

## THE MINERAL INDUSTRY OF

# CUBA

By George A. Rabchevsky<sup>1</sup>

Mining has traditionally been Cuba's second most important industry, after sugar production. The first mining activity in Cuba dates back to 1512, when bitumen was used to caulk boats; this was followed by the discovery of gold, and then by copper in 1534 when the El Cobre Mine was opened, near Santiago. In the 1800's, deposits of barite, chromite, magnetite, manganese, lead, nickel, salt, and zinc were discovered. Cuba's nickel reserves are among the world's largest and consist mainly of lateritic deposits. Nickel is now Cuba's most important mineral used in trade. Production of industrial minerals included asbestos, cement, clays, fertilizers, gypsum, lime and limestone, marble, nitrogen, and sulfur. Although there has been minor petroleum production, Cuba imported petroleum from Latin American countries and Russia.

The Ministry of Basic Industry drafted a new Mining Act based on those of other Latin American countries, and the Act was approved in December 1993 by Cuba's National Assembly. The two basic points covered in that Act included the maintenance of national sovereignty over Cuba's mineral resources and 14 articles addressing environmental issues.<sup>2</sup> In a major shift in policy, the Cuban National Assembly also changed the 1976 constitution in 1993 to make private and foreign investment legal and to open the country to foreign trade. The law allowed foreign investment in selected state enterprises, permitted Cuban companies to export or import goods without Government permission, and recognized foreign ownership of property in joint-venture deals.

Because of extensive dust emissions, one of the most polluting processes in Cuba is the reduction-ammonia leaching process for nickel and cobalt recovery. All plants, except the Moa plant, are using the same process, in spite of the pollution problem. In a pilot plant at Punta Gorda, built in 1987, no measures were taken to eliminate these problems, while the Nicaro plant which opened in 1943, was still polluting the atmosphere. The hydrogen sulfide acid, used in the Moa plant to precipitate nickel-cobalt, is now disposed as untreated. The gas has also a high solubility in water and is highly corrosive.

Cuba continued to produce the same commodities as those of 1993, but outputs declined. The falling production was attributed to the lack of fuel; shortages of electrical energy, spare parts for machinery, chemical reagents; and lack of incentives and motivation. The disappearance and changing patterns of trade also caused disruptions in Cuban production. Most production in Cuba was destined for

export. The disappearance and changing patterns of trade have been in flux since 1991, causing disruptions in Cuban production following the breakup of the Soviet Union. Nickel continued to be the main commodities produced for trade. Production of nickel has declined steadily since 1989. (*See table 1.*)

In 1994, Canadian, European, and Latin American companies signed exploration and trade agreements with the Cuban Government. The United States has been the only major country maintaining a trade embargo since 1961.

The main exports in Cuba's minerals sector were chromite, nickel-cobalt ore, and nickel-based metallurgical products. Nickel was once Cuba's second largest export earner (after sugar); nickel has now slipped to third place behind tourism. Prior to the collapse of the Soviet economy, the former Soviet Union took all Cuban nickel exports through a countertrade arrangement. Cuba currently sells its nickel to Canadian and Western European refining companies. In 1994, Cuba exported nickel to 26 countries, including Austria, Canada, China, Finland, France, Germany, Ireland, Italy, Japan, Mexico, the Netherlands, Russia, Spain, the United Kingdom, Venezuela, and other Latin American countries. Canada was the major Cuban nickel importer. Most Cuban trade was based on hard currency instead of the barter process.

In 1994, Cuba became one of 27 Caribbean and Latin American countries to form the Association of Caribbean States (ACS), with a combined market of 200 million people and total gross national product of \$500 billion, thus taking the first step toward regional integration. The ACS reportedly will not be a trading bloc, but rather a forum for discussions of economic and security issues.<sup>3</sup>

Already hurt by the 33-year-old U.S. economic embargo, Cuba lost 85% of its foreign trade since the Soviet bloc collapsed. In 1994, The Russian-Cuban Economic Association (ROSCUBA) was officially registered in Cuba. The articles of agreement were signed by 25 Russian and 77 Cuban firms, including oil and nickel companies. It is not clear whether the agreement states how the Russian oil will be delivered to Cuba, either directly or through Venezuela. Russia now delivers oil to Venezuelan-owned refineries in Europe and Venezuela delivers similar amounts of oil to Cuba.<sup>4</sup>

At yearend 1994, an economic, scientific, and technical cooperation agreement was signed by Cuba with Jordan, leading to the establishment of joint ventures in both

countries. Reportedly, one of the clauses in the agreement included the importation by Jordan of Cuban sugar and the export of Jordanian phosphate and potash to Cuba.

