The Mineral Industry of South Africa

By Staff

The Republic of South Africa was one of the world's major mining and mineral-processing nations. Its rich natural-resource endowment served as the base for one of the strongest economies on the African continent. According to the South Africa Department of Minerals and Energy (2004§[1]), in 2003, South Africa produced more than 59 different mineral commodities from about 920 mines and quarries, which included 116 diamond, 59 coal, 42 gold, and 21 platinum-group metals (PGM) operations. South Africa ranked first in the world in production of aluminosilicates (andalusite), chromite, ferrochrome, gold, manganese, PGM, vanadium, and vermiculite, and second in production of titanium minerals (chiefly ilmenite) and zirconium. The country ranked fifth in population and eighth in land area on the continent with 42.8 million people and 1.2 million square kilometers, respectively (Amey, 2005; Corathers, 2005; Gambogi, 2005; Hedrick, 2005; Hilliard, 2005; Magyar, 2005; Papp, 2005; Potter, 2005a, b; Chamber of Mines of South Africa, 2004§; U.S. Central Intelligence Agency, 2003§).

In 2003, South Africa had a gross domestic product (GDP) based on purchasing power parity of $466.4 billion[2] and a GDP per capita based on purchasing power parity of $10,044. The mining industry accounted for about 7.1% of the GDP; if the indirect multiplier effects of the industry, such as related service and supply industries, are included, then the overall contribution of mining to the GDP was estimated to be 11%. During 2003, South Africa's export-oriented economy had a real growth rate of 1.9% and an inflation rate of 5.8%. The average exchange rate for the rand appreciated by 28% against the U.S. dollar during 2003, although the rand began to depreciate against the dollar in December. The rand appreciation had significant implications for the mining and mineral-processing sector because dollar-denominated exports brought in fewer rands to meet domestic rand-denominated operating costs (Chamber of Mines of South Africa, 2004§; International Monetary Fund, 2004§; South African Reserve Bank, 2004§).

The most important mineral commodities produced in South Africa were, in descending order of value, gold, PGM, coal, ferroalloys (ferrochromium, ferromanganese, ferrosilicon, and ferrovanadium), diamond, and aluminum. Additionally, important output of metallic commodities included antimony, chromite, cobalt, copper, iron ore, lead, manganese, nickel, silver, steel, titanium, uranium, vanadium, zinc, and zirconium. Significant industrial minerals production included aggregate and sand, andalusite, asbestos, dimension stone, fluorspar, limestone and lime, phosphate rock, sulfur, and vermiculite. South Africa was a major producer and the world's third leading exporter of coal; it also was the leading producer of synthetic liquid fuels and petrochemicals derived from coal. South Africa's well-developed railway and port infrastructure served the domestic mineral industry and those in neighboring countries (South Africa Department of Minerals and Energy, 2004§).

Government Policies and Programs

The Ministry of Mines and Energy's Department of Minerals and Energy (DME) was the primary Government entity responsible for the establishment and implementation of minerals and energy policy and for oversight of the country's mineral industry. A number of parastatal institutions were associated with the DME; they included the Atomic Energy Corp., Central Energy Fund (Pty.) Ltd. (CEF), the Council for Geosciences (formerly the Geological Survey of South Africa), the Council for Mineral Technology (Mintek), the Council for Nuclear Safety, the National Electricity Regulator, and the South African Diamond Board.

Key mineral-related legislation included the Mining Titles Registration Act, 1967, and the Mining Titles Registration Amendment Act, 2003; the Central Energy Fund Act, 1977; the Petroleum Products Act, 1977; the Diamonds Act, 1986; the Electricity Act, 1987; the Mineral Technology Act, 1989; the Nuclear Energy Act, 1993; the Liquid Fuels and Oil Repeal Act, 1993; the Mineral and Energy Laws Rationalization Act, 1994; the Mine Health and Safety Act, 1996, and the Minerals and Petroleum Resources Development Act, 2002. In 2003, the Government submitted the Minerals and Petroleum Royalty Bill, which would impose royalties on mining revenues.

Production

In 2003, South Africa was one of the leading mineral producers in the world. Mineral production statistics are listed in table 1. For 2003, the DME Minerals Economics Directorate reported that the value of primary mined products was about $15.6 billion and that of processed mineral products, about $3.7 billion. On a value basis, about 26% of primary mined products and 25% of processed mineral materials were consumed domestically in 2003 (South Africa Department of Minerals and Energy, 2004§).

