THE MINERAL INDUSTRIES OF PARAGUAY AND URUGUAY

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PARAGUAY

Paraguay, a landlocked country, is located in central South America to the northeast of Argentina, southeast of Bolivia, and southwest of Brazil. The three main rivers of Paraguay are the Paraguay River, which runs from north to south across central Paraguay, the Parana River which runs along the southeast side of the country and is shared with Argentina and Brazil, and the Pilcomayo River, which is located in the southwest and is shared with Argentina (Rand McNally, 1995). Paraguay has a total area of 406,750 square kilometers (km²) and had an estimated population of 6.0 million in 2004. Paraguay was a Spanish possession until 1811, when independence was granted (United Nations Population Fund, 2004; U.S. Central Intelligence Agency, 2004§¹; World Bank, 2004§).

Paraguay's main industries included cement, iron and steel, and petroleum (refinery products). In 2004, the gross domestic product (GDP) based on purchasing power parity was estimated to be \$27.58 billion, which was an increase of 4.5% compared with that of 2003 (International Monetary Fund, 2005§). In 2004, exports constituted about \$2.9 billion for such products as cotton, hydropower, leather, meat, soybean, and wood. Export partners included Uruguay (27.8%), Brazil (19.2%), Argentina (6.3%), Switzerland (4.1%) and others (42.6%). Imports of such goods as consumer goods, electrical machinery, petroleum products, tobacco, and vehicles totaled about \$3.3 billion. Import partners included Brazil (30.9%), Argentina (23.3%), China (16.6%), the United States (4%), and others (25.2%) (U.S. Central Intelligence Agency, 2005§).

In December 2004, the Executive Board of the International Monetary Fund (IMF) completed the third review under a \$76.2 million standby agreement for Paraguay and granted an extension of the agreement until September 30, 2005. The agreement, which was originally granted in December 2003 for a 15-month period, allows the country to receive subsidized loans from the IMF. The extension of the agreement was approved based on the financial findings for 2004, which included Paraguay's better-than-expected macroeconomic performance, a real GDP growth of almost 3% (the highest in almost a decade), a decrease of 3% in the country's inflation (the lowest in more than two decades), fiscal accounts that were in surplus for the first time in a decade, and international reserves that were at a record-high level (Banco Central del Paraguay, 2004, p. 1-4; International Monetary Fund, 2004, 2005; Comisión Económica para América Latina y el Caribe, 2005).

Paraguay's economy was highly dependent on its neighboring countries and fellow members of the Southern Cone Common

Market [Mercado Común del Sur (MERCOSUR)], which created a free trade zone among Argentina, Brazil, and Uruguay. Agriculture represented almost 25% of Paraguay's economy. Important mineral industries included cement, hydroelectric power, steel, sugar, textiles, and wood products. Paraguay had no known natural gas or oil reserves but was a major exporter and producer of hydroelectric power. To meet its crude oil and petroleum products demand, Paraguay relied completely on imports of approximately 25,000 barrels per day (bbl/d) based on 2003 estimates (U.S. Energy Information Administration, 2005§).

Commodity Review

Metals

Iron and Steel.—Based on the world crude steel production report of the International Iron and Steel Institute, Paraguay produced 107,000 metric tons (t) of crude steel in 2004, which was a 17.6% increase compared with production in 2003 (table 1) (International Iron and Steel Institute, 2005§).

Industrial Minerals

Cement.—The Paraguayan state-owned company Industria Nacional del Cemento (INC) planned to invest \$15 million during 2005 to increase and optimize cement production. According to the president of INC, another \$80 million will be invested in the construction of a 1.2-million-metric-ton (Mt) clinker production line. INC, which was the only cement producer in Paraguay, has an installed capacity of 675,000 metric tons per year (t/yr) (International Cement Review, 2004).

Mineral Fuels

Natural Gas.—A new hydrocarbons law proposed in 2004 contained legislation aimed to promote natural gas usage, although Paraguay was neither a consumer nor a producer of this form of mineral fuel. The main purpose of this initiative was to decrease the consumption of charcoal and firewood in an attempt to diminish the rapid pace of deforestation in the country. Paraguay's Government announced in September 2004 their intention to expand natural gas exploration activities in northwestern Paraguay through the granting of 12 hydrocarbon exploration and production (E&P) concessions that totaled 26 million hectares. Local companies involved in the E&P concessions included Amerisur S.A. (a subsidiary of Chaco Resources Plc), Aurora Petróleos S.A., Boreal Petróleos S.A., and Paraguay Gas; foreign companies included Guaraní Exploration, H.A. & E.R. Exploraciones, Hidroener Consultora,

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

Pilcomayo Petróleos S.A., and Union Oil Co. (Rigzone.com, 2004b§; U.S. Energy Information Administration, 2005§).