In 1994, according to Government and published sources, Latin America became Cuba's main commercial partner. In 1990, trade with Latin America represented only 5% of Cuba's total trade, but since then has increased to 40%.

In early 1994, Geominera S.A., a Government agency overseeing the mineral industry in Cuba, announced that 28 of 37 blocks were made available for bids for mineral exploration. Ten Canadian companies and one Australian firm signed contracts for exploration, mostly for gold. Some are joint ventures with Cuban companies; others are risk ventures. Thirty contracts were signed involving a total of 14,600 square kilometers (km<sup>2</sup>) in various parts of the country. Foreign companies also were searching for chromium, copper, lead, manganese, silver, and zinc.

Geominera also entered into a joint venture with a Ghanaian petroleum company to extract and refine marine salt. Cuba discussed plans with several Latin American companies to mine kaolin, phosphate, salt, and other minerals.<sup>5</sup>

The mineral industry in Cuba continued to be centrally controlled by the Government in 1994. The government's Ministry—Ministerio de Industria Básica (MIB)—has managed all geological, mining, and petroleum operations since 1980. MIB was responsible for the exploration and production of all minerals, including natural gas and oil. Within the ministry, an organization known as Union de Empresas Geólogo-Mineras, was responsible for developing the country's mining sector, except for nickel.

In 1994, La Compania General de Niquel S.A. (CGN) replaced the agency Union Empresas del Níquel, and CGN continued to oversee nickel production in Cuba, under the jurisdiction of MIB. The exploration and production of industrial minerals was under the Ministerio de Industria Materia Construcción. All mining joint ventures came under the auspices of Geominera, which held a 50% interest in all mining concessions granted to foreign companies.

The National Registry for Foreign Trade Commission Agents, affiliated with the Chamber of Commerce of Cuba, continued to be in charge of registering all firms, including mining enterprises, interested in establishing offices in the country.

The State Committee for Economic Cooperation (SCEC) was responsible for the negotiation of all Cuban joint ventures, except those related to tourism. SCEC worked in conjunction with the Cuban Trade Ministry (CTM), the Banco Nacional, the Cuban Chamber of Commerce, and with various Cuban enterprises. CTM was assigned overall responsibility for resolving all questions regarding joint ventures in order to provide interested investors with rapid and definitive responses. The final approval for any joint ventures came from the Executive Council of Ministers, usually chaired by the President of Cuba. (*See table 2.*)

Cuba's reserves of cobalt were estimated to be the world's second largest, after Zaire, accounting for 26%, or 1,040,000 metric tons (mt), of total world reserves. The lateritic

deposits in the Moa Bay and Nicaro areas contain an average 0.1% cobalt. No metallic cobalt has been produced in Cuba on a commercial scale; rather, only chemical concentrates of sulfides were produced. Cobalt was a byproduct of nickel ore processing at the Moa Bay, Nicaro, and Punta Gorda plants. Reportedly, cobalt recovery plants were being built at Nicaro and Punta Gorda and were planned for the Las Camariocas facility.

Although copper mining in Cuba was important in the 19th century, it currently is reliant on copper imports. The small El Cobre copper mine, near Santiago de Cuba, is in the Sierra Maestra area in the eastern part of the island, and the Bucaro and Matahambre Mines are in Pinar del Rio Province, southwest of Havana. Reportedly, the Matahambre Mine produced about 2,000 mt of 30% copper concentrate in 1994. A gold-processing plant also was opened at the Matahambre Mine, with an initial annual capacity of 300 kilograms (kg), and employed 230 workers.<sup>6</sup>

One copper smelter, the Conrado Benítez Enterprise in San Jose, was under construction. The plant intends to operate two furnaces, with a capacity of 30,000 metric tons per year (mt/a) of copper. The equipment came from Italy and Britain.

In early 1994, a small gold mine, Castellanos, 125 km west of Havana, reportedly began producing gold. It planned to produce 300 kg of gold in 1994 using the low-cost heap-leaching method. According to several published sources, the gold content is 1.5 grams per metric ton (g/mt). The ore also contains lead and zinc. The Nieves deposit nearby was estimated to contain about 4 million metric tons (Mmt) of lead and zinc ore.<sup>7</sup>

Miramar Mining Corp. of Canada's subsidiary, Matlock Hierro S.A. (MH), entered into the joint-mining agreement with a Cuban government agency in 1993. The agreement granted MH the right to explore and develop the Mantua copper deposit for an initial 15-year period. The copper project is in Pinar del Rio Province, 285 km southwest of Havana. Proven and probable reserves total 4.8 Mmt grading 3.40% copper, according to Miramar. The feasibility study calls for an open pit development, producing 20,000 mt/a of copper at an 80% recovery rate. Reportedly, the Mantua deposit is one of the highest-grade leachable copper deposits known throughout the Western Hemisphere. Infrastructure already exists, power was being installed on site, and a sulfuric acid plant was built at Port Santa Lucia. The deposit was discovered in 1964 by Russian geologists during a uranium exploration program.<sup>8</sup>

