

THE MINERAL INDUSTRY OF

VENEZUELA

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Venezuela's gross domestic product increased by 5.1% in 1997 after a 0.4% decrease in 1996 (U.S. Embassy, Caracas, Venezuela, August 1998, p. 1). Inflation decreased to 37.6% from 103.2% in 1996 (U.S. Embassy, Caracas, Venezuela, August 1998, p. 8). Unemployment during the year was 10.4%, an improvement from 1996 when it totaled 12.4% (U.S. Embassy, Caracas, Venezuela, August 1998, p. 20).

The mining sector continued to contribute modestly to the economy, and petroleum continued to be the most important mineral commodity to the Venezuelan economy. The petroleum sector' was the country's largest source of foreign exchange contributing about 79% of the total exports, and was the Government's largest source of revenue.

Under the Venezuelan Constitution, ownership of Venezuela's mineral and hydrocarbon resources belong to the nation, and the rights to explore and exploit these resources may be granted through concessions. The Venezuelan mining law, enacted in December 1944, and published in January 1945, regulates prospecting, exploration, mining concessions, and claims. Legislation and resolutions have been enacted to modify specific items of the mining law. Resolution No. 115 of March 1990 modified issues of concessions and mining contracts (Latin America Mining Institute, 1993). Resolution No. 96-12-02 deals with the exports of gold and requires 15% of the domestic gold production to be sold internally; gold exporters must be registered with the Central Bank. Decree No. 2.095 of 1992, regulates foreign investment and ensures equal treatment of foreign and domestic investment. Under the decree, the domestic or international private sector may participate in the exploration and production of minerals, except iron ore, which is reserved for the Venezuelan Government, although its processing and transformation is open to the private sector (Labrador, 1997, p. 7).

El Ministerio de Energía y Minas, [the Ministry of Energy and Mines (MEM)], is responsible for managing all mining and energy activities. In some instances, MEM has granted mining concessions to regional Government entities, which, in turn, may lease these concession to the private sector. Nonmetallic minerals (for construction and ornamentals, excluding precious materials) are outside of the purview of MEM unless found in Government land. Under Article 7 of the mining law, these minerals may be exploited as determined by the landowner without further formality (Labrador, 1997, p. 10).

In 1996, Decree No. 3.281, which gave Corporación Venezolana de Guayana (C.V.G.), the right to enter into contracts on gold and diamonds, was derogated. A proposal to change the mining law has been considered in recent years. In 1997, review of the proposed law continued and efforts to enact the new law were unsuccessful.

The Ley Orgánica del Ambiente (organic environmental law) deals with environmental control and the restoration of areas of mining activity. In addition to MEM, the regional offices of the Ministerio del Ambiente y de los Recursos Naturales Renovables (the Ministry of the Environment and Renewable Natural Resources) must approve mining projects. For approval, companies must complete an environmental impact study and a mining reclamation plan. Decree No. 1.257 of March 1996, specifies mining activities for which environmental impact studies are required.

Although petroleum and natural gas continued to dominate Venezuela's mineral industry and the contribution of the nonfuel mineral industry to the economy continued to be modest, Venezuela was an important producer of some nonfuel minerals. According to the U.S. Geological Survey world production data, it was the seventh largest world producers of bauxite and alumina and the ninth largest world producer of aluminum. It was also the second largest producer of iron ore in Latin America, after Brazil, and the largest world producer of direct-reduced iron. It also produced a few other metals and metal products, such as ferroalloys, gold, and steel. In terms of industrial minerals and their products, Venezuela ranked as the fourth largest cement producer in Latin America after Brazil, Mexico, and Colombia. It also produced a variety of construction materials, minerals used in the chemical and fertilizer sectors, and diamonds.

Output of most nonfuel mineral commodities increased in 1997 (table 1). In metals, the largest increase was in the output of gold (90%). The only metal that had a decrease in output was iron ore (0.3%). In the industrial mineral sector, significant increases in output was achieved from 1996 levels for phosphate rock (more than doubled), diamond (44%), granite (40%), and gypsum. Output of several industrial minerals decreased, the most notable of those being kaolin (38%), feldspar (22%), and limestone (19%). In fuel minerals, the largest increase was achieved by the coal sector (26.4%).

