Creamer Media's ResearchChannel

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South Africa's Platinum Industry 2005

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History

The use of platinum dates back to 700 BC, when Ancient Egyptians first mastered techniques for processing the metal. Indians in pre-Columbian South America also reportedly used platinum, combining it with gold, in about 100 BC.

It was not until the Spanish conquest of the New World during the fifteenth and sixteenth centuries, however, that platinum was introduced to Europe, where it was noted for its noncorrosive qualities and its high melting temperature.

It was during the eighteenth century that the same qualities which had, for centuries, made platinum difficult to work with, now made it attractive for industrial uses. In 1780 platinum was used in France to make crucibles for glass production, and in 1784 it was used to make laboratory instruments in Berlin.

Early in the nineteenth century, new refining techniques were discovered, and this increased platinum's availability for use in a growing number of industries. It was soon being used in gun parts, sophisticated batteries, and in the production of caustic chemicals and the purification of hydrogen.

As new industrial uses for platinum were discovered, its beauty and strength also began to impress jewellers. Demand for platinum grew in both science and fashion due to several major discoveries, including a process for making platinum malleable.

By the beginning of the nineteenth century, Colombia, which had mined platinum since the end of the seventeenth century, was still the only major producer of platinum in the world, and supplies were therefore very limited.

To add to the supply problem, Colombia ceased exporting platinum in 1820, after the nation's independence from Spain.

New supplies were soon found, with the 1822 discovery of platinum in the Ural mountains in Russia.

In Russia, however, there was little demand for platinum in jewellery, or for industrial and scientific use, and so the Russian authorities decided to make platinum a monetary metal, producing platinum roubles. Thus Russia introduced to the world the notion that platinum was not just a commodity, but also a store of value.

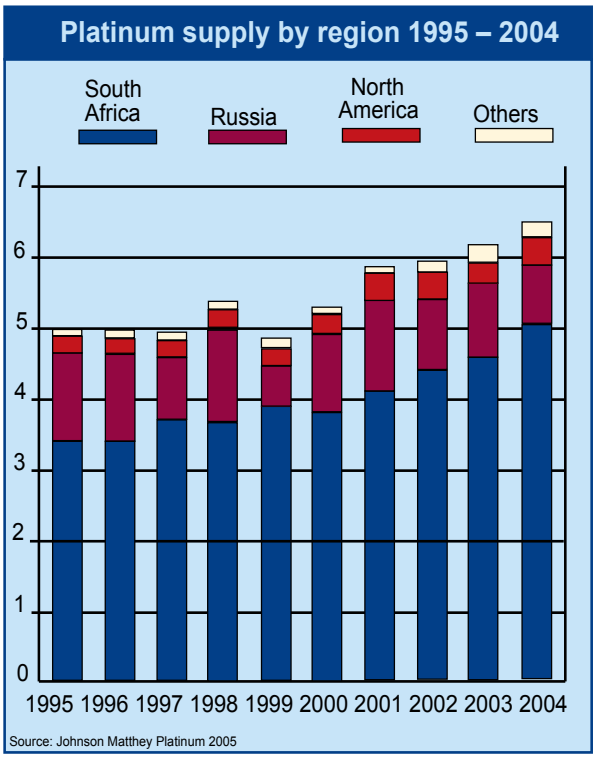
In the early 1900s, the hidden characteristics of platinum were revealed when Louis Cartier became the first person to successfully create platinum jewellery.

The birth of the modern platinum industry occurred when the world's largest platinum deposit was discovered in South Africa in 1924. During the twentieth century the number and scope of platinum's industrial uses expanded dramatically, to a point where now, one in every five manufactured goods either contains or is produced using platinum.

Two areas, South Africa and Russia, supply over 85% of the world's platinum, with smaller amounts coming from the US, Canada and Zimbabwe. Supply of the metal, however, continues to be limited

Sources of platinum

Supply of platinum continues to be limited, with only two areas, Russia and South Africa, being responsible for almost all the world's supply. Small amounts are also produced in the US, Canada and Zimbabwe.



South Africa

South Africa is home to some of the richest mineral deposits in the world and produces large amounts of precious metals, gems and industrial minerals. Platinum deposits are concentrated in one of the biggest metal-bearing intrusions in the world, the Bushveld Igneous Complex.

The Bushveld Igneous Complex, located in the northern reaches of South Africa and cutting through the North West, Limpopo and Mpumulanga provinces, was formed about two-billion years ago, and has a series of distinct layers, three of which have economic concentrations of platinum-group metals (PGMs).

The principal PGM-bearing reefs found in the complex are the Merensky Reef and the Upper Group 2 (UG2) Reef, which occur around the eastern and western sides of the saucer-shaped complex. The third PGM-rich layer, the Platreef, is found only on the Potgietersrust limb at the north-eastern edge.

The Merensky and UG2 reefs are narrow, and the stopes are generally too cramped to permit the use of mechanised equipment, with the result that miners use hand-held pneumatic drills to bore holes which are then filled with explosives. The Platreef, which is between 5 m and 90 m thick, is much wider than the other reefs, and is mined using openpit methods.

The Merensky orebody, which is around a metre thick and has a thin seam of chromite along the top and bottom, has been the principal source of PGMs since it was first worked in 1925. However, the other orebodies have grown in importance, supplying just under 50% of all the platinum-bearing ore processed in South Africa. Exploitation of the UG2 orebody began in the 1970s and the Platreef was not exploited on a large scale until 1993.

Together, the eastern and the western limbs of the Bushveld Igneous Complex represent the largest concentration of PGM deposits in the world. The western limb traditionally hosted platinum mining on the Merensky Reef reserves. However, over the past five years, there has been an expansion onto the eastern limb, where UG2 orebodies dominate. Platinum production on the eastern limb accounted for 6 % in 2002 and is expected to increase to 18 percent by 2006.

Several new platinum mines, owned mainly by Anglo Platinum, have been established in the area and continued growth with other already established mines is expected in the future.

By 2000, platinum had outstripped gold as South Africa's number one earner of foreign exchange. In 2004, South Africa was the source of 5,03-million ounces of platinum, which was up on the previous year's production of 4,63-million ounces. In 2004, South Africa's PGM sales overtook those of gold, due to the drop in gold production.

The country's Intelligence Minister has identified platinum as a key component in the development of an alternative energy source, the hydrogen fuel cell, and has indicated the importance of the country taking the necessary security steps to protect its reserves.

A number of projects are being undertaken by various platinum-miners to further increase South Africa's output of the metal, but, as platinum-miners have been affected by the current strength of the rand, some of the projects have been reassessed, and are proceeding on a revised scale.

According to platinum analysts, there are few opportunities left for platinum properties on the Bushveld Complex and, in future, access to properties will have to be gained through dealmaking. There are very few greenfield properties left, and downdip properties are too deep to mine at current prices.

Russia

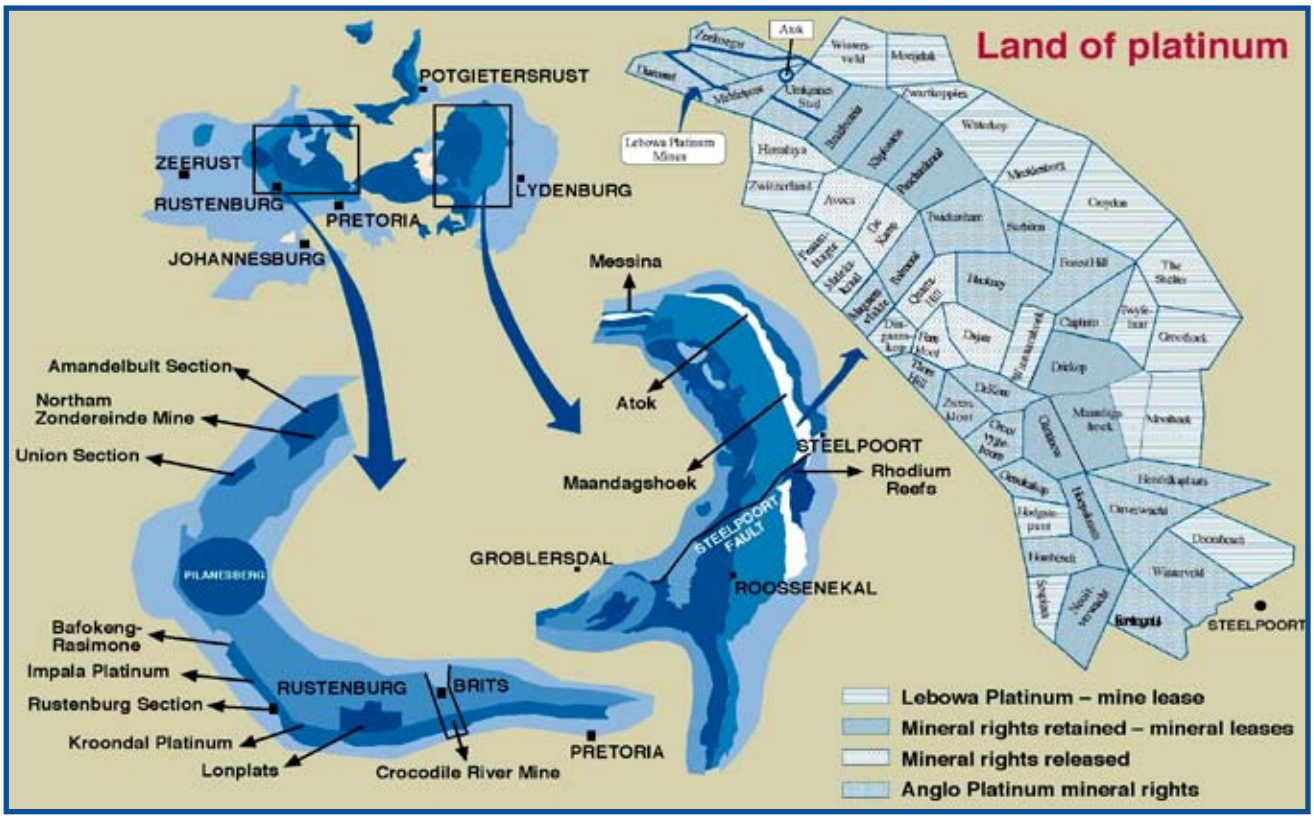
The large alluvial platinum deposits in Russia's Ural Mountains have been exploited since 1823. The deposits once represented the richest known underground sources of platinum, but have since been stripped of the highest-grade ore.

From the 1920s, production from the Urals started to decline, to a point where the deposits now account for less than one per cent of Russian platinum production.

Russia's most important source of PGM reserves are the PGM-containing copper-nickel deposits on the Tamyr Peninsula in northern Siberia. Exploitation of these deposits began in 1935.

In 1960, valuable copper-nickel deposits were discovered at Talnakh. Four mines were developed there, all of which are still in operation.

Small quantities of PGMs are also produced from copper-nickel deposits on the Kola Peninsula, and the past ten years have seen the exploitation of two alluvial deposits in the far east region of Russia.



Russian PGM production is dominated by Norilsk Nickel, which produces platinum, palladium and minor PGMs from its copper-nickel mining and smelting complex in northern Siberia, and from its copper-nickel mines in the Kola Peninsula. The Russian company is also involved in a project in Finland, with Gold Fields, and has acquired the majority share in North American miner Stillwater. In line with its reorganisation process and plans to create a major international company with a listing on a Western exchange, Norilsk recently announced that it had consolidated its gold assets, including its 20% stake in Gold Fields, under its Polyus gold subsidiary.

South African company Anglo Platinum is currently conducting exploration in Russia.

In 2004, Russia produced an estimated 850 000 ounces of platinum, which was down from the previous year's production of 1,05-million ounces.

Despite the importance of the Russian PGM mining industry to global PGM markets, however, information on reserves, production and sales has historically been difficult to obtain, as data was deemed confidential under the Russian State secrecy law. To amend this situation, a bill was passed in late 2003 to declassify PGM information, with the exception of government stocks and sales. The bill took effect in February 2004, but publication of the PGM data appeared to have been delayed by regulatory procedures until President Putin signed a decree, in March 2005, permitting the release of the data. PGM data by Norilsk is now expected in late 2005.

Canada and North America

North America accounts for a modest part of world platinum output and deposits in the region have a high percentage of palladium.

PGMs produced in Canada are largely a byproduct of nickel mining.

The Sudbury Basin, in central Ontario, discovered in 1883, has the largest number of PGM-producing mines in the country. This complex is the source of three per cent of the world's platinum. In Northern Quebec, PGMs are extracted from the Raglan nickel mine and, in Manitoba, another nickel complex produces PGMs. In all these orebodies palladium is the primary PGM produced.

Near Thunder Bay, in western Ontario, the Lac des Iles mine is the only existing source of PGMs in Canada. Between 1963 and 1966, eight zones containing PGMs and base metals were identified here. Commercial production from one of these zones began in 1993.

In the United States, primary production of PGMs is confined to the Stillwater mine in Montana, where PGMs are extracted from the high-grade J-M reef – a two-metre-wide palladium-rich orebody. Palladium accounts for about 75% of the production, with the remainder being platinum.Production from this reef started in 1987, and accounts for 1,5% of the world's platinum production.

Russian PGM mining districts and refineries

In 2004, North American platinum production amounted to 385 000 oz, which was up on the 295 000 oz produced in 2003.

South African companies Anglo Platinum and Impala Platinum are both exploring in the Sudbury area of Canada.

Zimbabwe

Zimbabwe's platinum deposits are located in a geological sequence known as the Great Dyke – an igneous intrusion 30 km wide and 550 km in length, spanning almost the length of Zimbabwe in a north-to-south direction.

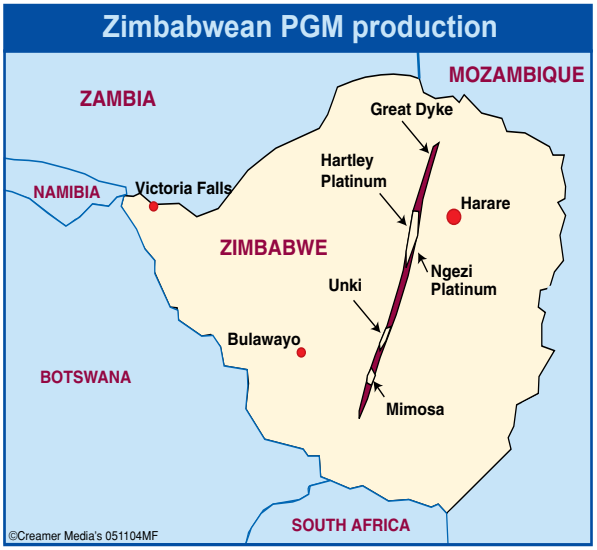
Within the dyke there is horizontal layering, with distinctive zones of certain rock types being evident, and PGM-bearing ore is found between the surface and 500 m in depth.

In spite of political tensions in the country, supplies of PGMs from Zimbabwe are set to increase significantly over the next few years. It is estimated that around three per cent of the world's platinum could, in due course, be produced from the Great Dyke orebody.

In 2004, production was up five percent to 145 000 ounces.

There has been a rush of platinum companies moving back into Zimbabwe, despite political instability in the country and a lack of clarity on indigenous equity ownership. Announcements were made that the government was planning on dramatically increasing black mine ownership, possibly to as high as 50%, but later suggestions have indicated indigenous equity ownership targets of 20% within two years, 25% within seven years, and 30% within ten years of the approval of the regulations.

Zimbabwean opposition leader Morgan Tsvangirai recently voiced concerns about foreign companies negotiating deals with the Zimbabwean government. He has warned that South African companies, especially, should be aware that any deals negotiated with Robert Mugabe's government may not necessarily be honoured. This puts additional pressure on South African companies like Implats and Anglo Platinum that are currently trying to conduct business amid political unrest.



Finland

Finland is one of the few world locations that contain an abundance of layered mafic intrusions filled with platinum-group-elements. The Arctic Platinum Project is an advanced PGM project in the Northern Finland Portimo intrusion complex, close to the Arctic Circle, and is 100% owned by South African gold-miner, Gold Fields. The latest feasibility study of the project, however, has indicated that Gold Fields will either delay or scale down the initial ten-million-ton-a-year project, mainly due to the appreciation of the euro against the dollar. By the end of March 2005, Gold Fields had invested a total of $90-million into the Arctic Platinum Project and intends holding on to the project for development in the future, pending favourable economic conditions.

The global platinum market is one in which demand continues to outstrip supply, despite supplies increasing and major platinum mines introducing expansion programmes.

Global market

According to the Johnson Matthey Platinum 2005 report, total global demand for platinum in 2004 was 6,58-million ounces, which was up on the previous year's demand of 6,53-million ounces.

Demand for the metal by the automotive industry continued to rise in 2004, while demand from the jewellery industry fell sharply, and resulted in the automotive industry replacing jewellery as the lead demand sector for platinum for the second year in a row. Industrial demand for platinum increased slightly in 2004, and investment demand rose, showing a great improvement from 2003.