MH also signed an agreement relating to the Delita gold project on the Isla de la Juventud (the Island of Youth). The island has a well-developed infrastructure and a paved road passes the mine site. The mine is less than 4 km from the coast. Delita is the largest known gold resource in Cuba, with about 53 mt of contained gold and 467 mt of silver. Proven and probable reserves totaled 6 Mmt grading 3.9 g/mt gold and 40 g/mt silver.<sup>9</sup> The deposit was discovered in 1910 and mined by a Canadian company in the 1950's. Operations were abandoned in 1958 when the Texas smelter closed and then resumed after the 1959 revolution. In the

1970's and 1980's, exploration resumed, delineating the deposit. Miramar has retained Davy International Ltd., of Toronto, to conduct a feasibility study by mid-1995.

Caribgold Resources, Ltd., of Toronto, was investigating the El Descanso, the La Melonera, and the Oropesa gold deposits in Villa Clara Province, on the Isla de la Juventud. Classified as small deposits, these reportedly contained a high concentration of gold, and conditions were favorable for mining.<sup>10</sup> Joutel Resources Ltd. reported exploring for gold in the Sierra Maestra concession in southeastern Cuba. Trenching and drilling occurred in the Barite Zone (La Zona Barita), also containing barite. The zone is 15 km west of Santiago de Cuba. Joutel also is exploring the La Vega concession, 50 km southwest of Santa Clara, and the El Jaguey gold prospect, 50 km southeast of Camaguey. Reportedly, Joutel allocated at least \$2 million for drilling in 1995. Teck Corp., of Vancouver, signed an agreement with Joutel giving Teck the right to earn 50% of Joutel's interest in three mineral properties in Cuba in return for \$718,000 in financing, accomplished through the purchase of Joutel shares and stock options.<sup>11</sup>

McDonald Mines Exploration Ltd., a Canadian company, signed a letter of intent with Cuba to mine gold in the Florencia-Jojoba concessions in Camaguey Province in east-central Cuba. McDonald plans to build a mining facility and start surface and underground mines.<sup>12</sup>

Iron ore is not mined in Cuba and pig iron is produced as a byproduct from treatment of the nickel-cobalt laterite ores.

The largest steel producer in Cuba was Antillana de Acero, in Cotorro, about 20 km south of Havana. The plant started operations in 1959, giving rise to the Cuban steel industry. The annual capacity of the plant was estimated in 1993 at 600,000 mt/a. Three sintering furnaces, four continuous billet casting machines, and an oxygen plant were operating. The plant also was equipped with two electric arc furnaces having a capacity of 70 tons each, and a third of the same capacity was being installed in 1994. The plant's 60-ton electric arc furnace, a sintering furnace, a continuous casting machine, and other equipment were supplied under a long-term agreement with Italian plantmaker Danieli & C Officine Meccaniche SpA. Six rolling mills facilitated the production of steel bars used for reinforcement in construction work.<sup>13</sup>

Acinox S.A., the second largest steel producer in Cuba, operated in Guines, 50 km south of Havana. The company was established in 1992. Acinox owns all steelworks in Cuba, including Antillana de Acero, Camaguey metallurgical plant, Las Tunas iron and steel works, and was building a refractory plant. Acinox traded with more than 40 countries, and exported carbon steel in bars, rods, and wire to Canada, Colombia, Costa Rica, Dominican Republic, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, Panama, and Venezuela. Offices also were opened in Italy, Russia, and Spain. The plant also produced billets, pipes, sheet metal, and other products.<sup>14</sup>

A steel semimanufacture plant was being operated at Camaguey, about 100 km northwest of Las Tunas. The plant complex included four factories producing annually more

than 50,000 mt of drawn wire, 20,000 mt of galvanized wire, 15,000 mt of barbed wire, 2,400 mt of welding electrodes, and other products.<sup>15</sup>

Cuba's nickel production fell for the sixth year, from 46,509 mt in 1989 to 26,000 mt in 1994, mainly because of maintenance problems and energy shortages. Cuba was the world's eighth largest producer of nickel. According to some sources, nickel exports from Cuba were forecast to total 15,000 mt in 1994, down from 17,000 mt in the previous year. In 1993, exports were artificially inflated by the rundown of stocks accumulated in the late 1980's. Cuba possessed the largest reserves of nickel in the world, accounting for 38% of all the world's known nickel ore reserves. Cuba's nickel ore reserves are on the island's northeast coast near the town of Moa. The Mining Journal reported estimated reserves amounting to 1 billion mt of lateritic nickel ore averaging 0.8% to 1.5% metal content, 80 Mmt of cobalt, 40 Mmt of manganese, and 18 Mmt of chromite.<sup>16</sup>

