

THE MINERAL INDUSTRY OF GREECE

By Harold R. Newman

The mining and metal-processing sectors of the economy of Greece were small but important parts of the national economy and were highly concentrated. About 60% of the sector's turnover was handled by five mining companies. Bauxite was the most important of the Greek mineral commodities. Other important commodities were chromite, gold, iron, lead, nickel, and zinc. Aluminum was produced from domestic sources of bauxite and alumina and was important in the domestically integrated metal's sector. The steel produced was mostly from imported scrap. Greece was the largest producer of bauxite and nickel in the European Union (EU).

The industrial mineral sector was more important in the national economy than the metal sector. In 1998, the more important commodities were bentonite, magnesite, and perlite. Privatization efforts were continuing in the magnesite and refractories industries. Greece was the largest producer of magnesium and perlite in the EU. (See table 1.)

Production of mineral commodities in Greece was closely tied to the export market. Exports of minerals, such as bauxite, bentonite, nickel, and perlite, made up a major share of total revenues. Although about 50% of the country's minerals were exported, the sector's significance has been slowly lessening recently. General trade information for Greece indicated that the other members of the EU continued to strengthen their positions as the principal destinations and sources of Greek mineral exports and imports.

Northern Greece is thought to contain a significant amount of exploitable mineral resources and was receiving more attention in regards to exploration activities. In 1998, most activities were directed toward gold. A number of multinational companies, such as Rio Tinto Plc., Normandy Mining Ltd., and Newmont Inc., expressed their interests in Greece's northern territories (Mining and Metals, February 1998, Tapping into Greece's mineral treasure chest, accessed April 29, 1999, at URL <http://www.ana.gr/hermes/1998/feb/mining.htm>).

Very few foreign companies have invested in Greek mines. Foreign companies present in Greece in 1998 included the Canada-based TVX Hellas, which bought the Kassandra Mines; United Kingdom-based Microfine S.A., which operated mines in northern Greece extracting the rare hundite, which is unique for its flame-retardant properties; the German-based Otavi Minen Hellas S.A., which operated perlite mines on the island of Milos; and the U.S.-based Mykobar Mining Co. S.A., which operated bentonite mines, also on Milos. Selected Greek companies with major equity owners are listed in table 2.

Environmental concerns are the responsibility of the Ministry of Environment, Town Planning, and Public Works. The Government takes an active role in programs for the protection

of the environment. The general laws enacted by the Government included Law 1360/76 "Siting Arrangement and Environment," Presidential Executive Order 1180/81, and Law 1650/86 "Environmental Protection," which form the basis of the active legislative framework. For the harmonization with EU Order 88/609 concerning emission limitations, the Government has implemented Ministry Decision 58751/2370/15.4.93, which also includes the limits of the main pollutants from electric powerplants.

Individual industrial concerns were charged with much of the responsibility of environmental protection. The Public Power Corporation (PPC), a state-controlled agency, had projects underway for reducing sulfur dioxide emissions from powerplants in southern Greece, and new electrostatic precipitators were being installed in the lignite powerplant operations in northern Greece. In central Greece, some fuel oil powerplant units were being modified to burn natural gas. In addition, several new projects using wind power were under development on the islands of the Aegean Sea (Public Power Corporation, January 3, 1998, Overview—Environment, accessed May 21, 1998, at URL <http://www.newfaces.gr/html>).

The Government's decision to import natural gas from Russia and possibly Algeria was based, in part, on the fact that natural gas is much cleaner to burn than the traditional lignite.

Aluminium de Grèce S.A. announced plans to restart Hall 2 and to reach full aluminum production in 1998. The company had invested about \$39 million in the plant during 1997. Also, the company's hydrated alumina production was expected to rise to 686,000 metric tons (t) in 1998, and calcined alumina production was expected to reach 655,000 t. This was a part of Pechiney's Challenge 2000 program to boost output and increase competitiveness (Metal Bulletin, 1998a).

Bauxite mining operations continued through 1998. Bauxites Parnasse Mining Co. S.A.'s operations were mainly in the Itea area with most of the production being exported. Silver and Barytes Ores Mining Co. S.A.'s (S&B) operations were at Euboea, Helicon, and Parnassos. Delphi-Distomon S.A. continued to produce bauxite, which was sold to Aluminium de Grèce S.A.'s operation at Distomon.