The Venezuelan mineral sector continued to be dominated by the petroleum sector, which, in terms of value, accounted for 79% of total exports. The value of petroleum exports decreased slightly to \$18.18 billion from \$18.47 in 1996, although the average export price decreased to \$16.32 from \$18.39 during the same period (U.S. Embassy, Caracas, Venezuela, August 1998, p. 13). Nonpetroleum exports increased by almost 14%, to \$4.79 billion, but total imports increased by 38%, to \$12.31 billion. In March, the Venezuelan central administration legal counsel approved the exemption of new investments in export-oriented industries from wholesales taxes (16.5%) in the preproduction phase (Metals & Minerals Latin America, 1997c) for a period of 5 years, and could be extended for another 5 years. Approval by

the Ministerial Council would be the next step before final approval. The iron and steel and the mining sectors would benefit from this tax break.

New direct foreign investment in Venezuela was \$664.9 million in 1997, a 68.2% increase from that of 1996. The largest source of Venezuela's direct foreign investment in 1997 was the United States with 36.9% of the total. Spain was the second largest foreign investor (17.8%), followed by the Republic of Korea (7.9%), Panama (5.8%), and Canada (4.6%). The largest amount of direct foreign investment went to manufacturing (41%), finance and real estate (24.5%), mining (17.2%), and agriculture (7.4%). U.S. investment was mainly directed toward the petroleum sector and the Canadian investment was mainly in the mining sector (U.S. Embassy, Caracas, Venezuela, August 1998, p. 16-17).

Production of bauxite, alumina, and aluminum increased modestly in 1997. The sale of 70% of the Government aluminum complex, which included the two aluminum smelters, Aluminio del Caroní S.A. and Industria Venezolana del Aluminio C.A., the bauxite and alumina producer, C.V.G.-Bauxilum C.A., and the carbon anode producer, Carbonorca, was approved by the Congress late in the year, but attempts to privatize it during the year had been unsuccessful.

Gold production almost doubled to 22 tons in 1997. The ownership rights dispute of Las Cristinas in the State of Bolívar, the largest gold project in Venezuela, and potentially in South America, however, continued to affect adversely the development of the mining sector and to diminish the interest from foreign investors (Metals & Minerals Latin America, 1997a). In March, Crystallex International Corporation of Canada purchased Inversora Mael C.A., a company claiming ownership of concessions 4 and 6 of Las Cristinas property. Las Cristinas was being developed by Minera Las Cristinas C.A. (Minca), the joint venture company of Placer Dome and C.V. G.

In July, the Supreme Court rejected Crystallex's gold claims (Metals & Minerals Latin America, 1997b). In August, 2 days after receiving the environmental permits and tax exemption, Minca began construction of an open-pit mine and a 40,000-metric-ton-per-year processing plant (Colitt, 1997b). The capital cost has been estimated to be \$600 million, and construction, 2 years. After delays caused by property right issues and because C.V.G. had not signed some contracts with Placer Dome until early 1997, production of gold in copper concentrate and in doré, originally scheduled for 1998, was rescheduled to begin in late 1999. Placer Dome revised "the total ore reserve estimate at Las Cristinas to 11.8 million ozs. of gold" (Placer Dome, Inc., August 2, 1997, Placer Dome starts construction of Las Cristinas mine; announces addition to gold reserves, company press release, accessed August 4, 1997, at URL http://biz.yahoo.com/pmews/97/08/02/aes_pdg_y_1.htxnl). Minca had spent \$110 million in Las Cristinas since 1992 (Mining Journal, 1998).

At yearend, Compañía Aurífera Brisas del Cuyuni C.A., a wholly owned subsidiary of Gold Reserve Corp. of the United States, was waiting for the results of the prefeasibility study of Las Brisas copper and gold property in the State of Bolívar. The prefeasibility study was being done by a division of Jacobs Engineering Group Inc. (Gold Reserve Corporation, March 3, 1998, Gold Reserve reports on Brisas pre-feasibility study,

company press release, accessed March 4, 1998, at URL <http://biz.yahoo.com/bw/980303/gold-reser-1.html>).

