema in the final quarter of 2006 (RNC Gold Inc., 2005, p. 16, 44; Yamana Gold Inc., 2006, p. 81). In 2004, the Cerro Colorado copper deposit reverted back to Government control after Aur Resources Inc.'s option agreement for exploration on the property expired in March 2003. Aur was informed in February 2005 that the Government would be seeking to attract a different investor to explore and develop the property (Aur Resources Inc., 2005, p. 22; Mining Journal, 2005).

During 2004, Panama's mining law was under review. Additional FDI incentive laws provided, among other measures, tax exemptions for vehicles and other designated goods imported for use in, or to build infrastructure for, the mining sector. With respect to trade laws, the Government was still gradually phasing out tariff and other trade incentives that favored importation of raw materials for further processing in Panama (Mining Journal, 2003; U.S. Commercial Service, 2005, p. 46).

In 2004, crude petroleum accounted for only about 28% of total mineral fuel shipments through the Panama Canal (bidirectional). Most of this crude was being shipped in the direction of the Atlantic Ocean from the Pacific Ocean, and much of it originated in the North Slope in Alaska. Petroleum refinery products accounted for most of the mineral fuels transported from the Atlantic Ocean to the Pacific Ocean. Additional crude petroleum was transported across Panama via the Trans-Panama pipeline near the border with Costa Rica, but this oil mostly originated in Ecuador and was to be shipped to the Caribbean Sea. In 1982, the pipeline was designed for a larger capacity than it carried in 2004 because it was designed to aid many of the petroleum transportation vessels coming down

from the northern Pacific Ocean that were too large to pass through the canal in the 1980s, but alternative routes for these big shipments of petroleum had been discovered by 1996. In 2004, the President of Venezuela held talks with the Government of Panama about possibly transporting crude petroleum to China through the underutilized pipeline by reversing the flow in the direction of the Pacific Ocean from the Atlantic Ocean (Ellis, 2005; U.S. Energy Information Administration, 2005).

In 2004, petroleum products that were consumed in Panama were mostly imported from Ecuador, Mexico, Saudi Arabia, and Venezuela. During 2004, the Government was interested in attracting firms to explore for mineral fuel reserves both onshore and offshore. Harken Energy Corporation was eligible to conduct exploration and possible exploitation of mineral fuels in the Provinces of Bocas del Toro, Colon, and Panama, including the areas around Panama City and the Panama Canal, but was still negotiating terms of possible contracts to do so during the year. The company conducted its operations in the Central American region through its 85% ownership of Global Energy Development PLC, which permitted Harken to control rights to all the mineral fuel exploration concessions in Panama (Ellis, 2005; Harken Energy Corporation, 2005, p. 2, 13, 28).

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Outlook

In 2004, all the countries of Central America succeeded in attracting more investment in metallic mineral exploration and exploitation than in 2003. As a result of this increased investment, however, they will not see significant increases in contributions of the mineral industry toward their national GDPs until sometime in 2006, at the earliest. In 2004, much of the increased investment in the mineral industries of the region can be attributed to substantial increases in the annual average prices of most mineral commodities compared with those of 2003. Investment was also encouraged by recent reviews of the mining laws in Guatemala and Honduras, however, which were the two leading mineral producers in the region. In 2004, the GDPs per capita based on purchasing power parity for these two countries were below the average for the Central American region, and there remained a strong economic appeal to attracting even more FDI to their mineral industries.

The entire isthmus of Central America remained still largely unexplored using modern exploration methods for minerals. Countries in the region that have a higher standard of living, such as Costa Rica and Belize, do not possess sufficient economic incentives to allocate more labor or financing toward the extractive industries and away from environmental interests and the tourism sector. Higher labor costs in these two countries also meant that they could not offer lower cost project alternatives to foreign mining investors, as compared with those opportunities in nearby countries with similar mineral resources. Political uncertainty concerning implementation of mining laws and investment rights in all of these countries has deterred mining investment. Because of the widespread high prices of minerals in 2004, the countries of the region that are better able to minimize these uncertainties will come out ahead in developing a mineral industry for 2006 and beyond. In 2004, the countries in the region that appeared to be furthest along with such efforts to improve the mining investment environment were El Salvador, Guatemala, and Honduras. Substantial inertia remained in the capital-intensive mining sector, however, and most of the countries of Central America will not be in an advantageous position to significantly increase mine production of most metals and industrial minerals while prices remain high. Mine production of gold in Costa Rica, Guatemala, and

Nicaragua are the areas of the mineral industries of Central America that appear most likely to show significant increases by the end of 2006 (Ávila, 2005, p. 19-20; Mining Journal, 2005).