The Kassandra Mines (Skouries and Olympias deposits) in northern Greece have produced lead, silver, and zinc for more than 30 years. The mines were bought in 1996 by TVX Hellas, an affiliate of TVX Gold Inc. of Canada, with the idea of exploiting the refractory gold ore by incorporating pressure oxidation technology into the ore-processing phase.

The Kassandra ore bodies are massive sulfide-strata-bound replacement deposits and occur within marble layers interbedded with gneiss and amphibolite in the Kerdyllia

Formation of the Serbo-Macedonian Massif, a series of Paleozoic and older rocks. Gold mineralization in the Olympias deposit is associated with arsenopyrite and pyrite. The deposit consists of two zones. The west zone is on the west flank of an anticline and is lensoid in shape, averaging 11 meters (m) in thickness, 350 m along strike, and 1,500 m down-dip. The east zone 300-m distance is arc-shaped and averages 9 m in thickness, 250 m along strike, and 550 m down-dip.

In 1998, bankable feasibility studies were completed on the Olympias and the Skouries deposits. During the first 5 years of operation, the two deposits combined were forecast to add about 410,000 ounces of gold to TVX Hellas's gold production profile at an average cost of below \$80 per ounce net of byproduct credits. Construction costs at Olympias were estimated to be \$225 million, and EU grants were expected to defray up to \$70 million of that cost. At Skouries, the feasibility study estimated a \$240 million capital cost; the EU could contribute as much as \$96 million (Northern Miner, 1998b).

Royal Gold Inc. (RGI) of the United States announced that its joint-venture Milos project with Australia's Rakov Pty. Ltd. had been revived after terms were negotiated to resolve the problems that resulted in the dissolution of the partnership earlier in the year. Goldmax Resources of Canada agreed to acquire all the capital stock of Rakov and to support Rakov financially in the reestablished joint venture. The partners will jointly fund a 3-year, \$5 million exploration program managed by RGI. Prior exploration on Milos Island by Renison Goldfields of Australia confirmed that the area has the potential to host epithermal gold deposits. Exploration was intended to test some of the more attractive targets that may host epithermal deposits (Mining Journal, 1998).

Thracean Gold Mining S.A., headed by Normandy Mining of Australia, reported a promising gold discovery at Perama Hill, 15 kilometers (km) northwest of Alexandroupolis in northwestern Greece. The discovery was located on tenements wholly owned by Normandy, Inmet Mining Corp., and S&B. A total of 5,265 m was drilled in 54 diamond-drill and reverse-circulation holes, defining a zone of continuous gold mineralization over an area 700 m long and 100 to 300 m wide. The deepest hole in the center of the zone was 262 m. Oxide intercepts included 48 m of 11.2 grams per ton (g/t) gold, 31 m of 11.6 g/t, and 38 m of 7.5 g/t; these three intercepts began at the surface. Drilling continued on a 50-by-50-m grid to establish a resource estimate. Metallurgical test work on the oxide mineralization indicated possible recovery of more than 90% by conventional methods (Northern Miner, 1998a).

Danae Resources NL raised \$3.5 billion to fund further exploration and development work on the Sappes gold project in northeastern Greece. The money would be used to exploit the potential of the Sappes project, which had an estimated minable reserve of 1.2 million metric tons of ore grading 12.2 g/t. The project was a joint venture between Danae's subsidiary, Kypros Gold Ltd. (51%), and Greenwich Resources Plc (49%) (Danae Resources NL, August 1998, Deal to expand Greek project, accessed April 30, 1999, at URL http://erd.com.au/Paydirt_Online/gmj98aug.htm).

General Mining & Metallurgical Co. S.A. (LARCO), a ferronickel producer, was the latest state-owned company to be put up for sale by the Greek Government. Tenders for the expression of a nonbinding interest were to be submitted by February 26, 1999. LARCO was one of the world's highest cost producers of nickel in ferronickel (Metal Bulletin, 1998b).

In the industrial minerals sector, Hellenic Mineral Mining Co. S.A. continued asbestos mining operations at the Zidani Mine near Kozani. Most of the various grades of asbestos fibers produced were exported. The fibers are suitable for mixed applications, such as asbestos cement pipes and roofing applications. The open pit mine was designed with 10-m vertical benches with an opening of nearly 2 km in diameter and a depth of about 160 m. About 45% of material mined has been discarded to achieve optimum grade control. At the mill, ore is fed into a primary gyratory crusher, conveyed to a system of impact crushing and screening where barren material is separated from asbestos-rich material. The fibers are processed and sent to their corresponding fiber bins, homogenized through several screw conveyors and then sent to the pressure packers (Industrial Minerals, 1998a).