Trade

Primary mineral exports totaled $11.5 billion and accounted for 34% of all merchandise trade in 2003. Beneficiated mineral exports and primary mineral exports accounted for about 42% of total merchandise exports. In 2003, gold exports, which were valued at $4.3 billion, exceeded PGM exports, which were valued at $3.4 billion. Other leading exports were coal, which was valued at about $1.8 billion, and diamond. Although diamond export data are not published, the value of rough

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

[2]Where necessary, values have been converted from South African rands (R) to U.S. dollars (US$) at the rate of R7.56=US$1.00 for 2003 and R10.54=US$1.00 for 2002.

diamond production was estimated to be about $1.4 billion, and polished diamond production, less than $200 million. Ferrous metal exports were valued at $550 million; nonferrous metals, at about $246 million; and industrial minerals, at $182 million. In addition to exports of mining and quarrying products, about $2.8 billion in value-added processed mineral products were exported during 2003, of which ferroalloys accounted for $1.4 billion; aluminum, about $659 million; and vanadium, about $142 million (South Africa Department of Minerals and Energy, 2004§).

About 70% of produced coal (by weight) was used domestically. The price of coal increased significantly in 2003 to $42.5 per metric ton in December from $22.87 per ton in April. Coal exports, which increased to 71.4 million metric tons (Mt) from about 69 Mt in 2002, were constrained by insufficient infrastructure and the unavailability of export-grade coal (South Africa Department of Minerals and Energy, 2004§).

Imports for 2003 included $3.7 billion in crude oil and about $1.9 billion of primary and processed mineral products [primarily diamond (about $618 million) and industrial mineral products (about $606 million)] which resulted in a fuel and mineral merchandise trade-balance deficit of about $1.3 billion (South Africa Department of Minerals and Energy, 2004§; South African Revenue Service, 2004§).

Structure of the Mineral Industry

The South African mineral industry operated on a free-enterprise market-driven basis. Historically, mineral rights were owned by either the Government or private entities. Under the new Minerals and Petroleum Resources Development Act, existing mineral rights revert to the Government unless companies act within 5 years to convert "old order" exploration and mining rights into "new" rights under terms specified in the new legislation. Direct Government involvement in the energy and minerals sectors was minimal and primarily confined to ownership of the national electric power utility, Eskom Holdings Ltd., the national oil and gas exploration company, Petroleum Oil and Gas Corp. of South Africa (Pty) (PetroSA), which was a wholly owned subsidiary of CEF, and the parastatal synthetic fuel company, Sasol Ltd.

The Chamber of Mines, whose members represent the majority of coal, gold, and uranium producers, was responsible for a variety of advisory and service functions for mining interests in South Africa. One of its main activities was the annual wage negotiations between member mines and the National Union of Mineworkers.

Commodity Review

Metals

Aluminum.—In December, BHP Billiton Aluminium South Africa Ltd. completed the 88,000-metric-ton-per-year (t/yr) Hillside III expansion program, which increased the Hillside smelter's capacity to 622,000 t/yr of aluminum (BHP Billiton plc, 2004, p. 13).

Chromium.—Xstrata South Africa (Pty.) Ltd. (a subsidiary of Xstrata plc of the United Kingdom) continued to expand its production operations at the company's Kroondal, Thorncliffe, and Waterval chrome mines. The 500,000-t/yr-capacity Rustenburg pelletizing plant was commissioned in 2003. In December, Xtrata proceeded with the $165 million Phase I of the Lion Project. Phase I would include the installation of submerged arc furnaces that could produce 330,000 t/yr of lower silicon ferrochromium (Xstrata plc, 2004, p. 9, 35-38).

Gold.—South Africa continued to be the world's leading gold producer. As a result of lower income from gold exports, which was associated with the appreciation of the rand against the U.S. dollar, the long-term decline of South African gold production that appeared to have been arrested in 2002 resumed. Despite the production decline of more than 25,500 kilograms (kg) for the year, South Africa's production of 372,767 kg exceeded Australian production by more than 90 metric tons (t). South African output represented about 15% of world gold production compared with about 11% for national production from Australia and the United States and 8% from China. South African production had peaked in 1970 when it accounted for 67% of world production. The South African share of world gold production was 27% in 1993 and 17% in 1998.