In early 2004, CDS Oil & Gas Group Plc of the United Kingdom reported the completion of a production test of the natural gas well Independencia-1, which is located in the Chaco region of northwestern Paraguay. The company reported a well flow rate of 960,000 cubic feet per day (27,200 cubic meters per day); additional exploration and drilling was planned to determine the feasibility of commercial production of gas from this well. Given the results of analysis in the Independencia-1 well, CDS Oil & Gas Group expressed an interest in exploring for petroleum and natural gas fields in the northwestern part of the country. Paraguay's Deputy Mining and Energy Minister indicated optimism about the possibility of a natural gas field discovery, which could trigger the production of hydrocarbons in Paraguay (Alexander's Gas & Oil Connections, 2004a§, b§; U.S. Energy Information Administration, 2005§).

Petroleum.—Petróleos Paraguayos (Petropar) (the stateowned oil company) was responsible for the management of all crude oil and petroleum product imports and sales. Petropar also operated Paraguay's only refinery, which had a capacity of 7,500 bbl/d. In September 2004, Petropar held bidding rounds and awarded Glencore International A.G. of Switzerland, Petróleo Brasileiro S.A. (Petrobrás) of Brazil, and Repsol YPF, S.A. of Spain contracts to supply oil and petroleum products to Paraguay through January 2005 (U.S Energy Information Administration, 2005§).

In November 2004, the presidents of Paraguay and Venezuela signed an energy cooperation agreement in which Venezuela's state oil company, Petróleos de Venezuela S.A., will supply 18,600 bbl/d of crude refined products and liquid petroleum gas to Paraguay. The agreement will be valid for a year beginning February 2005 and was offered under preferential financing terms, which required Paraguay to pay 75% of the fuel value within 90 days of delivery and the remaining 25% during the next 15 years at a 2% fixed annual rate of interest (Rigzone.com, 2004a§).

Outlook

Paraguay's economy was expected to continue to grow in 2005 and 2006 at a rate of 5.2% and 5.1%, respectively (International Monetary Fund, 2005§). The increase in the GDP will be highly dependant on the continued regional economic stability of neighboring countries Argentina and Brazil.

The cement industry was expected to grow during 2005 and on into the near future with equipment renewals, planned expansions, and the construction of a new clinker plant by INC. Exploration activities for natural gas in Paraguay were expected to be very active during 2005 given the discovery of natural gas in the Independencia-1 well.

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URUGUAY

Uruguay, which is located on the southwestern coast of South America, is bordered by Argentina to the west; Brazil to the northeast; the Atlantic Ocean to the southeast; Rio de la Plata's delta to the southwest; and Rio Uruguay, which it shares with neighboring country Argentina, to the west (Rand McNally, 1995). Uruguay has a total area of 176,220 km² and had an estimated population of 3.4 million as of 2004. In 1811, the then-Spanish possession initiated a revolt against Spain; by 1821, Uruguay was annexed to Brazil as a separate province and, in 1825, declared its independence. Shortly thereafter, Uruguay strategically adhered to a regional federation with Argentina to defeat Brazil in a 3-year war over Uruguay's territory. In 1828, the Treaty of Montevideo, which was encouraged by the United Kingdom, created the independent state of Uruguay (United Nations Population Fund, 2004; U.S. Central Intelligence Agency, 2004§, 2005§; World Bank, 2004§).

In 2004, Uruguay, which was a founding member of MERCOSUR, had an estimated GDP based on purchasing power parity of \$30.99 billion, which was an increase of 12.6%

compared with that of 2003 (International Monetary Fund, 2005§). The main industries in Uruguay were chemicals, electrical machinery, food processing, petroleum refinery products, textiles, and transportation equipment.

