

THE MINERAL INDUSTRY OF

ZIMBABWE

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Zimbabwe was self-sufficient in most minerals, with more than 50 different mineral commodities being produced from more than 400 mines. Zimbabwe's dynamic mineral industry played a major role in the world supply of ferrochromium, chrysotile asbestos, and lithium minerals. More than one-half of the world's known reserves of high-grade chromium ore was in Zimbabwe.

The mineral industry's nucleus of asbestos, chromite, copper, gold, and nickel operations was rapidly diversifying with the successful mining activity at River Ranch diamond mine. Gold production remained the country's leading mineral sector in 1994. Gold output exceeded 20 metric tons, accounting for approximately 44% of mineral exports. Gold production was expected to grow with continued international investment in new gold mines and expansion of existing production capacity. However, the largest new investment underway was the \$220 million Hartley Platinum Mine.² Annual export revenue from this one project alone was expected to be \$130 million. Reunion Mining plc of the United Kingdom and Zimbabwe Mining Development Corp. (ZMDC) also broke ground in 1994 for their copper-zinc mine at Sanyati. Connecticut-based Union Carbide Corp. divested itself of Union Carbide Zimbabwe through a local management buyout, after 72 years of doing business in the country.

The extractive industry contributed about 7% to the gross domestic product at factor cost. There was significant refurbishment of equipment with the continuing liberalization of foreign currency regulations and assistance under the Government's Economic Structural Adjustment Program (Esap). A yearend Central Statistical Office survey indicated that 36% of mining companies contacted were operating at full capacity, up from 14% in 1993.³ The optimism of the mineral industry was tempered by cash flow problems, high interest rates, equipment failures, and increased energy costs.

The Government continued its economic reforms. Real economic growth was estimated to be 4% in 1994 compared with 2% in 1993. Inflation averaged 22.2% and unemployment was about 30% in 1994. The ceiling on dividend remittances for pre-Independence investors jumped to 50% of after-tax profits in January 1994 from 25% previously, and was adjusted upward to 100% for all international investors at yearend.

Government Policies and Programs

All mining activities came under the Mines and Minerals Act (Chapter 165) (1961), its amendments and associated regulations. All mineral rights were vested in the state through the President of Zimbabwe. Exclusive Prospecting Orders (EPO's) were renewable, 3-year rights to search for specified minerals in a given geographic location.

Zimbabwe promoted international tax equity to encourage foreign investment. Treaties to avoid double taxation existed with a number of European countries, and negotiations were underway with Canada. Corporate tax levels were 37.5%, and the individual rate was 40%. Buildings, equipment, shaft sinking, and premining development could be expensed at 100% in the year of the expenditure.

Zimbabwe floated its currency in January 1994 and devalued the official exchange rate by 17% to Z\$8.2=one U.S. dollar. The Government increased the percentage of foreign exchange that exporters were allowed to keep under the Export Retention Scheme from 50% to 60%. Additional foreign exchange was available through the Minerals Marketing Corp. of Zimbabwe (MMCZ) loan program under the Government's 1991 Esap. The surtax on imports was reduced to 15%.

The Zimbabwe Investment Center assisted investors with permits and licenses. The 1993 Zimbabwe Investment Center Act accelerated the investment project sanctioning process. The Center reported that 366 projects were approved in 1994.

The Gold Trade Act gave the Reserve Bank of Zimbabwe the monopoly on buying and selling all produced gold. The MMCZ handled most other mineral exports.

At yearend, the Canadian International Development Agency (CIDA) agreed to fund a 3-year, \$1.8 million mineral data and information management facility for the Ministry of Mines. CIDA had previously sponsored the national aeromagnetic survey that had unleashed the current diamond exploration frenzy. Austria established a \$3 million revolving fund for the development of small-scale mining during 1994.

Environmental Issues

The debate over environmental legislation continued. The Ministry of Environment and Tourism had proposed that interim environmental impact assessments be required by 1994.⁴ However, administration of existing environmental

protection and pollution control legislation historically has been hampered by limited funding available for the Government's enforcement efforts as well as the adverse effect it would have on the Nation's many economically marginal mining operations.