In 2004, ratification of CAFTA-DR was expected to increase FDI in the mineral industries of the region as well as increase trade opportunities. The United States was already the leading trading partner for all of the countries in the region, however, and mineral resource companies based in the United States and Canada already accounted for a majority of the FDI in the mineral industries of Central America. Increased enforcement of existing labor, investment, and mining laws was also expected in the countries that eventually ratify CAFTA-DR, although it is unclear to what extent. U.S. companies that invest in the mineral industries of this region will be expected to adopt policies that ameliorate transition costs and to invest in community development to directly support lower income groups and rural families, including potential miners or those inconvenienced in areas near proposed mining developments. Although the Governments in these countries have historically faced difficulties in adopting policies that reduce the tax burdens on foreign companies and attract FDI, especially to the mineral industry, improvements in economic growth related to a more-open U.S. market are expected to help offset any short-term losses of Government revenue through this type of restructuring. These countries may be able to realize a comparative advantage over the United States in the production of mineral commodities, but they will have to be open to the required investment.

Some portions of the mineral industries in these countries that were established through tariff protection (import substitution policies) are more likely to survive the multilateral tariff reductions of CAFTA-DR if they rely on mineral inputs in which the country has a resource-based comparative advantage over the United States (including transportation costs) or a large enough domestic market for the manufactured product (such as cement). It will be more difficult for some of the countries in this region to continue to manufacture products with imported mineral raw materials, if they do not have a comparative advantage over the United States for either the mineral inputs or the manufactured output. This type of risk for the continued manufacturing of such products as steel in some of these Central American countries has been discussed, and China's rapid growth had already applied competitive pressure on these latter types of manufacturing sectors in most Latin American countries by 2004 (Singh, 2005, p. 3, 14, 46).

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TABLE 1
CENTRAL AMERICA: PRODUCTION OF MINERAL COMMODITIES^{1,2}

(Metric tons unless otherwise specified)

Country and commodity	2000	2001	2002	2003 ^e	2004 ^e	
BELIZE						
Clays ³	thousand metric tons	622	557	487	413 ^{r,4}	571 ⁴
Dolomite		5,272	4,525	5,500	6,319 ^{r,4}	3,288 ⁴
Gold	grams	6,720 ^r	715 ^r	-- ^r	-- ^{r,4}	-- ⁴
Lime ^e		1,250	1,200	1,200	1,200	1,200
Limestone, including marl ⁵	thousand metric tons	728 ^r	1,140	358 ^r	881 ^{r,4}	571
Quartz sand (silica)	cubic meters	11,936	23,078	38,000 ^c	30,631 ⁴	27,763 ⁴
Sand, including silt and mud (offshore)	thousand cubic meters	80	264	95	82 ⁴	250 ⁴
Sand and gravel	do.	145 ^r	165	109 ^c	109 ^{r,4}	162 ⁴
COSTA RICA⁶						
Cement	thousand metric tons	1,050	1,200	1,200 ^c	1,600 ^r	1,900
Clays, common ^e		418,000	420,000	420,000	419,000	420,000
Diatomite		34,704	26,350	26,400 ^c	26,450 ⁴	26,500
Gold ^c	kilograms	50	100	100	110	500
Iron and steel, semimanufactures ^c		80,000	80,000	80,000	75,000	75,000
Lime ^e		9,800	9,000	9,900	9,900	9,900
Petroleum, refinery products ^{e,7}	thousand 42-gallon barrels	5,500	5,500	5,500	5,450	5,400
Pumice ^e		8,000	8,000	8,000	8,000	8,000
Salt, marine ^e		37,000	37,000	37,000	36,800	36,500
Silver ^e	kilograms	100 ⁴	100	100	110	110
Stone, sand and gravel: ^e						
Crushed rock and rough stone	thousand metric tons	201 ⁴	200	200	200	200
Limestone and calcareous materials	do.	905 ⁴	900	900	920	920
Sand and gravel	do.	1,650	1,500	1,500	1,550	1,550
Sandstone	do.	3,300	3,300	3,300	3,250	3,250
EL SALVADOR						
Aluminum, metal including alloys, semimanufactures ^c		2,650	2,650	2,650	2,600	2,600
Cement, hydraulic		1,064	1,174	1,318	1,390	1,256 ⁴
Fertilizer materials: ^e						
Phosphatic		13,600	13,600	13,600	13,600	13,600
Other mixed materials		56,500	56,500	56,500	56,000	56,000
Gypsum ^c		5,600	5,600	5,600	5,600	5,600
Limestone	thousand metric tons	1,400	1,425	1,631	1,194 ^{r,4}	1,161 ⁴
Petroleum, refinery products ^{e,7}	thousand 42-gallon barrels	6,300	6,300	6,300	6,300	6,300
Pozzolan	cubic meters	210,647	365,458	279,389	294,871 ⁴	222,826 ⁴
Salt, marine		32,444	31,610	31,552	31,366 ⁴	31,400
Steel, semimanufactures		40,506	38,502	48,832	56,900	57,000
GUATEMALA⁸						
Antimony ^e		--	--	--	20 ⁴	2,686 ⁴
Basalt	thousand cubic meters	--	243	318	936 ⁴	1,050 ⁴
Barite ^e		113	700 ⁴	100	100	70 ⁴
Cement, hydraulic	thousand metric tons	1,960	2,000	1,800 ^c	1,800 ^r	1,800
Clays:						
Bentonite		3,317	3,000 ^c	4,436	6,438 ⁴	81,688 ⁴
Ferruginous ^c		--	--	--	64,683 ⁴	54,293 ⁴
Kaolin		77 ^c	227	372	1,497 ⁴	-- ⁴
Unspecified		20,000 ^c	73,267	64,683	20,000 ^r	20,000
Feldspar		17,804	6,809	11,843	9,320 ⁴	4,473 ⁴
Gold ^c	kilograms	4,500 ⁴	4,500	4,500	4,550	2,000
Gypsum		212,109	96,817	80,571	66,981 ⁴	106,140 ⁴
Iron and steel:						
Iron ore, gross weight		16,254	15,000 ^c	35,226	2,276 ^{r,4}	2,823 ⁴
Steel, crude		166,453	201,802	216,108	226,000	226,000
Lead, metal including secondary		57 ^c	50	39	19 ⁴	47 ⁴
Lime, hydrated		--	182 ^c	547	386 ⁴	-- ⁴
Natural gas, gross ^c	thousand cubic meters	622 ⁴	630	650	670	620