Corporation General de Niquel (CGN) owned 50% of the Moa Bay assets in 1994 (with Sherritt owning the remainder) and 100% of Punta Gorda, Nicaro, and Las Camariocas plants. CGN was granted more autonomy over its affairs, including an agreement that the company could keep 50% of the profits. This permitted CGN to attract foreign investment for much needed maintenance and upgrading of its operations. CGN operated three plants—Moa Bay, Nicaro, and Punta Gorda—in the Holguín Province of eastern Cuba, employing, in all, about 15,000 workers. These plants made a profit despite the present low nickel price; the Moa plant was the most profitable because of its low-fuel input and higher cobalt content. It was built by the former Freeport Nickel Co. in 1959 and financed, in part, by the U.S. Government. The Nicaro and Punta Gorda plants were based on the ammonium carbonate leaching process, and the Moa plant used sulfuric acid to leach limonitic ore. The sulfuric acid plant began operating again in Pinar del Rio Province, after 11 years of repairs. The acid was being delivered primarily to the Moa plant. Construction of a fourth nickel plant in Las Camariocas, based on the ammonia leaching process, is currently underway. That plant is near Moa, about 10 km from the Punta Gorda refinery. Production capacity was expected to be 30,000 mt/a, in addition to an unspecified amount of cobalt.

The refinery at Moa produced about 13,000 mt of nickel and cobalt sulfides. Reportedly, modernization at the plant is expected to expand production to about 24,000 mt/a of mixed nickel and cobalt sulfide by 1997. In 1993, the Moa plant exported about 12,100 mt of nickel in intermediate products to the Canadian nickel refiner Sherritt Inc., or 85% of Moa's total production, and 3,000 mt to Yuzhural Nickel Complex at Orsk in Russia's Ural Mountains. In 1994, less than 1,000 mt of nickel was shipped to the Orsk refinery and the rest to Sherritt's Fort Saskatchewan, Alba., refinery plant in Canada.

La Compania General de Niquel S.A. (General Nickel S.A.), the owner of the Moa plant, and Sherritt jointly

announced in December 1994 the signing of a contract to establish a jointly owned enterprise to mine, refine, and market nickel and cobalt worldwide. The 50-50 joint venture would upgrade and expand the Moa mine and the concentrator complex facility. The new enterprise was expected to have a total work force of about 2,000, 85% of whom will be based in Cuba and the rest in Fort Saskatchewan. Cuba's contribution to the joint venture centered on the form of mineral concessions, including more than 60 Mmt of nickeliferous limonite, 80% of which are proven reserves. These concessions were determined to be sufficient to ensure 25 years of operation at the Moa plant. Additional concessions would exceed 15,000 hectares for an additional 25-year life. The agreement was the culmination of a 4-year attempt to secure a long-term feed source for Sherritt's Fort Saskatchewan nickel refinery, which already refines Cuban nickel and cobalt under an existing agreement between the two countries. The joint venture includes Moa Nickel S.A., Cobalt Refinery Company, Inc., of Fort Saskatchewan, and International Cobalt Company, Inc.<sup>17</sup>

The Punta Gorda and Nicaro plants produced about 14,000 mt of nickel oxide sinter in 1994, or 4,000 and 10,000 mt, respectively, from those plants, representing less than one-half of their outputs of a decade ago. Most of the sinter, containing about 75% nickel, was sold to Sherritt, where it was then processed into brick form and sold to stainless steel producers for alloying. Davy International was to upgrade the Punta Gorda's smelter. Improvements had begun to reduce dust emissions and increase energy efficiency in the furnaces.<sup>18</sup>

In March 1994, Cuba reportedly received an approximately \$20-million credit from a Dutch bank to modernize its nickel industry. Repayment was expected through improved nickel production. The Punta Gorda plant sustained an earthquake in 1992 and was scheduled to be repaired to boost its production to 30,000 mt/a. The other three plants, not affected by the earthquake, also will be modernized.