The Ministry of Mines was responsible, under the provisions of the Mines and Minerals Act (1961), for verifying that exploration and development operations have minimal long-term environmental impact. The Ministry of Lands, Agriculture, and Water Development monitored water pollution under the Water Act (1976), as did the Ministry of Environment and Tourism's Department of Natural Resources under the Natural Resources Amendment Act (1975). City councils also maintained water quality standards. The Ministry of Health was responsible for air quality under the Atmospheric Pollution Prevention Act (1971).

The Natural Resource Board held its annual environmental conservation competition to evaluate mining companies' efforts to rehabilitate slimes and tailings disposal areas. Trojan Nickel Mines' Epoch Mine won competition for mines milling at least 10,000 metric tons per month (mt/m) of ore (Class A). The Trojan Mine was runnerup in the Class A category. Rio Tinto Zimbabwe's (RTZ) Patchway Mine was the winner in the smaller tonnage Class B section, and Trojan Nickel Mines' Madziwa Mine was second.

Production

The value of mineral production in 1994 exceeded \$516 million. The country's most significant minerals produced in 1994 were, in order of percent of total mineral value, gold (48%), nickel (15%), asbestos (13%), coal (11%), copper (4%), chromite (4%), granite (2%), diamond (2%), limestone (1%), and phosphate (1%). Most of the country's major commodities posted higher production in 1994 than in 1993. (See table 1.)

Trade

Most of the country's mineral industries were export-oriented and thus exposed to world market fluctuations. Many exports were processed, in accordance with the Government's strategy of increasing value-added natural resource exports.

During 1994, mineral exports were valued at \$549 million, up from \$460 million in 1993. The increase was attributed to a weaker local dollar, higher production, and stronger overseas metal prices. The main mineral commodities exported were gold (\$244 million), ferroalloys (\$122 million), nickel (\$72 million), asbestos (\$62 million), black granite (dimension stone) (\$10 million), and coke (\$2 million). Leading buyers for Zimbabwe's total exports were South Africa (14%), the United Kingdom (12%), the United States (8%), Germany (6%), Japan (6%), and Botswana

(6%). Principal mineral exports to the United States were ferrochromium and nickel. Exports, except gold, were handled by the MMCZ, which charged a 0.875% commission.

The most significant imports in 1993, the most recent year for which trade data are available, were chemicals, fuel, and machinery and transport equipment. Notable sources for the imports were South Africa (26%), the United Kingdom (10%), the United States (9%), Japan (6%), Germany (5%), and the Netherlands (3%).⁵ Zimbabwe continued its effort to renew the 1964 preferential trade arrangement with South Africa.

Structure of the Mineral Industry

Large multinationals, such as Anglo American Corp. Svc. Ltd. (Anglo), Lonrho Zimbabwe Ltd., RTZ, and Union Carbide Zimbabwe, historically have maintained a significant presence in the Nation's mining industry. Recently, the country's exploration potential has attracted the interest of a number of foreign companies. International junior mining corporations spent much of 1994 negotiating and exercising exploration options and performing geological and geophysical work.

The Government's mining company, ZMDC, had an interest in a number of mining operations. Refractory ores containing gold were treated at the state's oldest government-owned company, The Roasting Plant. Doré was delivered to Fidelity Printers and Refiners (Pvt.) Ltd., the subsidiary of the Reserve Bank of Zimbabwe that purchased all gold produced in the country. The state's Industrial Development Corp. of Zimbabwe Ltd. had a number of subsidiary companies operating in the industrial mineral sector. (See table 2.) Exports were usually shipped out of the country aboard the state-owned National Railways of Zimbabwe.

Approximately 50,000 people were employed in medium- and large-scale mining operations, including about 3,000 people in the industry's mining cooperatives. An estimated 10,000 people worked the Nation's small mines, and an estimated 100,000 people were involved in informal gold panning.⁶ The Hartley Platinum Mine was expected to create more than 2,500 new jobs. During 1994, a total of 34 fatal mining accidents was reported nationwide.⁷

Commodity Review

The number of active EPO's increased to 131 in 1994, compared with 120 in 1993, and 62 in 1992. Diamond continued as the most popular exploration target.⁸ About 12.5 million hectares were covered by the EPO's compared with about 500,000 hectares in 1986. The Mining Affairs Board had an additional 104 EPO applications pending.