Automotive Industry

In all, demand for platinum by the automotive industry in 2004, at 3,51-million ounces, was 7% up on the previous year's 3,27-million-ounce-demand. In North America, however, demand fell by almost 10%. Europe recorded increased demand of 14%, Japanese demand increased 18%, and demand in the rest of the world was up by 7%.

In contrast to the 54% increase in 2003, North America bought less platinum in 2004.The decrease in demand from the North American auto market was largely a consequence of automakers' preference for palladium-based autocatalyst systems and the plan to continue to reduce their use of platinum.

In Europe, the increase was mostly due to the sale of diesel cars, which accounted for 48% of new cars sold in 2004. Further, emissions standards in Europe are tightening, resulting in higher average diesel catalyst loadings and the introduction of platinum catalysed diesel particulate filters as original equipment on some light vehicles.

In Japan, the introduction of new heavy-duty diesel emissions legislation and the building up of PGM stock was largely responsible for the increase in demand while, in China, emissions regulations continued to tighten, resulting in an increased demand for platinum-bearing autocatalysts.

Demand for platinum from the automotive industry is expected to continue on its upward trend in 2005, but will be less prominent than in 2004.

Jewellery Demand

According to Johnson Matthey, platinum demand in the jewellery industry in 2004 was 2,20-million ounces, which was 310 000 oz down on the previous year's demand of 2,51-million ounces, despite an increase in demand for the metal from the UK jewellery industry. In North America, retail sales of platinum jewellery dipped, while major falls in demand for a second year in succession were recorded in China and Japan.

In China, the performance of the platinum price had a major effect on restricting manufacturing demand, which fell 19% year-on-year. The cost of financing the industry inventories of platinum products and the financial risk of holding metal increased with the rise and volatility of the metal price, which resulted in retailers and wholesalers returning old jewellery stock to manufacturers. Further, platinum jewellery retail prices were raised throughout the year on several occasions, which resulted in the platinum price losing some market share to less expensive white gold and palladium jewellery. Some relief may come in the form of the bridal and diamond sectors of the platinum market, which are expected to offer the potential for growth and higher margins in the future.

In Japan, platinum jewellery maintained its overall market share in 2004, but the Japanese jewellery market as a whole contracted, resulting in a fall in the demand for platinum for jewellery manufacture in the country. This was compounded by a rise in recycled platinum stock in the country, which contributed a significant amount of metal to the market. As white gold takes further market share, Japanese sales of

platinum jewellery are expected to weaken again in 2005, resulting in a further fall in platinum demand.

Industrial and Investment Demand

Industrial demand for platinum in 2004, at 1,53-million ounces, was substantially higher than the previous year's 1,38-million ounces, with the growth in platinum demand from the glass industry which increased by 210 000 oz.

Demand for platinum as an investment in 2004, at 40 000 oz, was up on the previous year's 15 000 oz demand.

Platinum Demand 1999 – 2004 (000 oz)

	1999	2000	2001	2002	2003	2004
Autocatalyst: gross recovery	1 610 (420)	1 890 (470)	2 520 (530)	2 590 (565)	3 270 (645)	3 510 (700)
Jewellery	2 880	2 830	2 590	2 820	2 510	2 200
Industrial	1 340	1 490	1 560	1 545	1 380	1 530
Investment	180	(60)	90	80	15	40
Total demand	5 590	5 680	6 230	6 470	6 530	6 580

Source: Johnson Matthey

Platinum Supply

According to Johnson Matthey, the increases in platinum demand in 2004 were accompanied by increases in supply, although supplies once again fell below the level of demand, by 80 000 oz. Total supply was 6,50-million ounces, which was up on the previous year's 6,20-million ounces.

South Africa contributed the largest amount of platinum to supply, at 5,03-million ounces, which was up on the previous year's 4,63-million ounces, but well off initial expectations, as a number of platinum-related expansions in the country were scaled-back as a result of the strength of the rand. For example, Anglo Platinum's expansion programme to increase production to 3,5-million ounces by 2006 has been slowed down, and the company now intends producing 2,8-million ounces by 2006.

Supplies from Russia in 2004, at 850 000 ounces, were down on the previous year's 1,05-million oz. A decree to repeal the secrecy laws concerning PGM production data has been signed by President Putin, and it now appears that geological reserves and mine production, with the exception of government stocks and sales, will be released by the end of the year.

Supplies from North America in 2004, at 385 000 oz, were up on the previous year's supply of 295 000 oz.

Zimbabwean platinum production in 2004 increased slightly to 145 000 oz, as expansions at the Ngezi and Mimosa operations came into production.

Platinum Supply 1999 – 2004 (000 oz)

	1999	2000	2001	2002	2003	2004
South Africa	3 900	3 800	4 100	4 450	4 630	5 030
Russia	540	1 100	1 300	980	1 050	850
North America	270	285	360	390	295	385
Other	160	105	100	150	225	235
Total supply	4 870	5 290	5 860	5 970	6 200	6 500

Source: Johnson Matthey

According to Johnson Matthey, 2004 saw the highest annual average price of platinum since 1980, which was supported by the firmness of overall demand and other investor buying. The average platinum price increased to $845,75, which was up 22% from the 2003 average.

Analysts are predicting that platinum prices will remain strong in 2005 as the Chinese demand for platinum seems to be recovering, having already showed signs of strengthening from the last quarter of 2004.

The world market, according to Johnson Matthey, is expected to stay roughly in balance as supply and demand for platinum increase slightly. The increase in supply would not be as rapid as 2004, due to reduced growth in production from Anglo Platinum on the strength of the rand. Additional demand increases are expected from the auto sector. However, it is yet to be seen whether the actions of hedge funds and other investors will have a greater impact than the basics of demand and supply, resulting in wide fluctuations in the price, as was the case in 2004.

There are other observers who are concerned about the slowed pace of production increases. These analysts fear that any sustained period of supply deficit could result in destructive price spikes, which could undermine the long-term prospects for the metal.

Platinum is used in a range of applicaions, from jewellery to ctalysts for the automotive industry, as well as in fuel cells and the electroonics sector.

Applications

In the international jewellery industry, platinum's strength and tarnish-resistant qualities have increased its popularity in markets that have traditionally been dominated by gold.

The ability of platinum to be repeatedly heated and cooled without hardening and oxidation effects, as well as its ability to produce settings which permanently retain their shape, has made the metal popular among jewellery manufacturers, although the use of platinum does make certain demands on the skills of the jeweller.

The 1 796 °C melting temperature of pure platinum necessitates the use of high-temperature melting and casting equipment. In addition, a clean working environment is required for platinum jewellery fabrication, and specialised polishing techniques must be used to achieve a highly-reflective finish.

In addition to its popularity as a jewellery metal, awareness of platinum as an investment, in the form of bars, ingots and bullion coins, is increasing. Popular platinum coins include the Canadian Maple Leaf, the Australian Koala and the United States Eagle.

Platinum has the ability, in certain chemical forms, to inhibit the division of living cells, a property that has led to its application in the medical industry, where it has been used to develop anti-cancer drugs.

Furthermore, platinum's non-corrosive and highly-conductive qualities make it an ideal electrode for use inside the body, in devices such as pacemakers.

Platinum marker bands and guide wires are also used on catheters, assisting surgeons to guide the devices to the treatment site.

Platinum is widely used in the chemical industry as a catalyst for chemical reactions.

Its catalytic properties enhance the production of biodegradable components for household detergents, and the production of nitric acid – essential for the manufacture of fertilisers and explosives – where knitted platinum gauze acts as the catalyst. It is also used as a catalyst in the petroleum refining industry.

The largest demand for platinum in the chemical industry, however, is as a catalyst in the manufacture of speciality silicones, used for adhesives in the paper and construction industries. The metal is also involved in the manufacture of silicones for the aerospace and automotive industry.

Its involvement in the automotive industry, however, extends far beyond the production of silicones, as platinum is becoming increasingly important in the reduction of automotive pollution. The automotive industry accounts for about 40% of annual global platinum consumption.

Platinum, palladium and rhodium are the primary components in autocatalysts, which convert 90% of the hydrocarbons, carbon monoxide and oxides of nitrogen from petrol engines into less harmful carbon dioxide, nitrogen and water vapour.

Autocatalysts also reduce the pollutants in diesel exhaust.

In the last decade, legislation surrounding vehicle emissions has become far more stringent, resulting in increased demand for platinum from the automotive sector.

Also in the automotive industry, platinum is used as a catalyst in fuel-cells, which are being developed for the generation of electric power. Fuel-cells will be an environment-friendly alternative to current combustion-powered cars, as they have virtually no emissions, and are highly energy efficient.

Fuel-cells are also able to provide electric power for homes and offices and, in the United States, Europe and Japan, they are already being used to power hospitals and industrial plants.

In his 2003 State of the Union address, US President George Bush announced a $1,2-billion grant for research into the development of fuel-cells.This announcement is expected to raise the price of platinum.

In the electronics industry, platinum is used in computer hard disks, enabling data to be stored at higher densities. The metal is also used in temperature- and gas-sensing equipment, and in the production of glass-reinforced plastics, glass for liquid-crystal displays and glass-making equipment.

South African metals research institute Mintek is currently leading a project to create materials that can withstand higher temperatures than nickel-based alloys used in turbine blades. The organisation believes that platinum will allow the new materials to remain solid at heat of 1 300 °C to 1 350 °C, as opposed to the 1 150 °C that nickel can withstand.

Aircraft turbines and power generators would then be able to run more efficiently at higher temperatures. The South African government and platinum producers Anglo Platinum, Impala Platinum and Lonmin are funding the research initiative, with research scientists assisting from various institutions in South Africa, Japan, Britain and Germany.

The requirements of the Mineral and Petroleum Resources Development Act and the Mining Charter are reshaping South Africa's mining industry

Legislative and policy environment

The Mineral and Petroleum Resources Development Act (MPRDA), which came into effect on May 1, 2004, was drafted in an attempt to formulate a regulatory framework for South Africa's mining and minerals industry. The aim of the legislation is to correct historical imbalances in the industry caused by the legacy of apartheid, without threatening its attractiveness to domestic and international investors.

The Act follows international trends in minerals regulation, especially those seen in Canada, Australia and North America, and centres around the provision that all mineral rights will revert to the State, representing a move away from the previous system where ownership of mineral resources lay in the hands of private companies.

The intention of this development is to ensure increased access to mining activity for historically-disadvantaged people, and to enable the State to put an end to the hoarding of mineral rights, with a use-it-or-lose-it principle ensuring that if a company fails to use its mineral rights it will lose those rights after a certain period.

This will affect mining companies holding unutilised reserves, as well as those who own projects that have been shut down due to unprofitability. In addition, the principle allows the State the discretion to force the holder of mineral rights to abandon development projects if it is of the opinion that the project is not producing at the most efficient levels.

The Act also answers the need for broader access to geological, geochemical and geophysical information, which, in the past, was held by the entity that conducted the exploration and was protected by restrictions on disclosure. Through this, and improved access to mineral rights, the Act is designed to bring an end to the situation in which a few large companies dominate South Africa's mining industry, and is intended to stimulate the development of South Africa's junior mining sector, which is currently small and compares poorly with junior mining sectors in other parts of the world.

Junior mining companies are expected to benefit from the proposal in the Act that requires evidence of the participation of historically-disadvantaged people in applications for prospecting and mining rights. Government and industry have drafted a socioeconomic empowerment charter that will form part of the Department of Minerals and Energy's (DME's) regulations and criteria for awarding prospecting and mining licences.

The development of the charter was provided for in section 100 of the Mineral and Petroleum Resources Development Bill, under the heading Transformation of the Industry, which stated that within six months of the Bill taking effect as an Act, the Minister of Minerals and Energy must have developed a charter that sets the framework, targets and timetable for effecting the entry of historically-disadvantaged South Africans into the mining industry. The charter establishes how to achieve equitable access to South Africa's mineral and petroleum resources for all South Africans, and outlines how the creation of employment and the advancement of social and economic welfare can take place through the appropriate use of these resources. The charter also sets a framework that ensures that the holders of mining and production rights contribute towards the socioeconomic development of the areas in which they are operating.

The charter has been the source of much speculation and agitation among many in the industry, but is considered necessary in order to correct the racial balance of the South African mining industry, which remains white-controlled. There has been some confusion about how the mining charter will be affected by the recently-published Broad-Based Black Economic Empowerment Codes of Good Practice, but government has indicated that the charter and

Scorecard for the broad-based socioeconomic empowerment charter for the South African mining industry

	Description	5-year target	10-year target
	Human resource development		
1	Has the company offered every employee the opportunity to be functionally literate and numerate by the year 2005 and are employees being trained?	Yes No	
	Has the company implemented career paths for HDSA employees including skills development plans?	Yes No	
2	Has the company developed systems through which empowerment groups can be mentored?	Yes No	
	Employment equity		
	Has the company published its employment equity plan and reported on its annual progess in meeting that plan?	Yes No	
3	Has the company established a plan to achieve a target for HDSA participation in management of 40% within five years and is implementing the plan?		
	Has the company identified a talent pool and is it fast tracking it?	Yes No	
4	Has the company established a plan to achieve a target for women participation in mining of 10% within the five years and is implementing the plan?		
	Migrant labour		
5	Has the company subscribed to government and industry agreements to ensure non-discrimination against foreign migrant labour?	Yes No	
	Mine community and rural development		
	Has the company cooperated in the formulation of integrated development plans and is the company cooperating with government in the implementation of these plans for communities where mining takes place and for major labour-sending areas? Has there been effort on the side of the company to engage the local mine community and major labour-sending area communities? (Companies will be required to cite a pattern of consultation, indicate money expenditures and show a plan).	Yes No	
	Housing and living conditions		
6	For company-provided housing has the mine, in consultation with stakeholders, established measures for improving the standard of housing, including the upgrading of the hostels, conversion of hostels to family units and promoted home ownership options for mine employees? Companies will be required to indicate what they have done to improve housing and show a plan to progress the issue over time and is implementing the plan?	Yes No	
7	For company-provided nutrition has the mine established measures for improving the nutrition of mine employees? Companies will be required to indicate what they have done to improve nutrition and show a plan to progress the issue over time and is implementing the plan?	Yes No	
	Procurement		
	Has the mining company given HDSAs preferred supplier status?	Yes No	
	Has the mining company identified current level of procurement from HDSA companies in terms of capital goods, consumables and services?	Yes No	
8	Has the mining company indicated a commitment to a progression of procurement from HDSA companies over a 3–5 year time frame in terms of capital goods, consumables and services and to what extent has the commitment been implemented?	Yes No	
	Ownership and joint ventures		
9	Has the mining company achieved HDSA participation in terms of ownership for equity or attributable units of production of 15 per cent in HDSA hands within 5 years and 26 per cent in 10 years?	15%	26%
	Beneficiation		
	Has the mining company identified its current level of beneficiation?	Yes No	
10	Has the mining company established its base-line level of beneficiation and indicated the extent that this will have to be grown in order to qualify for an offset?	Yes No	
	Reporting		
	Has the company reported on an annual basis its progress towards achieving its commitments in its annual report?	Yes No	

the MPRDA will remain the definitive economic empowerment medium for the mining industry. This decision, as well as the charter itself, will be reviewed after a five-year period.

The charter requires that 15% of the ownership of existing mining industry assets must be held by historically-disadvantaged South Africans within five years, and 26% within ten years. While the charter does not provide clarity on the issue of new mining projects, a meeting, held in July 2004, between the Department of Minerals and Energy, labour unions and mine resource owners, resolved this issue. Agreement was reached that all new mining projects where the mineral rights were previously State-owned must have a 51% BEE shareholding within the one-year transitional period, and a 26% BEE shareholding if the mineral rights were formerly privately held. For pending applications for prospecting rights the same criteria will apply. All applications for rights not falling into these categories that are in the custodianship of the State will be subject to a minimum 26% BEE participation.

The targets for the participation of historically-disadvantaged individuals must be reached by individual companies, but companies can earn offset points whereby the ownership target will be moderated should the company facilitate value-addition downstream opportunities. This will be clarified in future promotion of beneficiation legislation. The charter also requires companies to procure from BEE companies, engage in skills upliftment, improve worker housing conditions and develop social plans for retrenched workers. These obligations cannot be used to offset equity obligations.

In addition to requiring the involvement of historically-disadvantaged people, which will be facilitated through the empowerment charter, the Act also requires that companies consult with government should they wish to beneficiate locally-produced minerals outside the country. This provision is designed to promote the use of mineral resources for sustainable economic development, and to avoid the trap that many developing countries fall into of exporting jobs through the exportation of unbeneficiated minerals.

Based on this, the granting of mineral rights will be influenced by the involvement of historically-disadvantaged people, and by plans to beneficiate the minerals locally.

In order to give effect to the charter, a scorecard has been released by which companies will be evaluated to determine whether they have complied with the provisions contained in the charter and the Act, and thus to determine whether their old-order mining rights should be converted to new rights. The entire scorecard will be taken into account in the adjudication by the Minister of Minerals and Energy.