In 2003, African Rainbow Minerals Gold Ltd. and Harmony Gold Mining Co. Ltd. merged. Harmony subsequently proceeded with the acquisition of Avgold Ltd. and Avgold's Target Mine from Anglovaal Mining Ltd. Harmony started mining the shaft pillar at the Nyala Shaft and continued to develop the new Elandsrand Mine. The company continued work on the development of the South Reef from the Doornkop Shaft. Deepening of the Doornkop Shaft was scheduled to begin in February 2004 with commissioning expected in 2005. Harmony also proposed to deepen the Phakisa Shaft and to develop the Tshepong North Decline.

The Afrikander Lease Ltd. suspended mining operations at the New Kleinfontein gold mine in May and commissioned the Reitkuil carbon-in-leach plant at its Klerksdorp operation in June. Mining at the Klerksdorp operation was temporarily suspended at yearend because of the production of lower grade ore and the strong rand. The company continued exploration of the Bonanza South and the Modder East gold projects (Afrikander Lease Ltd., The, 2004§).

AngloGold Ltd. announced a proposed merger with Ashanti Goldfields Co. Ltd. of Ghana. In South Africa, AngloGold continued with development of the Moab Khotsong Mine, which was scheduled to start commercial production in 2006. AngloGold also was working on the Mponeng shaft deepening project, the TauTona below-120-meter-level project, the TauTona extension project, and the TauTona Ventersdorp Contact Reef development project.

Iron and Steel.—Kumba Resources Ltd. continued its expansion of the Sishen Mine's production capacity. Modifications of the iron ore mine's facilities and production systems were expected to increase mine capacity to 27 million metric tons per year (Mt/yr) of iron ore from the 2003 26-Mt/yr capacity. Transnet Ltd., which was the Government's transportation company, was expanding port facilities at Saldanha Bay and connecting rail infrastructure. In 2003, Kumba negotiated for additional access to the Saldanha Bay export facilities. Kumba also continued studies on the

development of the Sishen South deposit (Kumba Resources Ltd., 2003a, p. 26).

South Africa was the leading producer of crude steel in Africa and the 19th-leading steel-producing nation in the world. South African companies that produced crude steel included Iscor Ltd. and Saldanha Steel (Pty.) Ltd. Columbus Stainless (Pty.) Ltd. produced stainless steel.

Manganese.—Assmang Ltd. completed the 2.2-kilometer shaft complex at the Nchwaning III Mine. The complex was scheduled to be commissioned in 2004 (Assmang Ltd., 2004).

Platinum-Group Metals.—Despite the nearly 40% increase in the international market price of platinum during 2003, Anglo American Platinum Corp. Ltd. (Anglo Platinum) was adversely affected by the appreciation of the rand, the declining international prices for iridium and palladium, and increased rand-based costs. Anglo Platinum, which was the leading PGM producer in the world, proposed to delay several major production-capacity expansion projects by 1 to 3 years. These expansion projects, which included the development of the Der Brochen and the Twickenhan projects on the Eastern Limb of the Bushveld Complex and the Pandora project and Phase II of the Western Limb tailings retreatment project on the Western Limb, would have accounted for nearly 15% of the company's proposed total capacity.

In June, Aquarius Platinum South Africa (Pty.) Ltd. (a subsidiary of Aquarius Platinum Ltd. of Australia) assigned the Kroondal operations to a venture under a pooling and sharing agreement (P&SA) with Rustenburg Platinum Mines Ltd. (a subsidiary of Anglo Platinum). Aquarius designed a new concentrator plant for Kroondal, which was expected to be commissioned in 2005. As part of the P&SA, Aquarius expected to build a new shaft, which would double Kroondal's PGM production to about 16 t/yr and extend the life of the Kroondal mine to 2016 from 2008 (Aquarius Platinum South Africa (Pty.) Ltd., 2004a§).

Aquarius also continued to ramp up production at the open pit Marikana Mine, which had been commissioned in 2002, and completed the feasibility study for the Everest South project. Everest South reserves were estimated to be 26.86 Mt at a grade of 3.36 grams per metric ton gold and PGM. In December, Aquarius proposed to begin operations at Everest South in mid-2004 and to reach full production of about 7 t/yr by 2006; these plans were subject to financing, which was to be partially filled by the black economic empowerment groups Chuma Holdings (Pty.) Ltd., Malibongwe Women's Development Organisation, and Savannah Resources (Pty.) Ltd., which were raising $114 million to acquire 26% of Aquarius-issued equity shares (Aquarius Platinum South Africa (Pty.) Ltd., 2004b§).

