

# THE MINERAL INDUSTRIES OF FRENCH GUIANA, GUYANA, AND SURINAME

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## FRENCH GUIANA

French Guiana (Guyane), which is located on the northern coast of South America, is bordered by Brazil to the south and southeast, Suriname to the west, and the Atlantic Ocean to the north. French Guiana has a total area of 91,000 square kilometers (km<sup>2</sup>) and had an estimated population of 191,300 as of 2004 (U.S. Central Intelligence Agency, 2004<sup>§1</sup>). French Guiana has been an overseas Department of France since 1946, and its economy was closely tied to that of France through imports and subsidies. The mineral sector was administered according to French law. Such goods as chemicals, food, fuels, machinery, and transport equipment were imported from France. Major exports from French Guiana included fish and shrimp, gold, and timber (U.S. Central Intelligence Agency, 2005<sup>§</sup>).

French Guiana's most recent gross domestic product (GDP) estimate based on purchasing power parity was \$1.55 billion in 2003 (U.S. Central Intelligence Agency, 2005<sup>§</sup>). The leading economic developments in the country were the aerospace activity at the French space center in Kourou, fishing, and forestry. French Guiana's main mineral industries included cement, clays, columbite and tantalite, sand, and crushed stone. In 2004, the mining sector was affected by a 22% decrease in gold production (table 1); gold has been mined since 1853 (U.S. Central Intelligence Agency, 2005<sup>§</sup>).

In recent years, the mineral industry has been focused on gold and petroleum exploration. Gold exploration was conducted by Cambior Inc. of Canada and Guyanor Ressources S.A. of France. Guyanor was a French precious-metals exploration company whose majority shareholder was Golden Star Resources Ltd., with a 52.8% interest. The company held interests in the Bon Espoir, the Dorlin, the Paul Isnard, and the Yaou gold properties, which are located mostly to the west of French Guiana's capital of Cayenne. Cambior was a gold producer that focused mainly on project development and exploration activities in Canada, French Guiana, Guyana, Peru, and Suriname. During 2004, the French Government granted a mining concession for Cambior's Camp Caiman property. Hardman Resources Ltd. of Australia was the principal petroleum exploration company in French Guiana during 2004.

During 2004, Guyanor and its subsidiary Société de Travaux Publics et de Mines Aurifères en Guyane S.A.R.L. (SOTRAPMAG) went through a major reorganization in which the Guyanor restructuring agreement was negotiated with major shareholder Golden Star. The purpose of the agreement was to restructure Guyanor's and SOTRAPMAG's debts of \$17.4 million owed to Golden Star and for Golden Star to acquire

interest in Guyanor and its subsidiary's assets. For repayment purposes, Guyanor settled with Golden Star on a series of agreements, which included a loan amendment agreement, a data acquisition agreement, and three transactions related to Guyanor's Paul Isnard property—an option agreement (together with SOTRAPMAG), a joint-venture agreement, and a purchase option. Under the loan amendment agreement, Golden Star will limit the debt owed by Guyanor and its subsidiary to \$16 million; any excess over that amount will be forgiven. The data acquisition agreement consisted of the sale of Guyanor's Guiana Shield geologic and exploration database to Golden Star for a total of \$6 million. The \$6 million purchase price owed by Golden Star will be applied to Guyanor's original \$16 million debt and reduce Guyanor's remaining balance to \$10 million. Repayments to Golden Star will depend upon Guyanor's achieving better financial conditions, and no interest will accrue (Guyanor Ressources S.A., 2005, p. 3, 6, 9; American Stock Exchange, 2004b<sup>§</sup>).

During 2004, the Paul Isnard property, which is located in northwestern French Guiana approximately 200 km west of Cayenne, was under care and maintenance. The inferred mineral resources of this property was estimated to be 8.2 million metric tons (Mt) at a grade of 1.78 grams per metric ton (g/t) gold based on analysis of the Gold Mountain deposit located at the southern boundary of Paul Isnard. The Paul Isnard property was a key element in the three-phased repayment transaction to Golden Star agreed to in the Guyanor restructuring agreement. The option agreement provided an opportunity for Golden Star to acquire 100% interest in the 433-km<sup>2</sup> Paul Isnard property. The property also included an exclusive exploration permit (held by Guyanor) and eight mineral concessions (owned by SOTRAPMAG). The option agreement required three annual payments of \$500,000 each in 2004, 2005 and 2006 from Golden Star and an investment of \$2 million in the Paul Isnard property. Fulfilling the terms of the option agreement will allow Golden Star to earn 50% interest in the property. Golden Star may increase its total interest to 70% by completing a feasibility study and submitting an additional \$3.5 million payment, all within 3 years from the signing date of the option agreement (Guyanor Ressources S.A., 2005, p. 6, 9; American Stock Exchange, 2004b<sup>§</sup>; Golden Star Resources Ltd., 2005<sup>§</sup>).