Mineral rights for established operations will offer security of tenure for an initial 30 years, renewable for additional 30-year periods. The Act allows for the provision of a retention permit, allowing the company granted the mineral rights to retain the rights without developing them for a period of three years, renewable for two years, if market conditions are poor. New prospecting rights are valid for a period not exceeding five years, with possible renewal once for another period of a maximum of three years and, once prospecting has been completed, the company must reapply to convert these rights into mining rights if it wishes to establish operations.

All new mining licences, including those for existing mineral rights properties, will require evidence of a black economic empowerment plan, a social plan, and an environmental management plan.

Under the MPRDA, a transitional period allows current holders of mineral and mining rights to convert their old-order rights to the new order of rights.

Mineral-rights holders who did not hold prospecting permits or mining authorisations and who were not actively prospecting or mining on their properties were given a year from the date on which the Act came into effect to apply for prospecting or mining rights under the new legislation. Mineral-rights holders who did not apply within this period lost their rights, and any other persons or groups will be able to apply directly to the State for prospecting or mining rights for the areas formerly covered by those rights.

Mineral-rights holders who were actively prospecting or mining on the properties to which their old-order rights relate (with the necessary permits or authorisations from the DME) were given two and five years, respectively, from the date on which the MPRDA came into effect, to convert their old-order rights to new-order prospecting or mining rights.

Within 14 days of lodging an application for the conversion of prospecting or mining rights with the

DME, a decision as to whether or not this application has been accepted will be made by the department. If an application is rejected, the process ends there. However, if the application is accepted, the mining company is given 30 days to consult with interested and affected parties, and to give the results of this consultation to the DME. Then, depending on whether it is an application for a mining title conversion or prospecting right, the mining company is given either 180 days or 60 days respectively to devise an environmental management plan. Once this has been submitted to the DME, the department has 120 days to assess the application.

To date, the DME has issued more than 300 new-order licences for prospecting and mining, but has received several thousand applications. Mining companies are discontented over the time taken to be awarded new-order rights, and the lengthy application process has been identified by some as causing widespread uncertainty among mining and exploration companies operating in South Africa.

Legislation, separate to the MPRDA, aimed at overhauling the registration of mining titles and setting up a central office to regulate all mining and prospecting rights has been passed. It is known as the Mining Titles Registration Amendment Act. This law seeks to bring registration in line with the MPRDA, and aims to establish a central point for the registration and recording of all mining titles.

The MPRDA represents a significant move away from the old regulatory regime, and the DME is required by the Act to put in place the necessary supporting infrastructure to implement it. A Minerals and Mining Development Board, consisting of no fewer than 14 and no more than 18 members, will be established to advise the Minister on the sustainable development of the country's mineral resources, as well as on the transformation and downscaling of the industry. The board will also play a role in dispute resolution, and will, in consultation with the Mining Qualifications Authority, promote the development of human resources.

To facilitate the passage of the new regulatory environment, the Act provides for transitional arrangements that will be used to phase-in the new framework. These will ensure that security of tenure is protected, and will give the holders of old-order rights and OP26 rights the opportunity to comply with the Act.

In spite of the transitional mechanisms, however, uncertainties remain regarding the practical implementation of the Act, and business has expressed concerns over this.

Other concerns being voiced by business include what they have identified as broad discretionary powers granted to the Minister, and the absence of clearly-defined recourse to the courts in the event of having to challenge a ministerial decision made by virtue of these powers.

Government, however, holds that, in comparison to the Minerals Act of 1991, the Act limits the extent of discretionary power through containing objective statutory requirements that will be used to determine whether a company is granted prospecting or mining rights. Government also emphasises that, as a fundamental right contained in the South African Constitution, recourse to the courts is implied, and is not excluded under the new Act.

Concerns have also been raised over what is perceived as overregulation of the industry, demonstrated in the Act's requirement that companies consult with government should they wish to beneficiate locally-produced minerals outside the country. Government feels justified in this, however, as it provides incentives for the local beneficiation of minerals.

In addition, business is concerned that, through the use-it-or-lose-it principle, mineral resources previously held by companies that were likely to exploit them over a long period, may now be developed in the next few years, increasing supply to the market and disrupting the delicate supply-and-demand balance, thereby exerting downward pressure on metals prices.

Of the country's minerals industries, the gold industry is least likely to be affected by this, as most remaining gold deposits are deep and of a complicated geology, thus representing a barrier to entry, as mine development will be extremely costly. Entering the diamond industry may also prove difficult, as most known diamond deposits are already being mined, and a newcomer would have to conduct exploration, a factor which may serve as a deterrent.

The impact of the use-it-or-lose it principle on the coal industry, however, is expected to be more significant, as the country has extensive shallow coal resources that could be exploited relatively cheaply. Nonetheless, a barrier against entry to this industry exists in the form

of the Richards Bay Coal Terminal, which is currently operating at maximum capacity, thereby limiting the ability of any newcomers to export their production.

The industry most likely to be affected is the platinum industry, where barriers to entry are low. Several fairly shallow unmined deposits exist, and investor returns in this industry are known to be high, making investments attractive. The iron-ore industry may also be targeted by new investors, as prices are stable and margins are high.

However, given that new projects of any significant scale take some four years to reach full production means that no imminent rise in metals production is expected, and that the market will have time to readjust its balances.

The environmental policies of the MPRDA are expected to ensure responsible mining practices, to some extent, although the enforcement of these policies will be the ultimate determinant of their effectiveness.

Everyone applying for a prospecting or mining right must lodge an environmental management programme report (EMPR) evaluating the impact of the proposed operations on the environment and on the socioeconomic conditions of affected people. In order for this EMPR to be approved, applicants must make the prescribed financial provisions for the management of environmental impacts, and for rehabilitation.

The Act empowers the Minister to force a permit holder to take urgent remedial action to deal with an environmental hazard, and the minister is even authorised to use State funds to pay for this, although the money must be recovered from the permit holder.

Although certain other environmental provisions are made in the Act, it does not represent a definitive piece of environmental legislation, and the interrelationship between the Act and other environmental laws remains important.

Firstly, environmental rights are included in the Constitution, which requires that environmental considerations are accorded appropriate recognition in the South African economy.

To substantiate these environmental rights, the National Environmental Management Act (Nema) explicitly outlines principles for cooperative environmental governance, and mining companies find themselves subject to this piece of legislation.

One of the most significant environmental challenges faced by the mining industry relates to water and, in order to define responsibility in this area, companies fall under the National Water Act.

As a result of this, it has been noted that environmental law in South Africa appears fragmented and, on occasion, contradictory, with the result that uncertainty exists as to what is required of mining companies with regard to environmental protection.

A new piece of legislation intended to regulate South Africa's mining sector, released early in 2003, is the Mineral and Petroleum Royalty Bill, which has caused much concern among local miners. The draft bill imposes royalties on revenues derived from mineral production in the country. Gold royalties have been proposed at three per cent, and platinum at four per cent. The royalty on coal, copper, zinc, iron-ore and nickel has been proposed at two per cent, while the royalty on diamonds has been proposed at eight per cent. The royalty on offshore oil and gas has been proposed at one per cent.

Other features of the proposed legislation include that royalties will also be levied on mineral beneficiation activities, and exemptions will be granted to operations mining low-grade ores, those deemed to be marginal and those whose economic viability is questionable.

The royalties are to be paid quarterly, on conversion of mining rights in terms of the MPRDA.

Mining companies are concerned over the consequences such a piece of legislation could have, and the Chamber of Mines, supported by the mining industry, has argued that, if a royalty regime is necessary, it should be profit-based, which would ensure that royalties are payable only when an operation is profitable. The companies claim that the proposed Royalty Bill will reduce the viability of existing operations, increase pay-limits and, consequently, cause job losses. The legislation could also substantially increase hurdle rates for new and organic growth projects. Another consequence of the proposed legislation is that it may negate much of the goodwill that has been re-established following the leaking of the mining charter in 2002. It is generally believed that the bill, in its current form, will threaten the long-term viability of the industry.

Mining industry participants hold that the royalty rates are too high, and that the fact that the rates are levied on revenue rather than profit fails to take into account

the total tax package being paid by mining companies. Government, on the other hand, has stated that it arrived at the levy figures after studying the rates applicable in other mining countries, and appears set to persist with its proposed revenue-based system.

The process of legislating the bill is still in its early stages, and mining houses are submitting comments on the document, which are being considered by the National Treasury. The Finance Minister has indicated that this piece of legislation will take effect in 2009.

Still to come is the Promotion of Beneficiation Bill, which is expected to provide incentives for upstream companies that facilitate downstream investments, in order to reduce the exporting of unprocessed mineral products and to promote local value addition. The process of drafting this bill has been slowed in order to allow for greater engagement with industry, which seems opposed to the idea, claiming that it is not reasonable to expect those involved in primary extraction to get involved in beneficiation. More clarity on the beneficiation bill is expected during 2005.

This section contains profiles of the main participants in South Africa's platinum industry, including Anglo Platinum, Impala Platinum, Lonmin Platinum and Northam among others.

Main participants

Anglo Platinum

Brief history

Anglo Platinum as a company was formed in 1995, after the unbundling of JCI. Out of JCI came three companies: JCI, Johnnic and Amplats which, in 2000, changed its name to Anglo Platinum.

Nature of business and market position

Anglo Platinum is the world's leading primary producer of platinum, accounting for more than half of South Africa's 75% contribution to world supplies. The company mines, processes, refines and markets the metal, as well as other platinum-group metals (PGMs) – palladium, rhodium, ruthenium, iridium and osmium – and produces small quantities of gold, nickel, copper and cobalt.

The company's primary listing is on the JSE Securities Exchange, and it has secondary listings in London and Brussels. Market capitalisation is an estimated R55-billion.

Anglo Platinum has five wholly-owned operating mines in South Africa – Rustenburg Section, Amandelbult Section, Union Section, Potgietersrust and Lebowa – and two joint venture mines – Bafokeng Rasimone and Modikwa – as well as several projects under development. The company also has three smelters, a base metals refinery and a precious-metals refinery. A third smelter is under development.

From these facilities, the company produced 2,45-million ounces of platinum and 1,31-million ounces of palladium in 2004, which contributed to total PGM production for the year of 4,43-million ounces.

Output in 2004 was up on the previous year's production, when Anglo Platinum produced 2,31-million ounces of platinum and 1,19-million ounces of palladium, contributing to total PGM production of 4,16-million ounces.

Anglo Platinum's Output 2000 – 2004 (000 oz)

	2004	2003	2002	2001	2000
Platinum	2 453,5	2 307,8	2 251,1	2 109,2	1 871,7
Palladium	1 310,7	1 190,9	1 115,3	1 049,0	946,6
Rhodium	253,3	232,5	211,7	200,4	165,1
Gold	109,9	116,1	107,1	102,2	97,9
PGMs	4 426,4	4 161,5	3 947,6	3 673,6	3 255,4
Nickel	22,3	22,1	19,4	19,5	19,2
Copper	12,9	12,9	10,5	10,8	10,8

Source: Anglo Platinum Website

The increases in production experienced are indicative of the company's drive to raise output from the 2,1-million-ounce level of 2001 to the revised target of 2,7 – 2,8 million ounces of platinum in 2006. Despite the appreciating rand having a restraining effect on the company, Anglo Platinum met the original target of 2,45-million ounces in 2004 and is expected reach the interim target of 2,6-million ounces set for 2005.

To facilitate the increased production, Anglo Platinum is implementing a suite of projects that will contribute additional ounces to the group's output. Among the projects being undertaken are new mine developments, smelting and refining capacity upgrades, and expansions to existing operations. Additional ounces will also accrue from the pooling-and-sharing agreement reached in November 2003 with Aquarius Platinum, involving the company's contiguous Rustenburg and Kroondal lease areas, and the Unki mine being developed in Zimbabwe in partnership with Anglo American Zimbabwe.

To secure funds for the expansion programme, Anglo Platinum undertook a rights issue in 2004, raising R4-billion. The issue, which was supported by Anglo American plc, Anglo Platinum's majority shareholder, took the form of convertible perpetual preference

shares, and the company felt that raising funds through a rights issue rather than borrowing would bolster its balance sheet and give it enough flexibility to fund the remainder of its capital-spending commitments. The offer was oversubscribed.

The expansion programme was originally targeting output of 3,5-million ounces by 2006, but was scaled back towards the end of 2003 and again in 2004, due to rising costs and the impact of the strength of the rand on the ability of the new projects to achieve profitability. In addition, Anglo Platinum has warned that it may be forced to further curtail its expansion programme as a result of the continued strength of the rand.

Towards avoiding such a situation, the company set cost-containment as its top priority for 2004, and embarked on a cost-cutting strategy, by which it aimed to limit cost increases to the level of inflation. The progress of this initiative has resulted in the company achieving sustainable cost savings from 2005, with continuous efforts being made to improve cost management.

The company appointed external consultants to redesign its structures and identify inefficiencies and, as a result, Anglo Platinum is to be redefined into six primary areas of business. Further initiatives for cutting costs will see the utilisation of idle refining capacity, which will improve efficiencies, and unit costs will also be cut through the ramping-up of production at new or expanded facilities. Company executives are focusing on on-mine costs, which account for 85% of cash operating costs, with labour and stores being the two biggest cost components under evaluation.

Ongoing capital expenditure until 2006 is expected to average R3,7-billion a year, while expansion capital expenditure in the same period will total R8,3-billion. In 2004, the group expected to spend in the region of R6,5-billion but, following the release of its June results, announced that it had reduced its capital budget for the year by R1,5-billion to R5-billion.

Capex amounted to R4,61-billion (2003: R7,60-billion) in 2004. Of this, R2,68-billion (2003: R4,13-billion) was spent on maintaining and replacing production, and R1,73-billion (2003: R3,27-billion) was spent on expansion projects. Capital expenditure decreased in 2004 due to the company's focus on capital optimisation. Anglo Platinum anticipates capex of R6-billion for 2005, but this remains subject to the ongoing review of the feasibility and implementation project programme. Towards meeting the BEE requirements of the mining charter, Anglo Platinum is involved in a number of joint venture activities with empowerment partners. For example, the Modikwa mine is owned in partnership with African Rainbow Minerals, with each of the parties contributing half of the development cost of the mine. The Bafokeng Rasimone mine is also owned by a joint venture between Anglo Platinum and a BEE partner. Further, Anglo Platinum has engaged an empowerment partner for the development of the Booysendal prospect on the Eastern Limb of the Bushveld Complex, and holds a share in Northam Platinum. A 22,5% interest in Northam Platinum was sold to BEE company Mvelaphanda Platinum. Anglo Platinum and Lonmin Platinum have entered a joint venture, together with empowerment partners – the Bapo Ba Mogale tribe and Northam Platinum – at the Pandora property east of Lonmin's current operations, providing the company with additional BEE credits.

There are concerns, though, that some of Anglo Platinum's BEE credits could now be in jeopardy due to the slowed pace of the project implementation, especially on the East Limb where many of the BEE deals were centred.

The company conducts exploration activities to secure replacement ounces at its existing operations, as well as in other regions of South Africa and the world, such as Canada and Russia.

Anglo Platinum is involved in marketing campaigns, through the Platinum Guild International, to sustain the metal's popularity in existing markets, and to develop new markets, and is committed to conducting research into new platinum uses, with the intention of exploiting new opportunities that will be created through the resultant market growth.

The company's relationship with Johnson Matthey provides the intelligence and market research essential for the formulation of successful marketing and operational strategies and, in joint venture with Johnson Matthey, Anglo Platinum researches and promotes new products that use PGMs. One of these joint arrangements, announced in 2002, involved the acquisition by Anglo Platinum of a 17,5% stake in Johnson Matthey Fuel Cells, the fuel-cell subsidiary of Johnson Matthey. Anglo Platinum is also a member of the World Fuel Cell Council, a body dedicated to the commercialisation of fuel-cell technology.

The company is actively involved in other industry organisations, including the International Platinum Association, which provides a communication forum for producers and fabricators and facilitates market development.

However, the development of the platinum market will fail to benefit Anglo Platinum if the company is unable to mitigate the impact of HIV/Aids and sustain production levels in the face of rising infection rates. Towards managing this challenge, in 2003, the company introduced a programme of free antiretroviral treatment for employees, and is reportedly achieving good results with this intervention. The company also launched a "Wealthy and Healthy Living" campaign, with aims to expand this service in 2005, where employees participating in testing and counselling for HIV/Aids exceeded the company's target of 15%.

Platinum operations in South Africa

Anglo Platinum has five wholly-owned operating mines in South Africa – Rustenburg section, Amandelbult section, Union section, Potgietersrust and Lebowa – and two joint venture mines – Bafokeng Rasimone and Modikwa – as well as several projects under development. The company also has three smelters, a base metals refinery and a precious metals refinery.

The Rustenburg, Amandelbult and Union sections are all owned by Rustenburg Platinum Mines (RPM), a wholly-owned subsidiary of Anglo Platinum. RPM holds mineral rights throughout the western limb of the Bushveld Complex, with both the Merensky and UG2 reefs occurring on the properties.