In November, Bolivar Goldfields Ltd. of Canada announced that it would begin producing gold from its Tomi mine in El Callao District, State of Bolívar in 1998. The company received final permit to begin production from the Ministerio del Ambiente y de los Recursos Naturales Renobables in late 1997 (Vheadlines, VENews, November 11, 1997, Bolivar Goldfields to start production at half million ounce Venezuelan Tomi gold project next year, electronic news, accessed December 21, 1998, at URL <http://www.vheadline.com/9711/3297.htm>). A feasibility study completed in 1996 recommended the construction of three open pits to extract ore from the Charlie Richards, the McKenzie, and the Milagrito ore bodies. According to the study, proven minable and probable reserves are 2.96 million metric tons averaging 3.68 grams of gold per ton of ore (Canadian Corporate News, October 24, 1996, Positive feasibility study at Tomi indicates mine will have 25 percent internal rate of return and a payback period of two years. Accessed December 21, 1998 on <http://www.cdn-news.com/database/main/1996/10/24/1024016N.html>). Plans call for production of 48,000 ounces per year of gold for 7 years. The proposed design calls for a conventional crushing-grinding circuit and a carbon-in-leach process plant with a capacity to treat 490,000 metric tons per year of oxide and 350,000 tons per year of sulfide ore. The stripping ratio was to be 4.62:1. The estimated capital cost was \$33.1 million.

In November, the Supreme Court of Venezuela temporarily banned new gold mine concessions in the 3.6-million hectare Imataca Forest Reserve, which holds about 70% of Venezuela's gold deposits (Mining Journal, 1997), while it determined the legality and constitutionality of Presidential Decree 1.850 of 1997, which allows mining in 40% of the Reserve. Imataca, a forest reserve since 1961, is the area where Las Cristinas, Las Brisas, and Tomi are found. The 257 existing concessions in Imataca at the time of the ban would not be affected by the Supreme Court decision (Colitt, 1997a), the action put 90 pending concessions on hold and hindered efforts by two subsidiaries (C.V.G.-Tecmin and C.V.G.-Ferromintec) to offer bids for 200,000 hectares to private mining companies for joint ventures or strategic associations. One of C.V.G.'s goals is to increase gold output to 25 million tons in 5 years and 50 million tons in 15 years (Engineering & Mining Journal, 1997).

Other companies exploring for gold in Venezuela in 1997 included El Callao Mining Co., Bema Gold Corp. (Lo Increíble), Homestake Mining Co., Vista Gold Corp. (El Guariche), and Monarch Resources Ltd.

In 1997, Venezuela was the 11th largest world producer and the 2d largest Latin American producer of iron ore after Brazil. The sole producer of iron ore was C.V.G.-Ferrominera Orinoco C.A. (Ferrominera), a subsidiary of C.V.G., the Government holding company. Ferrominera has been in operation since January 1976 when the Venezuelan iron ore industry was nationalized. The company, which has a production capacity of 25 million metric tons per year, exports about 51% of its production (Acero Latinoamericano, 1998, p. 30). Production of 18.4 million tons in 1997 represented about 1.8% of the world output. Ferrominera also has an iron pellet plant with a production capacity of 3.3 million tons per year. The company plans to expand the pellet

plant to 3.6 million tons per year by yearend 1998.

In December 1997, C.V.G. privatized 70% of its C.V.G.-Siderúrgica del Orinoco C.A. (SIDOR), the largest steel producer in Venezuela and the last of the Latin American steel producers to be privatized in the decade (Acero Latinoamericano, 1998, p. 71). The Amazonia Consortium, comprising GRUPO TECHINT of Argentina (40%), GRUPO HYLAMEX of Mexico (30%), GRUPO SIVENSA of Venezuela (20%), and USIMINAS of Brazil (10%), paid \$2.3 billion for the company (Acero Latinoamericano, 1998, p. 70). Two-thirds of the remaining 30% was to be transferred to the employees, and one-third was to be sold in the stock market. SIDOR had capacities of 6.6 million tons per year of iron ore pellets, 3.7 million tons per year of direct-reduced iron, 3.6 million tons per year of crude steel, 2.25 million tons per year of plates, and 100,000 per year tons of ingots. SIDOR sold 48% of its products in the domestic market and exported the rest to Colombia (26%), the European Union and Canada (23.2%), South America (18.2%), and Mexico (12.2%). The capacities of the other two steel producers in Venezuela, SIVENSA and SIZUCA were 907,000 and 1,000 tons per year, respectively.

