THE MINERAL INDUSTRY OF

SPAIN

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Spain is a significant European producer of nonferrous and precious metals, with some of the most mineralized territory in Western Europe. The main polymetallic deposits, from west to east, include Tharsis, Scotiel, Rio Tinto, and Aznalcollar. There are very few large mines. In terms of value of metallic and nonmetallic minerals and quarry products, Spain is a leader among the European Union (EU) countries. Consequently, Spain had one of the highest levels of self-sufficiency with respect to mineral raw materials among the EU members. Of a total of approximately 100 mineral products mined, only about 18 are produced in significant quantities. These are: bentonite, calcinated magnetite, copper, fluorspar, glauberite, iron, lead, mercury, potassic and sepiolitic salts, pyrites, quartz, refractory argillite, sea and rock salt, tin, tungsten, and zinc.

Production of many metallic minerals in Spain is insufficient to meet domestic demand, so these must be imported. However, for most nonmetallic minerals, production far exceeds domestic consumption, and thus there is a surplus, which is exported. The economic development of certain regions, such as the Basque country and Asturias, was based on their mineral wealth, and mining continues to be an important current and potential source of income in these and other areas.

The overall economic conditions in which mining took place in Spain were less than favorable, with some strong points. The average annual growth in gross national product (GNP) was about 2.2%, a decrease from that of 1995. Unemployment in the fourth quarter stood at a relatively high 21.8%. The average annual increase in inflation was 4.7% (Mining Journal, 1996c). The trade deficit, measured by figures from the Customs Branch, decreased by 6.1% in the first 7 months of the year compared with that of the similar period of 1995, as exports rose. With regard to the public deficit, cumulative figures to August indicated a reduction of the deficit of 9% compared with that of the previous year. (Accessed November 18, 1997, on the World Wide Web at URL http://tuspain.com/). Privitization of the Spanish mining industry continued and was the subject of protest at a number of mining operations throughout the country because of employment issues.

With a few exceptions, the year was marked by a decline in output of mineral products. Of the major metals, the only commodity with a significant increase in metal mine production was copper. Mine production of copper rose 66% compared with that in 1995. Production of gold, iron ore, lead, silver, and zinc declined. Total refined copper production also increased, rising 61% year on year. However, lead metal output dropped slightly, while zinc rose slightly. Primary aluminum metal production stayed about the same. The mercury mines at Almaden operated at relatively low levels, with production rising only slightly, owing to lower levels of demand because of environmentally driven international pressures to reduce mercury content in finished products. Among industrial minerals, fluorspar and magnesite production remained nearly constant, while potash production was estimated to decrease about 20% and sepiolite was estimated to increase 7%. Quarried mineral products, particularly quarried stone, accounted for a significant share of the value of all mineral production in Spain. In mineral fuels and related materials, coal and crude oil output declined by 4% and 21%, respectively. (*See table 1.*)

Trade flows were liberalized after Spain joined the EU and the differences between Spanish tariffs and EU Common Market tariffs nearly erased. The only commodities in which Spain was a net exporter to other EU countries in 1996, thereby reducing its trade deficit, were lead, mercury, nonmetallic mineral manufactured products, slate and other crude industrial minerals, and zinc. With respect to rest-of-world trade, Spain was a net exporter of iron and steel, lead, magnesite, mercury, nonmetallic mineral manufactured products, and slate. (*See tables 3 and 4.*)

Spain was one of the largest coal producer in the EU, with 27.4 million tons for the year. Coal reserves are abundant in Spain but difficult to mine. Consequently, cost of production is higher, making Spanish coal less competitive than that of many other countries. The leading producer of soft coal was Huelleras del Norte S.A. (Hunosa), and the leading producer of lignite was Empresa Nacional de Electricidad S.A. (ENDESA). The country continued to be a large importer of mineral fuels. Spain's production of crude oil was very limited—3.8 million barrels in 1996.

The mineral industry was composed of a mix of state and privately owned companies. Minerals belonged to the state under an arrangement known as the "Regalía Principal." The Mining Law of July 19, 1944, as amended, and the Hydrocarbon Law of December 26, 1950, governed the mineral industry. The Ministry of Industry and Energy implemented the mineral laws, regulated the private sector, and managed most of the stateowned companies through the Instituto Nacional de Industria (INI), a state holding company. INI and Instituto Geológico y Minero are the principal Government mineral-resource agencies.

The companies, domestic and foreign, conducting exploration for copper, gold, lead, and zinc were Almagrera, Atlantic Copper Holding S.A., Minas de Rio Tinto, Riomín BP, SEIEMSA Bureau de Recherches Géologiques et Minières (BRGM), Boliden Apirsa SA, Outokumpu Oyj, Caledonian, and Nava Resources, principally in the southeastern pyrite belt. Prospecting for lead and zinc was carried out by Outokumpu in Galicia, León, Cantabria, and Viscava; by Asturiana de Zinc at Reocín (Cantabria) and by Navan at Mazarrón (Murcia). Gold was being sought in northeastern Spain in Asturia by Reo Narcea Gold Mines, which acquired concessions and permits which belonged to the Spanish subsidiary of Anglo American Corp. The Narcea Gold exploration program was believed to be the largest in Western Europe, involving a total of 1,261 square kilometers of mining concessions and investigation permits and 4,200 square kilometers of prospecting licences located on the gold-bearing belts Río Narcea, Navelgas, Oscos, and Salavé (Mining Journal, 1996c). Mining development was started on the deposit at El Valle-Boinas and in December work was begun on three pits. A total of 32,127 meters was drilled at 189 locations, raising reported reserves to 63 million grams of gold in a total of 14.7 million metric tons (Mt) of ore with an average grade of 4.1 grams per ton of gold (Mining Journal, 1996c).

Alumina and primary aluminum were produced almost entirely by the Industria Española del Aluminio S.A. (Inespal). Inespal was a holding company with four operating subsidiaries: Aluminio Español S.A., Inespal Extrusión S.A., Inespal Conversión S.A., and Inespal Productos Planos S.A. INI was Inespal's major shareholder. Alúmina Española S.A., a subsidiary near San Ciprián, produced alumina, primary aluminum in standard sheets and ingots, and special alloys.

Copper was mined mainly at the deposits in Sotiel and Migollas in Huelva, mined by Almagrera, and at Aznalcollar (Los Frailes deposit) in Seville, mined by Boliden Apirsa. Almagrera recovered 360,000 tons (t) of copper-bearing ore from its Migollas deposit with grades of 3.29% copper. From the Sotiel deposit, 355,000 t of complex ore were mined with grades of 0.8% copper, 1.91% lead, and 4.61% zinc. Among the companies mining pyrite are Almagrera SA, Boliden Apirsa SL, and Nueva Tharsis SAL (Mining Journal, 1996c). In September, Boliden Apirsa started up a new open pit mine. The company produced 26,057 t of copper concentrates with 21.1% copper, and 372 g/t of silver; 26,344 t of lead concentrates with 49.01% lead and 559 g/t of silver; and 86,663 t of zinc concentrates with 47.37% zinc, and 102 g/t of silver (Mining Journal, 1996c).

Expansion of RioTinto Minera's copper refinery in Huelva, in southern Spain, was completed, and production was expected to reach full capacity in June. The expansion, from 190,000 tons of copper per year (t/yr) to 270,000 t/yr, made the operation the fifth largest copper refinery in the world (Mining Magazine, 1996). Production in the third quarter was a record, with operating income of \$2.4 million, as compared with a loss of \$5.6 million for the same period of 1995. This was a reflection of the higher volumes and treatment charge rates. In an unrelated development, Rio Tinto Minera, S.A. also changed its name, in September, to Atlantic Copper Holding, S.A. (Accessed October 22, 1996, on the World Wide Web at URL http://biz.yahoo.com/b...006_1.html+y0023+96+10).