Western Mining Corp. of Australia reached an agreement in principle in September 1994 with the Cuban Commercial Caribbean Nickel Co. to assess and develop the Pinares de Mayari West nickel deposit, 200 km west of Moa. The Australian participation was to be 65% and the Cuban share, 35%. Reportedly, the laterite nickel deposit was estimated to contain more than 200 Mmt of ore grading at greater than 1% contained nickel and 0.1% contained cobalt. The agreement also included plans to build a refinery in Cuba.<sup>19</sup>

The Taiwanese steelmaker, Taiwan Nickel Refining Corp., a subsidiary of Inco Ltd. (Canada), reportedly was considering importing nickel from Cuba to use in its stainless steel plants.<sup>20</sup>

Cuba produced a small variety of industrial minerals, such as bentonite, gypsum, limestone, salt, and sand and gravel. Kyanite was quarried on the Isla de la Juventud to support a small ceramics factory; the wares were targeted for the tourist trade.

The Ministry of Construction Materials operated six cement plants, with a capacity exceeding 3.5 Mmt/a. The

largest plant was in Mariel, accounting for about 30% of total production. The largest Mexican cement company, Cementos Mexicanos S.A., began managing the Mariel cement plant. The Ministry planned to export 1 Mmt in 1994 to generate hard currency. Cement plants were occasionally shut down because of shortages of fuel oil, electricity, and spare parts. The cement plants were being adapted so that they could remain open by using Cuban-produced heavy crude oil.

Cimtech S.A. was responsible for most of the industrial minerals produced in Cuba. Cimtech produced micronized calcium carbonate for use as a filler and extender in the paper, paint, plastics, and rubber markets. The CoCo Peredo calcium carbonate mine, east of Havana, has been in operation for 20 years, with production of 70,000-to-120,000 mt/a of calcium carbonate crushed to 16 centimeters and about 5,000-to-6,000 mt/a ground to 40 microns for the domestic market. Reportedly, reserves of the mine were 20 Mmt of high purity (99.9%) calcium carbonate. Separately, a Canadian company, Robex Resources Ltd. (RR), acquired a 50% interest in Coco Peredo in 1994. RR planned to construct a micronization plant with an initial capacity of 200,000 mt/a of calcium carbide. RR's feasibility study was expected to be finished by early 1995, according to various news reports.

In addition to the Isla de la Juventud, marble deposits occur in four other provinces on the main island. Among the latest discoveries were deposits in La Guanábana on the Isla de la Juventud. Eleven quarries were producing a variety of different-colored marble. The quarries on the island, such as in Mariel and in Bayamo, are equipped with modern technology. Production statistics and capacities of the marble quarries vary from 47,000 mt to 1 Mmt per year, respectively. Marble was exported to Colombia, Europe (primarily to Italy), and to Mexico.<sup>21</sup>

In 1994, Cuba reported that it identified at least 25 zeolite deposits and surveyed 12 of them, but only 4 were in production. Cuba operated four zeolite plants, with a capacity of 150,000 mt each. The plants, close to the deposits, were in Jaruco, Havana Province; Najasa, Camaguey Province; San Andres, Holguin Province; and Tasajera, Villa Clara Province. Potential reserves of zeolite were 300 Mmt. Cuban zeolite was exported to Brazil, Colombia, Ecuador, France, Italy, Mexico, and Spain. In 1994, a contract was signed with Colombia to supply the latter with 4,000 mt used in animal feed; plans were to ship an additional 6,000 mt in 1995.<sup>22</sup>

In June 1994, Cuba reported its first offshore oil discovery in Block X of Cardenas Bay in about 6 meters of water, according to published sources. The new deposit, between the city of Cardenas and Varadero beach, was on the site of the first attempt at oil drilling in Cuba during the 19th century. Canadian Northwest Energy, a subsidiary of Sherritt Inc., and Fortuna Petroleum Inc., a subsidiary of Talisman Energy Ltd. of Alberta, Canada, began drilling in December 1993 and discovered the deposit in May 1994. The oil was classified as heavy fuel, but of higher quality (with less

sulfur) than the petroleum extracted at Varadero. About \$120 million was invested in Cuba for exploration in 1994. Drilling had been suspended until early 1995, pending further evaluations of reservoir size and oil quality. Sherritt also had an interest in two other exploration blocks: Block IX, south of the Bay of Cardenas, and Block XXIII in south central Cuba. Reportedly, Talisman sold its interests in Cuba for \$15 million at the end of 1994 to Sherritt. Talisman entered Cuba through its subsidiary Fortuna in December 1992 as a nonoperating partner in three exploration blocks, with working interests ranging from 15% to 40%.<sup>23</sup>

Oil and gas exploration in Cuba dates back to 1881 when the first field was discovered. Since then, 25 oil and gas fields have been found. Most discoveries have been east of Havana, in carbonate deposits. Cuba currently is continuing its oil exploration program north of Matanzas Province and south of Camaguey Province.