As the world's largest producer of direct-reduced iron, Venezuela produced about 5.3 million tons in 1997, about 90% of its installed capacity. Capacity, however, was expected to almost double to 10.5 million tons per year of DRI between 1998 and 2000, with the completion of the three new hot-briquette plants under construction by Complejo Siderúrgico Guayana C.A. (1 million tons), POSVEN C.A. (1.5 million tons), and Orinoco Iron (2.2 million tons), all in the Guayana region where iron ore is produced and there is abundance of inexpensive electric energy and natural gas.

In early September, financing for the \$415 million Loma de Níquel nickel project near Caracas in the States of Aragua and Miranda was secured by Mineral Loma de Níquel C.A., a company owned by the Minorco Group (81.5%), Jordex Resources Inc. (7.5%), Corporación Caracas (7.5%), a Venezuelan investment group, and International Finance Corp. (IFC) (3.5%), the financial arm of the World Bank (Jordex Resources, Inc., September 3, 1997, Jordex Resources financing secured for Loma de Níquel, company press release, accessed September 5, 1997, at URL <http://biz.yahoo.com/bw/97/09/03/jdx-ocl-1.html>). IFC and Germany's Kreditanstalt für Wiederaufbau agreed to loan \$215 million, and the shareholders, the remainder. The project, scheduled to begin in 2000 and with an estimated mine life of more than 27 years, will produce from 16,000 to 18,000 tons per year of nickel in ferronickel for exports. The property's proximity to Puerto Cabello's deep port and low electricity and natural gas costs are some of the positive aspects affecting the cost of production. At yearend, however, Jordex announced that it would refrain from further funding of its 7.5% interest in the project and that it had been unable to find a buyer for its equity in the company (Jordex Resources, Inc., December 15, 1997, Jordex Resources Loma de Níquel update, company press release, accessed on December 16, 1997 at URL <http://biz.yahoo.com/bw/971215/jordex-resources-inc-1.html>).

Production of coal increased by 26% to 5.3 million tons. The largest producer was Carbones del Guasare S.A. in the State of Zulia where 81% of the measured, indicated, and inferred reserves

and 82% of the resources are located (Dirección de Planificación y Economía, 1997). Of the total coal production, 71.5% or 3.7 million tons was exported. The leading recipient of Venezuelan coal was the Netherlands, which received 31%, followed by France which received 18%. The United States imported 6% of Venezuela's coal exports (Gellici, 1998). The State of Zulia planned to offer coal concessions in the western part, near Casigua in 1998 (Coal Age, 1997).

The business plan (1997-2007) of Petróleos de Venezuela, S.A. (PDVSA), one of the world's largest petroleum companies 10-year plan called for a significant expansion in the country's production capacity—to 6.3 million barrels per day by 2007. The estimated cost of the expansion plan was \$50 billion. The private sector would finance \$15 billion through a number of joint-venture agreements with the Government-owned company (Petróleos de Venezuela S.A., February 26, 1998, En 10 años 50 mil millones de dólares se invertirán en la exploración y producción [Over 10 years 50 billion dollars will be invested in exploration and production], comunicados de prensa [press releases], accessed December 29, 1998, at http://www.pdvsa.pdv.com/news/espanol/noticias_graLes.html).

As part of PDVSA's expansion plan, the company through its subsidiaries signed 17 production contracts with the private sector in July. This was part of the third round of contract offers to incorporate the private sector in the reactivation, rehabilitation, and development of hydrocarbon deposits in selected areas (Petróleos de Venezuela, S.A., September 1997, Por un FDV total de US\$2 millardos 080 millones mil 567 PDVSA firma convenios de la tercera ronda [For total value factor of \$2,080,001,567 PDVSA signs third round operating agreements], comunicados de prensa [press releases], accessed December 29, 1998 at URL <http://www.pdvsa.pdv.com/news/espanol/noticias-firma-es.html>). The 20-year contracts were in the States of Anzoátegui, Falcón, Monagas, and Zulia.

In August, Petrozuata began drilling its first well in the Orinoco oil belt. Petrozuata, a joint venture between Conoco and PDVSA's subsidiary Maraven, plans to produce extra-heavy crude petroleum to convert it to synthetic light. The 35-year project is the first in the strategic partnership contract to reach the production stage. Petrozuata plans to produce 1.5 billion to 2 billion barrels of extra heavy oil during the lifetime of the project (Alexander's Gas and Oil Connections, October 20, 1997, Petrozuata drill first well in Venezuela's Orinoco oil belt, company news, accessed December 12, 1998 at URL <http://www.gasandoil.com/goc/company/cnl74334.htm>).