Caledonia Mining Corporation of Toronto announced that it had completed financing arrangements with the Canadian

Imperial Bank of Commerce to provide a total of \$13 million for the plant expansion of its 98.3% owned Filón Sur Gold Mine in Spain. Filón Sur had the capacity to process 600,000 t of ore per year to produce approximately 866 kilograms (kg) of gold and 4,945 kg of silver. The plant expansion, expected to be completed by yearend, would increase production annually to1 Mt of ore, with approximately 1,555 kg of gold. Of the \$13 million, \$7.5 million was to be used for the plant expansion program, and the balance was to be distributed in two stages, with \$2.5 made available after commissioning (Caledonia Mining Corp., 1996).

Río Narcea Gold Mines announced the results of a bankable feasibility study. The study confirmed the economic viability of the company's El Valle project in Asturias, in northwestern Spain. MinCorp., of Denver, CO, conducted the study. An open pit mining operation with a 0.6 million t/y capacity mill having an average feed grade of 5.5 g/t is planned. Average cash operating costs over 7.5-year mine life are estimated at \$4,534/kg. Pre-production capital expenditures were expected to be \$45 million. The project permitting process was completed during the year, paving the way for start of construction. The first gold would would not be produced until late 1997 or early 1998. The three planned open pits planned contain an estimated 23,045 kg of recoverable gold. Total resources are estimated at 65,300 kg, excluding resources in the "Black Skarn" deposit, a zone of major copper-gold-silver mineralization located at depth at El Valle. Another coppergold skarn deposit, the Carles, is located 10 km north of El Valle. A feasibility study by Ango American Corp. in 1991 indicated a gold and base metal sulfide resource at Carles of approximately 16,794 kg of recoverable gold. Further drilling was underway to confirm the finding (Mining Journal, 1996b).

The furnace dust procesor Cía Industrial de Asua-Erandio (Aser) treated 90,323 t of furnace dust during fiscal 1995-96. Sales for the period totaled 35,611 t. Exports were distributed to Japan (42%), Germany (35%), France (12%), and the Netherlands (11%). Aser was negotiating a long-term contract with Spain's Asturiana de Zinc for the sale of Waelz oxide. Aser made its first shipment to the company, which could become its principal customer. A fall in zinc treatment charges, a rise in the grade of zinc dust, strong growth in exports, and a rise in the average price of Waelz oxide all contributed to the improved performance of Aser. The company expected to treat 80,000 t of dust during the 1996-1997 fiscal year (Metal Bulletin, 1996a).

Outokumpu Oyj and Rio Tinto Minera (RTM) signed a memorandum of understanding in December for the transfer of explortion rights from RTM to Outokumpu. The areas covered are in the Provinces of Badajoz, Huelva, and Sevilla, in areas known as La Monaguera and La Remonte, where the Agua Blanca nickel-copper deposit is located. Exploration rights, titles, and interests were to be transferred. Outokumpu in turn formed a 50:50 consortium with Prereducidos Integrados del Curieste (Presur), a company in which the Spanish Government holds an interest (Engineering and Mining Journal, 1996b; Mining Journal, 1996a).

The principal producer of iron ore was Compañia Andaluza

de Minas (CAM), which works its mines at Marzuesado (Granada), but mining was halted in October, and remained inactive for the rest of the year (Mining Journal, 1996a).

Navan Resources delayed the development of its Mazarrón zinc-lead-silver deposit, 120 km south of Alicante, while awaiting planning permission from various Spanish departments. Mine production was to be from an open pit. The concentrator was expected to produce about 47,000 t/yr of lead and zinc concentrates, from which 20,000 t/yr of zinc, 7,000 t/yr of lead, and 21,770 kg of silver would be recovered. Production was not expected to begin until the first half of 1998. Ore reserves were estimated at 9.08 million tons, grading 2.58% zinc, 0.6% lead, and 16 g/t of silver (Metal Bulletin, 1996b; Engineering and Mining Journal, 1996a). Navan Resources also acquired from Sociedad Estatal de Participaciones Industriales (a government-owned entity) the Minas de Almagrera, SA, in the Andevalo region of the Province of Huelva. Workers at the mine protested by striking for 4 days in December against Spain's privitization program. In this sale the Government gained \$3.43 million (Metal Bulletin, 1996c).

Production at the Aznalcollar Mine outside Seville terminated at yearend. However, production started at the nearby Los Frailes, one of the biggest open pit mines in Europe, making Boliden, its operator, one of the largest zinc producers in the world. Ore production at Los Frailes was estimated to be approximately 4 M t/yr (Accessed November 7, 1997, on the World Wide Web at URL http://www.trellgroup.se/ trellgroup/boliden/LOSFRAILES.html).

Anglo Pacific Resources plc (APR) of South Africa, in a joint venture with Geocesa jv (70% and 30% ownership, respectively), completed the evaluation of an andalusite project near Picobello in northwestern Spain. Development was expected to begin early in 1996. This would be only Europe's second domestic source of andalusite, the first being at Glomel, Brittany, in France. Anglovaal Ltd., APR's largest shareholder, owns the world's largest single andalusite operation, Rhino Andalusite Mines (Pty) Ltd. in South Africa. The joint venture has also recently obtained a permit for exploration for graphite in southeastern Spain (O'Driscoll, 1996).

Tolsa SA, the privately owned Spanish minerals and mining group, purchased the Bentonite and Absorbents Department of Redland Minerals, the industrial minerals business of Redland Aggregates Ltd. in July. Tolsa is also the world's largest producer of sepiolite (meerschaum). The company is known for production of cat litters, animal feeds- and mineral-based industrial and consumer products, serving markets throughout Europe. The new company was to trade under the name Steetley Bentonite and Absorbents Ltd. Tolsa has headquarters in Madrid, with clay mining operations at Vicalvaro-Vallecas, Madrid, and Yunclillos, Toledo (sepiolite); subsidiaries produce attapulgite at Torrejón el Rubio, Cáceres; sepiolitic clav at Lebrija in Sevilla; and peat at Vivero in Lugo. The group produced about 0.5 Mt/yr of sepiolite-based products for pet litter (70%), followed by aggregates (24%), while bricks and other segments contributed 6% (Industrial Minerals, 1996b).

Spanish cement production dropped 2.5% in 1995-96 to 24.7 Mt, but was still far ahead of production during 1994-95.

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Export increases in cement and clinker from the country rose from just under 5 Mt in 1994 to 5.6 Mt in 1995, and continued to rise in 1996 to 6.3 Mt, including 2.4 Mt of clinker shipments (International Bulk Journal, 1997).

FLS Industries AS of Spain said that its Spanish unit secured a \$60 million order for a turnkey cement production line for Spain's Cementos Portland SA. The new line, to be installed at Cementos Portland's El Alto factory, near Madrid, would have a cement production capacity of 700 t/day. The plant currently has a cement production capacity of 1.2 Mt/yr (International Cement Review, 1996b). In another development, Cementos Alfa planned to invest substantially over the next 4 years in its Mataporquera plant in Cantabria, northern Spain. Estimated output at the plant was to be 750,000 t/yr (International Cement Review, 1996a).

Ceramics has become an increasingly important industry in Spain, representing almost 1% of the country's GDP. The tile industry, with 400 million square meters of production, leads the industry, followed by brick and roof tile production (15 M t/yr). Spain produces almost 9 million pieces of sanitary ware annually, about 500,000 t of glazes and frits, and 340,000 t of refractory materials. Spain also produces tableware (60 million pieces), giftware, traditional ceramics, and advanced technical ceramics. Spain has an excellent supply of red clay and ball clay raw materials from which to make many of these products (Regueiro and others, 1996).