Cuba produced about 8.5 million barrels (Mbbbl) of oil in 1994, principally from the Boca de Jaruco, Pina, and Varadero fields, the latter being the largest producer. The Cuban oilfields supplied about 30% of the fuel oil for the country's power stations. The Cuban oil typically has been thick, with a high sulfur content, yet highly inflammable, and has been difficult to refine. Oil imports in 1993 totaled about 35 Mbbbl, or one-half of the island's needs. In 1994, oil imports decreased even further; reportedly, 11 Mbbbl were imported from Russia and 7 Mbbbl were sold to Cuba via the world market.<sup>24</sup>

In 1993-94, a total of 33 blocks (23 onshore and 10 offshore) were offered during the first international bidding. Eleven companies from Canada, France, Sweden, and the United Kingdom were exploring for oil in Cuba. Sixteen risk contracts were signed by Cubapetroleo S.A. (Cupet) with CNE and TE, in addition to British Borneo Ltd., Consolidated Oil Fields Ltd., and Premier Ltd., all of the United Kingdom. This was the first bidding involving foreign companies since the revolution in 1959.<sup>25</sup>

Cuba's plans called for foreign oil companies to extract more oil from the existing Cuban wells and to explore for new deposits. France's Total Co. continued exploration for oil north of the Cárdenas Bay in western Cuba, claiming that the deposit could yield up to 330 Mbbbl/a. Another French company, Geopetrol Co., was searching for oil with Cupet, west of Havana. Geopetrol also was working on improving production at wells in the Yumuri Valley, Puerto Escondido oilfields in northern Matanzas Province, and at Martin Mesa. Gas also was extracted from Martin Mesa, supplying the glass factory in La Lisa, on the outskirts of Havana. Sweden's Taurus Petroleum AB has held a production-sharing contract since 1992, covering three blocks off southern Cuba, in the Golfo de Ana Maria (Blocks VI and VII) and Golfo de Guacanayabo (Block V). Oil slicks and gas bubbling to the surface of the sea were reported, but so far no well has reached the oil reservoir. Taurus planned to drill during 1995 a wildcat well to test the first of the more than two dozen Eocene reefs or banks mapped by seismic crews.

Cuba operated four oil refineries, including Cabaiguan, Cienfuegos, Havana, and Santiago de Cuba, with a combined capacity of more than 220,000 barrels per day (bbl/d). Early in 1994, a letter of intent was signed with a group of Mexican companies to use the Cienfuegos oil refinery, 180 km southeast of Havana. Negotiations also were underway regarding investment of \$200 million by the MEX-PETROL company, a subsidiary of a Mexican State Petroleum Company. Mexico also was to provide Cuba crude oil at current market prices. Mexico was selling Cubans about \$92 million per year of lubricants and other derivatives.<sup>26</sup> The United States' Texaco Inc. prepared detailed plans to enter the market, once the embargo is lifted. Texaco's refinery and gas stations were nationalized in Cuba following the revolution.<sup>27</sup>

Cuba had about 14,400 km of paved roads. The country had less than 15,000 km of railroad tracks, used primarily by the sugar industry. Installed electrical capacity in Cuba was 3,900 megawatts. About 40% of the island's electricity was generated using crude oil as fuel. Reportedly, some plants were operating at about 25% of rated capacity because of fuel shortages.

Cuba has 16 ports, including the Nueva Gerona port on the Isla de la Juventud. Nickel was shipped from the Ports of Moa and Nicaro. At least 8 ports handle cement, fertilizers, and sulfur, and 13 ports handled crude oil, petroleum products, and sulfuric acid. Cuba has a supertanker facility in the Matanzas Bay. Imported crude oil was offloaded in Matanzas, then transported to other cities in smaller coastal tankers. A 187-km oil pipeline also transported oil from the port to the Cienfuegos refinery.

Three oil refineries operated in Cuba. In late 1994, Mexico reportedly signed a joint agreement with the Government to renovate the refinery at Cienfuegos. A group of Mexican state and private companies were granted a 49% interest in the refinery. That agreement also included helping Cuba with its cement production and signing of a document on scientific and technical cooperation.<sup>28</sup>

Political and economic conditions are changing in Cuba. Foreign companies, primarily Canada, started investing in metal, mineral, and oil joint ventures. Nickel mines and oil refineries are now being renovated to accommodate the newly found oil deposit in the Cienfuegos Bay. Considering all of that, Cuba apparently is recovering from its economic and political shock. However, in the near term, Cuba still lacks the basics for everyday life. The infrastructure to meet its growing market needs to be overhauled. In the future, conditions may change for the better if tourism and trade infuses capital to the Cuban economy; nickel-cobalt ore production improves; and crude oil production increases. Then Cuba could become one of the top nickel-producing countries in the world, thus being able to trade with any country.

<sup>1</sup>Text prepared Mar. 9, 1995.