Provided that all the conditions to earn the 70% interest in the Paul Isnard property are met within the stated timeframe, Golden Star will enter into a joint-venture agreement. The purchase option offers Golden Star the opportunity to acquire the remaining 30% of the property, with the condition that it must start production within 5 years from the signing date of the option agreement. Guyanor and SOTRAPMAG will sell their interest in the Paul Isnard property to Golden Star for \$5 million; in addition, the sellers will require a net smelter return

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

royalty on a maximum of two million ounces of gold production (Guyanor Ressources S.A., 2005, p. 9; American Stock Exchange, 2004b§).

Golden Star planned to invest approximately \$150,000 in the Paul Isnard property in 2005, focusing mainly on the revision of historical studies in the area and the development of new areas suitable for future exploration (Guyanor Ressources S.A., 2005, p. 6).

Other provisions of the Guyanor restructuring agreement included the sale of Guyanor's 50% interest in the Dorlin and the Yaou properties to the private company Auplata S.A. in exchange for a 0.5% gold production royalty. Under equal terms, Golden Star also sold its 50% ownership interest to Auplata S.A.; both transactions were completed on June 30, 2004 (Golden Star Resources Ltd., 2004; Guyanor Ressources S.A., 2005, p. 9; American Stock Exchange, 2004a§).

In December 2003, Golden Star acquired a 100% interest in the 466-km<sup>2</sup> Bon Espoir property, which is located north of the Paul Isnard property approximately 320 km west-southwest of Cayenne. No activity was reported during 2004. Soil geochemistry analysis was planned for 2005 in a 5-kilometer (km) by 40-km area within the Armina and the Orapu Formations (Golden Star Resources Ltd., 2005§).

In December 2004, the French Government granted Cambior a 30-km<sup>2</sup> mining concession for the Camp Caiman project; the concession will be valid for 25 years. The gold project, which is located 45 km southeast of Cayenne, was acquired by Cambior in late 2003 as a result of a merger transaction with Ariane Gold Corp. This project had an estimated 1.2 million troy ounces [37 metric tons (t)] of gold. The Camp Caiman project budgeted \$7.0 million for a 24,100-meter (m) drilling program and the completion of an environmental impact study and a feasibility study. The completion of these studies will allow the company to start applying for the necessary operating permits. Cambior expected to start commercial production by 2007 if the feasibility study is approved by Cambior's Board of Directors and all required authorizations have been obtained from the French Government (Cambior Inc., 2005a§, b§).

Hardman Resources Ltd. was the 97.5% interest holder of an exclusive exploration license (EEL) offshore French Guiana. The EEL extended 12 miles along the coast of French Guiana (from border to border with neighboring countries Suriname and Brazil) to the 3,000-m water-depth contour and covered a total area of approximately 65,000 km<sup>2</sup>. During 2004, analyses of 7,700 km of two-dimensional (2D) seismic data collected in 2002 and 2003 were completed. The results of the analyses revealed the possible presence of hydrocarbons in the Matamata Prospect, which is located in the northwest portion of the EEL area. Hardman planned to start a second round of 2D and three-dimensional (3D) seismic data acquisition in 2005; preliminary results will determine the possibility of starting the drilling phase by 2006 (Hardman Resources Ltd., 2004; 2005§).

## Outlook

During 2005, gold exploration and investment activities in French Guiana will likely continue as projects begun in 2004 progress. Golden Star plans for 2005 include the investment

of approximately \$150,000 in the Paul Isnard property for development and exploration purposes and geochemistry analysis in the Bon Espoir gold property. Cambior will invest \$7.0 million in the Camp Caiman project for a drilling program and for the completion of an environmental impact study and a feasibility study. In the minerals fuels sector, the petroleum exploration company Hardman will perform a second round of 2D and 3D seismic data acquisition in 2005.

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## GUYANA

Guyana is the fourth smallest country in South America after French Guiana, Suriname, and Uruguay. It is located in northern South America and is bordered by the Atlantic Ocean to the north, Brazil to the south, Suriname to the east, and Venezuela to the west. Guyana has a total area of 214,970 km<sup>2</sup> and had an estimated population of 772,100 in 2004. Guyana was a British possession from 1815 to 1966 when independence was granted (U.S. Central Intelligence Agency, 2005§; World Bank Group, 2005§).

During 2004, Guyana took actions related to their border disputes with neighboring country Suriname. In February 2004, Guyana took its maritime boundary dispute with Suriname to the United Nations International Tribunal for the Law of the Sea in Hamburg, Germany, to accelerate a resolution that could

benefit both countries. The Government of Guyana submitted a Statement of Claim to the Government of Suriname outlining its case under the United Nations Convention of the Law of the Sea (CGX Energy Inc., 2005§). The border dispute had prevented Guyana from offshore hydrocarbon and oil exploration.