Minersa y Productos Derivados SA (Minersa), a fluorspar producer, acquired Bayer AG's share in Derivados del Fluor SA (DDF), thereby increasing downstream integration of the company. The purchase raises Minersa's share to 72%. DDF produces anhydrous and aqueous hydrogen fluoride from a 40,000 t/yr-capacity plant at Ontón in Cantabria, which sells the liquid or processes it into aluminum fluoride, cryolite, ammonium bifluoride, sodium fluoride, fluoborates, fluotitanates, etc. Minersa operates three underground mines in Asturias, at Moscón, Emilio, and Jaimina, and processes the ore in a 150,000 t/yr-capacity flotation plant at Berbes. Planned output of acid grade fluorspar in 1996 was about 112,500 t. Minersa has for many years provided fluorspar feedstock to meet DDF's requirements (Industrial Minerals, 1996a). Magnesite production in Spain is of caustic calcined grades for non-refractory markets, or crude magnesite produced from deposits at Eugui, Navarra, and used to make magnesia-based refractory bricks. Output of both has been trending upward in the 1990's. The increase in crude magnesite production is a reflection of the improvements in the steel industry, where refractory bricks are used to line furnaces.

An increasing proportion of granular potash has been produced by Grupo Potasas, and with a decline in potash consumption in Spain, exports have been rising, mainly to other European countries (Phosphorus and Potassium, 1996).

Erkimia of Barcelona and the Spanish Government-owned Minas de Almadén are planning to increase production of strontium carbonate. A new process is being tested at a 400-t/yr pilot plant in Cartagena. At full scale, 2,000 t/yr would be produced. This is a diversification for Minas de Almadén, which traditionally has operated mercury mines in Spain (Chemical Week, 1996a).

Among the companies mining pyrite are Almagrera SA, Boliden Apirsa SL, and Nueva Tharsis SAL (Mining Journal, 1996a).

Production of coal by the ENDESA Group declined 12.1% from that of 1995. Of the total, 7.63 Mt were produced by the parent company and 1.11 Mt by the subsidiary ENCASUR. The decrease was attributed to reduced use of the As Pontes fossilfuel plant and the replacement of lignite as the only fuel used at the plant. Total volume of coal purchases also decreased. Purchases of Spanish coal increased by 2.3%, and use of imported coal declined by 15.5%.

The Spanish Government reduced its share in the petroleum company Repsol to 10% from 21% by selling a portion of the refining and petrochemicals company to private and institutional investors (Chemical Week, 1996b). In general, the Spanish Government expected that as much as \$2.3 billion could be set aside over several years to provide redevelopment aid for northern coal mining regions. However, Government subsidies to state and private sector mines were to continue for some years. All of Spain's coal production, about 17 Mt/yr, was used for electricity generation. A European Coal and Steel Community treaty, set to expire in 2002, allowed Spain to continue subsidies, but called for the country to liberalize its coal market, reduce aid to this sector, and reduce production. That these conditions had not been met was a source of controversy within the EU (Financial Times, 1996).

References Cited

Caledonia Mining Corp., 1996, Caledonia's Spanish subsidiary announces \$U.S. 13 million financing: Caledonia Press Release, March 18.

Chemical Week, 1996a, Erkimia plans strontium carbonate unit: Chemical

Week, October 30, p. 25.

ENDESA, 1997, ENDESA Group Activities, press release, September 30, 2 p.

- Engineering and Mining Journal, 1996a, Lead and zinc: Engineering and Mining Journal, v. 197, no. 1, January, p. 25.
- ——1996b, Spain: Engineering and Mining Journal, v. 197, no. 12, December, p. 17.
- Financial Times, 1996, Spanish coal regions win big aid: Financial Times, December 19, p. 92.
- Industrial Minerals, 1996a, Mineras buys HF plant: Industrial Minerals, no. 347, August, p. 10.
- International Bulk Journal, 1997, Cement industry slowdown clouds trade outlook: International Bulk Journal, v. 17, no. 9, September, p. 7.
- International Cement Review (ICR), 1996a, Cementos Alfa invests: ICR's Building Bulletin, May, p. 8.

- Metal Bulletin, 1996a, Aser sees improved results: Metal Bulletin, no. 8137, December 12, p. 12.
- ——1996b, Mining problems continue as Navan delays Spain's Mazarron zinc-lead-silver project: Metal Bulletin, no. 8136, December 9, p. 9.
- ——1996c, Strike ends at Almagrera, Metal Bulletin, no. 8137, December 12, p. 13.
- Mining Journal, 1996a, Outokumpu's Spanish memorandum: Mining Journal, v. 327, no. 8390, August 9, p. 105.
- ——1996b, Rio Narcea on track: Mining Journal, v. 327, no. 8398, October 4, p. 263.
- Mining Magazine, 1996, RTM expands Helva smelter, Spain: Mining Magazine, v. 174, no. 3, March, p. 202.
- O'Driscoll, Mike, 1996, Anglo Pacifice Resources, adding a new dimension to the highlands: Industrial Minerals, no. 341, February, p. 62-64.
- Phosphorus and Potassium, 1996, A new strategy for a single market: Phosphorus and Potassium, no. 202, March-April, p. 15-19.
- Rugueiro, Manuel; Sánchez, Enrique; Criado, Emilio; and Solana, V.S., 1996, Ceramics in Spain—high winds for earth and fire: Industrial Minerals, no. 348, September, p. 75-89.

TABLE 1 SPAIN: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity	1992	1993	1994	1995	1996 e/
METALS					
Aluminum:					
Bauxite	3,900				
Alumina 2/	959,100	1,060,000	1,070,600 r/	1,070,580 r/	1,094,797 3/
Metal:	_				
Primary	359,022	364,256	338,106	361,100	361,829 3/
Secondary	96,500	99,700	103,500 r/	106,975 r/	153,837 3/
Cadmium metal	361	365	387	397 r/	307 3/
Copper:		2 510	1.0.10	22 (14)	27 510 24
Mine output, Cu content	9,432	3,518	4,940	22,614 r/	37,510 3/
Metal:	_				
Drimory		125 800	141 600	124 200	248 500 2/
Secondary		133,800	46 800	47 100	248,300 3/
Total	147,000	180,600	188.400	181 400	22,400 3/
Refined:		100,000	100,100	101,100	270,900 3/
Primary	134.325	180.600	141.600	117.100	210.000
Secondary	44.775	180.600	46.800	47.100	54.000
Total	179,100	361,200	188,400	164,200	264,000
Gold, mine output, Au content kilogram	is 6,572	6,083	5,852	4,131 r/	3,128 3/
Iron and steel:					
Iron ore and concentrates (including byproduct concentrate), Fe content					
thousand tor	<u>1,641</u>	1,109	2,086	960 r/	588 3/
Metal:					
Pig iron do	<u>5,076</u>	5,394	5,447	5,128	4,127 3/
Ferroalloys, electric furnace de	0. <u>145 e/</u>	117	70	125	125
Steel:	_				
Crude do	<u>).</u> 12,295	12,646	13,547	13,975	12,038 3/
Castings and forgings do	<u>). 160 e/</u>	165	175	121 r/	123
Total	12,455 e/	12,811	13,722	14,096 r/	12,161
Semimanufactures do	<u>.</u> 10,753	11,563	12,103	13,175 r/	11,647 3/
Lead:		25 200	22 572	20.077/	22.826.21
Mine output, Pb content		25,300	23,573	30,077 r/	23,826 3/
Drimony	- 62.000	62 400	70.400	*/	
Secondary	58,000	61,000	75,000	1/ 82 000 r/	76.000
Mercury metal thousand kilogram		64	393	1 497 r/	1 500
Silver mine output Ag content	<u>191 000</u>	192.418	195.754	123.615 r/	65 878 3/
Tantalum minerals (tin byproduct): e/	<u>. </u>	192,110	190,101	120,010 1/	00,070 0/
Gross weight do		6.000	5.000	r/	
Ta content de	2,000	1,500	1,200	r/	
Tin:					
Mine output, Sn content do). 7	2	5	2	2
Metal, primary e/	2,230	2,000	2,000	1,589 r/ 3/	1,200
Titanium dioxide e/	30,000	25,000	20,000	20,000	18,000
Uranium, mine output, U3O8 content	187	215	301	420 r/	424 3/
Zinc:	_				
Mine output, Zn content	204,655	170,200	150,422	172,400 r/	140,100 3/
Metal, primary and secondary	352,000	328,000	298,700	354,000 r/	360,000
INDUSTRIAL MINERALS	_				
Barite	6,194 r/	17,656 r/	28,037 r/	28,600 r/	28,000
Bromine e/	250	200	200	200	100
Cement, hydraulic, other than natural thousand tor	<u>s</u> 24,615	22,878	25,131	26,423	25,157 3/
Clays:		05 000	95 000	04.000 / 2/	04.000
Attapulgite e/		85,000	85,000	94,266 r/ 3/	94,000
Bentonite e/		150,000	150,000	1/2,265 r/ 3/	172,000
Other a/		148,000	∠90,000 13 650	25 200	15 000
Distemite and tripoli	<u>10,000</u> 36,000	38,000	13,030	23,300 28.271 r/	30,000
Faldspar	247.000	230,000	250,000	20,2/1 1/	400.000
I ciuspai	247,000	239,000	230,000	517,204 I/	400,000
Acid-grade	94 000	82 000	97 000	108 205 r/	109 085 3/
Metallurgical-grade	2.960	5 000	10,000	10.206 r/	7.441 3/
Total		87.000	107.000	118,411 r/	116.526 3/
Gypsum and anhydrite, crude thousand tor	6 760	7.250	7,300	7 495 r/	7.500
	5,700	,,200	7,500	1,125 1/	7,500