Metals

Copper.—Mhangura Copper Mines Ltd., the country's principal copper producer, received a Government loan in 1994 to pay creditors. Besides the debt issue, Mhangura was contending with poor ore grades (0.65% copper) in the Miriam shaft, its remaining mine.

Reunion Mining plc of the United Kingdom proceeded with plans to develop the oxides on the Sanyati prospect. Messina (Transvaal) Development Co., had investigated more than 60 gossans in the region, formerly known as the Copper Queen and Copper King claims, during the early 1950's.⁹ The 10 most promising oxide ore bodies extend to a depth of about 35 meters (m). Owing to higher grade reserves, initial operations were expected to be at the Copper Queen area. Reunion planned an open pit mine with a stripping ratio of 1.2:1. Copper and zinc were to be recovered from the heap leach solution by solvent extraction and electrowinning (SX-EW).

Estimated reserves were 5.8 million tons (Mmt) grading 1.1% copper and 1.2% zinc for the oxides. Sulfide reserves were estimated at 14.2 Mmt containing 1.2% copper and 3.2% zinc and 0.9% lead. The prospect also contained an estimated 0.015% cobalt and 0.8% manganese.¹⁰

The initial plan to produce 2,500 metric tons (mt) of copper cathode annually from 240,000 mt of treated ore was revised upward after the European Investment Bank approved a \$7.13 million loan for the project late in 1994. Reunion forecast an expanded copper production rate of 5,000 metric tons per year (mt/a). Construction of the SX-EW plant began in September. Reunion also obtained a 6-year option to evaluate the sulfide deposits at Sanyati.

Ferrochrome.—Union Carbide Corp. of the United States divested its ferrochrome operations in October when the management of Union Carbide Zimbabwe (Pvt.) Ltd. bought out the United Kingdom-based holding company Union Carbide Metals Ltd. At yearend, Union Carbide Zimbabwe's Zimbabwe Mining and Smelting Co. (Pvt.) Ltd. (ZIMASCO) subsidiary reopened the Kwekwe's divisions East smelting plant.

Zimbabwe Alloys Limited (Zimalloys), a subsidiary of the Anglo American Corporation, proposed to spend \$16 million to recover ferroalloys from the slag dump at the Gweru refinery and for a separation plant to upgrade ore shipments from Zimalloys' North Dyke Mine. The dormant Zimbabwe Alloys Mines Ltd. was revived as the company to treat 70,000 mt/m of slag in the slag dump project. ZIMASCO had previously set up a metal from slag (MFS) plant adjacent to its West Smelter in Kwekwe to reprocess its slag dumps.

Gold.—Most of the new gold operations were based on the application of new technology to old operations. Alluvial gold panning was one of Zimbabwe's fastest growing industry areas, as the rural alternative to subsistence farming.

However, most panning was illegal, and while an increasing amount of panned gold was sold to the Reserve Bank, much of the production was smuggled out of the country. The resultant tax avoidance and extensive environmental damage due to riverbank erosion and stream siltation resulted in increased official awareness of the activity. The Mining (Alluvial Gold) (Public Streams) Regulations (1991) authorized selective alluvial gold mining. However, the mandate was unfunded, and local authorities were unable to administer the law. The lack of staff, funding, equipment, and expertise resulted in uncontrollable panning along approximately 4,600 kilometers (km) of rivers.

Cluff Resources Zimbabwe Ltd.'s Freda Rebecca underground mine was at full production at yearend. Also in December 1994, Falcon Gold Zimbabwe Ltd. acquired the Golden Quarry Mine, which Falcon expected to produce 400 kilograms per year (kg/a). An additional mill was installed at Olympus Gold Mines' Old Nic Mine. Kinross Gold Corp. of Canada continued a \$4 million expansion of the Golden Kopje Mine that Falconbridge Gold Corp. had begun in 1993. Design capacity of the mine was doubled to 400 metric tons per day (mt/d). Kinross also began construction of a 3,500 mt/d carbon-in-leach tailings retreatment plant at the Blanket Mine. Antares Mining and Exploration Corp. of Canada and the Forbes and Thompson group of Zimbabwe continued exploration on the Lady Lina property with an underground evaluation program.