Barplats Investments Ltd. ceased mining operations at the Crocodile River Mine in November and placed the mine on care-and-maintenance status. Barplats continued trial mining at Zandfontein. Harmony continued exploration of the Kalahari platinum project, which was located west of the Bushveld Complex.

Impala Platinum Holdings Ltd. (Implats) continued its long-term capital expenditure program, which included development plans for additional declines and shafts to access deeper ore, and increased mechanization. A scavenging plant was commissioned at the tailings dam in December. The plant was expected to recover an additional 300 kilograms per year (kg/yr) of platinum from the tailings. At Marula Platinum, Implats was sinking declines at Clapham and Driekop and had started stoping at Clapham. Implats also completed construction of the Marula concentrator, which was expected to be commissioned in early 2004 (Impala Platinum Holdings Ltd., 2004, p. 49).

After the December 2002 accident at Lonmin Plc's No. 1 furnace, the company recommissioned four furnaces at the Western Platinum Ltd. smelter and made arrangements for Impala Refining Services (a subsidiary of Implats) to toll smelt excess concentrates and to toll refine matte. Repairs to the No. 1 furnace were completed by yearend 2003. With the deferral of the Pandora joint venture with Anglo Platinum, Lonmin developed accelerated plans for the proposed development of the Hossy and the K4 Twin Shaft complexes, and the Rowland and the Saffy Shafts.

Messina Platinum Mines Ltd. (a subsidiary of Messina Ltd. in which SouthernEra Resources Ltd. of Canada owned 73.1%) continued to ramp up production from the Voorspoed Mine, which had started production in 2002. By yearend 2003, the mine was producing gold and PGM at a rate of 2,600 kg/yr (SouthernEra Resources Ltd., 2004).

Titanium and Zirconium.—The Ticor Heavy Minerals Project, which included the Hillendale Mine and Minerals Separation Plant and a titanium-slag smelter complex at Empangeni near the Richards Bay deep-sea port in the Province of KwaZulu-Natal, commissioned its first smelter furnace in March and began production from the second furnace in October (Kumba Resources Ltd., 2003a, p. 32; b).

Vanadium.—In November, Xstrata Alloys proposed to place the Vantech plant on care-and-maintenance status in early 2004. Xstrata had mined out the Kennedy Vale ore deposit and suspended the development of the Steelpoortdrift ore body because of the strength of the rand (Xstrata plc, 2004, p. 144).

Industrial Minerals

Diamond.—As in years past, mines owned by De Beers Consolidated Mines Ltd. dominated the diamond sector with about 94% of the total production. Total diamond production for De Beers' South African operations in 2003 amounted to 11.9 million carats recovered from 28.7 Mt of material treated. De Beers production was from six kimberlite mines and the Namaqualand alluvial mine. In 2003, reported production came from the Venetia Mine (6,600,721 carats), the Finsch Mine (1,942,235 carats), the Cullinan Mine (formerly the Premier Mine) (1,273,022 carats), the Kimberley Mine (1,054,181 carats), the Namaqualand Mine (829,686 carats), the Koffiefontein Mine (113,715 carats), and The Oaks Mine (100,123 carats). Plans to expand the Cullinan Mine (the "Centenary Cut" project) were still under consideration in 2003 (De Beers Group, The, 2004§).

Reserves

South Africa's mineral reserves are large and varied and reflect the country's complex geology. A detailed description of

the geology and mineral resources of South Africa was updated by the Council for Geosciences in 1998. The bulk of South Africa's mineral production is from the northern one-half of the country. South Africa's reserves appear to rank among the top five countries and first in the world for andalusite, chromite, gold, manganese, PGM, and vanadium (Wilson and Anhaeusser, 1998).