TABLE 1--Continued SPAIN: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity		1992	1993	1994	1995	1996 e/
INDUSTRIAL MINERALSContinued						
Kyanite, andalusite, related materials e/		3,600	3,000	3,500	2,000 r/	2,000
Lime, hydrated and quicklime e/	thousand tons	1,200	1,200	1,000	1,500	1,500
Magnesite:						
Calcined		133,032	131,000	135,000	150,000 e/	150,000
Crude e/		400,000	400,000	400,000	491,397 r/ 3/	490,000
Mica e/		250	250	250	200	200
Nitrogen, N content of ammonia	thousand tons	479	354	360 e/	400 e/	400
Pigments, mineral: e/						
Ocher		7,910	8,000	8,000	7,000	8,000
Red iron oxide		18,000	16,000	16,000	15,000	15,000
Potash, K2O equivalent		593,605	660,900	683,700	759,923 r/	600,000
Pumice e/		800,000	700,000	700,000	700,000	700,000
Pyrite, including cuprous, gross weight	thousand tons	862	722	746	875 r/	850
Salt:						
Rock, including byproduct from potash works						
	do.	2,710	2,510	2,850	2,215 r/	2,400
Marine and other	do.	965	900	850	1,471 r/	1,500
Sand and gravel, silica sand e/ 4/	do.	2,180	2,200	2,000	2,000	2,200
Sepiolite e/		400,000	400,000	375,000	375,000	400,000
Sodium compounds, n.e.s.:						
Soda ash, manufactured e/	thousand tons	500	500	500	500	500
Sulfate: Natural						
Glauberite, Na2SO4 content		482,000	260,000 e/	350,000 e/	637,525	630,000
Thenardite, Na2SO4 content		189,000	158,000 e/	250,000 e/	176,600	175,000
Manufactured e/		150,000	150,000	150,000	150,000	100,000
Stone: Calcareous e/						
Chalk	thousand tons	659	500	400	136 r/ 3/	140
Dolomite	do.	4,380	4,500	4,400	4,608 r/3/	4,600
Limestone	do.	1,750 r/	1,600 r/	1,450 r/	2,326 r/ 3/	2,400
Marble	do.	1,990	2,130	2,132	1,978 r/3/	2,000
Marl	do.	3,960	4,000	5,000	5,145 r/3/	5,200
Basalt	do.	3,000	4,480	4,500	1,195 r/3/	1,200
Granite	do.	980	1,170	1,338	1,800 r/ 3/	2,000
Ophite	do.	1,750	2,500	2,500 r/	2,165 r/ 3/	2,200
Phonolite	do.	700	500	600 r/	677 r/ 3/	650
Porphyry	do.	958	500	500	783 r/3/	800
Quartz	do.	991	1,600	1,500	1,445 r/ 3/	1,500
Quartzite	do.	1,332	1,000	2,000 r/	2,255 r/ 3/	2,200
Sandstone	do.	1,700	1,600	1,500	2,629 r/3/	2,600
Serpentine	do.	811	800 r/	900 r/	979 r/ 3/	900
Other	do.	600 r/	600 r/	600 r/	619 r/ 3/	600
Strontium minerals: e/						
Gross weight		65,000	50,000	50,000	106,000 r/ 3/	100,000
Sr2O4 content		18,000	12,000	12,000	99,000 r/ 3/	94
Sulfur:						
S content of pyrites	thousand tons	406	327	350	403 r/	479 3/
Byproduct: e/						
Of metallurgy	do.	258	250	250	250	250
Of petroleum	do.	90	100	100	100	100
Of coal (lignite) gasification	do.	2	2	2	2	2
Total sulfur e/		756	679	702	755 r/	831
Talc and steatite e/		70.000	65.000	65.000	112.000 r/ 3/	100.000
MINERAL FUELS AND RELATED MATER	IALS					
Coal (marketable):						
Anthracite	thousand tons	6 180	6.050	6756 r/	6 275 r/	6 4 8 7 3/
Bituminous	do	12,400	13.300	12,000	11.425 r/	11.262 3/
Lignite		18 700	17 457	15 499	10 776 r/	9 604 3/
Total		37 280	36.807	34.255 r/	28 476 r/	27.353 3/
Coke metallurgical e/		2 940	3,000	3,000	2 4 3 8 3/	2410 3/
Gas natural (marketed)	llion cubic meters	1 220	633	107	2, 4 30 5/ 477 r/	2, 4 10 J/
Peat e/	mon cubic mettro	70,000	70 000	70,000	70 000	50 000

TABLE 1--Continued SPAIN: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodit	У	1992	1993	1994	1995	1996 e/
MINERAL FUELS AND RELATEI	D MATERIALSContinued					
Petroleum:						
Crude	thousand 42-gallon barrels	7,818	6,376	5,879	4,747 r/	3,759 3/
Refinery products:						
Liquefied petroleum gas	do.	21,541	18,600	19,848	21,019 r/	17,655 3/
Naphtha	do.	22,040	19,600	19,006	12,900 r/	19,797 3/
Gasoline, motor	do.	84,499	79,300	84,388	82,544 r/	83,113 3/
Jet fuel	do.	25,899	24,500	29,192	32,064 r/	33,504 3/
Kerosene	do.	26,404	25,100	29,249	12,555 r/	581 3/
Distillate fuel oil	do.	122,128	114,000	121,695	124,097 r/	129,080 3/
Residual fuel oil	do.	121,188	97,900	94,912	80,366 r/	73,213 3/
Other e/	do.	30,000	30,000	30,000	52,696 r/	50,624 3/
Refinery fuel and losses e/	do.	12,000	12,000	12,000	13,531 r/	12,026 3/
Total e/	do.	465,699	421,000	440,290	431,772 r/	419,593

e/ Estimated. r/ Revised.

1/ Table includes data available through Sept. 1997.

2/ Reflects aluminum hydrate.

3/ Reported figure.

4/ Includes sand obtained as a byproduct of feldspar and kaolin production.