ZMDC was searching for a new joint-venture partner to continue the expansion of the Sabi Mine from 6,500 mt/m to more than 30,000 mt/m. Jena Mines Ltd. expanded capacity with a new mill and leach circuit.

Rio Tinto Zimbabwe Ltd.'s Patchway Mine reduced production for 2 months during refurbishment of the mine's shaft system. Independence Mining (Pvt.) Ltd.'s Athens Mine repaired the main shaft hoist, resulting in reduced production. The Shamva Mine expanded capacity to 28,000 mt/m. The How Mine expanded throughput to 27,000 mt/m.

While large mines dominated the gold sector, numerous medium- and small-scale producers contributed about 10% to the Nation's gold production.

Iron and Steel.—Zimbabwe Iron and Steel Co.'s (Zisco) blast furnace No. 4 remained shut down during 1994. Zisco's No. 3 blast furnace at Redcliff was down for approximately 3 months for refractory relining. Zisco's No. 3 blast furnace, at full capacity of 600 mt/d, historically heated less than 40% of the company's annual production.

The Government continued its efforts to reduce its role in Zisco. International management was solicited to train existing Zisco management and to guide the company through partial privatization.

Iron ore mining at Buchwa was minimal and the closure of Zisco's No. 4 blast furnace effectively prolonged the life of the Buchwa iron mine. Buchwa Iron Mining Company (BIMCO) began operating its limestone and dolomite quarry

at Redcliff, which had formerly been mined by contractors. Preparations for BIMCO's new iron mine at Ripple Creek continued. A 15.8-km conveyor to carry Ripple Creek ore to the Redcliff sinter plant was under construction. The 150,000 mt/m mine was scheduled to be opened in mid-1996.

Nickel.—Bindura Smelter & Refinery upgraded its Outokumpu leach facilities at Bindura with the installation of a Sherritt Gordon pressure leach line and a Sirosmelt furnace. The additions, scheduled to be on-line in 1995, would improve base metal recovery rates slightly and boost the byproduct platinum-group metals (PGM) recovery rate from 30% to almost 95%. In 1994, Bindura posted record nickel cathode production.

RTZ's Empress nickel refinery toll refined matte from BCL's Selebi Phikwe smelter in Botswana. Empress had installed a Sirosmelt smelter in June 1992 to treat the residue remaining after leaching matte. Empress formerly shipped about 7,300 mt/a of leach residue to BCL for further treatment.¹¹

Platinum-Group Metals.—Investment conditions for the Hartley Platinum Project at Selous were successfully negotiated with the Zimbabwean Government. BHP Minerals, a subsidiary of Broken Hill Proprietary Co. Ltd. of Australia, and Delta Gold NL of Australia signed a Mining Agreement with the Government on August 24. Groundbreaking at the mine site, about 80 km from Harare, took place on September 9.

BHP was constructing declines in the footwall to bring out ore with conveyor belts. With development starting at about 100 m below the surface, Hartley was considerably shallower than South African platinum operations. The mine is projected to be producing ore in late 1995. A mill and a concentrator are programmed for the end of 1996 and full production proposed for early 1997. The mine was being designed to process 2.16 Mmt/a of ore. The Hartley platinum deposits were of lower grade than those in South Africa. However, the visible 2-m thick sulfide zone contained platinum, palladium, rhodium, osmium, iridium, and ruthenium, in addition to gold, nickel, copper, and cobalt.

BHP planned to construct a smelter and a base-metal refinery to produce nickel and copper cathode. PGM and gold will be toll refined in Europe. Projected annual production was 4.6 mt of platinum, 3.4 mt of palladium, 358 kilograms (kg) of rhodium, 715 kg of gold, 3,200 mt of nickel, and 2,300 mt of copper.¹²

Zimasco continued trial mining and renovated the concentrating plant for its Mimosa platinum project. Feasibility studies were positive.