In 2004, the GDP based on purchasing power parity was estimated to be \$3.45 billion, which was an increase of 4.8% from the \$3.3 billion reported in 2003 (International Monetary Fund, 2005§). The increase in the GDP during 2004 was owing in part to farming and the recovery of the sugar industry, which was a key Guyanese product that went into an unpredicted reduction in production and slowed the economy in 2003. Development of the mineral industry in Guyana has been affected in recent years by a shortage of skilled labor, deficiencies in the infrastructure, and border disputes with Suriname and Venezuela. In 2004, bauxite production decreased by 13.8% compared with that of 2003, and gold production decreased by 5.8% (table 1). The decrease in gold production was the result of a depletion of reserves in the Omai Gold Mine, which is the principal gold-producing mine in the country. Since 2000, bauxite production has decreased by about 40%; gold production has decreased by about 19% since 2001 (table 1; Comisión Económica para América Latina y el Caribe, 2005; U.S. Central Intelligence Agency, 2005§).

Guyana's main industries included bauxite, gold, rice, sugar, textiles, and timber. In 2004, exports of such goods as bauxite and alumina, gold, rice, rum, shrimp, sugar, and timber were about \$580 million, of which \$44.7 million was bauxite exports and \$145 million was gold exports. Export partners included Canada (23.2%), the United States (19.2%), the United Kingdom (10.9%), Portugal (9%), Belgium (6.4%), Jamaica (5.2%), and others (26.1%). Imports constituted about \$650 million for such products as food, machinery, manufactures, and petroleum. Import partners included Trinidad and Tobago (24.8%), the United States (24.5%), Cuba (6.8%), the United Kingdom (5.4%), and others (38.5%) (Bank of Guyana, 2005a§, b§; U.S. Central Intelligence Agency, 2005§).

## Commodity Review

### Metals

**Bauxite and Alumina.**—Two bauxite projects were active in Guyana during 2004—the bauxite industry in Berbice, which included Aroaima Mining Company (AMC) (a subsidiary of Aroaima Bauxite Company), and Linden Mining Enterprises Ltd. (Linmine). Russian Aluminum Company (RUSAL) through its subsidiaries Bauxite and Alumina Mining Venture (BAMV) and Bauxite Company of Guyana Inc. (BCGI) entered into an agreement with the Government of Guyana and AMC to invest \$20 million in the form of operating assets in Berbice. The agreement will allow BAMV to lease equipment to AMC with the goal of expanding bauxite production from 1.3 million metric tons per year (Mt/yr) to 2.5 Mt/yr by 2006. The companies involved in this project were expected to sign a joint-venture agreement in early 2005 that will allow BAMV to acquire 90% interest in the Berbice bauxite industry and the Government of Guyana to hold the remaining 10% (Stabroek News, 2004a§, d§).

In the 4th quarter of 2004, Cambior concluded an agreement with the Government of Guyana to privatize certain assets of Linmine, which is a bauxite mining and processing operation located 100 km south of Guyana's capital of Georgetown. The new assets were held by Omai Bauxite Mining Inc. (OBMI), which was a new company that was 70% owned by Cambior and 30% held by the Guyanese Government. The Government's contribution to OBMI consisted of a bauxite processing plant and service facility, the Montgomery mine (which has an estimated reserve of 63 Mt of bauxite at a grade of 60%  $Al_2O_3$ ), and other mining leases and prospecting licenses in the Linden area, such as Block 37 (which has an estimated resource of 85 Mt of bauxite at a grade of 59%  $Al_2O_3$ ). Cambior planned to invest \$10 million in the venture, to be distributed as \$5 million in cash and \$5 million in the form of mining equipment from the Omai Gold Mine. During 2004, Cambior and the Government of Guyana planned to finalize an agreement for the installation of a diesel-powered generator with 17 megawatts of electricity-generating capacity to be installed by Cambior's subsidiary Omai Services Ltd. The powerplant will generate power for Linmine and the local Linden community. The main product produced at Linmine is high-alumina-content refractory bauxite. Cambior had a production target of 210,000 t for 2005 and 300,000 t for 2006 (Cambior Inc., 2004; Industrial Minerals, 2004; Mining Journal, 2004).

**Gold.**—Gold exploration and production activities in Guyana during 2004 were carried out mainly by such gold companies as Cambior, Guyana Goldfields Inc., StrataGold Corporation, and Vannessa Ventures Ltd.