TABLE 2SPAIN: STRUCTURE OF THE MINERAL INDUSTRY OF 1996

(Thousand metric tons unless otherwise specified)

	Major operating companies	Location of	Annual
Commodity	and major equity owners	main facilities	capacity
Alumina	Alumina Española S.A.	Alumina plant at San Ciprián, Lugo	1,000
Aluminum	Aluminio Español S.A.	Electrolytic plant at San Ciprián, Lugo	180
Do.	Industria Española del Aluminio, S.A.	Electrolytic plant at Avilés	100
Do.	do.	Electorlytic plant at La Coruña	25
Do.	Aluminío de Galicia S.A.	Electorlytic plant at Sabiñánigo	78
Do.	do.	do.	14
Coal:			
Anthracite	Antracitas Gaiztarro S.A.	Mines at María and Paulìna	2,000
Do.	Antracitas de Gillón S.A.	Mines near Oviedo	2,000
Do.	Antracitas del Bierzo S.A.	Mines near León	1,000
Bituminous	Hulleras del Norte S.A. (Hunosa)	Various mines and plant	3,300
Do.	Hulleras Vasco Leonesa S.A.	Santa Lucia Mine, Leon	2,000
Do.	Minas de Figaredo S.A.	Mines near Oviedo	1,000
Do.	Nacional de Carbon del Sur (Encasur)	Rampa 3 and San Jose Mines, Cordoba	200
Lignite	Empresa Nacional de Electricidad (Endesa)	As Pontes Mine, and Andorra Mine, La Coroña	1,500
Barite	Minas de Baritina S.A. (Kali-Chemie of	Mine and plant in Espiel area, Córdoba	50
	Germany, 100%)		
Cement	Approximately 36 cement companies,	54 plants, including	44,000
	of which the largest is	5 (Asland) plants, of which the largest ones	(6,000)
	Asland S.A.	are plants at Puerto de Sagunto, Valencia,	2,000
		and at Villaluenga de la Sagra, Toledo	2,000
Copper:			
Metal	Atlantic Copper Holding S.A. (Freeport	Smelter at Huelva	85
	MacMoRan Inc., 65%; Ercros Group, 35%)		
Do.	do.	Electrolytic refinery at Huelva	105
Do.	Industrias Reunidas de Cobre	Smelter at Asua-Bilbao	30
Do.	Electrolítico y Metales S.A.	Fire and electrolytic refinery at	36
	·	Asua-Bibao	
Ore	Atlantic Copper Holding, S.A. (Freeport	Mines and plant at Arientero, near	12
	MacMoRan Inc., 65%, Ercros Group, 35%)	Santiago de Compostela, Galicia	
Do.	do.	Corta Atalay opencast mine, Cerro	30
		Colorado opencast mine and plant, and	
		Alfredo underground mineall in Rio	
		Tinto area	

TABLE 2--Continued SPAIN: STRUCTURE OF THE MINERAL INDUSTRY OF 1996

(Thousand metric tons unless otherwise specified)

		Major operating companies	Location of	Annual
Commodity		and major equity owners	main facilities	capacity
Fluorspar, ore		Fluoruros S.A. (Bethelhem Steel Corp., 49%)	Plant at Caravia, near Colunga	400
Do.		do.	Opencast mmines at San Lino and Val	350
			Negro, and underground mine at	
			Eduardo, near Caraviaall in Asturias	
Do.		do.	Plant at Collada, Gijón	200
			Mines at Veneros Sur and Corona, Gijón	
Iron ore		Compañía Andaluza de Minas S.A.(Mokta, 62%)	Mine at Alquife, Granada	4,000
Do.		Altos Hornos de Vizcaya S.A. (U.S. Steel, 25%)	Nine mines in Province of Vizcaya	4,000
Do.		Compañìa Minera Siderúgica de Ponferrada S.A.	Eight mines in Province of León	3,000
Do.		Minera del Andévalo S.A.	Opencast mine at Coba, Huelba	2,000
Lead:				
Metal		Sociedad Minera y Metalúrgica de Peñarroya	Smelter at Cartagena, Murcia	60
		de España, S.A. (Peñarroya, France, 98%)	Refinery at Cartagena, Murcia	60
Do.		Compañia La Cruz, Minas y Fundaciones	Smelter at Lineares, Jaén	40
		de Plomo S.A.	Refinery at Lineares, Jaén	40
Do.		Tudor S.A.	Secondary smelter at Saragoza	16
Do.		Ferroaleaciones Españolas, S.A.	Secondary smelter at Medina del Campo	12
Do		Derivados de Minerales y Metales	Secondary smelter at Barcelona	5
Ore		Sociedad Minera y Metalúrgica de Peñarroya	Opencast mine at Montos de Los Azules.	25
		España S.A. (Peñarrova, France 90%)	near Unión. Murcia	
Do		Andaluza de Piritas S A (APIRSA)	Opencast mine at Aznalcóllar, Sevilla	21
Do		Exploración Minera International	Underground mine at Rubiales Lugo	
D0.		$E_{\text{spaña}} \leq A_{\text{spaña}} (EXMINESA)$	Challes, Eugo	10
Magnacita		Magnesitas de Pubión S A	Plants at Zubiri	100
Do		do	Figures and plant poor Sarria south of Luco	100
D0.	floolro	du. Minee de Almedér y Americanes S A	Mines and prant near Sarria, south of Lugo	70 000
Wercury	Hasks	(Concernment 1000/)	Mine and smener at Affiaden	70,000
D. (1		(Government 100%)		
Petroleum:	h	Character C. A	O'lf ald at Carablenas	200
	barrels per day	Chevron S.A.		300
Refined	do.	Repsol Petroleo S.A.	Refineries at Escombreras	200,000
Do.	do.	do.	Puertollano	14,000
Do	do.		Tarragona	260,000
Do.	do.	Refineria de Petróleos del Norte S.A. (Petronor)	Refinery at Somorrostro	240,000
Do.	do.	Compañía Española de Petróleos S.A.	Refinery at Santa Cruz de Tenerife	160,000
Do.	do.	Petroleos del Mediterraneo S.A. (Petromed)	Refinery at Castellón de la Plana	120,000
Do.	do.	Compañía Iberica Refinadora de Petróleos	Refinery at La Coruña	140,000
		S.A. (Petroliber)		
Potash, ore		Potasas de Navarra S.A.	Mines and plant near Pamplona	
Do.		Minas de Potasas de Suria S.A.	Mines at Suria	1,000
Do.		Uníon Explosivos Rio Tinto S.A.	Mines at Balsareny/Sallent and Cardona	2,000
Pyrite		Compañia Española de Mines de Tharsis	Mines and plants at Tharsis and Zarza,	1,300
			near Seville	
Do.		do.	Plant at Huelva	600
Do.		Rio Tinto Minera S.A. Uníon Explosivos	Mines and plant at Rio Tinto, near	900
		(Rio Tinto, 75%; Rio Tinto Zinc, 25%)	Seville	
Sepiolite		Tolsa S.A.	Mine and plant at Vicalvaro, near Toledo	100
Do.		Silicatos-Anglo-Ingleses S.A.	Mine and plant at Villecas near Madrid	200
Steel		Empresa Siderúrgica S.A. (Ensidesa),	Plants at Avilés, Veriña, and Mieres	6,000
		(Government, 100%)	in Oviedo, and Moreda, Gijón	
Do.		Altos Hornos de Viscaya S.A. (U.S. Steel, 20%)	Ironworks and steelworks at Sestao, Bilbao	1,500
Uranium, U3O8	metric tons	Empresa Nacional del Uranio (Enusa),	Mines and plant near Ciudad Real	500
		(Government, 100%)	*	
Zinc:				
Metal		Asturiana de Zinc S.A.	Electrolytic zinc plant at San Juan	200
			de Nieva	
Ore		do.	Reocin mines and plants near	500
			Torrelayega Santander	500
Do.		Andaluza de Piritas S A (APIRSA)	Open pit mine at Aznalcóllar	3 500
DV.			Sevilla	5,500
Do		Exploración Minera International Ecnaña	Underground mine at Rubiales Lugo	500
D0.		$S \Delta (FXMINES\Delta)$	Chaorground mine at Rublaics, Eugo	500
Do		Sociedad Minera y Metalýrgica de	Mines and plants at Montos de los	200
D 0.		Penarrova-Espano S A	A rules y Sierre de Luier - Son A sustin	200
		i chanoya-España S.A.	Azures y Siena de Lujai, San Agusun	

TABLE 3 SPAIN: EXPORTS OF SELECTED MINERAL COMMODITIES IN 1996 1/

(Metric tons unless otherwise specified)