The Rustenburg section, which consists of three mining units – the West mine, comprising Frank, Townlands and Paardekraal shafts; the East mine, comprising Turffontein, Bleskop and Brakspruit shafts; and the Waterval mine – produced 545 800 oz of platinum in 2004, which was down on the 571 300 oz produced in 2003. The fall in production was due to a decrease in available Merensky reserves. The cash on-mine cost per equivalent refined platinum ounce increased by 12,6 % in 2004, partly due to effects of a wage strike in October, where some 15 000 oz was lost.

The Rustenburg UG2 project is expanding UG2 mining at the Frank, Townlands, Paardekraal, Bleskop and Brakspruit shafts, and at the Waterval mine, achieving a 49% increase in tons milled in 2004.

Capital expenditure at Rustenburg section in 2004 amounted to R1,21-billion, including expenditure on Phase 2 of the UG2 project.

In its 2004 annual report, Anglo Platinum predicts that production at Rustenburg section will continue to increase in 2005, with additional output from the UG2 project partly offset by lower Merensky production.

The Amandelbult section produced 591 700 oz of refined platinum in 2004, which was down eight per cent on the previous year's production of 644 700. Difficult geology led to lower production from the Merensky operations during 2004 at No 2 shaft, owing to the lack of mineable face length and poor ground conditions. Further, opencast output fell in line with the depletion of near-surface reserves and Amandelbult was the worst affected by the wage strike, losing some 23 000 oz of platinum. The cash on-mine cost per equivalent platinum ounce at Amandelbult increased by 22,1% in 2004.

Capital expenditure at Amandelbult in 2004 amounted to R314,4-million, which was all allocated to maintaining and replacing production. Progress has been made on issues affecting Amandelbult's Merensky production in 2004, and production is expected to be constant in 2005.

A multibillion-rand project under consideration for the Amandelbult mine will see the sinking of a number three shaft, which will mine the ground downdip of the number one shaft. The new three shaft is expected to go down to 2 000 m, current operations are mainly at 1 000 m, and to add a further 250 000 t of ore a month to Amandelbult's output. The project, which sources say has a price tag of R4,2-billion, is still at the appraisal-study phase, and may be deferred if the rand platinum price remains at current levels. However, if the project is given the green light, the new shaft will take about seven years to build, with a further five years required to bring it to full production. The project will not increase Amandelbult's ore production substantially; rather, it is intended to replace Merensky ore production from the number one shaft.

The Union section produced 313 000 oz of refined platinum in 2004, which was down slightly on the previous year's production of 318 200 oz, primarily due to the wage strike that resulted in the loss of 6 000 oz. Lower opencast production was largely offset by the additional output from the new UG2 declines and the processing of old tailings. Cash on-mine costs per

equivalent refined platinum ounce increased by 18,7% in 2004, mainly as a result of the negative effects of substituting opencast tons with underground tons.

Capital expenditure at Union section in 2004, which totalled R294,3-million, was down from the R606-million in 2004, mainly due to the completion of the declines and the new UG2 plant module in 2003. Production levels, supported by the strong performance of the declines, are expected to remain constant for the year.

Potgietersrust Platinums (PPRust) holds mineral rights over an area of 7 000 hectares on the Platreef, situated on the northern limb of the Bushveld Complex, in the Mokopane and Mokerong districts. Under mineral lease agreements with the Lebowa Mineral Trust, the company has the right to mine a further 6 888 hectares.

PPRust produced 200 100 oz of platinum in 2004, which was up on the previous year's production of 191 800 oz, as a result of Sandsloot maintaining its previous performance and newly-opened Zwartfontein South pit reaching capacity with its higher-grade ore. Cash on-mine costs per equivalent refined platinum ounce rose by 0,6% in the year, mainly due to the the high output volumes and strict cost control. Capital expenditure for 2004 totalled R186,2-million, including the cost the replacement of some haul trucks and pit mining equipment, and the establishment of infrastructure to ensure the long-term sustainable supply of water.

PPRust will continue to mine both the Sandsloot and Zwartfontein South pits in 2005, and production is expected to be similar to that of 2004.

Lebowa Platinum Mines (Leplats) mines PGMs from the UG2 and Merensky reefs on the eastern limb of the Bushveld Complex. The operation produced 118 800 oz of platinum in 2004, up on the 105 000 oz produced in 2003, and is expected to maintain production at a similar level in 2005.

Cash on-mine costs per equivalent refined platinum ounce produced at Leplats increased to 3,7% in 2003, while capital expenditure for the year amounted to R138,1-million, to maintain and replace production.

The Bafokeng Rasimone platinum mine, situated on the Western Limb of the Bushveld Complex, is a joint venture between Anglo Platinum and Royal Bafokeng Resources. The mine has been contributing to Anglo Platinum's production and earnings since 1999, and was a steady-state operation for the first time in 2004.

In 2004, Bafokeng Rasimone produced 184 900 oz of platinum, slightly up on the previous year's 183 500 oz, mainly due to the increase in production at the South shafts. Capital expenditure at the mine in 2004 amounted to R124,8-million, which was primarily spent on extensions to the North and South shaft complex and ongoing development. Cash on-mine costs per equivalent refined platinum ounce fell by 6,7%, in 2004.

Equivalent refined platinum production in 2004 matched the original designed capacity of 200 000 oz, and the level is expected to rise in 2005. Opencast reserves were depleted at the end of 2003, with all tonnage now being sourced from underground. Extensions to the North and South shaft complex are expected to continue in 2005.

The Modikwa platinum mine, currently ramping up to full production, is a joint venture between Anglo Platinum and African Rainbow Minerals. Each of the parties provided half of the capital cost for the development of the mine, which produced 114 200 oz of platinum in 2004, which was up on the 91 000 oz produced in 2003, but still under targeted output levels. Cash on-mine costs per equivalent refined platinum ounce, decreased by 6,7% in 2004.

The pooling and sharing agreement (PSA) of Kroondal platinum-mine with Aquarius Platinum (South Africa) was announced in June 2003. It allows the two companies to mine contiguous properties on their respective Rustenburg and Kroondal lease areas. The agreement provides for the parties to pool their assets, while retaining ownership of them, and

Production from Anglo Platinum Operating Mines 2000 – 2004 (oz)

	2004	2003	2002	2001	2000
Rustenburg section	545 800	571 300	611 500	689 900	624 700
Amandelbult section	591 700	644 700	677 600	653 700	566 700
Union section	313 000	318 200	276 700	269 500	291 100
PPRust	200 100	191 800	164 700	211 400	202 600
Leplats	118 800	105 000	105 100	90 000	73 200
Bafokeng Rasimone (ramp up)	184 900	183 500	161 500	126 400	112 200
Modikwa (ramp up)	114 200	91 000	27 300	-	-
Kroondal (50%PSA)	148 000	-	-	-	-

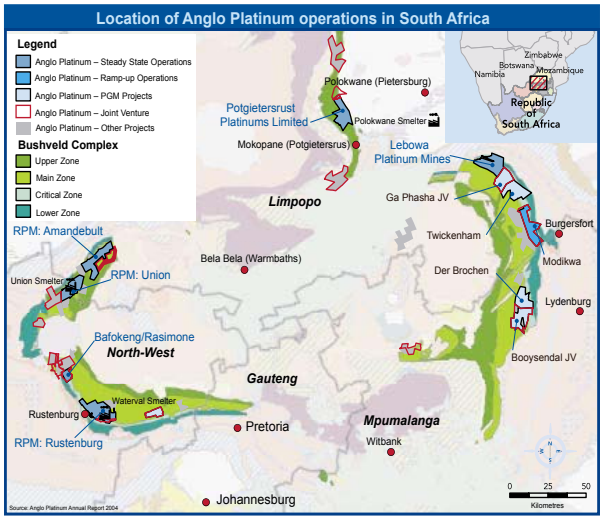
Source: Anglo Platinum Website

to share the proceeds equally. Equivalent refined platinum production in 2004 was 148 000 oz, of which 50% belonged to Anglo Platinum. The company also incurred capital expenditure to the amount of R202-million in respect of the expansion project.

Anglo Platinum's Waterval smelter processes concentrate from the mines, as well as furnace matte produced by the company's other smelters. The R1,6-billion Anglo Platinum Converting Process (ACP) project was has been commissioned at the Waterval, in order to significantly reduce the sulphur dioxide emissions from the smelter. The ACP plant a performed to expectations in 2004.

The Polokwane smelter, successfully commissioned in March 2003, processes concentrate from existing and new mines on the Eastern Limb, as well as providing backup capacity for the Waterval and Mortimer smelters.

Rustenburg Base Metal Refiners has two metallurgical processing plants – the magnetic concentration (MC) plant and the base-metal refinery plant, while Precious Metal Refiners (PMR), located in Rustenburg, remains the world leader in the field of PGM refining. PMR services all of Anglo Platinum's mines and joint ventures, and final concentrate from the MC plant and metallic concentrates from four of the company's concentrators are refined to high degrees of purity, and are fabricated into various forms, according to customer specifications.



Current capital projects

In May 2000, Anglo Platinum announced its intention to increase the group's production to 3,5-million ounces of refined platinum a year – up 1,5-million ounces from the 1999 base of two-million a year – through the implementation of an expansion programme, intended to bring a number of new operations into production and expand several existing operations and processing facilities.

During the second half of 2003, and again in 2004, the company reviewed its expansion programme against the backdrop of unfavourable economic conditions, and a decision was taken to slow the implementation of several mining projects by between one and three years. As a result, refined platinum production is now targeted to reach 2,7 – 2,8-million ounces in 2006.

Mining projects under development

One of the projects affected by the slow-down is the Rustenburg UG2 project. While phase one of the project, designed to produce 360 000 oz of platinum a year at the Rustenburg mine, has been completed according to its original specifications, and is ramping up to full production, expected in 2007, phase two of the project has been scaled back as a consequence of Anglo Platinum's reassessment of its expansion programme.

The original scope of phase two of the project, announced late in 2002, incorporated brownfields developments at the Frank and Townlands shafts, together with two new decline shaft clusters to be established at Boschfontein East and Boschfontein West, and the doubling of the capacity of the UG2 Waterval concentrator to process an additional 400 000 t/m of ore.

However, following Anglo Platinum's strategic review of its projects, the Boschfontein East portion of the project has been slowed down, and the Boschfontein West development has been modified to make use of pre-existing Merensky reef infrastructure in place of two of the three originally-proposed declines in the cluster. The Boschfontein West section is ahead in the development of its capital footprint and still in the ramp-up phase to steady-state production, with

full production expected during 2005. The proportion of UG2 reef that was to be accessed from the Frank and Townlands shafts has been reduced in favour of Merensky reef, and mining methods at these shafts have been adjusted in order to maximise head grade and extraction ratios.

In light of the revised exploitation strategy, the need for the 400 000 t/m concentrator capacity expansion was revisited, and it appears that further debottlenecking of the existing plant and a possible upgrade may make the additional capacity unnecessary. In 2004, the company scaled back the 400 000 t/m operation to 255 000 t/m.

The revised phase two project is expected to reach steady-state production in 2008.

Another project that has been slowed down is the Western Limb tailings retreatment project, situated near the Brakspruit shaft. The plant will draw feedstock from a number of tailings dams in the Klipfontein and Waterval areas.

The first phase of the project – with an operating capacity of 450 000 t/m to produce 70 000 oz of platinum and 17 000 oz of palladium a year – has been commissioned, but is experiencing some teething problems. An upgrade was completed in late 2004, and the operation is expected to ramp up production steadily. The second phase of the project, which entails doubling capacity to 900 000 t/m, has been deferred for a year as a result of adverse economic circumstances.

Also scaled-back has been the Twickenham development, originally announced as a R2,7-billion project (in 2002 terms) to be developed on the farms Twickenham, Hackney and Paschaskraal. However, the mining areas have since been changed in pursuit of the aims of the Mineral and Petroleum Resources Development Act and the mining charter, and the Twickenham Platinum Mine, to be 100% owned by Anglo Platinum, will exploit only the Twickenham and Hackney areas. Paschaskraal has been combined with the farm Klipfontein and with the down-dip State-owned mineral rights on the farms of Avoca and De Kamp, and will be exploited by a 50:50 joint venture between Anglo Platinum and a BEE consortium. This project is known as the Ga-Pasha PGM project.

The mining authorisation for the Twickenham mine was granted in December 2002, nine months later than anticipated, and capital expenditure for the 250 000 t/m project is expected to be in the region of R2,3-billion (in 2004 terms). The project is expected to produce 160 000 oz of refined platinum and 176 000 oz of refined palladium a year when it reaches steady-state production. The project is currently at the trial-mining stage, but is progressing at a very slow rate, and could possibly be put on hold altogether until economic conditions look more favourable.

In 2004, however, it was decided to continue with a mine on the Hackney shaft at a reduced level, with an expected output of 16 000 t/m in 2005. The initial mining exceeded expected results, in terms of grade and stoping widths, and a growth plan is currently being prepared for the mine.

At the Ga-Pasha PGM project, mining authorisation has been granted over the Paschaskraal and Klipfontein farms, but authorisations for the Avoca and De Kamp farms are still pending. Further mine design and the best exploitation strategy for the mining area is being determined.

Anglo Platinum's original BEE partner on this project was Pelawan, which has since been taken over by Canadian junior mining company Anooraq. The transaction between Anooraq and Pelawan was a reverse takeover, completed in early 2005, and has resulted in Anooraq obtaining a 50% participation interest in the Ga-Pasha PGM project. This has cleared the way for Anooraq to become the first offshore-listed BEE company in South Africa.

At the Der Brochen development, the originally proposed mining area of the project, south of the Steelpoort fault, incorporating the farms Der Brochen, Richmond, Helena, Booysendal, and Buttonshope, has been restructured, due to an agreement reached with government in terms of the Mineral and Petroleum Resources Development Act and the mining charter.

As a result, the Der Brochen Platinum Mine, which will be 100% owned by Anglo Platinum, will exploit only the Der Brochen, Richmond and Helena areas, with a mining authorisation for these areas having been granted in April 2003. The project is in the conceptual design phase, and site activities are limited to exploration drilling and land management.

The Booysendal and Buttonshope areas will be exploited by the Booysendal joint venture, a 50:50 arrangement between Anglo Platinum and BEE

company Mvelaphanda. The joint venture was originally between Anglo Platinum and a consortium known as Khumama Platinum, which has since been taken over by Mvelaphanda. A mining authorisation for this project has been issued, but the shareholders of Northam Platinum are still to decide whether to approve Mvelaphanda's acquisition of this stake.

In 2005, the South African Minister of Minerals and Energy approved the granting of prospecting licences for the remaining two farms in the Booysendal area. In a deal that is still to be finalised, Mvelaphanda intends to offer its 50% interest in the Booysendal joint venture to Northam Platinum, in return for additional shares in the company. This would result in Northam Platinum becoming compliant with the BEE ownership target of 26%.

Another development where Anglo Platinum is involved with BEE participants is the Pandora project, intended to exploit the UG2 reserves on the Hartebeespoort, Roodekopjes and Uitvalgrond farms, west of Brits. The participants in the project are Anglo Platinum, Lonmin Platinum, Northam Platinum and the Bapo Ba Mogale Tribe.

The project involves developing the existing infrastructure at Lonmin's Eastern Platinum Mine (EPM) to gain access to the mineral rights area adjacent to EPM. The capacity of the existing EPM concentrator will be expanded by 120 000 t/m, and a new 200 000 t/m concentrator will be constructed on the Pandora mine area, adjacent to EPM. Decline shaft systems will be installed, and steady-state production of 230 000 oz of refined platinum and 110 000 oz of refined palladium a year is expected.

The capital cost of this project, when originally announced in 2002, was R2,8-billion (R3,3-billion in 2004 terms). Anglo Platinum is only responsible for its portion of the capital expenditure, and will refine only its portion of production.

Delays experienced in obtaining the authorisations for the Pandora project, together with the unfavourable economic environment, have resulted in a slowing-down and possible rescoping of the project. It is envisaged that earliest production from the development will be in 2006.

At the Bafokeng Rasimone Platinum Mine (BRPM), Anglo Platinum, in joint venture with Royal Bafokeng Resources, the Styldrift expansion project has been rescoped with feasibility work and further geological study expected to continue in 2005. Approved and on schedule, the BRPM Phase 2 project involves the extension of the North and South shafts covered by an additional five levels from the already established five levels, and will see a continued output of 110 000 t/m per shaft system for an additional seven years.

Anglo Platinum's most recently announced projects are a pooling and sharing agreement with Aquarius Platinum (South Africa), and the Unki project, being undertaken with Anglo American Corporation Zimbabwe (Amzim).

The pooling and sharing agreement with Aquarius Platinum (South Africa), announced in June 2003, will see the two companies mining contiguous properties on their respective Rustenburg and Kroondal lease areas. The agreement provides for the parties to pool their assets, while retaining ownership of them, and to share the proceeds equally.