Anglo American Group's Valley Exploration & Mining sold its 38% interest in the Mhondoro platinum project to RTZ in 1994. Rio Tinto Zimbabwe Ltd. (38%) and Delta Gold (24%) held the remainder of the prospect, just south of the Hartley Mine. Delta completed evaluation studies on its

100%-owned Selous platinum prospect and the Delta-RTZ joint venture finished preliminary studies on the Mhondoro project. Delta Gold proposed to list its Zimbabwe platinum interests on the London Stock Exchange to raise additional development funds. A proposed Zimbabwe Platinum Mines Ltd. would hold 100% of Zimplats (Pvt.) Ltd. Zimplats would hold Delta's interest in the Hartley Mine, the Mhondoro project, and the Selous prospect.

Tin.—Kamativi Tin Mines closed in June. The company was unable to fund operations owing to deteriorating open pit ore grades, increased cost of operations, and the relatively low price of tin. This followed the closure of Rooiberg Mine in South Africa in 1993 and the cessation of cassiterite mining in Rwanda during 1994. With the loss of local and Rwandan feed, the smelter proposed to process ore from Zaire presently being shipped to Asia.

Industrial Minerals

The industrial minerals sector was expected to benefit from the private sector's office construction as well as the Government's proposed plan to build 85,000 houses annually to provide housing for 1 million people by the year 2000.

Asbestos.—African Associated Mines (Pvt.) Ltd. temporarily ceased production at the Shabanie Mine at the start of the year to draw down stockpiled asbestos. The Shabanie Mine was closed again for a month in August to further reduce existing stockpiles.

Cement.—Circle Cement Ltd. temporarily closed its clinker operations during an expansion and refurbishment program at the start of the year. In addition to the major kiln repairs, Circle Cement replaced its electrostatic precipitators to reduce the plant's dust emissions.

Diamond.—The River Ranch Mine was upgraded with the installation of a heavy-media separation plant formerly used at RTZ Corp.'s operation at Mafeking, South Africa. The separator allowed the expansion of the mine's annual capacity from 50,000 carats to 180,000 carats. Additional planned expansion would double the present capacity. Production was reported to be 60% gem quality.

A number of local and international junior mining companies were engaged in regional soil and stream sampling. Reunion and partners worked a number of diamond prospects, including the Bembezi, Gwaii, Hwange, Mlibiza, Nanda, and Quest projects, primarily by stream sediment sampling and reprocessing of aero-magnetic survey data.

Fertilizer.—The Institute of Mining Research continued a project with Dorowa Minerals; the Ministry of Lands, Agriculture, and Water Development; the University of

Guelph, Ontario, Canada; and Zimbabwe Phosphate Industries to develop a low-cost phosphate fertilizer from apatite rock.

Lithium.—Bikita Minerals (Pvt.) Ltd. 1994 capital expansion project consisted of the purchase of new equipment and the upgrading of existing equipment aimed at increasing spodumene production. Bikita exported about 95% of its production.

Vermiculite.—Dinidza Vermiculite Mining Co. (Pvt.) Ltd. continued to develop export markets for its 10,000-mt/a vermiculite mine in the Dorowa area. Shawa Vermiculite (Pvt.) Ltd. reportedly enlarged its operations to a total production capacity of 39,000 mt/a with the construction of a 24,000 mt/a processing plant.

Mineral Fuels

Shangani Energy Exploration continued exploration studies of its special grant area near Lupane. Shangani was owned by Zimasco (80%) and Maralex International Inc. (20%). Afpenn Exploration, a subsidiary of Afpenn Resources Ltd. of the United Kingdom, began a coalbed methane feasibility study in October 1994. Mobil Exploration suspended its petroleum exploration in the Zambezi Valley during the year.

Coal.—Local demand for Wankie coke improved, and new markets had been developed. However, significantly lower demand by Zisco, restricted availability of rail cars, and plant and equipment breakdowns constrained operations.

Wankie cleared the 6-km pipeline route from the coalfield to the Hwange power station. Laying of the pipeline began at yearend. Up to 5,000 cubic meters per hour of coke oven gas was expected to be supplied to Hwange to replace imported diesel fuel. The first delivery was scheduled for October 1995.

Infrastructure

Most of Zimbabwe's bulk commodities were moved by rail, the backbone of the country's agricultural and industrial development. All major cities and industrial centers were linked to Botswana, Mozambique, South Africa, and Zambia by the National Railways of Zimbabwe's 2,745 km of track.