				Destinations
			United	
Commodity		Total	States	Other (principal)
METALS				
Aluminum:				
Ore and concentrate	thousand tons	2,457		Guinea 2,366; Greece 41.
Oxides and hydroxides		39,912	170	Germany 18,439; France 15,612; Netherlands 3,007.
Metal including alloys:		41 501	1 000	
Scrap		41,781	1,903	France 13,612; Portugal 6,912; Russia 5,833.
Conwrought		137,279	48	Italy 34,203; Portugal 24,207; Netherlands 20,760.
Antimony, motal including allows, all forms		180,098	23,780	Germany 26: Maxiao 8: Erango 5
Cadmium metal including alloys, all forms		380		Netherlands 375: France 5
Cobalt:		580		Netherlands 575, 11ance 5.
Ore and concentrate		31		Finland 30: Belgium-Luxembourg 1
Oxides and hydroxides		24		Portugal 10: Netherlands 5: United Kingdom 3
Metal including alloys, all forms		49	8	Republic of Korea 15: Netherlands 12: Philippines 9.
Columbium and tantalum, metal including alloys, tanta	lum	9		France 5: Germany 4.
Copper:				
Ore and concentrate		736,576	10,824	Indonesia 460,761; Chile 128,146; Portugal 100,000.
Matte and speiss including cement copper		77		France 76; Portugal 1.
Metal including alloys:				· · · · · · · · · · · · · · · · · · ·
Scrap		59,273	2,509	France 13,406; Germany 9,530; Argentina 9,102.
Unwrought		116,836	3,394	United Kingdom 33,664; Italy 29,950; France 27,848.
Semimanufactures		104,366	218	Italy 37,378; Portugal 27,564; France 10,660.
Gold:				
Waste and sweepings vi	alue, thousands	\$100	\$23	Germany \$38; Switzerland \$24; Venezuela \$13.
Metal including alloys, unwrought and partly wrough	nt			
	kilograms	15,201	1,345	Portugal 7,703; United Kingdom 5,563; Italy 518.
Iron and steel, metal:				
Scrap	thousand tons	4,480	67	France 1,416; United Kingdom 1,392; Netherlands 419.
Pig iron, cast iron, related materials		1,590	191	Cuba 727; France 173; Germany 108.
Ferroalloys:		717	0.1	Destroyal 200: Even as 154: Calas 152
Ferrornomium		22.174	026	Cormony 7 060; Italy 5 470; United Kingdom 1 500
Ferromanganese		22,174	926	All to Portugal
Ferrosilicomanganese		54.685	2 888	Germany 13 004: Italy 10 200: Portugal 7 181
Ferrosilicon		3 278	2,000	Portugal 2 260: United Kingdom 500: Erance 431
Silicon metal		10,781	1,175	United Kingdom 4 218: France 3 684: Italy 713
Unspecified		602		Portugal 325: Netherlands 65: Cuba 59.
Steel, primary forms		245,137	3,272	France 95,686; Italy 63,962; India 18,059.
Semimanufactures:		,		
Flat-rolled products:				
Of iron or nonalloy steel:				
Not clad, plated, coated		827,165	22,670	France 155,219; Portugal 92,999; Italy 74,812.
Clad, plated, coated		627,616	75,862	France 104,531; United Kingdom 93,144; Belgium-Luxembourg
				42,361.
Of alloy steel v	alue, thousands	\$750,215	\$117,466	Germany \$125,038; France \$87,615; Hong Kong \$32,379.
Bars, rods, angles, shapes, sections	thousand tons	2,751	220	Portugal 488; France 280; United Kingdom 205.
Rails and accessories		11,850	377	Germany 2,273; Argentina 1,819; Portugal 1,310.
Wire		174,863	2,119	France 65,451; Portugal 35,751; Iran 20,217.
Tubes, pipes, fittings		459,966	22,904	France 90,489; Portugal 62,383; Italy 31,365.
Manganese:		402.002		
Ore and concentrate, metallurgical-grade		402,092		South Africa 222,008; Brazil 78,724; Ghana 30,355.
Uxides		164		Portugal 78; Cuba 45; South Africa 20.
Menung alloys, all forms		1,565		Norway 498; Germany 209; Italy 200.
Referring more motols motols including allows your motols	vaht and	549	14	Hong Kong 121; Netherlands 55; Komania 58.
Platinum-group metals, metals including alloys, unwrot	ugni anu	\$5 371	\$5 332	Germany \$2 378: France \$1 980: United Kingdom \$602
Silver	alue mousanus	\$5,571	\$5,552	Germany \$2,378, France \$1,989, Onned Knigdom \$002.
Ore and concentrate	kiloorams	28 512	1 342	Indonesia 16 275: Morocco 6 949: Chile 4 114
Metal including alloys unwrought and partly wrough	t	20,312	1,342	monesm 10,275, morocco 0,777, Cille 7,117.
v	alue, thousands	\$36,176	\$111	Germany \$9.805: Portugal \$9.344: France \$6 875
Tin:		-20,170	Ψ111	
Ore and concentrate		66		All to Nigeria.

TABLE 3--Continued SPAIN: EXPORTS OF SELECTED MINERAL COMMODITIES IN 1996 1/

(Metric tons unless otherwise specified)

			Destinations
		United	
Commodity	Total	States	Other (principal)
METALSContinued			
TinContinued:			
Metal including alloys:			
Scrap	28		Belgium-Luxembourg 24; France 4.
Unwrought thousand tons	\$823		Italy \$334; Portugal \$178; Germany \$177.
Semimanufactures	99	(2/)	Italy 75; Cuba 9; Mexico 8.
Titanium:			
Ore and concentrate	138,171		Australia 134,954; South Africa 1,278.
Oxides	7,301		Canada 6,235; Malaysia 601; Libya 80.
Metal including alloys:			
Scrap and unwrought	61		Israel 20; Netherlands 16; Malta 7.
Semimanufactures	302	(2/)	United Kingdom 93; Brazil 52; Italy 41.
Zinc:			
Ore and concentrate	521,113	20,939	Canada 279,824; Morocco 103,763; Peru 60,106.
Oxides	2,702		France 1,847; Portugal 571; Italy 115.
Blue powder	34		Italy 26; Belgium-Luxembourg 4; Germany 3.
Metal including alloys:			
Scrap	2,251		France 975; Italy 555; Belgium-Luxembourg 208.
Unwrought	198,139	83,465	Netherlands 48,965; France 31,271; Italy 12,807.
Semimanufactures value thousands	\$596		Portugal \$364; France \$45; Morocco \$32.
Zirconium, ore and concentrate	83,582	160	South Africa 48,187; Australia 28,234; Germany 2,268.
INDUSTRIAL MINERALS			
Asbestos, crude	27,030	9	Canada 15,450; Zimbabwe 6,721; Russia 3,362.
Barite and witherite	64,381		United Kingdom 26,547; Venezuela 20,796; Algeria 4,808.
Boron materials:			
Crude natural borates	93,935		Turkey 81,530; Argentina 12,306.
Oxides and acids	3,372		Italy 3,210; France 85; Portugal 64.
Cement thousand tons	6,206	1,755	Algeria 780; Ghana 772; Cote'd Ivoire 343.
Diamond, natural, gem not set or strung value, thousands	\$1,105		Belgium-Luxembourg \$798; Andorra \$218.
Feldspar	215,198		Turkey 133,060; France 46,811; Canada 15,098.
Fertilizer materials:			
Crude, n.e.s.	26,190		Andorra 7,304; Italy 6,949; Portugal 5,817.
Manufactured:	10.001		
Ammonia	12,334		Morocco 10,292; Iran 1,062.
Nitrogenous	440,556		Netherlands 135,060; Germany 82,089; France 76,591.
Phosphatic	2,412		Portugal 1,092; Mexico 412; Saudi Arabia 192.
Potassic	/15,/80		France 521,3/4; Italy 50,562; Belgium-Luxembourg 28,0/8.
Consecutive and mixed	255,628	22	Italy 70,877; Portugal 52,089; France 40,205.
Gypsum and plaster	27,241	2,114	Morocco 20,565; France 2,797; Portugal 916.
Lime thousand tons	/,134	1,797	Algeria /86; Ghana //2; France 561.
Pyrite, unroasted	149		Germany 77; Italy 48; Austria 24.
Stone, sand and gravel:			
Dimension stone:	522 702	5 600	Drazil 111 276. Managan 01 607. South Africa 66 597
Worked	<u>332,703</u> 824,182	42 282	Erange 245 047: Correspond 156 627: Hang Kang 62 561
Delemite chiefly refrectory crede	169 947	42,385	France 243,047; Germany 130,027; Hong Kong 02,301.
Crowel and anythed model	108,847		United Kingdom 132,/19; France 5,/30.
Limestone other than dimension	328,348		Morocco 294,095; Portugai 11,915; Italy 11,040.
Quartz and quartzite	1 560	(2)	Air to Includinalias.
Qualization qualizate	512.055	(2/)	Memory 220, India 552, France 254.
Sulfur:	515,955	125	Morocco 381,839; France 32,744; Souin Africa 38,625.
Elemental:			
Crude including pative and hyproduct	62 222		France 57 737. Italy / 272
Colloidal proginitated sublimed	652		All to Eropoo
Dioxide	1 400		An to Flance.
Sulfuric acid	301 770	30 001	Portugal 62 358: France A6 664: Brazil A2 006
Tale steatite soanstone nyronhyllite	28 160	57,901	France 25 730. China 6 522. Balajum Luzamboura 1 051
I are, steame, soapstone, pyrophymic Vermiculite perlite etc	<u> </u>	3/8	Greece 28 465: Turkey 10 000: South Africa 4 856
MINERAL FUELS AND DELATED MATEDIALS	+1,402		Grove 20,403, Turkey 10,000, S0ulli Allica 4,030.
Carbon black	21.676	Л	United Kingdom 6 542: France 5 416: Italy 5 195
See footnotes at end of table	21,070	4	Onice Eniguoni 0,342, France 3,410, Italy 3,193.
See roomotes at the or labit.			