Outlook

South Africa is endowed with one of the richest and most diverse concentrations of mineral resources on Earth. In terms of size and value, it has 1 of the top 10 mining and mineral-processing industries in the world. South Africa is moving aggressively to promote black economic empowerment and participation in the minerals sector but will face some constraints in meeting its goals owing to limited access to capital and to the lead time needed to develop competitive business, scientific, and technical skills within the black South African workforce. Internally, the impact of the high rate of HIV/AIDS on the country's able-bodied skilled and semiskilled workforce and the resultant increased direct and indirect labor costs to industry are of concern to companies and their investors (Wilson and Anhaeusser, 1998; Ellis and Terwin, 2004, p. i; Department of Trade and Industry, undated, p. 12-20).

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Major Sources of Information

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Chamber of Mines of South Africa:
Annual Report.
Statistical Tables, annual.
Department of Mineral and Energy Affairs: Annual Report.
Mineral Economics Directorate (Minerals Bureau):
South Africa's Mineral Industry, annual.
Directories, some of which are available online via a dropdown menu under Publications at URL http://www.dme.gov.za:
D1/2005 Operating mines, quarries and mineral processing plants
D2/2005 Operating and developing coal mines
D3/2003 Operating gold mines and recovery plants
D4/2002 Review of salt industry
D6/2003 Platinum-group metal mines
D7/2003 Diamond handbook and operating diamond mines
D8/2004 Ferrous minerals and producers
D9/2002 Producers of dimension stone
D10/2004 Producers of non-ferrous metals
D11/2004 Producers of industrial minerals
D12/2004 Operating and developing black empowerment mining companies
D13/2004 African mining companies, government depts & related organizations
D14/2003 Producers of sand and aggregate
Mineral Production and Sales Statistics, monthly.

TABLE 1
SOUTH AFRICA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		1999	2000	2001	2002	2003[p]
METALS						
Aluminum metal, primary		689,230	673,486	662,497	706,916	739,000
Antimony concentrate:						
Gross weight		9,100	6,400	8,320	9,910	9,000
Sb content (58% Sb)		5,278	3,710	4,927	5,746	5,310
Chromium, gross weight:						
44% to 48% chromic oxide	thousand tons	2,447	2,261	2,180	2,459	2,640
Less than 44% chromic oxide	do.	4,370	4,360	3,322	3,977	4,766
Total	do.	6,817	6,621	5,502	6,436	7,406
Cobalt:						
Mine output, Co content[e]		450	580	550	540	404
Refinery output:		306	397	371	366	271
Copper:						
Mine (company output), Cu content		144,263	137,092	141,865	129,589	89,501
Metal:						
Smelter		149,300	172,800	142,500	119,667	112,025
Refined, primary		134,500	126,100	132,078	101,000	93,300
Gold, primary	kilograms	451,300	430,800	394,800	398,300	372,767
Iron and steel:						
Ore and concentrate:						
Gross weight	thousand tons	29,512	33,707	34,757	36,484	38,086
Fe content (62% to 65%)	do.	18,442	21,570	22,240	23,200	24,200
Metal:						
Pig iron	do.	4,587	6,300	5,800	5,800	6,234
Direct-reduced iron	do.	1,260	1,530	1,560	1,700	1,542
Ferroalloys, electric arc furnace:						
Chromium ferroalloys	do.	2,155	2,674	2,141	2,351	2,700 [e]
Ferromanganese	do.	527	597	524	619	650 [e]
Ferrosilicon	do.	106	109	108	142	140 [e]
Ferrovanadium[e]	do.	6	18	18	25	6
Silicomanganese[e]	do.	267	238	220	273	284
Silicon metal	do.	36	41	39	43	40 [e]
Other	do.	30	30	64	85	80
Total	do.	3,127 [r]	3,707 [r]	3,114 [r]	3,538 [r]	3,900 [e]
Steel:						
Crude	do.	6,830	8,481	8,821	9,100	9,384
Stainless		450 [e]	436	440	550	643
Lead:						
Concentrate, Pb content		80,191	75,262	50,771	49,444	39,941
Smelter, secondary		55,000	46,200	53,000	50,000 [e]	53,000
Manganese:						
Ore and concentrate, gross weight:						
Metallurgical:						
More than 48% manganese	thousand tons	1,876	2,047	2,082	1,600	1,619
45% to 48% manganese	do.	12	302	--	728	178
40% to 45% manganese	do.	235	235	326	19	783
30% to 40% manganese	do.	970	1,029	832	955	905
Total	do.	3,093	3,613	3,240	3,302	3,485
Chemical, 35% to 65% manganese dioxide	do.	29	22	26	20	16
Grand total	do.	3,122	3,635	3,266	3,322	3,501
Metal, electrolytic[e]	do.	40	40	40	40	40
Nickel:						
Mine output, concentrate, nickel content[e]		36,200	36,616	36,443	38,546 [r]	40,842
Metal, electrolytic		28,345	30,900	30,500 [e]	31,646 [r]	25,500 [e]

See footnotes at end of table.