Omai Gold Mines Limited (OGML), which was owned by Cambior (95%) and the Government of Guyana (5%), was set to end operations during the fourth quarter of 2005 because of depletion of mineral ore reserves; rehabilitation and restoration of the mine site was started in late 2004. Omai will process the remaining 3.8 Mt, which had an average grade of 0.98 g/t gold, in 2005 to produce approximately 107,000 troy ounces of gold (3,328 kilograms [kg]). Peak production was recorded in 2001 as 354,300 troy ounces (11,020 kg) of gold; production in 2004 was recorded as 240,400 troy ounces (7,477 kg) of gold. Cambior announced that the Omai mine has produced more than 3.7 million troy ounces (115,083 kg) of gold during 13 years of operation (Cambior Inc., 2004§; Stabroek News, 2004c§).

Guyana Goldfields held 100% interest in Aurora Mine and Peters Mine. Aurora Mine, which is located on the Cuyuni River approximately 175 km west of Georgetown, covered more than over 16,000 acres (64.8 km<sup>2</sup>) and consisted of at least 5 known gold mineralization zones and more than 11 exploration targets. In 2004, several mineralized zones were discovered in the Aurora property. The Rory's Knoll zone and the East Walcott zone were the most predominant of those zones, with preliminary drilling intersections of average true width of approximately 90 m at a weighted average grade of 2.75 g/t gold and 70 m at an average grade of 2.58 g/t gold, respectively. Exploration efforts in 2004 at the Aurora property included diamond drilling and soil sampling. Peters Mine, which is located 140 km southwest of Georgetown, applied for a mining license in 2004 (Dundee Securities Corporation, 2004, p. 1-2; Guyana Goldfields, 2004a§-c§).

StrataGold has a 3-year option agreement that could earn StrataGold the exclusive right to develop, explore, and mine in the 3,521-acre (14.2-km<sup>2</sup>) Tassawini Gold property, which is located 170 km northwest of Georgetown in the Barima-Waini District of northwest Guyana. Some StrataGold obligations involved with the agreement included the investment of \$2.6 million in exploration expenditures and cash installment payments that totaled \$750,000. Other conditions included the completion of a feasibility study within 18 months of the signing of the option agreement; following the study, StrataGold must place the property into commercial production within 18 months of obtaining production financing. This advanced-stage gold exploration property was centered on the site of the former producing Tassawini Gold Mine, where an estimated 11,200 troy ounces (348 kg) of gold was recovered from 1907 to 1914. During 2004, a drilling program consisting of a total of 2,042 m in 45 drill holes was performed at two new mineralized zones in the Tassawini property, Black Ridge and Sonne, and the Tassawini East and West. The Tassawini West revealed an average grade of 3.92 g/t gold at 16.76 m. The Black Ridge zone was characterized by the presence of a soil anomaly that measured 0.14 km<sup>2</sup> and had an average grade of 1.30 g/t gold at 23.56 m; Sonne zone's soil anomaly measured 0.585 km<sup>2</sup> and had an average grade of 1.64 g/t gold at 15.94 m. Exploration drilling planned for 2005 included 8,000 m of core drilling and 14,000 m of reverse circulation drilling; core drilling was planned for the high-grade gold discoveries Tassawini East and Tassawini West zones, which were formerly known as the Paranapanema drill zone (StrataGold Corporation, 2004, p. 1-2; 2005, p. 3; 2004§).

Vannessa Ventures held an interest in the Marudi Mountain property and started a 2,600-m drilling program during the third quarter of 2004. The program was aimed at defining and testing the extension of the Mazoa mineralized zone, which had a measured mineral resource of 3.38 Mt at a grade of 2.94 g/t gold and an inferred mineral resource of 0.86 Mt at a grade of 2.45 g/t gold. In addition to the drilling program, Vannessa Ventures also had plans that included surface mapping of targeted areas of the Marudi Mountain property, relogging of the existing core, and revision of historical geologic analyses of the property. Romanex Guyana International, which was a 100% owned subsidiary of Vannessa Ventures and which held a 12,500-acre (50.6-km<sup>2</sup>) mining license at Marudi Mountain and Mazoa Hill, submitted the environmental impact assessment for the Marudi Mountain Gold Mine to the Environmental Protection Agency (EPA) in May 2004; the Environmental Assessment Board reviewed the study's findings and, by yearend, Romanex received approval from the EPA to commence gold mining operations in Region Nine of the Marudi Mountain property. The mine was to be located in the eastern portion of Marudi Mountain and would have an expected productive life of 7 years (Vannessa Ventures Ltd., 2005a, b; Caribbean Graphic, 2004§; Stabroek News, 2004b§).