TABLE 3--Continued SPAIN: EXPORTS OF SELECTED MINERAL COMMODITIES IN 1996 1/

(Metric tons unless otherwise specified)

				Destinations
			United	
Commodity		Total	States	Other (principal)
MINERAL FUELS AND RELATED MATE	RIALSContinued			
Coal:				
Anthracite		180	180	
Bituminous		223		Portugal 204; Andorra 19.
Coke and semicoke		94,597		France 38,570; United Kingdom 11,619; Morocco 8,701.
Peat including briquets and litter		3,912		Germany 2,335; France 995; Turkey 320.
Petroleum:				
Crude	value, thousands	\$12		Cuba \$6; France \$5.
Refinery products:				
Liquefied petroleum gas		147,298		Morocco 76,336; Portugal 30,728; Senegal 27,021.
Gasoline, motor	thousand tons	2,607	460	France 317; Netherlands 313; Belgium-Luxembourg 304.
Mineral jelly and wax		35,102	54	Portugal 6,791; Morocco 3,565; Italy 3,178.
Kerosene and jet fuel	thousand tons	2,459		Nigeria 155; United Kingdom 85; unspecified 1,927.
Distillate fuel oil	do.	1,718		Morocco 321; France 242; Malta 227.
Lubricants		330,500		India 70,801; Portugal 45,820; United Arab Emirates 18,466.
Residual fuel oil	thousand tons	5,137	925	Gibraltar 1,020; Italy 447; unspecified 1,554.
Bitumen and other residues		557,441	61,805	Portugal 185,925; France 115,964; Italy 62,846.
Bituminous mixtures		10,044		Portugal 4,064; Netherlands 2,087; France 1,226.
Petroleum coke		38,008		Portugal 13,641; United Kingdom 11,097; Germany 6,915.
1/ Table prepared by Virginia A. Woodson				

Table prepared by Virginia A. Woodson.
 Unreported quantity valued at less than \$15,000.

TABLE 4 SPAIN: IMPORTS OF SELECTED MINERAL COMMODITIES IN 1996 1/

(Metric tons unless otherwise specified)

			Sources
		United	
Commodity	Total	States	Other (principal)
METALS			
Aluminum:			
Ore and concentrate thousand to	ons 2,457		Guinea 2,365; Greece 42.
Oxides and hydroxides	39,912	170	Germany 18,439; France 15,612; Netherlands 3,007.
Metal including alloys:			
Scrap	41,781	1,903	France 13,612; Portugal 6,912; Russia 5,855.
Unwrought	127,594	280	Russia 58,130; France 12,777; Norway 8,392.
Semimanufactures	125,146	2,888	Germany 29,971; Italy 24,338; France 23,577.
Antimony, metal including alloys, all forms	1,179		China 1,089; Netherlands 33.
Cadmium, metal including alloys, all forms	13		Germany 10; Italy 2.
Cobalt:			
Ore and concentrate	31		Finland 30; Belgium-Luxembourg 1.
Oxides and hydroxides	540		Belgium-Luxembourg 224; Finland 181; Netherlands 60.
Metal including alloys, all forms	190	9	Belgium-Luxembourg 75; United Kingdom 57; France 24.
Columbium and tantalum, metal including alloys, all forms,			
tantalum	5		All from Germany.
Copper:			
Ore and concentrate	736,576	10,824	Indonesia 460,761; Chile 128,146; Portugal 100,000.
Matte and speiss including cement copper	77		France 76; Portugal 1.
Metal including alloys:			
Scrap	59,273	2,509	Germany 9,530; Argentina 9,102; United Kingdom 7,230.
Unwrought	41,419	36	Belgium-Luxembourg 13,831; Chile 7,238; France 4,836.
Semimanufactures	159,562	1,657	France 42,957; Italy 34,356; Germany 26,557.
Gold:			
Waste and sweepings value, thousan	ds \$1,144		All from Portugal.
Metal including alloys, unwrought and partly wrought			
kilograr	ns 28,213	971	United Kingdom 21,480; Sweden 2,065; Germany 1,244.
Iron and steel, metal:			
Scrap thousand to	ons 4,480	67	France 1,415; United Kingdom 1,393; Netherlands 419.
Pig iron, cast iron, related materials	614,332	1,322	Russia 331,022; Sweden 129,542; South Africa 20,300.
Conference of and after his			

TABLE 4--Continued SPAIN: IMPORTS OF SELECTED MINERAL COMMODITIES IN 1996 1/

(Metric tons unless otherwise specified)