Greece was the second largest world producer of bentonite after the United States. Bentonite was extracted from the island of Milos by open pit mining. Mykobar Mining Co. S.A. and S&B were the major producers and accounted for almost all Greek bentonite. Mykobar's operations produced more than 180,000 metric tons per year (t/yr), and S&B operated a 600,000-t/yr facility. Both companies used their own installations for the activation of bentonite with soda ash. Virtually all bentonite was exported, mainly to the EU. Major applications are iron ore pelletizing, drilling mud, civil engineering applications, foundry applications, and cat litter (Industrial Minerals, 1998b).

Lava Mining and Quarrying Co. S.A. specialized in industrial minerals with production of gypsum from the island of Crete, pozzolan from Milos, and pumice from the island of Yali.

Grecian Magnesite S.A. was a leading magnesite producer in the western world and the biggest exporter in the EU. Its open pit mine was at Yerakini in northern Greece. After mining, the material is processed, beneficiated, and fed into rotary or shaft kilns for conversion to caustic or dead-burned magnesite. The final processing facilities comprise one plant for caustic and one for dead-burned magnesite. Viomagn Fimisco Ltd. was the second largest magnesite producer with production from two mines, Kakavos and Gerorema, located on Euboea Island. Viomagn was the successor of Financial-Mining-Industrial and Shipping Corp., one of the country's former major magnesite producers (Industrial Minerals, 1998a).

The Greek marble industry continued to expand in 1998. It played a leading role in the international dimension stone market as a result of the marble's production in almost all areas of the country, variety of uses, and many colors (ash, black, brown, green, pink, red, and multicolored).

The marble industry was active in three steps of processing—the quarrying and the cutting of marble blocks and the sale of the blocks and finished products. About 80% of the marble was

sold as finished products; the remainder was sold in rough slab and block form.

S&B continued production of natural zeolite in northern Greece. The 50,000-t/yr operation produced five grain sizes of clinoptilolite, which has a high cation-exchange capacity owing to its honeycomb crystalline structure.

PPC was the major producer of lignite, the predominant fuel in electricity generation in Greece. PPC continued exploration in the basins of Amyntaion, Elasson, Florina, Megalopolis, and Ptolemais in 1998. PPC had reserves estimated to be 6.8 billion tons from which 4 billion tons was estimated to be economically recoverable by open pit mining (Public Power Corporation, May 5, 1998, Overview—Lignite mines, accessed May 25, 1998, at URL <http://www.newfaces.gr/ppc/mines.html>). Most PPC lignite was produced from the Ptolemais-Amyntaion basin with lesser amounts from the Megalopolis basin.

In the petroleum sector, PPC opened bidding for concessions and received offers for three onshore areas (Achaia, Aitolokarnania, and Epirus) and three offshore areas (south of Corfu, Katakolon, and Patraikos Bay).

Greece chose ILF of Germany and Brown and Root Corp. of the United States to prepare a feasibility study of a planned oil route to supply Russian crude from the Black Sea to Greece. ILF was chosen to prepare the first stage of the study, and Brown and Root was to prepare the second stage of the study. The pipeline was envisioned as an alternative route for the Caspian oil. It would carry between 225 to 260 million barrels of crude from Russia's port of Novorosilisk to the Bulgarian Black Sea port of Bourgas by tankers and from there an underground pipeline would take it to the northeastern Greek port of Alexandroupolis (Alexander's Gas & Oil Connections, December 10, 1998, Greece plans to bring Caspian crude to Mediterranean, accessed December 11, 1998, at URL <http://www.gasandoil.com/goc/news/nte85065.htm>).

An intensive development program largely financed by the EU will bring Greece's infrastructure in line with the more developed EU member states. Typical projects will include the construction of a north-south and an east-west motorway axis; the modernization and expansion of most large harbors; the construction of underground railways in Athens and Thessaloniki; and the establishment of a nationwide gas distribution system. One new trunk route, the Egnatia highway project, will stretch 680 km from the Ionian port of Igoumenitsa in the northwest to the Greek-Turkish border near Alexandroupolis on the Aegean. It is Europe's largest road building project and will form a vital southern link in the Trans-European Network (World Cement, 1998).