Other gold exploration projects in Guyana during 2004 were held by Aztek Technologies Inc., Sennen Resources Ltd., and Wollasco Minerals Inc. Aztek (a British Columbia, Canada-based company) acquired a 100% share of the Tiger River Gold property in May 2004 from a company called 1594360

Ontario Inc. (a private Ontario, Canada-based company). The Tiger River property is located 200 km south southwest of Georgetown in central Guyana and approximately 10 km from the village of Mahdia and 35 km west-southwest of Cambior's Omai Gold Mine. Preliminary analysis of the Tiger River property revealed that the site was underlain by lateritic and saprolitic mafic volcanic rocks of the Proterozoic-aged Guiana Shield. In 2004, Sennen Resources conducted extensive diamond-drilling exploration work in the Five Star/Makapa project, which is located in the Makapa zone in northwestern Guyana, but after a review of the results, the Sennen Resources Board of Directors announced in October 2004 that it would withdraw from the project. The company decided not to pursue its option agreement to acquire the share of Makapa Mining Inc. Wollasco Minerals entered into a diligence/acquisition agreement for the Akaiwong Project. The project was 100% owned by Guyana Diamond Trading Company (GDTC) of Georgetown, Guyana. The Akaiwong Project comprised three prospecting permits that totaled 3,429 acres (13.9 km<sup>2</sup>); it is located in Mining District Number 4 near Cuyuni and approximately 32 km southeast of Aurora Mine and 42 km northwest of Peters Mine, both of which were owned by Guyana Goldfield (Aztek Technologies Inc., 2004, p. 1-4; Sennen Resources Ltd., 2004; Wollasco Minerals Inc., 2004, p 1-2).

### *Industrial Minerals*

**Diamond.**—In late 2003, development of the Vannessa's Maple Creek Mine was completed. The mine encompasses the Potaro River and the Uewang River drainages. Bulk sampling of the site revealed gem-quality diamond. In 2004, the Maple Creek property, which was 60% owned by Vannessa Ventures, was focused on exploration activities in underexplored areas of the concession and in the reclamation of disturbed areas. The Maple Creek Diamond and Gold Mine construction was completed in 2004, and the property was under the final preproduction inspection phase by the Executive Branch of the Government of Guyana and the Ministry of Mines. Development expenses were covered under a \$2.2 million joint-venture agreement with Rohanni & Associates, which held the remaining 40% interest in the property. The Qatar-based diamond and investment group was funding the project and had a commitment to purchase up to \$5 million of Maple Creek's output per month (Caribbean Graphic, 2004§; Vannessa Ventures Ltd., 2004§).

### **Outlook**

Guyana's economy was expected to grow in 2005 and 2006 at a rate of 2.64% and 2.85%, respectively (International Monetary Fund, 2005§). Production in the mining sector will likely follow the trend of recent years and be dominated by the production of bauxite. Cambior has set goals for its Linmine assets to produce 210,000 t of high-alumina refractory bauxite for 2005 and 300,000 t for 2006. RUSAL will continue its active role in the bauxite industry in Guyana with its agreement with the Government of Guyana and AMC to invest \$20 million in the form of operating assets in the Berbice bauxite industry and by leasing equipment to Aroaima to expand the company's bauxite

production from 1.3 Mt/yr to 2.5 Mt/yr by 2006. The companies involved in this project are expected to sign a joint-venture agreement in early 2005 that will allow BAMV to acquire a 90% interest in the Berbice bauxite industry, and the Government of Guyana, the remaining 10%.

Production of gold will likely continue to decrease because of limited reserves in the Omai Gold Mine. Cambior plans to continue gold exploration in Guyana by investing an average yearly amount of \$1 million. Meanwhile, gold exploration activities in Guyana are likely to increase owing to several gold exploration projects that started in 2004. The Aurora and the Peters gold properties will be under analysis during 2005, which will include diamond drilling and soil sampling. The Tassawini property will also undergo exploration drilling in which 8,000 m of core drilling and 14,000 m of reverse-circulation drilling are planned to take place during 2005. Plans for the Marudi Mountain property in 2005 include surface mapping of targeted areas, relogging of the existing core, and reinterpretation of previously obtained geologic data, in addition to the drilling program.

The Maple Creek Diamond and Gold Mine is expecting the final preproduction inspection to be approved in 2005 by the Government of Guyana. Production activities in Maple Creek are expected to start in 2005 or 2006.

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## SURINAME

Suriname, which is on the northern coast of South America, is bordered by the Atlantic Ocean to the north, Brazil to the south, French Guiana to the east, and Guyana to the west. Suriname has a total land area of 163,270 km<sup>2</sup> and had an estimated population of 443,000 in 2004. Suriname, which was formerly known as Dutch Guiana, was integrated into the Kingdom of the Netherlands in 1948; independence from the Netherlands was granted in 1975 (U.S. Central Intelligence Agency, 2005§; World Bank Group, 2005§).