The parties will use the existing Kroondal Platinum Mine infrastructure to gain access to the Rustenburg Platinum Mine orebody downdip of Kroondal. The new 250 000 t/m concentrator is ahead of schedule and initial production from the new plant is expected between April and June 2005. An additional shaft capacity will also be sunk. The venture will have mineable reserves and resources totalling 69-million tons, which are expected to allow mining until 2016.

Initial production will be in the region of 140 000 oz of platinum a year, rising, by 2006, to 280 000 oz of platinum a year and 130 000 oz of palladium.

Aquarius Platinum will continue to honour its existing concentrate offtake agreement with Impala Refining Services, fixed at a total of some 586 000 oz of platinum in concentrate.

From 2005, Anglo Platinum will also treat concentrate from the new UG2 concentrator. It is estimated that production will become fully attributable to Anglo Platinum in 2009.

The capital expenditure for the establishment of the venture is estimated at R810-million (2004 terms) and will be equally funded by Anglo Platinum and Aquarius.

At the Unki project, in Zimbabwe, which Anglo Platinum is developing in partnership with Amzim at an estimated cost of $92-million, steady-state production of 58 000

oz of platinum and 40 000 oz of palladium is expected in 2008. The feasibility of upgrading the project from an 85 000 t/m operation to 120 000 t/m is continuing and subject to approval. Development costs for the project are currently under review, in light of economic conditions in Zimbabwe. Concentrate produced by the mine will be smelted and refined by Anglo Platinum in South Africa.

Anglo Platinum will be the majority shareholder in the Unki mine, and will also manage the operation. The project will also be subject to Zimbabwean and South African regulatory fiscal approvals.

At the Amandelbult mine, a multibillion-rand project that will see the sinking of a number three shaft is under consideration. The new three shaft is expected to go down to 2 000 m, current operations are mainly at 1 000 m, and to add a further 250 000 tons of ore a month to Amandelbult's output. The project, which sources say has a price tag of R4,2-billion, is still at the appraisal-study phase, and may be deferred if the rand platinum price remains at current levels. However, if the project is given the green light, the new shaft will take about seven years to build, with a further five years required to bring it to full production. The project will not increase Amandelbult's ore production substantially; rather, it is intended to replace Merensky ore production from the number one shaft.

Anglo Platinum is evaluating the viability of opening up a third pit at PPRust, with the Sandsloot and Zwartfontein pit closing by 2015. A prerequisite for establishing the PPRust replacement pit is the relocation of two villages situated close to the pit, which is scheduled for completion by 2007. An investigation regarding the expansion of the concentrating facilities by a further 400 000 tons will be carried out during 2005.

Processing projects under development

The Polokwane smelter, located on the Palmietfontein farm, to form a centre for the company's eastern platinum operations, has been commissioned. The smelter is a six-in-line 68 MW furnace, with a smelting capacity of 650 000 t/y. It will turn platinum-rich concentrate from all Anglo Platinum's mining operations on the eastern limb, into a matte and slag fraction. The matte will then be further refined at the Anglo Platinum Converting Process (ACP) plant near Rustenburg, while the slag will be remilled and reconcentrated at the Lebowa platinum mine.

The Anglo Platinum Converting Process (ACP) plant, intended to improve the company's environmental performance by significantly reducing sulphur dioxide emissions from the Waterval smelter, is in the process of being commissioned.

In April 2004, phase A was successfully ramped up, resulting in all matt convertion taking place in the ACP plant. The second standby ACP reactor, phase B, is currently in progress for commissioning at the end of 2005, with full production expected at the beginning of 2006.

The facility, which relies on a combination of smelting technology, high-efficiency gas collection and acid plants, is intended to bring Anglo Platinum's sulphur dioxide emissions below the 20 t/d environmental requirement stipulated by government.

The Waterval slag-cleaning furnace development has also been commissioned, and at the Precious Metals Refinery (PMR), a number of debottlenecking and optimisation projects are being undertaken. Construction on the PMR's gold extraction and insoluble metals plants continues, with the final phase of debottlenecking expected to be complete by the end of 2005. In light of the slowed expansion programme, the capital profile of this series of projects has been modified to realign them with the new build-up of production.

Exploration activities

In South Africa, Anglo Platinum's exploration activities are focused on supporting the company's expansion programme. Accordingly, the rate and volume of exploration in the country has been increased, with the bulk of activity taking place on the Eastern Limb, and several of the projects progressing into feasibility studies.

Under the Boikgantsho platinum-mine joint venture with Anooraq Resources, Anglo Platinum is undertaking drilling at the Drenthe PGM, gold and nickel deposit, situated 250 km north of Johannesburg on the Northern Limb of the Bushveld Complex. The goal of this joint venture is to explore and develop a large-scale, openpit PGM deposit, potentially using Anglo Platinum's nearby milling and smelting facilities that could provide substantial capital cost advantages to a new mining project.

The 2004 two-phase programme involved additional drilling to advance the project to the prefeasibility stage during the first part of 2005. It consisted of step-out and infill drilling on the Drenthe and Witrivier farms, and step-out drilling on the northern portion of the Overysel farm. By October 2004, 153 drillholes had been drilled. The Drenthe deposit also expanded significantly, after drilling saw mineralisation being traced for more than six kilometres.

At the beginning of 2005, encouraging drill results from the previous year resulted in drilling being restarted at the Boikgantsho Joint Venture properties. The 24 000 m multirig drilling programme is focused on the Drenthe deposit, with drilling proceeding at 50 m intervals along 50 m spaced lines in order to define measured mineral resources within the deposit, and advance the project towards a bankable feasibility study.

Anglo Platinum is also involved with Anooraq in an exploration joint venture, known as Thusong Platinum. In this venture, Anglo Platinum's Rustenburg Platinum Mines is partnering Anooraq's wholly-owned South African subsidiary Plateau Resources, to explore and develop PGM, gold and nickel mineralisation on the Wachteenbietjieslaagte 4 JQ, Vogelstruiskraal 400 KQ and Cyferkuil 1 JQ farms. The properties are located on the western limb of the Bushveld Complex, about 74 km north of Rustenburg.

In Canada, Anglo Platinum, in joint venture with Pacific North West Capital (PFN) is undertaking exploration on the River Valley property, located near Sudbury, in the province of Ontario. The prospect is a palladium-dominant deposit, and future exploration decisions will be affected by the palladium price.

Drilling has revealed the presence of potentially commercial base-metal sulphide-associated PGM deposits along the northern contact of the intrusion. Exploration for reef-type PGM targets has not yet begun, with almost all the work to date having focused on the contact environment. However, there are indications that reef-type mineralisation may be present, adding further potential to the property.

In April 2005, the $30-million phase 7 exploration programme, which included 20 740 m of diamond drilling and metallurgical testing, had been completed, with Anglo Platinum having approved a budget of C$1,5-million for phase 8. By June 2005, Anglo platinum had committed over C$15,8-million to the River Valley Project in total.

Anglo Platinum and PFN each hold a 50% interest in the River Valley project, and Anglo Platinum may increase its stake to 60% by completing the feasibility study, or to 65% by funding the project through to production.

Also in Canada, Anglo Platinum, in partnership with PFN and Platinum Group Metals (PTM), is conducting exploration on the Agnew Lake property, covering the Agnew Lake intrusion which is known to host anomalous and potentially economic concentrations of PGMs.

In terms of the agreement with PFN and PTM, Anglo Platinum may earn a 49,5% stake in the Agnew Lake project by making certain cash payments and reimbursements and by contributing C$6-million in exploration expenditure by December 31, 2004. Anglo Platinum can increase its interest in the property to 57% by completing a feasibility study, and to 60% by arranging 100% financing of the project to commercial production. By entering into this agreement Anglo Platinum and PFN have substantial interests in two of the three largest layered intrusions in the immediate Sudbury area.

By the end of 2003, Anglo Platinum had made the required cash payments, and by the beginning of 2005, financed approximately C$2,6-million in exploration.

In Russia, Anglo Platinum is conducting exploration in the Tylai-Kosvinsky area at West Kytlim, although work in 2003 was hampered by bureaucratic delays associated with the issue of the licence. In late 2004, the licenses were reissued with slight restrictions on the use of certain exploration techniques. Budgeted work programmes include reconnaissance and traverse drilling, accompanied by trenching and bulk sample processing. The objectives of this work are to establish grades and to test alternative recovery technologies targeting enhanced recovery of fine-grained platinum.

Preparation is also under way for drilling on a second licence area at Sosva, in the Northern Central Urals. The licence area covers a large alluvial basin at the junction of the Sosva and Sharp rivers, which drain the platinum-bearing Denezhkin-Kamen layered intrusive complex.

Reconnaissance for buried, potentially high-grade, and previously unmined platinum placers is also in progress.

In China, Anglo Platinum formed a joint venture with the Sichaun Bureau of Geology and Mineral Resources in late 2004. Exploration has started in four areas, with two other areas currently under review. Due to knowledge of PGM mineralisation, the Danba area (Yangliuping mine) on the Panxi Rift orogenic belt, is of particular interest. Consideration of several other targets is expected to continue.

In Brazil, exploration has advanced ten significant PGM targets at the Pedra Branca site to the drill-definition stage. The Esbarro project is the most advanced, with drill hole intersections often exceeding 2,5 p/t PGMs. Anglo Platinum will be able to earn a further 9% interest (to total 60%) by completing a bankable feasibility study within 18 months of earning its 50% interest. Anglo Platinum will also have the right to increase its interest to a total 65% by arranging the total financing required to place the project into commercial production.

Shareholding structure
As at December 2004:
Anglo South Africa Capital 74,84%

Annual turnover
R19,624-billion (December 2004)
R16,509-billion (December 2003)

$3,049-billion (December 2004)
$2,188-billion (December 2003)

Earnings
R2,617-billion (December 2004)
R2,092-billion (December 2003)

$392-million (December 2004)
$277-million (December 2003)

Leadership
Barry Davison (chairperson)
Ralph Havenstein (chief executive)

Employees
209 000

Directors
AW Lea, ba(Hons) , Executive Director: Finance
AJ Trahar, Bcomm,ca(Sa) , Chief Executive
D Hathorn, , Director: Executive
S Thompson, Director: Executive
Dr CE Fay, Bsc, Phd, Freng, Frse, Fice, Fei , Director: Non-executive
Prof Kalm Van Miert, Graduate In Diplomatic Sciences, Director: Non-executive
RM Godsell, Ma, Director: Non-executive
RJ Margetts, Ba, Freng , Director: Non-executive
RC Alexander, Director: Non-executive
M Moody-Stuart, Phd, Ma, Fgs, Chairman: Non-executive
Dj Challen, Ma, Mba, Director: Non-executive
Be Davison, ba , Director: Executive
Dr MSB Marques, ba(Public Admin), Phd(Economics) Director: Non-executive
FTM Phaswana, Bcom, Ma, Director: Non-executive
NF Oppenheimer, Ma, Director: Non-executive

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Impala Platinum

Nature of business and market position

Impala Platinum (Implats), mining the Bushveld Complex in South Africa and the Great Dyke in Zimbabwe, is the world's second-largest producer of platinum. It employs approximately 31 600 people at its operations, and is one of the lowest-cost platinum producers.

The company's primary listing is on the JSE Securities Exchange, and it has a secondary listing on the London Stock Exchange. The company also has a sponsored Level I American Depositary Receipt (ADR) programme, through which it hopes to grow its exposure in the US. The company is exploring the possibility of a full US listing which, should plans proceed as expected, could go ahead in the 2006 financial year.

In the year ended June 2004, Implats produced 1,96-million ounces of platinum, and 3,73-million ounces of PGMs. These figures were boosted by the refining of 232 000 oz of platinum for rival producer Lonplats, during the refurbishment of Lonplats' smelter. Without such a windfall to boost output in the year to June 2005, Implats expects production to fall to 1,8-million ounces. Implats' 880 300 oz of platinum production for the interim 2005 period, July to December the 2004 interim period. Unit cost increases are expected to be in line with inflation, as in the year to June 2004, when costs rose by 4,1%, which was less than the period's inflation level of 5%. Group margins were maintained at 33% for the interim period despite the continued strength of the strong rand.

Implats' growth plans are expected to ensure production of two-million ounces of platinum by 2006, and 2,3-million ounces in the 2008 financial year. For 2005, Implats approved a capex of R1,9-billion, R1,66-billion of which is to be spent on the developments at Impala. A capex of R3-billion has been reserved for 2006, with R500-million of this for Zimplats.

The company has attributable reserves and resources of 247-million ounces of platinum, and is conducting exploration projects in Southern Africa, Australia, Brazil and the United States.

Implats' existing operations consist of its wholly-owned Impala mine, situated on the Western Limb of South Africa's Bushveld Complex; an 80% stake in the Marula mine, on the Eastern Limb of the Bushveld Complex; and a 50% stake in Mimosa Investments, based in Mauritius, which owns Mimosa Platinum, in Zimbabwe. The stake in Zimbabwe Platinum Mines (Zimplats), which has mining operations in Zimbabwe, increased from 83% to 84,5% during the 2005 interim period, as a result of the acquisition of additional shareholding at a cost of R17,2-million. Together, these operations contributed 66% to Implats' profit in the year to June 2004.

The company's involvement in Zimbabwe is being pursued cautiously due to the country's political instability and economic crisis. Implats has indicated that it will not go ahead with expansion plans at its Zimbabwean mines until a bilateral accord is signed between South Africa and Zimbabwe protecting property rights.

In March 2004, investors in Zimbabwe were alarmed by a leaked draft law proposing that foreign mining companies be forced to sell up to 49% of shares in local operations to black Zimbabweans within three years. Announcements have since been made indicating indigenous equity ownership targets of 20% within two years, 25% within seven years, and 30% within ten years of the approval of the regulations.

While Zimplats holds a special mining lease that seemingly exempts the company's current operations and first phases of expansion from the requirements of that draft legislation, the company, along with others involved in Zimbabwe, is currently consulting with the country's mining ministry, and the draft legislation has been withdrawn.

Impala Refining Services (IRS) which, in addition to refining Implats' own production, processes third-party concentrates and undertakes toll-refining, contributed 13% to the company's profit in the year ended June 2004. This was higher than the 7% contributed during the six months ending December 31, 2004. IRS, situated in Springs, consists of two refinery operations, namely the Enhanced Platinum Metals Refinery (EPMR) and the Base Metals Refinery (BMR), which have been operational for over 30 years.

In addition to the contributions of its mining and processing operations to its profit for the year ended June 30, 2004, Implats has several strategic holdings and alliances that contributed 11% to the company's profit. These holdings include stakes in Aquarius Platinum and its unlisted subsidiary Aquarius Platinum South Africa (AQPSA), and a joint venture with African Rainbow Minerals to develop the Two Rivers platinum

project. In the year to June 2004, the company's strategic holdings also included a stake in Lonmin Platinum (Lonplats), although Implats has since disposed of this holding.

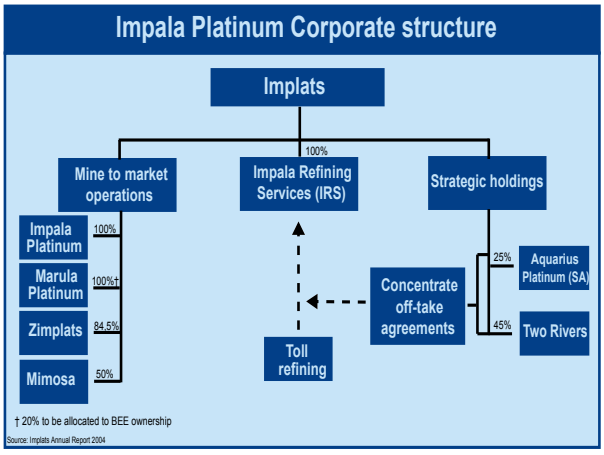
Implats' stake in Aquarius Platinum, which is listed on the LSE, ASX and the JSE currently stands at 8,6%, and the two companies are working together at the Mimosa mine in Zimbabwe, where each of the two companies holds a 50% stake. Implats' share in AQPSA was 25%, but has fallen to below 20%, following a transaction that resulted in the disposal of a portion of AQPSA to a BEE consortium led by Savannah Resources. This resulted in Implats acquiring an additional stake in the company to ensure that the 20% investment was maintained. Implats' involvement with AQPSA gives the company access to AQPSA's Kroondal and Marikana operations, and its Everest South project.

At the Two Rivers platinum project, Implats holds a 45% share. The balance of the shareholding is held by empowered miner, ARM Platinum. In June 2005, ARM and Implats announced their plans to proceed with the building of the R1,2-billion Two Rivers platinum mine.

Implats has also been involved in empowerment through its decision to sell its 27% stake in Lonplats, the platinum business of Britain's Lonmin. In July 2004, South Africa's Competition Tribunal unconditionally approved Implats' sale of this stake, clearing the way for a new black-controlled firm, Incwala Resources to acquire an 18% stake in Lonplats, while Lonmin acquired the other 9% on offer, boosting its stake in Lonplats to 82%. The transaction was concluded in Setember 2004, with Implats receiving a total of $763-million from the sale, of which $95-million was made available as loans to various BEE companies and will be fully repaid by 2011. The significant cash injection will further provide for the capital expenditure requirements at Impala, Marula and the Zimbabwean operations over the next few years.