An oil products transshipment terminal was built in Beria, Mozambique, to handle petroleum products destined for Zimbabwe. Petroleum was piped to Feruka, near Mutare, via the Beria pipeline, and then moved west via the Mutare-Harare pipeline or trucked.

Outlook

Zimbabwe was recovering from its recent history of foreign

exchange and price controls and strict regulation of private investment. Increased availability of foreign exchange has enabled the mineral industry to replace aging plants and obsolete equipment. Given the intensity of exploration, new mineral deposits were likely to be discovered. However, many of the country's small, marginal mineral operations were expected to continue to be adversely affected by poor economic conditions.

Asbestos, coal, ferroalloys, gold, and nickel were expected to remain the mainstays of the Zimbabwean mineral economy through the turn of the century, bolstered by diamonds and PGM's. Updated investment regulations, the Nation's well-developed and maintained infrastructure, and new exploration techniques were expected to encourage further local and foreign participation in the mineral industry.

¹Text prepared Aug. 1995.

²Where necessary, values have been converted from Zimbabwe dollars (Z\$) to U.S. dollars at the rate of \$Z6.9107=US\$1.00 for 1993 and at the rate of Z\$8.1=US\$1.00 for 1994.

³Central Statistical Office, Harare. Business Tendency Survey. Dec. 1994.

⁴Chamber of Mines Journal. Chamber of Mines' Report to Members. V. 35No. 12, Dec. 1993, p. 3.

⁵Central Statistical Office, Harare. Stats-Flash. No. 3, Apr. 1995.

⁶Chamber of Mines Journal. No End in Sight to Gold Panning. V. 36, No. 7, July 1994, p. 7.

⁷Chamber of Mines Journal. Thirty-Four People Die in Mining Accidents Countrywide. V. 37, No. 3, Mar. 1995, p. 17.

⁸Zimbabwe section in Proceedings of the Africa Mining Investment Conference (Denver, Colorado, June 6-8, 1994). 9 pp.

⁹Chamber of Mines Journal. Americans at the Copper Queen—25 years ago. V. 21, No. 11, Nov. 1979, pp. 38-40.

¹⁰The Northern Miner. Ontario, Canada. Caledonia Affiliate Upgrades Zimbabwe Copper Mine. Dec. 19, 1994, p. 16.

¹¹Mining Journal (London). Ausmelt Technology in Zimbabwe. V. 322, No. 8258, Jan. 14, 1994, p. 25.

¹²BHP Minerals. Minerals Global Report. Oct. 1, 1994, p. 1.

Major Sources of Information

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TABLE I
ZIMBABWE: PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Metric tons unless otherwise specified)