Suriname's GDP based on purchasing power parity was estimated to be \$2.68 billion in 2004, which was a 7.6% increase compared with \$2.49 billion in 2003 (International Monetary Fund, 2005§). The main economic sectors in Suriname included fishing, food processing, timbering, and mining, which involved the production of alumina, bauxite, gold, and oil. The output of the bauxite industry accounted for at least 15% of the GDP and about 70% of export earnings (U.S.

Central Intelligence Agency, 2005§). The increase in the GDP during 2004 was largely owing to growth in the agriculture, construction, and mining sectors (Comisión Económica para América Latina y el Caribe, 2005).

In recent years, mineral production in Suriname has been mainly focused on alumina, bauxite, and petroleum. In 2004, the production of alumina increased by 1.75% compared with that of 2003; bauxite production decreased by 3.87%; and petroleum and petroleum products, by 4.65% and 3.85%, respectively (table 1). Cambior's Rosebel gold mine began production in 2004, which increased Suriname's annual gold production to 8,513 kg from 300 kg in 2003 (table 1).

Export of goods such as alumina, bananas, beer, crude oil, gold, lumber, rice, and shrimp and fish, increased to \$600 million in 2004 from \$500 million in 2003. The increase in exports was mainly owing to increased gold exports from the Rosebel Mine. Suriname's export partners included Norway (29.3%), the United States (15.1%), Canada (12.5%), Belgium (10.2%), France (8.4%), the United Arab Emirates (6.1%), Iceland (4.3%), and others (14.1%). In 2004, imports decreased to \$470 million from \$500 million in 2003 mainly owing to reduced imports of material and equipment for the Rosebel Mine. Imported products included cotton, equipment, food, and petroleum. Import partners included the United States (26.2%), the Netherlands (19.3%), Trinidad and Tobago (13.5%), Japan (6.6%), China (4.6%), Brazil (4.2%), and others (25.6%) (Comisión Económica para América Latina y el Caribe, 2005; U.S. Central Intelligence Agency, 2005§).

## Commodity Review

### Metals

**Aluminum.**—In February 2005, Suriname Aluminum Company, L.L.C. (Suralco), which was owned by Alcoa World Alumina and Chemicals (a 60-40 joint venture between Alcoa Inc. and Alumina Ltd.), announced the completion of a 250,000-metric-ton-per-year (t/yr) expansion of its alumina refinery in Paranam. The refinery's expansion will raise the Paranam total capacity to approximately 2.2 Mt/yr; the project was completed at a total cost of approximately \$65 million. The Paranam refinery facility was owned by Suralco (55%) and an affiliate of BHP Billiton Plc (45%) (Alcoa Inc., 2005; Comisión Económica para América Latina y el Caribe, 2005).

**Gold.**—In February 2004, the Canadian gold exploration and mining company Canarc Resources Corp. announced the completion of the incorporation process of Benzdorp Gold N.V. Benzdorp Gold N.V. was a Surinamese joint-venture company that held the respective interest of Canarc and Grassalco N.V. (a Suriname state-owned company) in the Benzdorp mineral concession. Canarc held an option to acquire up to 80% of the voting shares and 100% of the net cash flow of Benzdorp Gold; the option was subject to a net revenue or net interest payment to Grassalco. A deep-drilling program in 2004 revealed the possible extension of the porphyry gold-copper mineralization to 200 m further south within the JQA prospect area; significant copper values were intersected in the same prospect area (Canarc Resources Corp., 2004a-c).

Rosebel Gold Mine N.V., which is located 100 km south of Suriname's capital of Paramaribo, commenced commercial production on February 11, 2004, and reached a capacity of 17,200 metric tons per day (t/d) at an average grade of 1.93 g/t gold by yearend. Cambior held a 95% interest in the Rosebel Mine; the remaining 5% interest was held by the Government of Suriname. Gold production at Rosebel was subject to royalties and price participation rights payable as follows: to Grassalco, a 2% royalty on all gold produced and 6.5% of the market price in excess of \$425 per ounce (based on the average market price in a given quarter); to a foundation that promotes the development of natural resources in Suriname, a royalty of 0.25%; and to Golden Star Resources (as consideration for their 50% interest transaction to Cambior in May 2002), a price participation right of 10% of the average quarterly market price in excess of \$300 per ounce on gold produced from soft and transitional ore and in excess of \$350 per ounce on gold produced from hard rock ore. In 2004, Rosebel paid a total of \$2.5 million in royalties to Grassalco and a foundation and \$2.9 million in gold price participation to Golden Star Resources. In December 2004, Golden Star concluded an agreement to sell its Rosebel Mine participation right to Guyanor for \$12 million, payable in two installments during 2005. Cambior expected Rosebel to produce 320,000 troy ounces (9,953 kg) of gold in 2005 at an estimated mine operating cost of \$193 per ounce. Rosebel Mine plans for 2005 included continuous exploration to discover new deposits and 44,000 m of diamond drilling to expand the six known deposits (Golden Star Resources Ltd., 2005; Mining Journal, 2005; Cambior Inc., 2004§).