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Major Source of Information

Institute of Geology and Mineral Exploration
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TABLE 1
GREECE: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity 2/	1994	1995	1996	1997	1998 e/
METALS					
Aluminum:					
Bauxite	2,196,371	2,200,216	2,451,734	1,876,600 r/	2,000,000
Alumina, Al ₂ O ₃ equivalent	548,000	597,620	601,580	602,000 e/	686,000
Metal:					
Primary	144,300	130,361	141,295	132,600 r/	145,900 3/
Secondary e/	3,000	3,000	3,000	3,000	3,000
Chromite:					
Run-of-mine	--	--	11,725	12,000 e/	12,000
Marketable products, concentrate	1,960	--	--	--	--
Iron and steel:					
Iron ore and concentrate, nickeliferous, Fe content e/ 4/	810,000	800,000	800,000	700,000	700,000
Metal:					
Steel, crude	847,612	939,170	950,000 e/	1,016,000 r/	1,109,000 3/
Ferroalloys, ferronickel	64,728	68,620	71,204	70,000 e/	68,000
Lead, mine output, Pb content by analysis	28,404	20,551	11,541	19,300 e/	18,000
Manganese:					
Ore, crude:					
Gross weight	8,600	9,850	11,000	12,067 r/	10,000
Mn content	1,960	2,130	2,572	2,600 e/	2,500
Concentrate:					
Gross weight e/	2,400	2,500	2,000	2,000	2,000
Mn content	1,768	2,035	1,443	1,443	1,440
Nickel:					
Ore:					
Gross weight	1,944,018	2,069,488	2,194,829	2,000,000 e/	2,000,000
Ni content of nickeliferous iron ore	18,182	19,941	17,801	18,400 r/	18,000
Metal, Ni content of ferronickel	16,197	17,164	17,801	18,000 e/	18,000
Silver, mine output, Ag content kilograms	44,900	33,000	16,600	35,900 e/	64,500
Tin, metal, secondary e/	150	150	150	150	200
Zinc, mine output, Zn content by analysis	17,200	14,500	13,602	17,800	20,700
INDUSTRIAL MINERALS					
Abrasives, natural, emery e/	7,500	--	--	--	--
Asbestos:					
Ore	4,647,033	4,920,650	4,862,799	4,038,076 r/	4,000,000
Processed, fibers	55,502	75,003	80,213	63,294 r/	60,000
Barite:					
Ore, crude	701	668	671	905 r/	800
Concentrate	641	600	530	742 r/	600
Cement, hydraulic e/ thousand tons	12,636 3/	12,000	12,000	12,000	12,000
Clays:					
Bentonite:					
Crude	697,773	1,115,119	973,517	942,555 r/	950,000
Processed	583,140	512,000	764,578	572,718 r/	750,000
Kaolin:					
Crude	117,254	68,682	60,453	60,000 e/	60,000
Processed	651	314	300	300 e/	300
Feldspar e/	35,000 3/	27,000	60,000	65,000	65,000
Gypsum and anhydrite	453,722	485,353	546,344	662,640 r/	600,000
Magnesite:					
Crude	575,472	565,720	682,346	623,050 r/	650,000
Dead-burned	76,965	69,543	57,438	86,260 e/	70,000
Caustic-calcined	151,559	206,532	120,072	116,775 r/	125,000
Huntite, crude e/	11,500	12,500	13,000 r/	19,422 r/	18,000
Nitrogen, N content of ammonia	45,200	64,900 e/	90,400 e/	82,700	82,000
Perlite:					
Crude	468,699	565,479	598,640	695,917 r/	600,000
Screened	371,945	431,054	417,882	500,714 r/	500,000
Pozzolan (Santorin earth)	649,608	691,722	745,790	766,750 r/	750,000
Pumice	977,646	856,450	867,450	841,646 r/	850,000
Salt, all types	206,427	143,351	147,239	150,000 e/	150,000
Silica	80,250 e/	68,050 r/	86,600	95,730 r/	90,000

See footnotes at end of table.

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

(Metric tons unless otherwise specified)