The Lonplats sale was structured so that Implats and Lonplats would both accrue credits for complying with the government's black-empowerment programme, and resulted in the allocation of 9% of ownership credits to Implats which, together with the company's current 1,5% holding of Royal Bafokeng Resources, would mean that Implats only needs a further four to five per cent to achieve the mining charter's five-year target.

In another major deal announced during the 2004 financial year, Implats disposed of its 83,2% stake



in Barplats, the JSE-listed company that owns the Crocodile River mine, which was decommissioned in December 2003 after having performed poorly. The share was sold to the Salene Platinum Consortium for R389-million and, overall, the impact of the consolidated loss for Barplats and the profit on its disposal, contributed 10% to Implats' profit for the year. The new owner assumed responsibility for the operation at the beginning of July, and has announced its intention to reopen the mine.

In line with the mining charter's focus on beneficiation, Implats has involved itself in a venture called Silplat, which sees the company in close collaboration with Italy's leading jewellery manufacturer, Silmar, local jewellery producer SA Link Company, and specialist corporate finance house Microfin Corporate Services. Equity and loan financing are being provided by Swedish-UK consortium Saab-BAE Systems, as part of its national industrial participation obligation arising from South Africa's purchase of new military aircraft. Silplat is expected to beneficiate more than three tons of platinum each year, generating approximately $100-million in annual sales, of which about 85% will be accounted for by export sales.

On the human resources front, the company is continuing to invest in its HIV/Aids programme which, through education initiatives, focuses on infection prevention. The programme has been in place for more than 10 years, and has yielded promising results, with prevalence levels having levelled off at around 17% of the company's 27 000 employees. It is estimated that HIV/Aids will cost the company some R46-million a year, when infections peak in 2011, which is significantly less than the R85,9-million that the disease would have cost had interventions not been put in place.

Platinum operations in South Africa

Implats' South African operations consist of the Impala and Marula mines, and Impala Refining Services (IRS).

The Impala mine, situated near the towns of Phokeng and Rustenburg on the Western Limb of the Bushveld Complex, is Implats' main operational unit, having produced 1,09-million ounces of the company's total output of 1,96-million ounces in the year ended June 2004. For the six months ending December 31, 2004, the company produced 547 000 oz of platinum despite losing ten days of production as a result of a wage strike in October. One of the key agreements reached during wage negotiations was the implementation of drill jigs, which should result in material improvements in productivity and safety.

This mine's operations cover an area of almost 250 km2 and include 13 shaft systems and five declines, two of which are currently operating at full production, with the remaining three in development and scheduled to be in production within the next few years. The mine also incorporates opencast mining and, in the year ended June 2004, higher output from the opencast operations, as well as from mechanised shafts, saw Impala mill record tonnages. Volumes were also supported by the increased mining of so-called white areas, which are unmined remnants in old mining areas. Refined platinum production in the 2005 financial year is expected to increase to 1,1-million ounces, and plans are in place to limit cost increases in line with inflation. Unit costs rose by 6,8% during the 2005 interim period, with the wage increase of 8% being the biggest cost driver.

The Impala mine also houses Mineral Processes, which incorporates the group's smelting and concentrating plants, also located on the Impala lease area, and Refineries, which include the base and precious-metals refineries situated in the town of Springs, in Gauteng. These facilities process ore and concentrate from Impala's own mining operations and on behalf of IRS. Following recent expansions, both Mineral Processes and Refineries have the capacity to process two-million ounces of platinum.

A major R5,3-billion capital expenditure programme is under way at Impala, of which R3,5-billion had been spent by the end of the 2004 financial year, mostly on the development of the decline projects. A further R642-million was expended during the six months ending December 31, 2004. This programme aims to maintain production from the lease area at between one-million and 1,1-million ounces of platinum a year, and involves extending the lives of existing shaft systems and creating new access to deeper reserves.

In September 2004, the Board approved capital expenditure of R6,6-bllion for 16 and 20 shafts that would add some 355 000 oz of platinum to its annual production by 2014. Initial work on the shafts has already begun, with 20 shaft scheduled for production in 2009 and 16 shaft in 2012.

Test data collected by Impala and modelling undertaken by external consultants indicates that the HIV prevalence rate among employees on the Impala lease area has levelled off at around 16%, which is lower than levels for similar adult groups in the country as a whole. At the Refineries, 3,5% of employees are currently known to be HIV-positive.

Impala Platinum Mine – output for the year ended June

2004	2003	2002	2001	2000
1,09-million ounces	1,04-million ounces	1,025-million ounces	1,002-million ounces	1,020-million ounces

Source: Impala Platinum Annual Report 2004

The Marula mine, situated on the Eastern Limb of the Bushveld complex, is 80% held by Implats, with the remaining 20% allocated to BEE interests. Of this, 10% is to be held by BEE mining company Mmakau Mining; 5% is to be held by the Marula Community Trust, which represents members of the local communities; and 5% is to be held directly by local business and communities.

The mine is currently ramping up to full production, but was identified in Implats' 2004 annual report as the company's 'single operating lowlight' for the year.

It is one of the first operations to have been developed on the relatively under exploited Eastern Limb and, although the metallurgical and surface infrastructure were delivered on schedule, development of underground mining operations at Marula is substantially behind schedule, as a result of an initially inappropriate mining method and unexpected geological conditions. In particular, the steeper dips affected mechanised machine efficiencies which also aggravated the extent of dilution by waste. Consequently, production was severely affected, with only 13 280 oz of platinum in concentrate produced in the year ended June 2004, which compares poorly with planned full production of

100 000 oz/y, originally scheduled for the first quarter of the 2005 financial year. For the six months ending December 31, 2004, the mine produced 17 300 oz of platinum concentrate, which was an improvement on the 2005 financial year, but still below plan.

Further, the original method, mechanised bord-and-pillar, chosen to mine the UG2 reef, failed to attain the expected results as a result of on-reef development being hampered by a rolling reef and steeper dips in the shallower parts of the Marula lease.

To tackle this problem, changes have been made to the mine layout in order to allow the development of the decline in the footwall. This will allow for faster development rates and is more suited to geological conditions in the area. Preliminary work has begun on advancing the footwall infrastructure, with an amount of R830-million being approved for further development in early 2005. The initial target of 100 000 oz is now scheduled for the 2009 financial year, with steady-state production of 140 000 oz expected to be reached by 2012.

Implats has admitted, with hindsight, that more trial mining should have been conducted prior to the implementation of the mining plan. However, based on the new level of full production, Marula has an expected mine-life of 25 years, and a prefeasibility study into the mining of the Merensky reef has been completed, which will possibly allow Phase 2 development at the operation.

Impala Refining Services (IRS) is the vehicle through which refining services are provided to third parties, enabling Implats to use its excess and otherwise idle capacity to generate additional revenue. IRS has customers in a number of countries around the world.

IRS enters into either purchase or toll-refining agreements with various partners and clients. In metal purchase agreements, an agreed percentage of the metal is bought after a pre-determined processing period, while with toll-refining agreements, IRS charges clients the processing costs and returns the agreed percentage of the precious metal content to the supplier.

IRS sources a wide variety of material from around the world, including flotation concentrate and smelter matte, and the facility is one of the largest refiners of spent autocatalysts in the world.

In the year ended June 2004, IRS produced unprecedented volumes of platinum and other PGMs, with performance having been boosted by concentrate processing on behalf of Lonplats, which experienced furnace failure in December 2002. Even excluding Lonplats' contribution, however, platinum production through IRS still increased in the 2004 financial year and continued to grow during the six months ending December 31, 2004.

Growth prospects remain positive, with at least one new major project likely to materialise during 2005, continued growth in the recycling of autocatalysts and additional volumes from Marula Platinum.

Platinum operations in the rest of Africa

Implats' Zimbabwean operations consist of its shareholdings in Zimbabwe Platinum Mines (Zimplats) and Mimosa Investments, which owns the Mimosa platinum mine.

As various expansion phases are implemented in years to come, production in Zimbabwe could account for 20% of total planned production by 2014.

Zimplats' mining operation, known as Makwiro Platinum, is situated on the Hartley Complex on the northern reaches of the Great Dyke. Makwiro consists of the Ngezi opencast mine, a trial underground mine and the Selous Metallurgical Complex. The converter matte produced at this operation is sold to IRS in South Africa, and processed in terms of a long-term offtake agreement. The operation has a life-of-mine of 20 years, and employs some 1 500 people, including contractors. It has reserves of 340,8-million tons, and resources of 2,492-billion tons.

In the year ended June 2004, 1,9-million tons of ore were mined from the opencast mine, and 185 000 t from the underground trial mine, producing 84 300 oz of platinum for the year. A go-slow by employees of the opencast contractor began on June 4, 2004, resulting in opencast operations being halted for three weeks. The operation used this time to conduct scheduled maintenance work on all equipment, and the processing facility continued milling, drawing from the 120 000 t run-of-mine stockpile and oxide ore. This stockpile has now been severely depleted and, consequently, a schedule has been put in place to expose ore at the opencast facility at a maximum rate. Platinum production rose by 2% to 42 300 oz for the six months ended December 31, 2004. High contractor costs with the open-cast contractor during

this period have resulted in the decision to substitute opencast tons with low-cost underground ore.

Zimplats' processing operations are achieving recoveries of 83% and, although a major breakdown at the smelter in July 2003 resulted in the furnace being out of operation for seven weeks, the concentrate stockpiled during this period has all been processed.

Zimplats is currently operating at close to production capacity, and there is potential for significant expansion, which will be undertaken in a modular fashion, given the political risks and geological challenges of developing on a new orebody. A feasibility study and trial mine to develop an underground mine have been successfully completed. The first phase of the planned expansion, which will increase production to 145 000 oz of platinum by 2006, has been approved in principle, subject to certain conditions precedent being met, such as security of tenure and a special mining lease. However, infrastructural developments, at a cost of $20-million, have been started, and will be funded internally. The first phase of development will involve capital expenditure of $109-million. A study team has been commissioned to investigate subsequent phases of the expansion, which could increase production at the mine to 345 000 oz/y by 2010.

By the end of the 2004 financial year, Implats' shareholding in Zimplats, which is listed on the Australian Stock Exchange, had been increased to 83,44%. This subsequently increased to 84,5% during the six months ending December 31, 2004. Implats and Zimplats hold 30% and 70% respectively in Makwiro Platinum.

In the Mimosa operation, situated on the southern part of the Great Dyke in Zimbabwe, on the Wedza geological complex, Implats holds a 50% stake, with the remaining 50% being held by Aquarius Platinum.

In the year ended June 2004, Mimosa produced 61 400 oz of platinum in concentrate, from 1,33-million tons of ore, and has concluded an expansion programme which will increase annual production to 69 000 oz a year. The expansion to 80 000 oz has been delayed pending the conclusion of talks with Zimbabwe's government regarding the domicile of foreign-currency accounts.

Mining at Mimosa takes place at a depth of 200 m, and the operation has a life-of-mine offtake agreement with IRS. Despite significant increases in the cost of fuel and power in the year to June 2004, Mimosa continues to be considered one of the most efficient low-cost operations in the world.

Negotiations on the sale of 15% of Mimosa to a consortium of Zimbabweans are under way. Both Implats and Aquarius will make available 7,5% of their respective holdings for purchase by the consortium.

Current capital projects

In line with the company's growth strategy, by which it is aiming to achieve production of two-million ounces of platinum a year by 2006, and possibly 2,3-million ounces by 2008, it is undertaking an expansion programme.

At the Impala mine, where Implats is aiming to maintain production at between 1-million and 1,1-million ounces a year over the next 30 years, a decline development programme is under way. This project involves the development of five decline shaft systems, below the current third-generation vertical shafts, and a vertical shaft link, which will extend the lives of existing shaft systems and create new access to deeper reserves. The second-generation shafts, which extend to about 800 m below surface, are nearing the end of their working lives.

Two of the five declines are functioning at full production, and a further two will reach full production in the 2005 financial year.

In all, R5,3-billion-worth of capital expenditure has been planned for Impala mine, of which R3,5-billion has already been spent, mostly on the development of the decline projects. In the six months ending December 31, 2004, the Impala section incurred capital expenditure of R642-million, which was largely accounted for by the decline projects.

In September 2004, the Board approved capital expenditure of R6,6-billion for 16 and 20 shafts that would add some 355 000 oz of platinum to its annual production by 2014. Initial work on the shafts has already begun, with 20 shaft scheduled for production in 2009 and 16 shaft in 2011. No 20 shaft is already in the construction phase at a cost of R2,1-billion. The project involves sinking two vertical shafts and later developing three 2,5 km declines to access and transport the reef. The No 16 shaft is expected to produce 226 500 t of reef a month from seven operational levels. Its ore reserves will be accessed by a downcast rock and man-material shaft and an

upcast ventilation shaft. The No 16 and 20 shafts are considerably deeper than those currently in operation, and will ensure that Impala maintains its production of 1,1-million oz of platinum a year.

At Implats' refining facilities, the company is spending R400-million on a project to increase capacity at its Springs plant from 1,65-million ounces of PGMs a year to 1,85-million ounces, and an additional R400-million will be spent between 2005 and 2006 to further boost the plant's refining capacity to two-million PGM ounces a year. The possibility exists that the plant's capacity could be further expanded to 2,5-million PGM ounces a year after 2005.

The money is to be spent on debottlenecking sections of the plant's base-metals refinery, particularly where the matte is leached and nickel and copper are removed. Expenditure in the region of R200-million is to be undertaken at the plant's precious-metals refinery, with the first phase of the expansion expected to be completed by the middle of 2005, and the entire project to be completed by the end of 2006.

At the Makwiro operation, in Zimbabwe, which is currently operating at close to production capacity, there is potential for significant expansion, which will be undertaken in a modular fashion, given the political risks and geological challenges of developing on a new orebody. A feasibility study and trial mine to develop an underground mine have been successfully completed. The first phase of the planned expansion, which will increase production to 145 000 oz of platinum by 2006, has been approved in principle, subject to certain conditions precedent being met, such as security of tenure and a special mining lease. However, infrastructural developments, at a cost of $20-million, have been started, and will be funded internally. The first phase of development will involve capital expenditure of $109-million. A study team has been commissioned to investigate subsequent phases of the expansion, which could increase production at the mine to 345 000 oz/y by 2010.

At the Mimosa mine, in Zimbabwe, the expansion from 69 000 oz to 80 000 oz of platinum a year, has been delayed pending the conclusion of talks with Zimbabwe's government regarding the domicile of foreign-currency accounts.

At the Two Rivers project, situated on the Eastern Limb of the Bushveld Complex, south of the town of Steelpoort, in Mpumulanga, Implats is involved in a joint venture (JV) with African Rainbow Minerals (ARM), with Implats holding a 45% share, and African Rainbow Minerals the remainder.

In June 2005, the JV partners announced their plans to proceed with the building of the Two Rivers platinum-mine, a 220 000 oz/y PGM project, as a result of the successful trial mining phase. Capital expenditure is estimated at R1,2-billion, of which half will be financed by the partners themselves in their respective shareholding ratios. The project will see about 1 000 people being employed and will also include the construction of a concentrator plant on the site. ARM will manage the project, while IRS will toll-smelt and refine the concentrate and market the PGMs. The underground mine is expected to have a yearly run-of-mine output of 2,2-million tons, producing about 120 000 oz of platinum a year. Full production is scheduled for the second half of 2006.

Implats recently announced its agreement with Canadian mining group Dynatec to join in a project that will involve the economic development and operation of the Ambatovy nickel-cobalt property in Madagascar. A feasibility study, released by Dynatec in February 2005, indicated the potential for a 60 000 t/y nickel and 5 600 t/y cobalt project. Capital expenditure is estimated at $2,25-billion and Implats will operate the refinery in Springs, on South Africa's East Rand on behalf of the project, and Dynatec Corporation will operate the mine and metallurgical facilities in Madagascar. Each of the 50% interests of Implats and Dynatec will be reduced proportionally, subject to the regulatory approvals of a third partner. To form the basis of the partner's decision to join in the project, Implats and Dynatec will jointly undertake the detailed engineering for the project, including the modification of the February feasibility study. Completion of the modifications is expected by the end of 2005, at a cost no more than $60-million.

Exploration activities

In the year ended June 2004, Implats spent R42-million on exploration, with particular attention focused on evaluating its mineral resources in Southern Africa and, to a lesser degree, internationally.

In South Africa, exploration activities were somewhat hampered by permitting issues encountered prior to the introduction of the Mineral and Petroleum Resources Development Act. However, the company's brownfields exploration at its Impala operation has progressed,

and has been aligned to support the revised long-term plan for the mine. Emphasis has been placed on the evaluation of the 20, 11c and 16 shaft blocks, with a particular focus on enhancing the 3D seismic data, geotechnical studies and mineral resource evaluation.