<sup>2</sup>Granma International (Havana): Jan. 18, 1995, p. 7.

<sup>3</sup>U.S./Latin Trade (Miami): Sept. 1994, p. 16. Journal of Commerce (New

York), Dec. 12, 1994, p. 6B.

<sup>4</sup>Granma International (Havana): Oct. 5, 1994, p. 6. Latin American Economy & Business (London): Dec. 1994, p. 10).

<sup>5</sup>\_\_\_\_\_. July 6, 1994, p. 7.

<sup>6</sup>Latin American Mining Letter (London): June 30, 30, 1994, p. 8.

<sup>7</sup>Latin American Economy & Business (London): May 1994, p. 27. Granma International (Havana): Mar. 30, 1994, p. 4.

<sup>8</sup>Miramar Mining Corp. (Vancouver): 1993 Annual Report.

<sup>9</sup>Latin American Mining Letter (London): July 15, 1994, p. 5.

<sup>10</sup>Granma International (Havana): July 6, 1994, p. 7.

Latin American Economy & Business (London): May 5, 1994, p. 27. The Northern Miner (Toronto): June 20, 1994, p. 3.

<sup>11</sup>Latin American Mining Letter (London): Aug. 15, 1994, p. 4; Sept. 30 1994, p. 2. The Northern Miner (Toronto): June 27, 1994, p. 16; July 25, 1994, p. 1; Oct. 3, 1994, p. 1. Wall Street Journal (New York): June 21, 1994, p. 4.

<sup>12</sup>Wall Street Journal (New York): June 21, 1994, p. 4.

<sup>13</sup>Granma International (Havana): June 15, 1994, p. 6.

<sup>14</sup>Work cited in footnote 13; Sept. 21, 1994, p. 6.

<sup>15</sup>Work cited in footnote 13.

<sup>16</sup>Mining Journal (London): May 1, 1992, p. 315.

<sup>17</sup>American Metal Market (New York): Nov. 7, 1994, p. 2; Dec. 5, 1994, p. 1; Dec. 6, 1994, p. 1. Granma International (Havana): July 6, 1994, p. 13; Dec. 21, 1994, p. 13. Latin American Mining Letter (London): Nov. 8, 1994, p. 5. The Northern Miner (Toronto): July 4, 1994, p. 1; Dec. 12, 1994, p. 10. Sherritt Inc. (Fort Saskatchewan, Alberta): News Release, June 24, 1994; 1994 Annual Report.

<sup>18</sup>Granma International (Havana): Dec. 21, 1994, p. 13. Journal of Commerce (New York): Jan. 23, 1995, p. 10A.

<sup>19</sup>American Metal Market (New York): Oct. 10, 1994, p. 5. Financial Times (London): Sept. 22, 1994, p. 24; Jan. 5, 1995, p. 23.

<sup>20</sup>Journal of Commerce (New York): Aug. 23, 1994, p. 6B.

<sup>21</sup>Granma International (Havana): Oct. 27, 1993, p. 12.

<sup>22</sup>\_\_\_\_\_. Dec. 21, 1994, p. 13.

<sup>23</sup>\_\_\_\_\_. June 22, 1994, p. 6; Nov. 23, 1994, p. 6; Jan. 4, 1995, p. 7. Oil & Gas Journal (Tulsa, Oklahoma): June 13, 1994, p. 40; Jan. 9, 1995, p. 20. Sherritt Inc. (Fort Saskatchewan, Alberta): 1993 Annual Report; 1994 First, Second, and Third Quarterly Reports.

<sup>24</sup>Journal of Commerce (New York): Nov. 3, 1994, p. 4B. Oil & Gas Journal (Tulsa, Oklahoma): Nov. 1, 1994, p. 42. Petroleum Economist (London): May 1994, p. 60.

<sup>25</sup>Granma International (Havana): June 22, 1994, p. 6; Nov. 23, 1994, p. 6. U.S./Latin Trade (Miami): Nov. 1994, p. 22.

<sup>26</sup>Journal of Commerce (New York): Sept. 20, 1994, p. 6B.

<sup>27</sup>Business Week (New York): Sept. 19, 1994, p. 33.

<sup>28</sup>Granma International (Havana): Oct. 5, 1994, p. 7; Oct. 12, 1994, p. 6. Oil & Gas Journal Newsletter (Tulsa, Oklahoma): Sept. 26, 1994. Petroleum Economist (London): Oct. 1994, p. 53.