Uruguay's mineral industries include clays, semiprecious gemstones, gold, iron and steel, sand and gravel, and stone. In 2004, exports constituted about \$2.2 billion for such commodities as dairy products, fish, leather, meat, rice, and wool. Export partners included the United States (17.3%), Brazil (16%), Germany (6.3%), Argentina (6.2%), Mexico (4.2%), and others (50%). Imports of such goods as chemicals, machinery, crude petroleum, and vehicles constituted about \$2.1 billion in 2004. Import partners included Argentina (19.5%), Brazil (19%), Paraguay (12.9%), the United States (9.2%), China (6%), and others (33.4%) (U.S. Central Intelligence Agency, 2004§, 2005§).

Uruguay's economy was highly dependent on those of its MERCOSUR partners. Setbacks and instability in Brazil's and Argentina's economies and finances affected Uruguay's economy from 1999 to 2002. In 2004, Uruguay's real GDP growth was 12.3%, which was a record high for recent years. Other factors, such as a reduction in inflation, an increase in world prices for Uruguayan agricultural exports, an economic revitalization of other MERCOSUR countries, and a \$2.9 billion aid package from the IMF contributed to the recovery of Uruguay's economy (U.S. Energy Information Administration, 2005§).

In 2002, Uruguay consumed 7.2 billion kilowatt-hours (Gkwh) of electricity, and power generation was reported as 9.1 Gkwh. In 2004, the Dirección Nacional de Energía y Tecnología (DNETN) reported 5.8 Gkwh of gross electricity generation and electricity consumption of 6.2 Gkwh. The difference between the production and consumption of electricity was compensated for by electricity imports from Argentina and Brazil. The country's 2.1 gigawatts of installed electricity-generating capacity came from four hydroelectric dams: Salto Grande (2.85 Gkwh; 50% capacity shared evenly between Argentina and Uruguay), Constitucion (0.98 Gkwh), Gabriel Terra (0.53 Gkwh), and Baygorria (0.40 Gkwh). Uruguay's remaining electric demand was met by thermal-fired powerplants (U.S. Energy Information Administration, 2005§).

Commodity Review

Metals

Gold.—Gold production in Uruguay has been decreasing since 2000 owing to depletion of ore reserves. Gold production in the country had decreased by about 29% from 2000 to 2003; from 2003 to 2004, production increased by 13.4% (table 1).

The only operating gold mine in Uruguay during 2004 was the Minas de Corrales Gold project (also known as San Gregorio), which includes the San Gregorio gold mine (Minera San Gregorio S.A.). Minas de Corrales, which is located 450 kilometers (km) north of the capital city of Montevideo in the Department of Rivera in northern Uruguay, was sold to the Canadian-based company Uruguay Mineral Exploration Inc. (UME) in October 2003. UME purchased all the shares of Bolir S.A., Brimol S.A., Dalvan S.A., Glendora S.A., Minera

San Gregorio S.A., and Montemura S.A. from Crystallex International Corporation of Canada for a purchase price of \$2 million. The total amount was paid in two 6-month installments of \$1 million each in April 2004 and October 2004. UME was a gold exploration and production company that operated exclusively the San Gregorio processing facility and gold mines at Minas de Corrales. The processing plant was fed from the San Gregorio and the Zapucay mines; future plans included processing of materials from the Arenal, the Castrillon, and the Sobresaliente deposits as well (Uruguay Mineral Exploration Inc., 2004, p. 3-4, 10-11; 2005a§-d§, Portal Uruguay, 2004§).

The Arenal gold deposit, which is located 3 km from the San Gregorio processing plant, was discovered in March 2003. The Arenal deposit was part of the Minas de Corrales Gold project and was considered the largest identified gold resource in Uruguay. By October 2004, the Arenal mine was commissioned and was expected to start production during fall 2004. Reports from UME that were based on several analyses from the Castrillon and the Sobresaliente deposits revealed measured resources of 82,000 Mt at a grade of 2.19 grams per metric tons (g/t) of gold and 283,000 Mt at a grade of 1.48 g/t gold, respectively. Both deposits were believed to contain granitehosted quartz veins. Evaluation of the grade and metallurgical characteristics of both deposits was scheduled to begin in 2005. UME's mining plans for 2005 included an increase in gold production at its Uruguay properties to approximately 3,000 kg (100,000 troy ounces), and exploration for copper, diamond, and nickel targets (Portal Uruguay, 2004§; Uruguay Mineral Exploration Inc., 2005a§-d§).