At Marula platinum, an infill drilling programme, targeting the Merensky reef has been completed, and a prefeasibility study has been undertaken. Limited work has been conducted on the Spitzkop, Kalkfontein and Buffelshoek properties.

In Zimbabwe, Implats has appointed a full-time exploration manager at Zimplats, who has overseen a review of the available information. This has been followed by the formulation of a long-term exploration strategy. The focus for the next few years will be on supporting the company's growth strategy in Zimbabwe, particularly in the Ngezi area, as well as on the evaluation of other mineral resources amendable to shallow mechanised mining. The company has compiled the geology and mineral resources and reserves for the phase 1 expansion feasibility study, and follow-up investigations have been conducted in the proposed portal 3 area. An exploration base has been established at Selous.

Outside Southern Africa, Implats is involved with international base-metals group Falconbridge. The alliance was unsuccessful at Narndee, in Western Australia, where drilling has been terminated, having failed to identify significant PGM mineralisation, and in the Carajás region of Brazil, the alliance's Cat et é joint venture has drill-tested several targets, although no significant encouragement has been encountered to date.

Also in Brazil, Falconbridge and Implats are involved in another agreement, whereby they are exploring part of the Niquelandia lobe in Goiás layered igneous complex. Falconbridge has previously conducted extensive geochemical and geophysical surveys in the area and defined specific target areas. The new scheme of arrangement includes a commitment of C$500 000 from Implats for the first phase, and payment of an additional C$1,5-million will entitle the company to a 50% interest in the project.

In joint venture with De Grey Mining, Implats is exploring the Three Kings project. Implats has committed A$400 000 for phase one exploration, which is designed to test the grade potential and lateral continuity of earlier successes, and is scheduled for completion by the end of 2004. Should Implats elect to proceed with a second phase of exploration, additional expenditure of A$800 000 will give Implats a 60% interest in the project.

In the US, Implats' earn-in joint venture with Fraconia Minerals Corporation is continuing at two targets on the Duluth Complex, despite permitting regulations and poor weather conditions having delayed the programme, and exploration work to date having failed to generate a viable target for follow-up work.

Shareholding structure
The following shareholders beneficially hold more than five per cent of Implats' issued share capital:
Old Mutual 7,3%
Public Investment Commissioners 6,7%
Tegniese Mynbeleggings 5%

Annual turnover
R11,81-billion (June 2004)
R11,81-billion (June 2003)
R11,9-billion (June 2002)

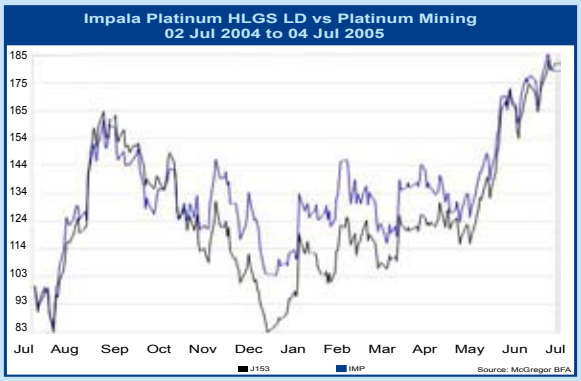
Earnings
R2,98-billion (June 2004)
R3,44-billion (June 2003)
R4,58-billion (June 2002)

Leadership
Keith Rumble (chief executive officer)
Dr Fred Roux (chairman)

Employees
31600

Directors
Dr K Mokhele, Bsc (Agric), Msc(Food Science), Phd(Microbiology) , Director: Non-executive
T Mokgaltha, Ca(Sa), Director: Non-executive South African
Ms CE Markus, Ba, Llb, Director: Executive South African
Dr FJP Roux, Bsc, Msc, Phd, Mba, Chairman: Independent
L Van Vught, Bsc(Hons)(Chemistry), Bcomm , Director: Independent
DH Brown, Ca(Sa) , Exec Director & Cfo South African
JV Roberts, Fcis, Acma, Mba , Dir: Independent Non Exec. South African
Ms MV Mennell, Ba, Mba, Fcma, Thd, Director: Non-executive South African
JM Mcmahon, Pr.eng, Bsc Mech Eng, Director: Non-executive British
LJ Paton, Bsc Hons Geology, Bcomm , Director: Executive South African
NDB Orleyn, B Juris,b Proc, Llb , Director: Non-executive
KC Rumble, Bsc Hons, Msc Geology, Chief Executive Officer South African

Share Performance



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Lonmin

Brief history

Lonhro Plc was incorporated in 1909, and over the years dabbled in a diversity of business opportunities.

During the 1990s the company demerged its African businesses, and in 1999 Lonhro Africa Plc changed its name to Lonmin Plc.

Although the company had started disposing of its non-core businesses around 1996, it was during 2000 that it disposed of its last remaining hotel and insurance-broking operations, completing the transformation to a precious-metals company.

Lonmin Platinum (Lonplats) holds the company's South African platinum operations.

Nature of business and market position

Lonmin Plc is a mining company specialising in the production of PGMs, and is the only PGM producer with its primary listing on the London Stock Exchange. The company operates principally in South Africa, where it is listed on the JSE Securities Exchange, and has an 82% shareholding in Lonmin Platinum (Lonplats), the third-biggest platinum miner in the world.

Until recently, Lonmin's stake in Lonplats stood at 72,9%, with the remaining 27,1% held by Impala Platinum. However, in a deal designed to generate BEE credits for Implats and Lonmin, Implats has disposed of its stake in Lonplats, allowing for Lonmin to increase its shareholding and for a BEE partner, Incwala Resources, to come on board with an 18% stake. Incwala Resources was formed specifically to assist Lonmin and Implats in complying with BEE legislation, and Lonmin holds a 23,6% stake in the company, as does the Industrial Development Corporation, while the remaining 52,8% is held by three black investment companies – Dema Capital, Andisa Capital and Vantage Capital; the Bapo Ba Mogale community, which resides near Lonplats' operations; Lonplats employees; and South African Women in Mining Investment Holdings.

Lonplats owns and operates three platinum-mines – Western Platinum, Eastern Platinum and Karee – in South Africa's North West Province, from which it produced 918 454 oz of the metal in the year ended September 2004, representing a slight decrease on the 932 867 oz produced the previous year, due to furnace No 1 only coming on line in January 2005, after being repaired during the first four months of the financial year. Total PGM production of 666 303 oz for the six months ending March 31, 2005, has resulted in Lonmin expecting platinum production of between 905 000 oz and 925 000 oz for the 2005 financial year. In June 2005, it acquired its fourth platinum-mine, Lonmin Platinum Limpopo (formerly Messina), as a result of the acquisition of Southern Platinum.

Lonplats production (oz) 2000 - 2004					
	2004	2003	2002	2001	2000
Refined platinum production	918 454	932 867	757 451	716 697	659 770
PGM production	1 679 871	1 757 757	1 467 525	1 357 301	1 235 501

Source: Lonmin Website

The company originally aimed to target production of a million ounces a year by 2008, developing three new shafts to contribute the additional tonnages needed and being involved in a joint venture project – Pandora – with Anglo Platinum, Northam Platinum and the Bapo Ba Mogale tribe. However Lonmin revised the original target with the acquisition of Southern Platinum.

In March 2005, Lonmin made a $190-million offer for Southern Platinum, which has a 91,5% stake in Messina Platinum in South Africa. In June 2005, Lonmin completed the acquisition and immediately gained control over the Messina mine operations. It was reported that the total cost of the acquisition of Southern Platinum was around $263-million, consisting of equity value of $190-million, acquired debt of $58-million and Implats, concentrate-purchase agreement with Messina of $15-million. Messina mine was subsequently renamed to Lonmin Platinum Limpopo. Lonmin's initial plan for the mine involves increasing production at the Voorspoed section from 45 000 oz to 75 000 oz of platinum a year, by 2007.

Lonmin Platinum Limpopo has full control of three platinum lease areas – Voorspoed, Doornvlei and Zebediela – on the northern portion of the eastern limb of the Bushveld Complex, and owns a fourth lease area in the vicinity – Dwaalkop – in which Mvelaphanda Resources may earn a 50% participation interest in

the prospecting activities. Lonmin Platinum Limpopo is currently ramping-up to full production from its first phase (Voorspoed), while phase 2 (Voorspoed East, Dwaalkop and Doornvlei) and phase 3 (Zebediela) is under investigation by Lonmin, based on findings by Southern Platinum.

The current acquisition of Southern Platinum together with continued growth from Lonmin's existing operations allows a revised target production of 1,1-million ounces a year by 2008.

In the six months ended March 2005, the company reported a growth in its half-year profit, overcoming the financial impact of the smelter explosion at the end of 2002. In attempting to manage cost efficiencies, Lonmin will lower the amount of higher-cost open-pit Merensky ore processed during the second half of the financial year.

To spread its risk, Lonmin is considering expanding outside South Africa, and is looking at diversifying away from platinum-group metals. The company has sold its stake in gold-miner AngloGold Ashanti, and intends using the cash generated to pursue its goals of diversification.

In tackling the challenge of /Aids, Lonmin is providing its employees with access to a comprehensive antiretroviral treatment programme, following a survey that indicated that 25% of the company's workforce is HIV-positive.

Platinum operations in South Africa

Lonplats consists of three companies:
Western Platinum, which operates Western Platinum mine, Karee mine, the Western Platinum refinery, the base-metal refinery, and the smelter;
Eastern Platinum, which operates the Eastern Platinum mine; and
Western Metal Sales, which markets the PGMs for Western Platinum and Eastern Platinum.

The mines are located in the Marikana district of South Africa's North West Province, and the refinery is situated in Brakpan, in the Gauteng province. Together, the lease areas of the mines cover a strike length of some 27 km of Merensky and UG2 reef.

Underground mining predominates, although opencast mining has been undertaken at all three of the operational units, and will continue over the next few years. The development of opencast mining was fast-tracked to provide between 115 000 oz and 120 000 oz a year during the development of the new underground shafts, but the operations are producing at above their planned rates, and indications are that opencast mining will continue beyond its original mid-2005 deadline. The deciding factor on whether opencast operations will be extended rests with the company's ability to mine the Merensky reef at a profit – there is a two-million-ton opencast reserve mainly on the Merensky horizon.

The mechanised Merensky mining site successfully achieved its target during the six months ending March 31, 2005, to the extent that Lonmin is now dedicated to rolling out this mining method with a further two sets of equipment at the Karee mine. This will ultimately lead to 70 000 t/m Merensky ore production by mid-2006 at potentially lower costs. Lonmin is currently in the advanced stage of plans to increase this mining method into the UG2 reef at Karee mine and other sites across the property.

The opencast operations are situated along a Lonmin-built road that connects the company's Eastern Platinum to the new K4 shaft that is being developed.

Base metals are produced at the base-metal refinery, and precious metal matte is sent to Brakpan for refining. The PGMs produced are sold through Western Metal Sales, which is the company's exclusive final product sales agent, registered in Bermuda.

In March 2005, Lonmin completed the development of its Saffy Shaft complex at the Eastern Platinum mine at a cost of R665-million. The mine is ramping up to full production and Lonmin expects full production in 2009.

Lonmin Platinum Limpopo, previously Messina and owned by Southern Platinum, has a strike length of 23 km with an attributable PGM resource base of 20-million oz to a depth of 1 000 m. The current mining operations cover a strike length of 4 km.

Production takes place from the first phase of the greater Lonmin Platinum Limpopo resource base. In 2004, the Voorspoed section produced an estimated 45 000 oz of refined platinum, and Lonmin currently plans to raise this to 75 000 oz/y by September 2007. This involves the re-engineering of the current operations to change the mining method to traditional long-hole

stoping above the 350 m level and mechanised long-hole stoping below the 350 m level. In achieving the level of production through these mining methods, Lonmin plans to incur capital expenditure of about $75-million over the next three years.

Current capital projects

In line with Lonplats' revised goal, due to the Southern Platinum acquisition, of increasing platinum production to 1,1-million ounces a year by 2008, the company is undertaking capital expenditure that will see the development of several new shafts.

The Hossy shaft complex, at Western Platinum, is the most advanced, with expenditure 64% complete as at March 31, 2004, and full production expected during 2008. The system is intended to exploit the deeper UG2 reef on dip beneath the Newman Incline. The Hossy Vertical has been completed, and is expected to mine 120 000 t/m of UG2 reef. The total cost of the project is estimated at R535-million.

The K4 shaft, being built at Karee mine, will be a twin-shaft complex that consists of a 1 356 m-deep main shaft and a 1 078 m-deep ventilation shaft, equipped with a winder, to serve as a secondary outlet in case of emergency. The main shaft will access Merensky and UG2 reef. In addition to hoisting ore, the shaft will boast a large worker-and-material conveyance, capable of transporting 200 employees a trip, and a medium-sized service conveyance, both operated by ground-mounted double drum winding plants. The design capacity of the shaft system is 230 000 t/m of ore, and 35 000 t/m of waste.

K4 is being developed at a cost of R1,662-billion, and is being rolled out in three phases, with completion scheduled for December 2006. Full production is expected by 2011.

Lonplats' Pandora joint venture with Anglo Platinum, Northam Platinum and the Bapo Ba Mogale Tribe, is intended to exploit the UG2 reserves on the Hartebeespoort, Roodekopjes and Uitvalgrond farms, west of Brits. The participants in the project are Anglo Platinum, Lonmin Platinum, Northam Platinum and the Bapo Ba Mogale Tribe.

The project involves developing the existing infrastructure at Lonmin's Eastern Platinum Mine (EPM) to gain access to the mineral rights area adjacent to EPM. The capacity of the existing EPM concentrator will be expanded by 120 000 t/m, and a new 200 000 t/m concentrator will be constructed on the Pandora mine area, adjacent to EPM. Decline shaft systems will be installed, and steady-state production of 230 000 oz of refined platinum and 110 000 oz of refined palladium a year is expected.

The capital cost of this project, when originally announced in 2002, was R2,8-billion (R3,3-billion in 2004 terms). Anglo Platinum is only responsible for its portion of the capital expenditure, and will refine only its portion of production.

Delays experienced in obtaining the authorisations for the Pandora project, together with the unfavourable economic environment, have resulted in a slowing-down and possible rescoping of the project. It is envisaged that earliest production from the development will be in 2006.

Lonmin will review the viability of additional production from phase 2 and phase 3 of the greater Lonmin Platinum resource base. This includes a feasibility study, already conducted by Southern Platinum, into a new mine on the Doornvlei and Dwaalkop sections of Phase 2, producing 150 000 oz platinum a year.

Exploration activities

While Lonmin is expanding its existing operations in South Africa, the company is also undertaking exploration in Canada, North America and other African countries.

In Tanzania, Lonmin is involved, in cooperation with Perth-based Goldstream Mining, in an exploration project in the Mibango area of Western Tanzania. Lonmin is solely funding the exploration under the joint venture arrangement, which requires it to fund and complete a feasibility study within a five-year period in order to earn a 65% equity interest. Exploration highlights so far include the identification of at least three kilometres of reef that returned values ranging from three to six grams per ton PGEs, the definition of a potential near-surface regolith resource over a 2,2 km2 area, and the intersection of a zone of high-grade nickel sulphide mineralisation. Drilling will continue in the 2005 financial year, to allow for further testing.

The Lonmin/Goldstream joint venture has also discovered a greenfields platinum prospect in the Luwumbu area of south-west Tanzania, where a

reconnaissance diamond-drilling programme on the 32-km-long layered intrusion at the Nkenja prospect returned promising results.

In Alaska, joint venture partners Lonmin and Canadian miners Pacific North West Capital and Freegold Ventures approved an exploration budget of $1,10-million for the Union Bay Platinum Project. The 2005 programme will entail ongoing delineation and drilling of targets identified from the past two years' field programmes. Lonmin will provide the funding and is expected to earn up to 70% interest by providing a full feasibility study.

In Canada, Lonmin, with joint venture partner Inco Limited, will explore for low-sulphide platinum-group metals over six of Inco's properties in the Sudbury Basin. During the 2004 financial year, a PGM discovery was made on the Wisner property, which has resulted in the same identification techniques being applied to the other properties.

Shareholding structure
Lonmin Platinum is held by:
Lonmin plc 82%
Incwala Resources 18%

Annual turnover
$1,030-million (September 2004)
$779-million (September 2003)

Earnings
$23-million (September 2004)
$27-million (loss) (September 2003)

Leadership
Brad Mills (chief executive)

Employees
18529

Directors
IP Farmer, Ca(Sa) , Director: Executive
M Hartnall, Director: Non-executive
Mrs K De Segundo, Director: Non-executive
Sir J Craven, Chairman: Non-executive
PC Godsoe, Director: Non-executive
B Mills, Chief Executive
JN Robinson, Director: Financial & Administration
B Mills, Director: Executive
JRB Phillimore, Director: Non-executive

Share performance

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Northam Platinum

Brief history

Northam Platinum, a stand-alone company, started its platinum operations when it was still a part of Gold Fields South Africa (GFSA).