## Major Sources of Information

Chamber of Commerce of Cuba

Calle 21, No. 661

Havana, Cuba

Telex: 51-1752

Ministerio de Industria Básica

Salvador Allende No. 666

Entre Soledad y Oquendo

Havana, Cuba

Phone: (537) 76979; Telex: (537) 0511183

Unión de Empresas del Níquel

Moa Holguín, Cuba

Phone: 67652; Telex: 21322 EUNI-CU

## Major Publications

Anuario Estadístico de Cuba, Estatal de Estadísticas, Havana  
Cuba, annual.

Center For Cuban Studies, 124 West 23d St., New York, New  
York 10011, Phone: (212) 242-0559. Newsletter, quarterly  
reports; Cuba Update, special reports.

Granma International, Havana, Cuba, daily newspaper.

Granma Weekly Review, Havana, Cuba.

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

(Metric tons unless otherwise specified)

Commodity 3/		1990	1991	1992	1993	1994 e/
Cement, hydraulic	thousand tons	3,000	2,000	2,000	1,000 r/	1,000
Chromite	do.	50	50	50	50	50
Cobalt 4/		1,600	1,600	1,500	1,500	1,000
Copper, mine output, Cu content		2,000 r/	2,000 r/	1,500 r/	1,500	1,400
Gas, natural:						
Gross	thousand cubic meters	34,000	34,000	36,000	36,000	37,000
Marketed	do.	4,000	4,000	4,000	4,000	4,000
Gypsum	thousand tons	130	130	125	125	125
Iron and steel: Steel, crude	do.	255 r/	180 r/	134 r/	90 r/	80
Lime	do.	180	180	160	180	170
Nickel:						
Mine output, Ni-Co content of oxide and sulfide		40,800 r/	33,400 r/	32,200 r/	30,200 r/ 5/	26,000
Metallurgical products, Ni content: 3/						
Granular oxide, oxide sinter, and powder		19,700 r/	14,600 r/	15,300 r/	14,000 r/	14,000
Sulfide		19,700 r/	14,600 r/	15,300 r/	14,000 r/	14,000
Total		39,400 r/	29,200 r/	30,600 r/	28,000 r/	28,000
Nitrogen: N content of anhydrous ammonia	thousand tons	140	140	135	135	130
Petroleum:						
Crude 5/	thousand 42-gallon barrels	4,980 5/	5,150 5/	5,870 r/ 5/	7,320 r/	9,320
Refinery products	do.	53,000	53,000	55,000	55,000	55,500
Salt	thousand tons	200	200	185	185	175
Silica (industrial sand and gravel)	do.	500	500	450	400	300
Sulfur, byproduct of petroleum	do.	5	4	5	5	4

e/ Estimated. r/ Revised.

1/ Table includes data available through Feb. 1995.

2/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines to three significant digits.

3/ In addition to commodities listed, crude construction materials ( marble, sand and gravel, stone, etc.) may also be produced, but data on such production are not available, and information is inadequate to make reliable estimates of output levels.

4/ Anuario Estadístico de Cuba provides figures of nickel-cobalt content of granular and powder oxide, oxide sinter, and sulfide production. Using an average cobalt content in these products of 0.9% in total granular and powder oxide, 1.1% in total oxide sinter, and 4.5% in total sulfide, the cobalt content of reported Ni-Co production was determined to be 1.16% of granular and powder oxide, 1.21% of oxide sinter, and 7.56% of sulfide. The remainder of reported figures would represent the nickel content.

5/ Reported figure.

TABLE 2  
CUBA: STRUCTURE OF THE MINERAL INDUSTRY FOR 1994

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Cement	Empresa del Cemento (Government, 100%)	Mariel, Pinar del Río Province Cienfuegos Province	3,500
Chromite	Ministerio de Industria (Government, 100%)	Mercedita Mine and plant, Holguín Province	60
Copper	Empresa Minera de Occidente (Government, 100%)	Mantua, Matahambre, and Jucrad Mines, Pinar del Río Province Mina Grande, Santiago de Cuba Province	3
Nickel	Empresa Niquelífera Comandante Ernesto Che Guevara (Government, 100%)	Punta Gorda, Holguín Province	30
Do.	Empresa Niquelífera Comandante Pedro Soto Alba (Government, 100%)	Moa, Holguín Province	24
Do.	Empresa Niquelífera Comandante Rene Ramos Latour (Government, 100%)	Nicaró, Holguín Province	30
Petroleum:			
Crude	42-gallon barrels per year Empresa de Perforación y Extracción de Petróleo (Government, 100%)	Northern coast area between Havana and Cárdenas	12,000
Refinery products	do. Instituto Cubano del Petróleo (Government, 100%)	Refineries at Cienfuegos, Havana, and Santiago de Cuba	160,000
Steel	Antillana de Acero (Acinox, 100%)	Cotorro, Havana Province	600
Do.	Acinox (Government, 100%)	Las Tunas, Las Tunas Province	150