Commodity 2/	1994	1995	1996	1997	1998 e/
INDUSTRIAL MINERALS--Continued					
Sodium compounds: e/					
Carbonate	750	750	750	750	750
Sulfate	6,000	6,000	6,000	6,000	5,000
Stone:					
Dolomite	78,920	92,920	23,000	90,000 e/	90,000
Marble cubic meters	160,181	379,502	196,669	200,000 e/	200,000
Flysch	88,662	35,434	85,138	90,000 e/	80,000
Quartz, processed	5,655	5,555 r/	6,350	7,500 e/	6,500
Sulfur:					
S content of pyrites	25,637	18,737	9,660	10,000	9,500
Byproduct: e/					
Natural gas	100,000	100,000	105,000	52,000	55,000
Petroleum	5,000	5,000	10,000	7,600	7,500
Total	130,637	123,737	124,660	69,600	72,000
Zeolite e/	--	--	2,000	3,000	4,000
Talc and steatite e/	400	--	--	--	--
MINERAL FUELS AND RELATED MATERIALS					
Coal:					
Lignite thousand tons	57,533	56,533	59,738 r/	58,000 e/	60,000
Lignite briquets e/	56,000 3/	50,000	50,000	50,000	50,000
Coke, gashouse e/	13,000	14,000	15,000	15,000	14,000
Gas:					
Manufactured, gasworks e/ million cubic meters	15	16	15	15	15
Natural do.	38	35	38	43	40
Natural gas plant liquids e/ thousand 42-gallon barrels	360 3/	350	350	350	350
Petroleum:					
Crude do.	3,902 r/	3,285	3,738	3,380 e/	3,400
Refinery products: e/					
Liquefied petroleum gas do.	5,450 3/	5,500	5,000	5,000	5,000
Gasoline do.	30,300 3/	30,000	30,000	30,000	30,000
Naphtha do.	4,670 3/	4,500	4,500	4,500	4,500
Mineral jelly and wax do.	15	15	15	15	15
Jet fuel do.	12,700 3/	12,000	12,000	12,000	12,000
Kerosene do.	194 3/	150	150	150	150
Distillate fuel oil do.	27,800 3/	26,000	26,000	26,000	26,000
Refinery gas do.	2,100	2,000	2,000	2,000	2,000
Lubricants do.	1,000	1,000	1,000	1,000	1,000
Residual fuel oil do.	35,400 3/	36,000	36,000	36,000	36,000
Bitumen do.	1,500	1,500	1,500	1,500	1,500
Petroleum coke do.	525	500	500	500	500
Other do.	400	400	400	400	400
Refinery fuel and losses do.	5,660 3/	6,000	5,500	5,500	5,500
Total 5/ do.	12,715 r/	125,565	124,565	124,565	124,565

e/ Estimated. r/ Revised.

1/ Table includes data available through March 1999.

2/ In addition to the commodities listed, other crude construction materials are produced, but no basis exists for estimation of production.

3/ Reported figure.

4/ Iron content of the nickeliferous ore mined for its nickel content. There is no indication that this iron is recovered, except as the iron content of ferronickel.

5/ Data may not add to totals shown owing to independent rounding.