In September, the Congress approved a joint-venture project among PDVSA's subsidiary Lagoven, Mobil Corporation, and Veba Oel AG of Germany for the production, upgrade, marketing of 120,000 barrels per day of extra-heavy crude of the Cerro Negro area in the State of Anzoátegui (Petróleos de Venezuela, S.A., September 1997, Congreso Nacional aprobó convenio de asociación para desarrollar crudo de la faja del Orinoco [The national congress approved association agreement for the development of crude from the Orinoco belt], comunicados de prensa [press releases], accessed December 29, 1998, at URL <http://www.pdvsa.pdv.com/news/noticias-mobil-es.html>). The Cerro Negro I project will upgrade 8.5° API to 16° API in a plant to be constructed in the José industrial complex in Anzoátegui.

Part of the crude will then be sent to the Chalmette refinery in Louisiana, U.S.A., and another part will be sent to Veba Oel's refinery system in Germany. Investment cost in Venezuela for this project has been estimated to be \$900 million.

In November, EXXON Corp. and Corpoven, another subsidiary of PDVSA, signed a "heads of agreement" to establish a joint venture to produce extra-heavy crude petroleum from the Harnaca area in the Orinoco oil belt (EXXON Corporation, 1997, South America—Exxon's presence continues to grow, Venezuela, financial and operating review, accessed December 28, 1998, at URL <http://www.exxon.com/exxoncorp/main-fraine-1.html>). Plans for a two-stage development, call for the production of 80,000 barrels per day of upgraded crude from the extra-heavy crude petroleum beginning in 2002. The 9° API crude would be diluted with naphtha and fed to a plant to reduce its viscosity and acidity. The crude would then be sold to EXXON under a long-term supply agreement. EXXON will process the upgraded crude in its Baton Rouge, Louisiana, and Bayton, Texas, refineries. By 2007 or 2008, the second phase of the project will begin with a target production level of 170,000 barrels per day. In this stage, a new heavy crude upgrading plant will be built in the José industrial complex (Petróleos de Venezuela, S.A., December 9, 1997, PDVSA firma con Exxon acuerdo de negociación en la faja del Orinoco [PDVSA signs heads of agreement with Exxon on the Orinoco belt], comunicados de prensa [press releases], accessed December 29, 1998 at URL <http://www.pdvsa.pdv.com/news/espanol/noticias-exxon-es.html>). At this plant, 90,000 barrels of heavy crude will be upgraded. The initial cost of the phase of the 35-year project was estimated to be \$820 million and the total investment cost, \$4.9 billion.

Also in November, Maraven, Total of France, Norsk Hydro and Statoil, the latter two of Norway, signed an agreement to form SINCOR, a company to develop the extra-heavy crude from Zuata in the State of Anzoátegui. SINCOR plans to produce 200,000 barrels per year of extra-heavy crude (8.5° API). This will produce 170,000 barrels per day of synthetic light (30° API) in the José industrial complex. Crude production is schedule to begin during the third quarter of 2000 with the upgrade facilities

scheduled for 2001. The investment required for the project is \$900 million (Petróleos de Venezuela, S.A., November 20, 1997, Total, Statoil, Norsk Hydro y Maraven PDVSA constituye SINCOR para el desarrollo de la faja del Orinoco [Total, Norsk Hydro, and PDVSA's subsidiary Maraven form SINCOR to develop the Orinoco belt], comunicados de prensa [press releases], accessed at URL <http://www.pdvsa.pdv.com/news/espanol/noticias-sincor-es.html>).