Commodity	1990	1991	1992	1993	1994	e/
METALS						
Antimony, mine output, concentrate, Sb content	101	160	254	95	65	3/
Beryllium: Beryl concentrate, gross weight	28	29	23	23	4	3/
Chromium: Chromite, gross weight	573	564	522	252	517	
Cobalt: 4/						
Mine output, Co content e/	102	105	80	90	100	
Metal (hydroxide)	127	130	100	113	126	3/
Columbium and tantalum: Tantalite concentrate, gross weight	35	111	94	48	7	3/
Copper:						
Mine output, concentrate, Cu content e/	15	14	10	9	9	
Metal:						
Smelter output, blister/anode, primary e/	14,400	13,800	9,690	8,200	10,000	
Refinery output, refined/cathode, primary	14,100	13,800	9,670	8,190	9,350	
Gold	16,900	17,800	18,300	18,900	20,500	
Iron and steel:						
Mine output, iron ore:						
Gross weight	1,260	1,140	1,180	375	4	
Fe content e/	730	660	710	225	3	
Metal:						
Pig iron e/	521	535	507	211	100	
Steel, crude	580	581	547	221	100	
Ferroalloys:						
Ferrochromium	222	187	191	124	219	
Ferrosilicon chromium	17	28	20	30	36	
Ferromanganese	--	--	--	2,151	--	
Nickel:						
Mine output, concentrate, Ni content e/	13,500	12,400	11,300	12,800	15,000	
Refinery output, refined metal 5/	11,400	11,300	10,300	11,100	13,516	
Platinum-group metals:						
Palladium	31	30	19	11	17	3/
Platinum	21	19	9	4	7	3/
Total	52	49	28	15	24	
Selenium	2,300 e/	2,550	1,740	1,110	2,010	
Silver	21,200	19,400	16,900	12,000	10,900	
Tin:						
Mine output, Sn content e/	1,120	1,060	950	800	100	
Smelter output, metal	838	796	716	657	82	3/
Tungsten, concentrate, W content e/	1	1	--	--	--	
INDUSTRIAL MINERALS						
Asbestos	161	142	150	157	152	
Barite	320	866	232	120	--	
Cement, hydraulic	700	865	900 e/	1,000 e/	1,000	
Clays:						
Bentonite (montmorillonite)	99,900	99,900 e/	83,000	83,000	169,000	
Fire clay	19,900	23,300	16,000	9,260	14,000	
Kaolin	--	65	83	90	462	
Diamond	--	--	40,700	43,900	174,000	
Feldspar	2,200	3,820	2,700	1,550	1,620	
Gemstones, precious and semiprecious: Emerald	822	667	46	635	276	3/
Graphite	16,400	12,900	12,300	7,140	7,890	3/
Kyanite	160	2,460	1,990	1,000	567	3/
Lithium minerals, gross weight	19,100	9,190	12,800	18,100	25,300	
Magnesium compounds: Magnesite	32,600	23,300	8,970	6,280	1,590	
Mica	1,300	506	495	510	213	3/
Nitrogen: N content of ammonia	62,500	66,000 e/	67,000 e/	70,000	70,000	
Phosphate rock, marketable concentrate	148	117	142	153	151	3/
Pigments, iron oxide	416	400 e/	538	550	438	3/
Stone, sand and gravel:						
Granite	70,000 e/	79,900	90,700	40,000	107,000	
Limestone	1,260	1,430	1,370	1,040	1,660	
Quartz 6/	63	70	77	61	131,000	

See footnotes at end of table.

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

(Metric tons unless otherwise specified)

Commodity	1990	1991	1992	1993	1994	e/
INDUSTRIAL MINERALS--Continued						
Sulfur						
Pyrite:						
Gross weight	66,600	69,900	66,300	72,600	71,000	
S content e/	29,300	30,700	29,200	30,000	30,000	
Byproduct acid, metallurgical and coal process gas e/	5,000	5,000	4,500	4,000 r/	4,500	
Talc	1,790	1,680	2,200	1,350	2,050	
Vermiculite	2,000 r/ e/	2,320	4,300	5,030	8,180	
MINERAL FUELS AND RELATED MATERIALS						
Coal, bituminous	thousand tons					
	5,500	5,620	5,550	5,290	5,520	3/
Coke, metallurgical e/ 7/	do.	565	560	500	500	550

e/ Estimated. r/ Revised.

1/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.

2/ Table includes data available through Aug. 4, 1995.

3/ Reported figure.

4/ "Mine output" figures are calculated from "metal" figures. "Metal" may include metal content of compounds/salts and may include cobalt recovered from nickel-copper matte imported from Botswana for toll refining.

5/ May include nickel content of nickel oxide.

6/ Includes rough and ground quartz as well as silica sand.

7/ Data represent output by the Wankie Colliery Co. Ltd.; additional output by the Redcliff plant of Zisco Ltd. may total 250,000 metric tons per year of metallurgical coke and coke breeze.