During 2004, another gold exploration agreement was reached by Uruguayan-based mineral exploration company DelcoSur S.A. and Everton Resources Inc. of Canada. Everton agreed to acquire the option to purchase up to 100% of the shares of DelcoSur. The prospecting permit agreement covered 70,400 hectares in the southern part of the country that comprises the Florida Greenstone Belt, which measures approximately 250 km long and between 5 and 30 km wide. The property included the Nueva Helvecia prospect, which DelcoSur and Everton estimated had a surface trenching value of 30.7 g/t of gold across 8.45 meters. Everton's acquisition agreement allowed the company to purchase up to 50% of DelcoSur's shares for a payment of \$60,000, the issuance of 1,250,000 Everton shares, and a \$2,550,000 work commitment during a period of 3 years. To acquire a 70% share in DelcoSur, Everton must issue an additional 1,500,000 shares and invest an additional \$1 million in work commitments. To acquire 85% of DelcoSur shares, Everton must fund a feasibility study and issue an additional 2 million shares. Exploration started in the Florida Greenstone Belt during fall 2004; work included a ground geophysical study, a drilling program at the Nueva Helvecia prospect, sampling, and trenching (Everton Resources Inc., 2004).

Iron and Steel.—Uruguay's Dirección Nacional de Minería y Geología (DINAMIGE) reported production of 9,319 t of iron ore in 2004, which was an increase of about 57% compared with that of 2003 (table 1). The 2004 production of crude steel reported by DINAMIGE was 55,000 t, which was an increase of about 34% compared with that of 2003 (table 1).

Industrial Minerals

During 2004, the increase of Uruguay's production of clays, semiprecious gemstones (agate and amethyst), and sand and gravel was evident when compared with 2003 production (table 1). Meanwhile, the production of different types of such stone as flagstone, diorite, dolomite, dimension granite, limestone and marl was varied when compared with that of 2003 (table 1).

Clay production increased by 34%; agate, by 152%; amethyst, by about 12%; common sand, by 76%; and gravel, by 63%. Production in the stone sector in 2004 varied as follows when compared with that of 2003: diorite and dolomite decreased by about 22% and 19%, respectively; flagstone, dimension granite, limestone, and marl increased by about 108%, 28%, 27% and 5%, respectively.

Mineral Fuels

Natural Gas.—Uruguay has no proven natural gas reserves; therefore, the natural gas supply was imported through two existing pipelines between Argentina and Uruguay. The first pipeline, Conducto del Litoral, had an operating capacity of 4.9 million cubic feet per day (138,753 cubic meters per day) and was managed by the state-owned oil company Administración Nacional de Combustibles, Alcohol y Portland (ANCAP). The second pipeline, Gasoducto Cruz del Sur, had an operating capacity of 176 million cubic feet per day (about 5 million cubic meters per day) and was owned by a consortium of international companies: British Gas Plc of the United Kingdom (40%), Pan American Energy L.L.C. of Argentina (30%), ANCAP of Uruguay (20%), and Wintershall AG of Germany (10%). In April 2004, an energy crisis in Argentina lead to a reduction in natural gas exports to Uruguay, which pushed the country to find alternative supply sources. In September 2004, Uruguay signed a natural gas supply agreement with Bolivia. In 2004, the Administración Nacional de Usinas y Transmisiones Eléctricas (UTE) proposed the construction of a 350- to 400-megawatt gas-fired powerplant (U.S. Energy Information Administration, 2005§).

In September 2004, the Ministerio de Industria, Energía y Minería signed an agreement with its Bolivian counterpart to buy 150,000 cubic meters of gas per day by 2005. The gas will be used to feed a powerplant in Uruguay. Larger volumes of gas were expected by 2006 from a gas pipeline that links northwest Argentina and Bolivia (Rigzone.com, 2004§).

Petroleum.—Uruguay has no proven reserves of oil. In 2004, the country's daily oil consumption was approximately 31,000 bbl/d, which was imported from Argentina. Uruguay's sole refinery was La Teja facility, which is located near Uruguay's capital city Montevideo and had a capacity of 50,000 bbl/d. The state-owned oil company ANCAP administered the oil sector, including the exportation, importation, and refinement of oil and petroleum products (U.S. Energy Information Administration, 2005§).