See footnotes at end of table.

TABLE 1--Continued
CENTRAL AMERICA: PRODUCTION OF MINERAL COMMODITIES^{1,2}

(Metric tons unless otherwise specified)

Country and commodity	2000	2001	2002	2003 ^e	2004 ^e	
GUATEMALA--Continued						
Petroleum:						
Crude	thousand 42-gallon barrels	7,571	7,695 ^r	9,005 ^r	9,028 ⁴	7,384 ⁴
Refinery products ^{e,7}	do.	7,300	7,600	7,600	-- ^r	--
Pumice	cubic meters	261,947	264,322	377,403	273,933 ⁴	226,459 ⁴
Salt ^e		50,000	50,000	50,000	60,000	60,000
Stone, sand, and gravel:						
Dolomite		63	87 ^e	24,881	613 ⁴	63,082 ⁴
Limestone	thousand metric tons	4,532	2,775	3,040	3,773 ⁴	4,270 ⁴
Marble:						
Block	cubic meters	10,200	15,039	3,185	7,461 ^{r,4}	33 ⁴
Chips and pieces		111,211	11,448	99,293	29,181 ^{r,4}	74,862 ⁴
Sand and gravel ⁹	thousand cubic meters	1,700 ^e	684	1,066	296 ^{r,4}	90 ⁴
Silica sand	thousand metric tons	173	161	38	30 ⁴	-- ⁴
Stone, crushed ^e		19,000 ^r	19,000 ^r	19,000 ^r	166,851 ^{r,4}	19,678 ⁴
Talc ^e		--	--	568 ⁴	1,585 ^{r,4}	2,863 ⁴
HONDURAS¹⁰						
Building materials:^e						
Limestone		1,230,478 ⁴	1,230,000	1,230,000	1,230,000	1,230,000
Marble	square meters	95,000	95,000	95,000	90,000	90,000
Cadmium, Cd content of lead-zinc concentrates ^e		75	75	75	60	60
Cement	thousand metric tons	1,284	1,321	1,360 ^e	1,400	1,400
Gold	kilograms	878	4,574	4,984	5,000	7,500
Gypsum		59,211	59,500	60,000 ^e	60,000	60,000
Iron oxide pigments		69,969	70,941	71,000 ^e	71,000	71,000
Lead, mine output, Pb content		4,805	6,750	8,128	8,000	8,000
Pozzolan		186,948	189,999	190,000 ^e	190,000	190,000
Rhyolite		35,680	32,700	32,700 ^e	33,000	33,000
Salt ^e		25,000	25,000	25,000	26,000	26,000
Silver	kilograms	31,958	46,831	52,877	48,000	48,000
Zinc, mine output, Zn content		31,226	48,485	46,339	46,500	46,500
NICARAGUA¹¹						
Bentonite ^e		6,490 ⁴	6,000	6,000	6,300	6,300
Cement		530,000	513,793	549,403	590,000	590,000
Gold, mine output, Au content	kilograms	3,673	3,840	3,493	3,029 ⁴	3,000
Gypsum and anhydrite, crude		28,170	34,369	28,153	30,642 ⁴	30,000
Lime ^e		58,000	55,000	56,000	55,000	55,000
Limestone:						
For cement		702,000	621,000	787,000	789,000 ⁴	780,000
For other uses		4,540	8,900	3,310	1,600 ⁴	1,600
Petroleum, refinery products ^{e,7}	thousand 42-gallon barrels	5,650	5,650	5,650	5,700	5,700
Salt, marine		16,100	17,710	29,710	31,320 ⁴	31,000
Sand and gravel ⁶	thousand cubic meters	970 ^e	708	492	636	600
Silver, mine output, Ag content	kilograms	1,589	2,532	2,198	2,040 ⁴	2,000
Stone, crushed	thousand metric tons	4,689	5,639	5,859	5,400	5,400
PANAMA						
Cement ^e		950,000	820,000	770,000	770,000	770,000
Clays:						
For cement	cubic meters	165,557	64,246	64,000 ^e	64,000	64,000
For products ^e	do.	4,300	4,300	4,300	4,300	4,300
Lime ^e		3,500	3,500	3,500	3,500	3,500
Petroleum, refinery products ^{e,7}	thousand 42-gallon barrels	10,000	--	--	--	--
Salt, marine ^e		22,500	22,500	22,500	23,000	22,000