### Mineral Fuels

**Petroleum.**—During 2004, the national oil company of Suriname, Staatsolie Maatschappij Suriname N.V., signed two offshore agreements with two international oil companies. In April 24, 2004, Staatsolie signed a production-sharing agreement with Spanish oil company Repsol YPF for the exploration and production of oil in Block 30, which is located 100 km offshore Suriname. The contract is valid for 30 years and included an exploration period of 6 years. Staatsolie retained an option to participate in the development phase of Block 30 with an acquisition right of up to 10% interest in the project. Block 30 covers an area of approximately 18,600 km<sup>2</sup> in the Guyana-Suriname basin where oil is currently produced at the Calcutta and the Tambaredjo Fields, which are located near Paramaribo. Repsol planned to carry out a 1,800-km 2D seismic program at yearend 2004 (Alexander's Gas & Oil Connections, 2004§; CGX Energy Inc., 2004a§).

On November 9, 2004, Staatsolie signed the second production-sharing agreement of the year, this time with the Danish oil company, Maersk Oil. The 30-year contract involved the development, exploration, and production of petroleum from Block 31, which is located 30 km off the coast of Suriname. Block 31 covered an area of approximately 13,800 km<sup>2</sup>. Maersk Oil had plans to carry out a seismic program in Block 31 to collect data from an area of approximately 5,600 km. Staatsolie held the option to participate in the commercial phase

of the project for a maximum of 15% in the development and production phase (CGX Energy Inc., 2004b§).

## Outlook

Suriname's economy was expected to grow in 2005 and 2006 at a rate of 4.85% and 4.27%, respectively (International Monetary Fund, 2005§). Changes in the aluminum and gold sectors of the mining industry of Suriname that took place in 2004 are expected to contribute to the economic growth in 2005. The completion of the Paranam refinery expansion in February 2005 will boost alumina production to approximately 2.2 Mt/yr. Gold production in Suriname was expected to grow given the inauguration of commercial production at Rosebel gold mine in February 2004. The expected gold production for 2005 from Rosebel is 9,953 kg of gold, which is an estimated increase of 17% compared with 2004 production.

The offshore oil-drilling industry in Suriname was boosted by the signing of two contracts in 2004 for the development, exploration, and production of petroleum in Blocks 30 and 31. The international companies that signed the contracts with Suriname (Maersk and Repsol) planned to start seismic programs in 2004 and 2005 to collect more detailed data on the offshore properties.

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TABLE 1  
FRENCH GUIANA, GUYANA, AND SURINAME: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Thousand metric tons unless otherwise specified)

Country and commodity		2000	2001	2002	2003	2004 <sup>e</sup>
FRENCH GUIANA <sup>c</sup>						
Cement	metric tons	88,000	58,000	62,000	62,000	62,000
Clays	do.	5,000	5,000	5,000	5,000	5,000
Columbite and tantalite	kilograms	1,100	1,500	1,500	1,500	1,500
Gold, mine output, Au content	do.	3,492 <sup>r, 2, 3</sup>	4,062 <sup>r, 2, 3</sup>	3,290 <sup>r, 2, 3</sup>	3,296 <sup>r, 2, 3</sup>	2,564 <sup>2, 3</sup>
Sand		1,500	1,500	1,500	1,500	1,500
Stone, crushed		1,500	1,500	1,500	1,500	1,500
GUYANA						
Bauxite, dry equivalent, gross weight		2,471 <sup>4</sup>	1,950	1,690	1,701 <sup>5</sup>	1,466 <sup>3, 5</sup>
Diamond	carats	81,706 <sup>4</sup>	178,698 <sup>4</sup>	248,436	412,537 <sup>r</sup>	450,000
Gold, mine output, Au content	kilograms	13,510	14,186	13,581	12,170 <sup>5</sup>	11,462 <sup>3, 5</sup>
Sand	metric tons	262,000 <sup>4</sup>	240,083	180,672	180,000 <sup>e</sup>	180,000
Stone, crushed	do.	120,000 <sup>e, 4</sup>	117,814	49,356	49,000 <sup>e</sup>	49,000
SURINAME <sup>c</sup>						
Aluminum:						
Bauxite, gross weight		3,610 <sup>3</sup>	4,394 <sup>3</sup>	4,002 <sup>3</sup>	4,215 <sup>3, 5</sup>	4,052 <sup>2, 3</sup>
Alumina		1,800	1,900 <sup>3</sup>	1,900	2,004 <sup>3, 6</sup>	2,039 <sup>3, 5</sup>
Cement, hydraulic		60	65 <sup>3</sup>	65	65	65
Clays, common		20	20	20	20	20
Gold, mine output, Au content	kilograms	300	300	300	300	8513 <sup>2, 3</sup>
Petroleum:						
Crude <sup>7</sup>	42-gallon barrels	4,500,000 <sup>3</sup>	4,700,000 <sup>3</sup>	4,500,000 <sup>3</sup>	4,300,000 <sup>3</sup>	4,100,000 <sup>3</sup>
Products	do.	--	2,550,000 <sup>3</sup>	2,700,000	2,600,000 <sup>7</sup>	2,500,000 <sup>3, 7</sup>
Sand and gravel:						
Gravel		35	35	35	35	35
Sand, common		160	160	160	160	160
Stone, crushed and broken		50	50	50	50	50