TABLE 2
GREECE: STRUCTURE OF THE MINERAL INDUSTRY IN 1998

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Alumina	Aluminium de Grèce S.A. (Pechiney of France, 60%)	Distomon, in Boeotia area	640
Aluminum	do.	do.	150
Asbestos	Hellenic Mineral Mining Co. S.A.	Mines at Zidani, near Kozani	100
Barite, BaSO ₄	Silver and Baryte Ores Mining Co. S.A. (Eliopoulos-Kyriakopoulos Group)	Milos Island	1
Bauxite	Bauxites Parnasse Mining Co. S.A. (Eliopoulos-Kyriakopoulos Group)	Mines at Fokis, plants at Fokis and Itea	2,000
Do.	Eleusis Bauxites Mines, S.A. (ELBAUMIN) (National Bank of Greece)	Mines near Drama, Itea, and Fthiotis-Fokis Plants in Aghia Marina, Drama, and Itea	300 400
Do.	Delphi-Distomon S.A.; Hellenic Bauxites of Distomon S.A.; (Aluminium de Grèce S.A.)	Opencast mines at Delphi-Distomon area	500
Bentonite:			
Crude	Mediterranean Bentonite Co. S.A. (Industria Chimica Mineraria S.p.A., Italy)	Surface mines on Milos Island	20
Do.	Mykobar Mining Co. S.A. (Silver and Baryte Ores Mining Co. S.A.)	Mines at Adamas, Milos Island Plants at Adamas, Milos Island	180 150
Do.	Silver and Baryte Ores Mining Co. S.A.	Mines at Adamas, Milos Island	500
Processed	do.	Plant at Vouidia Bay, Milos Island	400
Cement	Halkis Cement Co. S.A.	Micro-Vathi plant, west-central Euboea	3,000
Do.	Halyps Cement S.A. (Ciments Français, France)	Paralia Aspropyrgos plant, Athens	800
Do.	Heracles General Cement Co. S.A. [Industrial Reconstruction Organization (IRO), 69.8%]	Plant at Milaki Plant at Volos	1,900 4,600
Do.	Titan Cement Co. S.A.	Elefsis plant, Athens area Kamari plant, Boeotia Patra plant, northern Peloponnesus Thessaloniki plant, Thessaloniki	400 2,600 1,900 1,650
Chromite	Financial-Mining-Industrial and Shipping Corp. (FIMISCO) (IRO)	Tsingeli Mines and plant near Volos	25
Gold, Au in concentrate	TVX Hellas (TVX Gold Inc., Canada)	Kassandra Mines, Olympiada	25
Gypsum	Lava Mining and Quarrying Co. S.A.	Altsi deposit, Crete Island	250
Do.	Titan Cement Co. S.A.	do.	280
Ferroalloys, Ferronickel, Ni content	General Mining & Metallurgical Co. S.A. (LARCO) (IRO)	Larymna Metallurgical plant	25
Lead, mine, Pb in concentrate	TVX Hellas (TVX Gold Inc., Canada)	Kassandra mines (Olympias and Stratoni), northeast Chalkidiki	
Lignite	Public Power Corporation (Government)	Aliveri Mine, Euboea Island Megalopolis Mine, central Peloponnesus Ptolemais Mine, near Kozani	420 7,000 28,000
Magnesite, concentrate	Viomagn-Fimisco Ltd. (Violignit S.A., 65%, Alpha Ventures, 35%)	Mines at Gerorema and Kakavos, at Mantoudhi, northern Euboea Island	250
Do.	Grecian Magnesite S.A.	Mine and plant at Yerakini, Chalkidiki	200
Manganese, (battery-grade MnO ₂ concentrate)	Eleusis Bauxite Mines Mining, Industrial and Shipping S.A. (National Bank of Greece [OAE])	Nevrokopi, Drama	10
Natural gas	million cubic meters per day Public Petroleum Corporation (Government)	Prinos offshore gasfield and oilfield, east of Thasos Island	125
Nickel, ore	General Mining & Metallurgical Co. S.A. (LARCO) (IRO)	Aghios Ioannis Mines near Larymna Mines at Euboea	500 2,500
Perlite	Silver and Baryte Ores Mining Co. S.A.	Mines on Kos and Milos Islands Plant at Pireaus	300
Do.	Otavi Minen Hellas S.A. (Otavi Minen AG, Germany)	Milos Island	150
Do.	Bouras Co.	Kos Island	50
Petroleum, refined	42-gallon barrels per day Hellenic Aspropyrgos Refinery S.A.	Aspropyrgos	95,000
Do.	do. Motor Oil (Hellas) Corinth Refineries S.A.	Aghii Theodori, Corinth	140,000
Do.	do. Petrola Hellas S.A.	Eleusis	100,000
Do.	do. Thessaloniki Refining Co. A.E.	Thessaloniki	76,000
Pozzolan (Santorin earth)	Lava Mining & Quarrying Co. Ltd. (Heracles General Cement Co. S.A.)	Quarries in Milos	350
Do.	Titan Cement Co. S.A.	Do.	300
Steel, crude	Halyvourgia Thessalias S.A. [A subsidiary of Manassis Bros. and Voyatzis S.A. (65%); the balance, 35%, owned by the state-owned National Investment Bank for Industrial Development (NIBID) (35%)]	Steelworks at Volos (operates two 35-metric-ton electric arc furnaces)	1,500 300
			200

TABLE 2--Continued
 GREECE: STRUCTURE OF THE MINERAL INDUSTRY IN 1998

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Steel, crude--Continued:	Halyvourgiki, Inc.	Steelworks at Eleusis (three 100-metric-ton electric arc furnaces)	1,200
Do.	Helleniki Halivourgia S.A.	Steelworks at Aspropyrgos (two 55-metric-ton electric furnaces)	400
Do.	Helleniki Halivourgia S.A.	Steelworks at Aspropyrgos (two 55-metric-ton electric furnaces)	400
Do.	Sidenor S.A. (also known as Halyvourgia Voriou Ellados S.A.)	Steelworks at Nea Magnesia, near Thessaloniki (two 55-metric-ton and two 30-metric-ton electric arc furnaces)	350
Zeolite	Silver and Baryte Mining Co. S.A.	Mine at Pendalofos; plant at Ritsona	100
Zinc, mine, Zn in concentrate	TVX Hellas (TVX Gold Inc., Canada)	Kassandra mines (Olympias and Stratoni), northeast Chalkidiki	25