			Sources
		United	
Commodity	Total	States	Other (principal)
METALSContinued			
Iron and steel, metalContinued:			
Ferroalloys:			
Ferrochromium	146,344		South Africa 96,396; Zimbabwe 12,252; Finland 9,507.
Ferromanganese	18,364		France 10,310; Norway 5,707; South Africa 1,668.
Ferronickel	28,043		New Caledonia 10,362; Indonesia 7,307; Greece 4,352.
Ferrosilicochromium	5,718		Zimbabwe 3,648; China 1,997; Germany 74.
Ferrosilicomanganese	21,563		Norway 13,813; China 3,827; France 2,801.
Ferrosilicon	33,346	641	Norway 18,222; Macedonia 3,405; Brazil 3,300.
Silicon metal	3,649	(2/)	Russia 1,455; China 1,219; Norway 409.
Unspecified	12,001	27.969	France 2,051; Brazil 1,017; China 1,282.
Steel, primary forms	412,995	27,808	Brazil 120,380; Mexico 79,493; Russia 65,490.
Elet rolled meduate			
	2 625	60	Erones 962, Comments 220, United Kingdom 291
Clad plated coated	076.643	09	France 302, Germany 253 (10: United Kingdom 121 035
Of allow steel	231 201	313	France 80 753: Germany 58 915: Italy 23 662
Bars rods angles shapes sections	817 222	207	Italy 215 471: United Kingdom 174 361: Portugal 53 570
Rails and accessories	8 888	6	Germany 1 797: Belgium-Luxembourg 1 525: France 1 524
Wire	74 842	56	Belgium-Luxembourg 16 994: Italy 14 815: Portugal 12 635
Tubes pipes fittings	469 907	477	Italy 129 951: Germany 99 671: France 81 588
Manganese:	409,907		hary 129,951, Germany 99,071, 11ance 01,500.
Ore and concentrate metallurgical-grade	402 092	4	South Africa 222 008: Brazil 78 724: Ghana 30 355
Oxides	1 045		Brazil 483: South Africa 258: Norway 124
Metal including alloys all forms	2 054		China 1 502: United Kingdom 193: Mexico 80
Mercury	2,031	(2/)	Italy 140: Germany 59: Belgium-Luxembourg 42
Platinum-group metals:		(2)	The provide the second s
Waste and sweepings value, thousands	\$1.623		Brazil \$660: France \$398: Chile \$284.
Metals including alloys, unwrought and partly wrought			
do.	\$13,938	\$347	United Kingdom \$5,956; Germany \$2,359; Switzerland \$2,022.
Silver:			
Ore and concentrate kilograms	28,512	1,173	Indonesia 16,275; Morocco 6,949; Chile 4,114.
Metal including alloys, unwrought and partly wrought			
value, thousands	\$66,030	\$1,948	France \$26,109; Italy \$12,619; United Kingdom \$7,472.
Tin:			
Ore and concentrate	66		All from Nigeria.
Metal including alloys:			
Scrap	81		France 80; Portugal 1.
Unwrought	25,869	229	Malaysia 21,486; China 1,497; Germany 595.
Semimanufactures value, thousands	\$3,603	\$37	France \$1,397; United Kingdom \$958; Germany \$799.
Titanium:			
Ore and concentrate	138,171		Australia 134,954; South Africa 1,278.
Oxides	9,532	44	Saudi Arabia 2,622; Australia 2,143; China 1,083.
Metal including alloys:			
Scrap and unwrought	1,107	112	Germany 559; Ukraine 197; United Kingdom 95.
Semimanufactures	358	181	Italy 76; Germany 46; Japan 17.
Zinc:			
Ore and concentrate	521,113	20,939	Canada 279,824; Morocco 103,763; Peru 60,106.
Oxides	26,952	58	France 10,508; Italy 5,228; Portugal 3,758.
Blue powder	1,770	(2/)	Germany 845; Belgium-Luxembourg 740; United Kingdom 102.
Metal including alloys:	210		Energy 102: Deates at 100: Heles 72
Scrap	319		France 123; Portugal 100; Italy 73.
	11,853		Beigium-Luxembourg /,438; Italy 3,200.
Ziroonium	2,370	4	France 1,000; italy 002; Netherlands 158.
Zircoinum.	02 500	170	South Africa 18 187: Australia 28 224: Common 2 269
Metal including allow:	03,382	100	50uui Aniica 40,107, Austrania 28,254; Germany 2,208.
Scrap and unwrought	100		All from Balgium Luxambourg
Semimanufactures	22	 Q	Germany 25
		0	Oviniany 23.

TABLE 4--Continued SPAIN: IMPORTS OF SELECTED MINERAL COMMODITIES IN 1996 1/

(Metric tons unless otherwise specified)

				Sources
			United	
Commodity	Т	otal	States	Other (principal)
INDUSTRIAL MINERALS				
Asbestos, crude		27,030	9	Canada 15,450; Zimbabwe 6,713; Russia 3,362.
Barite and witherite		10,429		Morocco 6,500; Germany 2,025; China 1,297.
Boron materials:				
Crude natural borates	9	93,935		Turkey 81,530; Argentina 12,306.
Oxides and acids		15,776	11,541	Turkey 2,575; Italy 620; France 446.
Cement thousand	tons	3,608	(3/)	Turkey 1,549; Greece 1,026; Romania 399.
Feldspar	2	15,198		Turkey 133,060; France 46,811; Canada 15,098.
Fertilizer materials:				
Crude, n.e.s.		14,984	216	Israel 4,057; Portugal 3,240; Italy 3,230.
Manufactured:				
Ammonia	6	10,784		Ukraine 223,159; Russia 70,594; United Kingdom 53,921.
Nitrogenous thousand	tons	1,401	(3/)	Belgium-Luxembourg 251; Netherlands 206; Germany 193.
Phosphatic	12	29,843	39	Lebanon 44,407; Morocco 23,409; Tunisia 15,248.
Potassic	35	57,341		Israel 117,082; Jordan 95,230; Canada 72,407.
Unspecified and mixed	89	92,844	4,964	Belgium-Luxembourg 135,320; Poland 113,885; Norway 113,009.
Gypsum and plaster	-	27,241	2,114	Morocco 20,565; France 2,797; Portugal 916.
Pyrite, unroasted		149		Germanny 77; Italy 48; Austria 24.
Stone, sand and gravel:				
Dimension stone:				
Crude and partly worked	53	32,703	5,600	Brazil 111,376; Morocco 91,607; Portugal 66,520.
Worked	5	37,367	43	Italy 45,510; Portugal 25,374; Greece 3,288.
Dolomite, chiefly refractory-grade		5,613	3	France 2,225; Germany 1,360; Norway 789.
Gravel and crushed rock	32	28,548		Morocco 294,693; Portugal 11,915; Italy 11,646.
Quartz and quartzite		1,560	(2/)	Germany 626; India 332; France 254.
Sand other than metal-bearing	5	13,955	125	Morocco 318,839; France 52,744; South Africa 38,625.
Sulfur:				
Elemental:				
Crude including native and byproduct	(52,222		France 57,737; Italy 4,272.
Colloidal, precipitated, sublimed		271	(2/)	France 235; United Kingdom 21.
Dioxide		4,970	90	Sweden 2,633; Italy 2,025.
Sulfuric acid	1	15,678	26	Italy 43,737; Portugal 19,372; Norway 11,924.
Talc, steatite, soapstone, pyrophyllite		38,162	578	France 25,739; China 6,523; Belgium-Luxembourg 1,051.
Vermiculite, perlite, etc.	4	47,402		Greece 28,465; Turkey 10,000; South Africa 4,856.
MINERAL FUELS AND RELATED MATERIALS				
Carbon black	(57,360	792	France 27,913; Portugal 11,626; Russia 6,259.
Coal:				
Anthracite	28	32,449		Netherlands 105,462; South Africa 67,815; United Kingdom
				26,661.
Bituminous thousand	tons	6,177	2,108	South Africa 1,943; Australia 885; Colombia 613.
Coke and semicoke	40	52,402	28,173	China 238,601; Poland 71,805; Portugal 36,550.
Gas, natural:				
Gaseous thousand	tons	1,080		Norway 890; Algeria 190.
Liquefied	do.	5,816		Algeria 4,151; Libya 940; United Arab Emirates 693.
Peat including briquets and litter	12	24,736	30	Germany 78,019; Estonia 10,941; Netherlands 10,646.
Petroleum:				
Crude thousand	tons	51,955	163	Nigeria 9,911; Saudi Arabia 8,059; Iran 6,508.
Refinery products:				
Liquefied petroleum gas	do.	1,182	(2/)	Algeria 349; Saudi Arabia 293; United Kingdom 279.
Gasoline, motor	do.	2,097	(3/)	Algeria 768; Italy 388; Greece 185.
Mineral jelly and wax		35,997	3,154	China 14,598; France 6,114; Germany 3,790.
Kerosene and jet fuel	1:	58,637	1	Netherlands 41,367; United Kingdom 21,948; Italy 21,548.
Distillate fuel oil thousand	tons	3,017	35	Italy 948; Russia 806; United Kingdom 583.
Lubricants	14	42,120	1,870	France 41,370; Italy 28,289; Portugal 15,132.
Residual fuel oil thousand	tons	1,328	(2/)	Russia 559; France 193; Italy 116.
Bitumen and other residues	32	23,739	96,223	France 65,423; Portugal 46,251; United Kingdom 22,406.
Bituminous mixtures		671		France 320; United Kingdom 156; Germany 96.
Petroleum coke thousand	tons	2,691	2,362	Venezuela 159; United Kingdom 94; Aruba 24.

1/ Table prepared by Virginia A. Woodson.2/ Unreported quantity valued at less than \$15,000.

3/ Less than 1/2 unit.