TABLE 1--Continued
SOUTH AFRICA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		1999	2000	2001	2002	2003[p]
METALS--Continued						
Platinum-group metals:						
Platinum	kilograms	NA	NA	NA	3,682	6,444
Platinum	do.	121,304	114,459	130,307	133,796	148,348
Palladium	do.	58,164	55,818	62,601	64,244	70,946
Rhodium	do.	12,752	12,067	13,507	15,367	16,816
Ruthenium	do.	NA	19,427	19,329	22,094	23,537
Other[2]	do.	24,259	4,999	4,169	3,850	59
Total	do.	216,479	206,770	229,913	243,033 [r]	266,150
Silver	do.	151,959	144,143	109,570	113,266	81,000
Titanium:[e]						
Ilmenite concentrate	thousand tons	1,851	1,800	1,750	1,800	2,000
Rutile concentrate	do.	100	130	120	120	150
Total	do.	1,951 [r]	1,930	1,870	1,920	2,150
Titaniferous slag[3]	do.	1,168	1,057	1,090	1,150	1,350
Uranium oxide		1,084	1,015	1,065	998	901
Vanadium, vanadium metal content		17,612	18,021	18,184	25,227	15,000
Zinc:						
Concentrate:						
Gross weight		129,200	116,100	113,400	118,900	103,100
Zn content		69,733	62,703	61,221	64,173	41,239
Metal, smelter, primary		108,000	103,000	109,000	105,000	116,000
Zirconium concentrate (baddeleyite and zircon)[e]		219,000	253,000	245,000	274,000	300,000
INDUSTRIAL MINERALS						
Andalusite		136,949	182,674	193,225	165,000	220,000
Asbestos, chrysotile		18,700	18,782	13,393	--	6,218
Barite		2,844	1,628	--	--	--
Cementitious products:						
Cement, finished product, sales	thousand tons	8,068	7,971	8,036	8,525	8,883
Granulated slag, fly ash, and others, sales	do.	940	1,020	1,129	1,099	1,280
Total	do.	9,008	8,991	9,165	9,624	10,163
Clays:						
Attapulgite		7,008	10,287	9,299	7,990	14,585
Bentonite		49,261	85,187	116,384	218,512	145,060
Fire clay		119,450	112,637	141,303	101,150	90,604
Flint clay, raw and calcined		88,864	47,256	50,848	41,963	53,279
Kaolin		123,173	98,897	85,556	91,380	85,260
Brick clay, local sales	thousand tons	3,289	5,347	5,823	6,203	7,593
Diamond, natural:						
Gem	thousand carats	4,006	4,316	4,465	4,350	5,144
Industrial	do.	6,009	6,474	6,698	6,526	7,540
Total	do.	10,015	10,790	11,163	10,876	12,684
Feldspar		59,336	66,774	66,736	57,197	57,738
Fluorspar:						
Acid-grade		203,280	201,737	272,068	254,000	223,000
Metallurgical-grade		14,000	10,618	14,319	13,000	12,000
Total		217,280	212,355	286,387	267,000	235,000
Gemstones, semiprecious, Tiger's eye[e]	kilograms	80,000	80,000	80,000	80,000	80,000
Gypsum, crude		505,404	413,105	382,830	415,387	394,069
Industrial or glass sand (silica)	thousand tons	2,170	2,138	2,132	2,262	2,312
Lime	do.	1,920	1,391	1,615	1,598	1,571
Magnesite, crude		74,000 [e]	74,000 [e]	33,900 [e]	40,000	40,000
Mica, scrap and ground		1,010	708	937	821	1,003
Nitrogen, N content of ammonia		784,800	560,200	505,900	491,900	493,200
Perlite[e]		400	400	400	400	400

See footnotes at end of table.