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TABLE 1
VENEZUELA: PRODUCTION OF MINERAL COMMODITIES 1/

(Thousand metric tons unless otherwise specified)

Commodity	1993	1994	1995	1996	1997	
METALS						
Aluminum:						
Alumina	1,500	1,551 r/	1,661 r/	1,701 r/	1,730	
Bauxite	2,530	4,419	5,022	4,807 r/	4,967	
Metal, primary, unalloyed	metric tons	568,000	585,445	629,828	629,263 r/	633,836
Gold, mine output, Au content	kilograms	8,985	10,094	7,110	11,719 r/	22,322
Iron and steel:						
Iron ore and concentrate	16,871	18,318	18,954	18,412 r/	18,359	
Metal, direct-reduced iron	4,432 r/	4,803 r/	5,099 r/	5,380 r/	5,258	
Ferroalloys:						
Ferromanganese e/	-- 2/	--	--	--	6 2/	
Ferrosilicomanganese	42	47 r/	48 r/	25 r/	37	
Ferrosilicon 3/	47	41	50	63	60 e/	
Total	89	81	90	103	103 e/	
Steel, crude	3,392	3,524	3,568	3,941 r/	4,019	
Semimanufactures, hot-rolled	2,560	2,390	3,080	3,100	3,100 e/	
Lead, secondary, refined e/	metric tons	14,000 2/	15,000 2/	16,000	16,000	
INDUSTRIAL MINERALS						
Amphibolite	143	50	243	77 r/	86	
Cement, hydraulic	6,840	6,927	7,672	7,556	7,600 e/	
Clays:						
Kaolin	32	10	6	8	5	
Other	2,036	2,434	5,467	2,737 r/	2,855	
Diamond:						
Gem e/	carats	267,000	380,000	125,000	99,129 r/	158,260
Industrial e/	do.	144,000	203,000	66,000	72,887 r/ 2/	89,948 2/
Total	do.	411,000	583,000	191,000	172,016 r/	248,208
Feldspar	187	137	227	205 r/	160	
Gypsum	210	135	100	57 r/	80	
Lime e/	250	250	250	279 2/	300	
Nitrogen, N content of ammonia	535	505	600	605 r/	612	
Phosphate rock	--	99	169	148 r/	319	
Pyrophyllite e/	32	32	32	32	32	
Salt, evaporated e/	metric tons	370,000	400,000	350,000	350,000	350,000
Serpentine, crushed e/	550	550	550	550	550	
Stone, sand and gravel:						
Stone:						
Dolomite	300	300	300	225 r/	204	
Granite	394	264	400	285 r/	400	
Limestone	12,621	11,687	14,630 r/	15,873 r/	12,885	
Sand and gravel	3,562	4,165	4,334	3,669 r/	3,884	
Silica sand	882	141	679	763 r/	885	
Sulfur, petroleum byproduct	135	158	180	250	319	
MINERAL FUELS AND RELATED MATERIALS						
Carbon black e/	60	60	60	60	60	
Coal, bituminous	3,958	4,434	4,264	4,181 r/	5,284	
Gas, natural:						
Gross	million cubic meters	42,500	31,640	34,360	38,470	40,000 e/
Marketed e/	do.	15,000 2/	25,000	26,000	27,000	28,000
Natural gas liquids: e/ 4/						
Natural gasoline	thousand 42-gallon barrels	7,900 2/	11,300	11,300	12,000	12,000
Liquid petroleum gas	do.	38,800 2/	49,275 2/	50,000	55,000	55,000
Total	do.	46,700 2/	60,575 2/	61,300	67,000	67,000

See footnotes at end of table.

TABLE 1--Continued
 VENEZUELA: PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Thousand metric tons unless otherwise specified)

Commodity	1993	1994	1995	1996	1997	
MINERAL FUELS AND RELATED MATERIALS--						
CONTINUED						
Petroleum:						
Crude	thousand 42-gallon barrels	816,000	940,000	1,018,000	1,086,000	1,180,000 e/
Refinery products:						
Liquified petroleum gas	do.	2,920	3,290	3,200 r/ e/	3,300	3,300 e/
Gasoline:						
Aviation	do.	64 e/		--	--	-- e/
Motor	do.	68,900	68,800	69,000 r/ e/	70,000 e/	70,000 e/
Naphtha	e/	58,000 2/	50,500	50,000 r/	51,000	51,000
Jet fuel	do.	28,500	27,700	27,700 r/ e/	28,000 e/	28,000 e/
Kerosene	do.	999	--	500 e/	600 e/	600 e/
Distillate fuel oil	do.	104,000	93,800	94,000 e/	96,000 e/	96,000 e/
Lubricants	do.	3,320	2,750	2,600 r/ e/	2,700 e/	2,700 e/
Residual fuel oil	do.	102,000	96,400	96,000 r/ e/	98,000 e/	98,000 e/
Asphalt and bitumen	do.	8,230	10,300	10,000 r/ e/	10,200 e/	10,200 e/
Refinery fuel gas	e/	27,900 2/	9,000	8,800 r/	9,000	9,000
Unspecified	e/	1,240	2,320 2/	2,200 r/	3,200	3,200
Total	e/	406,073	364,860	364,000 r/ 2/	372,000 2/	372,000

e/ Estimated. r/ Revised.