TABLE 2
ZIMBABWE: STRUCTURE OF THE MINERAL INDUSTRY FOR 1994

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Asbestos		Shabanie and Mashaba Mines (Pvt.) Ltd. (African Associated Mines (Pvt.) Ltd., 100%)	Shabanie Mine, Zvishavane; Gaths and King Mines, Mashava	300
Coal		Wankie Colliery Co. Ltd. (Private investors, 60%, Government, 40%)	Hwange	5,000
Cobalt	tons	Bindura Nickel Corp. (Anglo American Corp., 100%)	Shangani Mine, northwest of Shangani; Madziwa Mine, 50 kilometers northeast of Bindura; Trojan Mine, Bindura; Epoch Mine, Filabusi	150
Copper		Mhangura Copper Mines Ltd. (Zimbabwe Mining Development Corp. (ZMDC), 54.56%)	Mhangura	16
Do.		Lomagundi Smelting & Mining (Pvt.) Ltd. (ZMDC)	Smelter at Alaska	35
Do.		do.	Refinery at Alaska	28
Diamond	carats	Auridam Zimbabwe Ltd. (Auridam Consolidated NL, 50%; Redaurum Red Lake Mines Ltd., 50%)	River Ranch Mine, near Beitbridge	50,000
Gold	kilograms	Rio Tinto Zimbabwe Ltd. (RTZ Corp. plc., 56%)	Renco Mine, 75 kilometers southeast of Masvingo; Patchway Mine, Kadoma; Brompton Mine, Kadoma; and Cam and Motor dump, Kadoma	2,800
Do.	do.	Cluff Resources Zimbabwe Ltd. (Cluff Resources plc, 82.4%, private investors, 17.6%)	Freda Rebecca Mine, Bindura	2,500
Do.	do.	Independence Mining (Pvt.) Ltd. (Lonhro plc, 100%)	How Mine, Bulawayo; Athens Mine, Mvuma; Tiger Reef Mine, Kwekwe; Redwing Mine, Penhalonga; Shamva Mine, Shamva; Legion Dump, Kezi	3,300
Do.	do.	Falcon Gold Zimbabwe Ltd. (Falcon Investments S.A., 71.7%)	Dalny Mine, Chegutu; Venice Mine, Kadoma; and Golden Quarry Mine, Shurugui	2,000
Do.	do.	Corsyn Consolidated Mines (Pvt.) Ltd. (Lonrho plc, 100%)	Anzac Mine, Kwekwe; Arcturus Mine, Arcturus, Mazowe Mine, Mazowe; Muriel Mine, Mutorashanga	1,500
Do.	do.	ZMDC (Government, 100%)	Sabi Mine, south of Zvishavane and Elvington Gold Mine, near Chegutu	800
Do.	do.	Jena Mines Ltd. [ZMDC, 50%; Trillion Resources (Pvt.) Ltd. Zimbabwe, 50%]	Jena Group, Kwekwe area	400
Do.	do.	Masasa Mines (Delta Gold NL, 100%)	Giant tailings dump, near Chegutu	100
Iron and steel:				
Crude steel		Zimbabwe Iron and Steel Co. (Zisco) (Government, 92%)	Redcliff, near Gweru	1,000
Iron ore, gross weight		Buchwa Iron Mining Co (Zisco, 100%)	Buchwa West Mine, Buchwa; Ripple Creek Mine, near Redcliff	1,400
Ferroalloys:				
Ferrochromium, high-carbon		Zimbabwe Mining and Smelting Co. (Pvt) Ltd. (Zimasco) (Union Carbide Zimbabwe, 100%)	Smelter at Kwekwe	178
Ferrochromium, low-carbon		Zimbabwe Alloys Ltd. (Zimalloys) (Anglo American Corp., 100%)	Smelter at Gweru	35
Ferrochromium-silicon		do.	do.	28
Lithium		Bikita Minerals (Pvt.) Ltd. (Private, 100%)	Bikita Mine, 60 kilometers east of Masvingo	33
Nickel		Trojan Nickel Mines (Bindura Nickel Corp., 100%)	Shangani, Madziwa, Trojan, and Epoch Mines	17
Do.		BSR Ltd. (Bindura Nickel Corp., 100%)	Smelter and refinery at Bindura	16
Do.		Rio Tinto Zimbabwe Ltd.	Empress Nickel Refinery, Eiffel Flats, northeast of Kadoma	7
Phosphate		Dorowa Minerals (Pvt.) Ltd. (Chemplex Corp. Ltd., 100%)	Dorowa Mine, 90 kilometers west of Mutare	155
Tin		Kamativi Tin Mines Ltd. (ZMDC, 91%, private, 9%)	50 kilometers north of Dete	1 1/
Vermiculite		Shawa Vermiculite (Pvt.) Ltd. (Private, 100%)	Shawa Mine, near Dorowa	39
Do.		Dinidza Vermiculite Mining Co. (Pvt.) Ltd. (Private, 100%)	Dinidza Mine near Dorowa	10

1/ Kamativi Mines and smelter closed during 1994.