Outlook

Uruguay's economy was expected to continue to grow in 2005 and 2006 at rates of 6.2% and 5.6%, respectively (International Monetary Fund, 2005§). The increase in the GDP will be highly dependant on the stable economy of neighboring countries Argentina and Brazil.

Although Uruguay's gold industry suffered a setback from 2000 through 2003, the industry will likely grow during 2005 owing to several gold exploration projects that were started in 2004. UME's plans to increase gold production in 2005 indicate interest in Uruguayan gold deposits and may drive interest from other foreign companies. UME's gold production is expected to be about 3,100 kg during 2005.

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 $\label{eq:table 1} \textbf{TABLE 1}$ PARAGUAY AND URUGUAY: PRODUCTION OF MINERAL COMMODITIES 1

(Metric tons unless otherwise specified)

Country and commodity PARAGUAY ²	2000	2001	2002	2003	2004
	650	650	650	660	650
Cement, hydraulic ^c thousand metric tons Clays: ^c	650	650	650	660	030
	66,500 ³	66 500 3	((700	(((00	(((00
Kaolin	233,500 ³	66,500 ³	66,700	66,600	66,600
Other, unspecified	,	233,500 ³	233,000	230,000	230,000
Gypsum ^e	4,400	4,300 ³	4,300	4,500 r, 3	4,500
Iron and steel:	00.010	-1	0= 400	00 000 1 4	100 000 4
Pig iron	82,018	71,765	87,600	98,000 ^{r, 4}	100,000 e
Semimanufactures	63,287	56,729	51,700	51,600 e	51,600 °
Steel, crude	76,784	67,034	80,400	91,000 r, 4	107,000 4
Lime ^e	90,000	100,000 3	100,000	90,000	90,000
Petroleum, refinery products:	600	(00	(00	(00	(00
Distillate fuel oil ^e thousand 42-gallon barrels	600	600	600	600	600
Gasoline do.	632	675	670	660	660
Jet fuel do.	21	21	20	20	20 250
Kerosene do.	191	249	200	250	
Liquefied petroleum gas do.	628	638	630	630	630
Residual fuel oil do.	255	263	450	460	460
Unspecified ^e do.	37	37	37	40	40
Total do.	2,364	2,483	2,610	2,660	2,660
Pigments, mineral, natural, ocher ^e	300	300	300	250	250
Sand, including glass sand ^e	25,000	27,500	25,000	25,500	25,500
Stone: ^e					
Dimension thousand metric tons	70	70	70	70	70
Crushed and broken:					
Limestone, for cement and lime	16,320 ³	16,320 ³	16,000	16,300	16,300
Marble	750	750	750	750	750
Other	2,000	2,000	2,000	2,000	2,000
Talc, soapstone, pyrophyllite ^e	200	200	200	200	200
URUGUAY					
Aluminum, secondary ^e	45	45	45	45	45
Barite	33	12	15 ^e	15 ^e	15 ^e
Bentonite	120	125	70 ^{r, 5}	230 r, 5	122 5
Cement, hydraulic ^e thousand metric tons	700	1,015 3	1,000	1,050	1,050
Clays, unspecified	24,483	24,886	26,076 r, 5	35,444 r, 5	47,519 ⁵
Coke, gashouse	5,000	5,500	5,000 e	5,000 ^e	5,000 e
Feldspar	2,493	4,722	1,550 r,5	2,450 r, 5	1,950 5
Gemstones, semiprecious:					
Agate	529	416	1,004 r,5	5,361 r,5	13,513 5
Amethyst	87	179	140 r, 5	390 r, 5	435 5
Gold kilograms	2,177	2,083	2,079	1,550 r,6	1,758 ⁶
Gypsum thousand metric tons	1,076	1,127	1,130 e	1,130 e	1,130 e
Iron and steel:					
Iron ore	5,853	9,743	7,768 r, 5	5,941 r,5	9,319 5
Metal:					
Ferroalloys, electric-furnace ferrosilicon crust ^e	200	200	200	200	200
Semimanufactures	34,312	28,830	32,400 e	32,300 ^e	32,000 e
Steel, crude	38,102	30,890	34,900 e	41,000 r,4	55,000 4
Lime ^e	10,000	10,000	10,000	10,000	10,000
Petroleum, refinery products: ^e	,	,	,	,	7
Distillate fuel oil thousand 42-gallon barrels	4,100	4,100	4,100	4,200	4,200
Gasoline do.	2,200	2,200	2,200	2,200	2,200
Kerosene do.	500	500	500	500	500
Liquefied petroleum gas do.	400	400	400	400	400
Residual fuel oil do.	3,600	3,600	3,600	3,650	3,650
Unspecified do.	280	280	280	280	280
Total do.	11,100	11,100	11,100	11,200	11,200
Total do.	11,100	11,100	11,100	11,200	11,200