<sup>e</sup>Estimated; estimated data are rounded to no more than three significant digits. <sup>r</sup>Revised. -- Zero.

<sup>1</sup>Table includes data available through October 27, 2005.

<sup>2</sup>Source: Direction Regionale de l'Industrie, de La Recherche et de l'Environnement and Bureau de Recherches Géologiques et Minières.

<sup>3</sup>Reported figure.

<sup>4</sup>Source: Guyana Geology and Mines Commission.

<sup>5</sup>Source: World Bureau of Metal Statistics.

<sup>6</sup>Source: BHP Billiton Group.

<sup>7</sup>Source: Staatsolie Maatschappij Suriname N.V.



TABLE 2  
GUYANA AND SURINAME: STRUCTURE OF THE MINERAL INDUSTRIES IN 2004

(Thousand metric tons unless otherwise specified)

Country and commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
<b>GUYANA</b>			
<b>Bauxite and alumina:</b>			
Bauxite	Bauxite Industry Development Co., Ltd. (BIDCO) (Government, 100%)	Kara Kara, Northeast Dorabece, and East Montgomery Mines, MacKenzie, Linden, West Demerara District	3,500
Do.	do.	Block 2 Manaka, North, South mines, Kwakwani, East Berbice District	1,500
Do.	do.	Processing plant at Linden	900
Do.	do.	Processing plant at Everton, East Berbice District	700
Do.	C.A. Dayco (private, Venezuela, 100%) [Bauxite Industry Development Co., Ltd. (BIDCO) contract]	Kwakani area	500
Do.	Green Mining Inc. (Green Construction Co., United States, 100%) (Gyumine contract)	Dacouria Mine, Linden	NA
Do.	Aroaima Bauxite Co. [Bauxite Company of Guyana Inc. (BCGI)-Russian Aluminum (RUSAL) subsidiary in Guyana, 90%, and Government of Guyana, 10%]	Aroaima, East Berbice District Kwakwani Region Ten (Upper Demerara/Upper Berbice), subdivision #2	1,300
Alumina	Bauxite Industry Development Co., Ltd. (BIDCO)	Alumina refinery at Linden (presently closed)	300
Gold kilograms	Omai Gold Mines Limited (Cambior Inc., Canada, 95%, and Government of Guyana, 5%)	Omai Mine, Mazaruni-Potaro District	300
Gravel	Baracara Quarries (private)	Quarry near Bartica, Mazaruni-Potaro District	100
Silica sand	Minerals and Technology Ltd. (Minerals and Chemicals of Texas, United States)	Sand Hills, Demerara River, West Demerara District	300
Stone	Mazaruni Granite Products Inc. of Guyana (private)	Teperu/Itabu Quarry Mazaruni River, 5 miles from Bartica in Teperu	3,650
<b>SURINAME</b>			
Alumina	Suriname Aluminum Company L.L.C. (Suralco) (Alcoa, Inc., 55%, and BHP Billiton Plc, 45%)	Refinery at Paranam	1,925
Aluminum	Suralco, 55%, and BHP Billiton Plc, 45%	Smelter at Paranam	50
Bauxite	do.	Mines at Accaribo, Coermotibo, and Lelydorp III, District of Marowijne	4,000
do.	Suriname Aluminum Company L.L.C. (Suralco), 76%, and BHP Billiton Plc, 24%	Accaribo Mine, District of Para	1,000
Cement	Vensur N.V. (private, 100%)	Paramaribo, District of Para	60
Gold	No major operating companies	South and east Suriname	NA
Petroleum	Staatsolie Maatschappij Suriname N.V. (Government, 100%)	Tambaredjo, District of Saramacca	5,000
Petroleum products	do.	do.	2,600

NA Not available.