See footnotes at end of table.

TABLE 1--Continued
CENTRAL AMERICA: PRODUCTION OF MINERAL COMMODITIES^{1,2}

(Metric tons unless otherwise specified)

Country and commodity		2000	2001	2002	2003 ^e	2004 ^e
PANAMA--Continued						
Stone, sand and gravel:						
Limestone	thousand metric tons	939	469	270 ^e	270	270
Sand and gravel	thousand cubic meters	1,997	441	1,200 ^e	1,200	1,200

^eEstimated; estimated data are rounded to no more than three significant digits. ^fRevised. -- Zero.

¹Table includes data available through January 2006.

²In addition to the commodities listed, some additional construction materials (clays, gravel, miscellaneous rock, sand, and weathered tuff) were produced to meet domestic needs. Available information is inadequate to make reliable estimates of output levels.

³Some figures that were reported or estimated as a volumetric measure (cubic meters) were converted to a weight measure equivalent (metric tons) by multiplying by an average density of 2.40 for clay (common).

⁴Reported figure.

⁵Some figures that were reported or estimated as a volumetric measure (cubic meters) were converted to a weight measure equivalent (metric tons) by multiplying by an average density of 2.72 for limestone.

⁶The annual questionnaire sent out by the international minerals section of the Minerals Information Team at the U.S. Geological Survey (USGS) was last returned in 2001 for Costa Rica. Therefore, most of the data in this table for mineral production in this country is compiled from individual company reports and some secondary sources, or the subsequent data is estimated from the most recently reported (2000) figures.

⁷Includes liquefied petroleum gas, aviation and motor gasoline, diesel, kerosene, and distillate fuel oil.

⁸Production in 2004 of andesite, coal, ferruginous clay, flagstone, hematite, jade, magnesite, pyrolusite, sandstone, schist, other stone and stone dust, and volcanic sand was also reported by the Dirección General de Minería on the USGS international minerals questionnaire, but a sufficient time series was neither asked for nor provided such that this reported mineral production could be included in this table.

⁹Reported figures for production of lime as a separate commodity in Guatemala were not received prior to 2001.

¹⁰An official response to the USGS Minerals Questionnaire for Honduras was last received in December, 2003, with reported figures for 2001 and some estimated figures for 2002. Therefore, most of the data in this table for mineral production in this country is compiled from individual company and some secondary sources, or the subsequent data is estimated from the most recent officially reported figures.

¹¹In addition to the commodities listed, Nicaragua produced a variety of industrial minerals to meet domestic needs. Output of these materials was not reported, and available information is inadequate to make reliable estimates of output levels.