1/ Table includes data available through December 1998.

2/ Reported figure.

3/ Figures represent combined 45% silicon-content and 75% silicon-content production.

4/ From nonassociated gas only.

TABLE 2
VENEZUELA: STRUCTURE OF THE MINERAL INDUSTRY IN 1997

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Alumina		C.V.G.-Bauxilum C.A. (Government, 88.7%; Aluminio Suizo S. A., 11.3%)	Ciudad Guayana, Bolívar State	2,000.
Aluminum		Aluminio del Caroní S.A. (ALCASA) (Government, 82%; Reynolds International, Inc., 8%)	do.	210.
Do.		Industria Venezolana de Aluminio C.A. (VENALUM) (Government, 80%; six Japanese companies, 20%)	do.	430.
Bauxite		C.V.G.-Bauxilum C.A.	Los Pijiguaos, Bolívar State	6,000.
Cement		C. A. Venezolana de Cementos (VENCEMOS) (Cementos Mexicanos S.A. de C.V., 100%)	Barquisimeto, Lara State; Maracaibo, Zulia State; Pertigalete, Anzoátegui State	5,265 clinker.
Do.		C.A. Fábrica Nacional de Cementos (Lafarge, 46.13%)		1,770. clinker.
Coal		Carbones del Guasare S.A. (Carbones de Zulia S.A., 54.68%, Ruhrkohle Handel Inter, 22.66%; Shell Coal International, 22.66%)	Paso Diablo, Zulia State, Guasare coal basin	4,000.
Do.		Carbones de la Guajira S.A. (Carbones de Zulia S.A., 36%; Cabones del Mar S.A., 64%)	Mina Norte and Chachirí, Zulia State, Guasare coal basin	500.
Ferrosilicon		C.V.G.-Venezolana de Ferrosilicio C.A. (FESILVEN) (Government, 100%)		55.
Gold	kilograms	ReveMin (Monarch, 51%; C.V.G., 49%)	El Callao, Bolívar State	900 mill.
Do.	do.	Crystallex de Venezuela C.A. (Crystallex International Corp., 100%)	Albino mine, Kilometro 88, Bolívar State	1,500 mill.
Do.		Minera Las Cristinas C.A. (Placer Dome, 70%; C.V.G. 30%)	Las cristinas, Kilometro 88, Bolívar State	New.
Do.	do.	C.V.G.-Compañía General de Minería C.A. (MINERVEN) (Government 100%)	El Callao, Bolívar State	3,500.
Iron ore		C.V.G.- Ferrominera Orinoco C.A. (Government, 100%)	Cerro Bolívar, El Pao, Los Barrancos, and San Isidro mines, Bolívar State	25,000.
Iron ore pellets		do.	Ciudad Guayana, Bolívar State	3,300.
Do.		C.V.G.-Siderúrgica del Orinoco C.A. (SIDOR) (Amazonia Consortium, 70%, C.V.G., 30%)	do.	6,600.
Nickel		Loma de Níquel S.A. [Minorco Group, 81.5%; Jordex Resources Inc., 7.5%, Corporación Caracas, 7.5%, International Finance Corp. (IFC), 3.5%]	Loma de Níquel, Aragua and Miranda States	New.
Petroleum:				
Crude	million 42-gallon barrels	Petróleos de Venezuela, S.A. (PDVSA) (Government, 100%)	Fields in Anzoátegui, Apure, Falcón, Guárico, Monagas, and Zulia States	1,250.
Refinery products	do. do.	do.	Major refineries at Amuay Bay and Cardón, both in Falcón State	434.
Steel		C.V.G.-Siderúrgica del Orinoco C.A. (SIDOR) (Amazonia Consortium, 70%, C.V.G., 30%)	Ciudad Guayana, Bolívar State	3,600.
Do.		Siderúrgica del Turbio S.A. (SIDETUR) (private, 100%)	Antímano, Barquisimeto, and Casima	907.