TABLE 1--Continued
SOUTH AFRICA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		1999	2000	2001	2002	2003[p]
INDUSTRIAL MINERALS--Continued						
Phosphate rock:						
Gross weight	thousand tons	2,957	2,796	2,550	2,803	2,643
Phosphorus pentoxide content	do.	1,153	1,083	995	1,086	1,030
Pigments, mineral, natural:						
Ochers		118	550	801	143	608
Oxides		98	80	51	109	156
Total		216	630	852	252	764
Salt		388,380	345,632	353,998	430,647	438,335
Silica	thousand tons	2,170	2,137	2,127	2,248	2,457
Sodium sulfate, natural		53,400	49,712	57,759	53,793	52,813
Stone, n.e.s.:						
Dimension:						
Granite and norite[5]		782,000	648,818	716,294	765,486	945,098
Slate		24,500	24,952	40,984	24,386	50,880
Crushed and broken:						
Limestone and dolomite	thousand tons	19,030	15,881	18,764	19,922	15,980
Quartzite	do.	8,360	7,965	7,412	318	--
Shale:						
For cement	do.	286	294	243	275	345
Other[5]	do.	3	7,358	67	67	49
Total	do.	289	7,652	310	342	394
Aggregate and sand, n.e.s.	do.	29,326	27,836	28,459	31,516	35,890
Sulfur:						
S content of pyrite (53.45%)	do.	141	146	150	183	175
Byproduct:						
Metallurgy[e]	do.	126	100	265	362	316
Petroleum	do.	139	202	123	137	123 [e]
Total	do.	406	448	538 [r]	682 [r]	614
Talc and related materials:						
Talc		7,873	5,600	3,030	2,511	6,719
Pyrophyllite (wonderstone)		13,277	11,989	14,047	15,587	14,350
Vermiculite		217,800	208,835	156,632	210,000	183,802
MINERAL FUELS AND RELATED MATERIALS						
Coal (salable product):						
Anthracite	thousand tons	1,930	1,618	1,618	1,305	1,206
Bituminous	do.	221,541	222,500	221,882	218,895	238,105
Total	do.	223,471	224,118	223,500	220,200	239,311
Natural gas	million cubic meters	2,039	2,088	1,800 [e]	2,000 [e]	2,500 [e]
Petroleum:[6]						
Crude	thousand 42-gallon barrels	5,493	6,606	13,870	10,950	4,068
Refinery products:[e]						
Liquefied petroleum gases	do.	3,650	4,000 [4]	4,000	4,000	4,000
Gasoline	do.	67,000	67,900 [4]	67,900	67,900	67,900
Jet fuel	do.	12,000	13,900 [4]	13,900	13,900	13,400
Kerosene	do.	7,000	11,700 [4]	11,700	11,700	11,100
Distillate fuel oil	do.	55,000	51,500 [4]	51,500	51,500	53,400
Residual fuel oil	do.	24,000	34,700 [4]	34,700	34,700	35,100
Other, includes lubricants and greases	do.	12,400	18,250 [4]	18,300	18,300	17,400
Total[7]	do.	181,000	201,950 [4]	202,000	202,000	202,000

[e]Estimated; estimated data are rounded to no more than thee significant digits; may not add up to totals shown. NA Not available. [p] Preliminary. [r] Revised. -- Zero.

[1]Table includes data available through September 2004.

[2]Difference between total production reported by the South African Department of Minerals and Energy, Mineral Development Branch, Mineral Economics Directorate and palladium, platinum, and rhodium supplies (shipments) reported in Johnson and and Matthey Annual Platinum Review. Includes iridium and ruthenium production plus excess palladium, platinum, and rhodium inventory.

[3]Except for about 45,000 metric tons per year, slag derived from titaniferous magnetite by Highveld Steel and Vanadium Corp. Ltd., titaniferous slag is all from the smelting of ilmenite and likely represents most of that mineral's production, for which data are unavailable.

TABLE 1--Continued
SOUTH AFRICA: PRODUCTION OF MINERAL COMMODITIES[1]

[4]Reported figure.
[5]Converted from reported cubic meters by using 1 cubic meter = 2.7 tons.
[6]In addition, Sasol Ltd. produced about 67 million barrels per year of synthetic liquid petroleum fuels from coal.
[7]Excludes refinery fuel and losses.

Source: Mineral Economics Directorate, South Africa Department of Minerals and Energy.