See footnotes at end of table.

TABLE 1--Continued PARAGUAY AND URUGUAY: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Country and commodity		2000	2001	2002	2003	2004
URUGUAYConti	inued					
Sand and gravel:						
Sand, common	thousand metric tons	2,699	2,697	1,265 r, 5	958 r, 5	1,210 5
Gravel		49,776	40,373	24,095 r,5	29,417 r, 5	48,023 5
Stone:						
Flagstone		3,688	3,590	3,278 r, 5	2,697 r, 5	5,605 5
Granite:						
Dimension		6,817	4,369	3,463 r, 5	3,768 r, 5	4,834 5
Crushed and broken, alum schist	thousand metric tons	810	528	392 r, 5	1,072 r, 5	625 5
Other, rough stone		238,600 ^r	13,585 ^r	10,765 ^r	5,450 ^r	4,950
Diorite	thousand metric tons	1,076	1,092	1,100	1,019 r, 5	798 5
Dolomite		8,229	5,468	4,518 r, 5	12,177 r,5	9,839 5
Limestone	thousand metric tons	1,259	1,127 r, 5	754 ^{r, 5}	830 r, 5	1,052 5
Marble, in blocks and broken: ^e						
Onyx		60	121 3	120	121 r, 3, 5	$122^{-3,5}$
Travertine		35	39	30	27 r, 3, 5	3, 5
Other, unspecified		163	170	160	115 r, 3, 5	120
Marl		12,154 r,5	6,780	4,861 r,5	3,142 r, 5	3,310 5
Quartz		20	146	150 e	150 e	150 e
Other, including ballast	thousand metric tons	2,821	2,523	1,580 r,5	1,035 r, 5	1,453 5
Sulfur, elemental, byproduct ^e		3,000	3,000	3,000	3,000	3,000
Talc, soapstone, pryophyllite		2,903	1,694	816 r, 5	1,095 r, 5	1,042 5
Tuff, tufa	thousand metric tons	1,044	1,185	341 r, 5	1,281 r,5	142 5

^cEstimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. ^rRevised. -- Zero.

 ${\it TABLE \ 2}$ PARAGUAY AND URUGUAY: STRUCTURE OF THE MINERAL INDUSTRIES IN 2004

Country and comm	Country and commodity Major operating com		Location of main facilities	Annual capacity	
PARAGUAY					
Cement	thousand metric tons	Industria Nacional del Cemento (INC)	Cemento Vallemi	675 (2005).	
			Tte Alcorta esq. Avda.		
			Fernando de la Mora		
			Asuncion - Paraguay		
Petroleum, refinery products	thousand	Petróleos Paraguayos (Petropar)	Villa Elisa refinery	2,700.	
	42-gallon barrels		Villa Elisa municipality,		
			15 km north of Asuncion,		
			near Paraguay River		
URUGUAY					
Gold	kilograms	Uruguay Mineral Exploration Inc. (UME)	Minas de Corrales Gold	3,000.	
			project located in the		
			Department of Rivera,		
			northern Uruguay, 450 km		
			north of the capital city of		
			Montevideo		
Cement	metric tons	Compañía Uruguaya de Cemento Portland S.A	Mine and clinker plant	500,000.	
			located in the Department		
			of Lavalleja		

¹Includes data available through December 2005.

²In addition to the commodities listed, construction materials (clays, miscellaneous rock, sand, and weathered tuffs) were presumably produced, but available information is inadequate to make reliable estimates of output levels.

³Reported figure.

⁴Source: International Iron and Steel Institute.

⁵Source: Dirección Nacional de Minería y Geología.

⁶Source: Bureau de Recherches Géologiques et Minières.