GFSA owned the mineral rights to a 6 854 ha area covering a number of farms that were underlain by the Merensky and UG2 reefs, and in 1986 Northam announced its intention to exploit the Merensky reef.

Production began in January 1993.

After the unbundling of GFSA, Northam became an independent company, and acquired two contiguous properties from Anglo Platinum in November 1999, extending the life of Northam to more than 20 years.

Northam Platinum now operates the deepest platinum-mine in the world.

Nature of business and market position

Northam Platinum mining company, operating one mine – the Northam Platinum Mine – and holding an interest in two projects – the Booysendal project and the Pandora project.

The Northam Platinum Mine, situated on the Western Limb of South Africa's Bushveld Complex, produced 340 547 oz of precious metals in concentrate (3 PGE + Au) in the year ended June 2004, making Northam Platinum one of the country's largest platinum producers. Production for the year was up on the previous year's output of 332 888 oz, and costs for the year were well maintained. Northam performs treatment and refining activities, operating two concentrator plants, a smelter and a base-metals removal plant.

In September 2004, nine employees lost their lives in a fire at a conveyor belt used for transporting ore and waste materials. This resulted in the suspension of mining operations, which led to the loss of six weeks of output and had a regressive effect on the overall performance of the company. For the six months ending December 31, 2004, PGM production totalled 149 481 oz, a drop of 18% when compared to the first six months of 2004. Costs for the six months were high due to the lower output volumes coupled with high fixed costs.

Northam's involvement in the Booysendal project was brought about through its acquisition of black-empowerment company Mvelaphanda Resources' 50% share in this project, in a deal that is still to be finalised. Mvelaphanda is Northam's largest shareholder, with a 22,5% stake in the company and, on conclusion of the Booysendal transaction, Mvelaphanda's share in Northam is set to increase to 34%. Further, this would result in Northam Platinum becoming compliant with the BEE ownership target of 26%.

When this shareholding increases, Northam will re-acquire its 7,5% interest in the Pandora project. The interest has been temporarily vested in Mvelaphanda Resources, until such time as the empowerment shareholding in Northam will ensure that the company qualifies as an empowerment company, paving the way for its participation in the Pandora project.

It has been reported that Mvelaphanda Resources, which has interests in a variety of commodities, intends consolidating its platinum interests in Northam.

Platinum operations

The Northam Platinum Mine is located 175 km north-west of Johannesburg and 25 km south-west of Thabazimbi, where it exploits the Merensky and UG2 reefs.

Its operations on the Merensky reef take place at depths ranging from 1 360 m below collar to 2 050 m below collar, while mining of the UG2 reef is currently taking place between 1 360 m below collar and 1 670 metres below collar.

Such deep-level mining, enhancing the effects of the mine's high geothermal gradient, necessitated the adoption of innovative technology, placing Northam at the forefront of the development of a suite of hydropowered mining equipment now being more widely used in other deep-level mines in South Africa.

Most of the mine's conventional mining equipment is driven by chilled hydropower, and more than 60% of the Merensky reef is backfilled, providing regional support and preventing cool air from heating up in old abandoned areas.

The combination of these features has created a localised cool mining environment.

The mine's infrastructure comprises a twin shaft system, with ventilation being downcast through both shafts and returned through the segmented brattice wall of the number two shaft.

The hoisted ore is milled and concentrated by flotation, and the concentrates are smelted and converted, on site. Converter matte is treated by the company's base-metal removal plant. The precious-metal concentrates are sent to Germany for precious-metal recovery.

The Northam mine produced 340 547 oz of precious metals in concentrate in the year ended June 2004, from 2,2-million tons of ore, with a combined head-grade of 5,5 g/t.

When compared to the first six months of 2004, production in the six months to June 2004 fell by 18% due to a fire that broke out in September 2004 at a conveyor belt used for transporting ore and waste materials. The accident saw the death of nine employees and, in the aftermath, production was suspended, which resulted in lost output for six weeks.

Current capital projects

Northam is currently involved in two major capital projects – Booysendal and Pandora.

The Booysendal deposit – to be exploited by a 50:50 joint venture between Anglo Platinum and Northam – embraces 138 km2 on ten contiguous farms, underlain by Merensky and UG2 horizons. The UG2 horizon boasts grades of 4,93 g/t over an average width of 127 cm, while the Merensky horizon has been shown to have grades of 4,72 g/t over an average width of 100 cm. Measured, indicated and inferred resources, after a 24% allowance for geological losses, total 76,8-million ounces on the UG2 horizon and 47,6-million ounces on the Merensky horizon.

The Booysendal project was originally a joint venture between Anglo Platinum and a consortium known as Khumama Platinum, which has since been taken over by Mvelaphanda. A mining authorisation for this project has been issued, and Northam is expected to acquire Mvelaphanda's stake in the project during 2005. Booysendal comprises an estimated resource of some 124-million oz of which half is attributable to Northam.

The Pandora project, intended to exploit the UG2 reserves on the Hartebeespoort, Roodekopjes and Uitvalgrond farms, west of Brits, is a joint venture between Anglo Platinum, Lonmin Platinum, Northam Platinum and the Bapo Ba Mogale tribe. Currently Northam's stake in the project is vested with Mvelaphanda Resources, until such time as the empowerment shareholding in Northam has complied with the requirements of the Mineral and Petroleum Resources Development Act.

The Pandora project involves developing the existing infrastructure at Lonmin's Eastern Platinum Mine (EPM) to gain access to the mineral rights area adjacent to EPM. The capacity of the existing EPM concentrator will be expanded by 120 000 t/m, and a new 200 000 t/m concentrator will be constructed on the Pandora mine area, adjacent to EPM. Decline shaft systems will be installed, and steady-state production of 230 000 oz of refined platinum and 110 000 oz of refined palladium a year is expected.

The capital cost of this project, when originally announced in 2002, was R2,8-billion (R3,3-billion in 2004 terms). Anglo Platinum is only responsible for its portion of the capital expenditure, and will refine only its portion of production.

Delays experienced in obtaining the authorisations for the Pandora project, together with the unfavourable economic environment, have resulted in a slowing-down and possible rescoping of the project. It is envisaged that earliest production from the development will be in 2006.

Capital expenditure by Northam Platinum in the year to June 2004 amounted to R123-million, including R38-million on the development programme, R20-million on access infrastructure to levels 1 and 14, R12-million on safety improvements to skip design and R15-million on additional refrigeration plants. Northam Platinum incurred capital expenditure of R50-million for the six months ending December 31, 2004. Planned capital expenditure for 2005 amounts to a total of R136-million, including R33-million on the development programme, R11-million on development through the 20 line fissure fault, R12-million on the furnace slag treatment facility, R12-million on additional backfill facilities, and R33-million on access infrastructure to levels 1 and 14.

Shareholding structure
Northam's largest shareholder is Mvelaphanda Resources, which is set to increase its shareholding to 34%.

Annual turnover
R1,7-billion (June 2004)
R1,5-billion (June 2003)
R1,6-billion (June 2002)

Earnings
R254-billion (June 2004)
R275-million (June 2003)
R399-million (June 2002)

Leadership
Glyn Lewis (general manager)

Employees
6800

Directors
R Havenstein, Msc (Chemical Eng), Bcomm , Director: Non-executive
Dr NJ Dlamini, Director: Non-executive
Ms ET Kgosi, Director: Non-executive
RG Mills, Bsc (Eng), Fimm,fsaimm,director: Non-executive
GT Lewis, Chief Executive Officer
RHH Van Kerckhoven, Bcomm, Mbl, Director: Non-executive Belgian
MJ Willcox, Ba, Llb, Post Grad Dip Tax, Director: Non-executive
ME Beckett, Bsc, Fimm, Director: Non-executive British
E Molobi, Ba, Director: Non-executive
BR Van Rooyen, Ba, Llb, Director: Non-executive
TMG Sexwale, Certificate Bus. Studies, Chairman: Non-executive

Share performance

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Aquarius Platinum

Brief history

Aquarius Platinum first became involved in the platinum industry in 1995, when it began to explore the possibility of acquiring platinum mineral rights.

In 1996, Aquarius exercised options to acquire three companies (Gemex, Randex and Pacific Platinum) whose mineral rights were combined to make up the Kroondal lease area, in the North West Province of South Africa.

In 1998, Kroondal Platinum Mines (KPM), of which Aquarius now owns 95%, was listed in South Africa. The company has since been delisted, as part of the drive by Aquarius to consolidate its interests.

Nature of business and market position

Aquarius Platinum is an Australian company listed on the Australian and London Stock Exchanges. Aquarius made history when it listed on the JSE Securities Exchange, becoming the first foreign company allowed a secondary listing in South Africa under new foreign exchange control dispensation. The company holds a 75% interest in Aquarius Platinum South Africa (AQPSA), the operating arm of the Aquarius group in South Africa, which owns and operates the Kroondal and Marikana mines, and is soon to begin developing the Everest South project. The remaining 25% of AQPSA is owned by Implats. Aquarius Platinum also owns a 50% share in the Mimosa platinum mine, situated on the Great Dyke, in Zimbabwe, through its shareholding in ZCE Platinum, the Mauritian firm that owns 100% of the Mimosa Mining Company. Its partner in this joint venture is Implats.

In the year ended June 2004, Aquarius produced 307 063 attributable ounces of platinum-group metals, which was up on the previous year's production of 271 727 oz. In the half year ended December 2004, 145 714 oz of platinum-group metals was produced, which was down from the six months ended December 2003 due to the impact of the pooling and sharing agreement with Anglo Platinum. The company is aiming to increase production to 600 000 oz of PGMs by 2006 and, in line with this strategy, is undertaking several projects to account for the additional ounces.

The largest of these projects is the Everest South development, where construction started during the fourth quarter of 2004. The pooling and sharing agreement with Anglo Platinum, at Kroondal, has progressed relatively well and ahead of plan.

Aquarius Platinum made significant progress on the black economic-empowerment (BEE) front in October 2004, having completed a credible and bankable transaction, which saw Aquarius fully compliant with the equity component of the mining charter. The deal saw a BEE consortium, led by Savannah Resources, inject an estimated R860-million in exchange for new Aquarius shares, equal to about 29,1% of AQPSA, exchangeable in future into approximately 23% of Aquarius. Construction on the new Everest South mine began upon receipt of the funding.

Aquarius strives to develop orebodies that are too small for the established mining houses to exploit profitably, but which are too big to ignore. The company's strategy is to outsource all operational functions. For example, in order to avoid the expenses involved in processing PGMs, Aquarius has a life-of-mine agreement for the sale of PGM concentrates from all its mines to Implats, which smelts and refines the production at its IRS facilities, and then markets it. At Kroondal, Aquarius's flagship operation since its opening in 1999, less than 20 members of staff are employed by the company, as mining, plant operation, smelting, refining and marketing activities are all outsourced.

Aquarius's production for the year ended June 2004

	Kroondal	Marikana	Mimosa
Platinum production (oz)	143 408	57 774	61 422
Total PGM production (oz)	237 626	87 176	119 389

Source: Aquarius Platinum Annual Results

Platinum operations in South Africa

The Kroondal mine, situated about 120 km north-west of Johannesburg, on the Western Limb of the Bushveld Complex, came into operation in January 2000 and, in the year ended June 2004, produced 237 626 oz of PGMs, which was 13% up on the previous year's production. In the six months ended December 2004, Kroondaal produced PGMs of 139 009 ounces.

The UG2 reef outcrops on the Kroondal property, and comprises two mineralised seams – the Main and Leader reefs – which are separated by a pyroxenite zone, which is commonly known as the parting. With both reefs and the parting being mined, a wide-reef underground operation has resulted. Small-scale opencast mining also takes place.

In June 2003, Aquarius Platinum and Anglo Platinum announced a pooling and sharing agreement that will see the two companies mining contiguous properties on their respective Kroondal and Rustenburg lease areas. The agreement provides for the parties to pool their assets, while retaining ownership of them, and to share the proceeds equally. The parties will use the existing Kroondal infrastructure to gain access to the Rustenburg Platinum Mine orebody downdip of Kroondal.

A new 250 000 t/m concentrator was constructed ahead of schedule in March 2005, and steadystate level was expected to be reached by June 2005. This is in line with Aquarius's plan to double Kroondal's PGM output to 505 000 oz/y. The underground mine expansion is equally on track at the existing Central, East and new No 3 shafts. The venture will have mineable reserves and resources totalling 69-million tons, which are expected to allow mining until 2016. Initial production will be in the region of 140 000 oz of platinum a year, rising, by 2006, to 280 000 oz of platinum a year and 130 000 oz of palladium. Aquarius Platinum will continue to honour its existing concentrate offtake agreement with Impala Refining Services, fixed at a total of some 586 000 oz of platinum in concentrate. The agreement has significantly extended Kroondal's life-of-mine as, prior to the agreement, it faced closure in four years' time.

The pooling and sharing agreement became effective in November 2003 and, consequently, production from Kroondal that was attributable to Aquarius for the year ended June 2004 was 160 190 oz. This was calculated at four full months of production – from July 2003 to October 2003 – and eight months at 50% of total production – from November 2003 to June 2004. In the six months ended December 2004, attributable PGMs of 69 504 ounces were produced.

Construction on the RK1 project to treat chromite tailings through a purpose-built plant at Kroondal was completed in December 2004, with the initial concentrate shipped in January 2005. The initial year of the project is expected to yield more than 20 000 oz of PGMs, growing to 28 000 oz/y from the second year, with half of the production attributable to Aquarius. Aquarius holds 50% stake in the venture, and has been contracted to operate the tailings retreatment plant, for which it will receive a management fee. The resultant concentrates will be sold to Aquarius's current partners – Impala Platinum and Anglo Platinum.

The Marikana mine, situated eight kilometres east of Kroondal, first began mining in June 2002, and is still ramping up to full production. In the year ended June 2004, the operation produced 87 176 oz of PGMs from 1,45-million tons of run-of-mine ore. In the six months ended December 2004, 45 713 oz of PGMs were produced, which was an improvement from the first half of the year.

PGM build-up at the mine has not met preproduction expectations, although indications are that the operation is currently encountering deeper improved ore, which will allow it to increase its production in coming months. Trial underground mining, based on revised mining plans, is expected to start in 2005.

The orebody at Marikana, measuring approximately 1,5 km by 2 km, is a basin-like structure that dips down towards the centre from all sides. It is planned that mining will take place through an openpit to a depth of 100 m, whereafter underground mining will take place.

Platinum operations in the rest of Africa

Aquarius's 50% stake in the Mimosa operation, situated on the southern part of the Great Dyke in Zimbabwe, on the Wedza geological complex, contributed 59 697 attributable ounces of PGMs to production in the year ended June 2004. The other 50% of production was attributable to Implats. In the six months ended December 2004, attributable ounces of 30 497 were produced, which was slightly lower than the 2003 interim period.

Aquarius welcomed the substantial tax cut that the Zimbabwe government provided in December 2004, from 20% to 15%. However, the expansion to 80 000 oz/y has been delayed pending the conclusion of talks with Zimbabwe's government regarding the domicile of foreign currency accounts. Initial indications are that production from this mine could be doubled within four years.

Mining at Mimosa takes place at a depth of 200 m, and the operation has a life-of-mine offtake agreement with IRS. Despite significant increases in the cost of fuel and power in the year to June 2004, Mimosa continues

to be considered one of the most efficient low-cost operations in the world.

Negotiations on the sale of 15% of Mimosa to a consortium of Zimbabweans are under way. Both Implats and Aquarius will make available 7,5% of their respective holdings for purchase by the consortium.

Current capital projects

In July 2000, Aquarius acquired three Eastern Bushveld properties from Impala Platinum: Everest South, Chieftain's Plain and a portion of Everest North. While exploration is still to be conducted at Chieftain's Plain and Everest North, a bankable feasibility study has been conducted at Everest South, and development of the property went ahead in October 2004, with the proceeds of Aquarius's BEE transaction being used towards the development.

Everest Platinum mine has a UG2 reserve of 26,79-million tons at 3,36 g/t PGMs. Full production of 225 000 PGM ounces a year is scheduled for 2006. Advance engineering work is under way to ensure that the project can be rapidly mobilised.

Budgeted capital expenditure for the development is R819-million, including a R33-million allowance for escalation. In the quarter ended March 2005, Aquarius reported that the development of its Everest South mine is proceeding as planned, with 192 000 cubic metres of waste already removed from the South Pit. The predicted mine-life of Everest South is 12 years.

To facilitate the pooling and sharing agreement with Anglo Platinum at Kroondal, a new 250 000 t/m concentrator was constructed in March 2005, and steadystate level expected to be reached by June 2005. This is in line with Aquarius's plan to double Kroondal's PGM output to 505 000 oz/y. The underground mine expansion is equally on track at the existing Central, East and new No 3 shafts.

Shareholding structure
Substantial shareholders as at December 31, 2004:

Impala Platinum 8,63%
JP Morgan Nominees Australia 6,66%
Chase Nominees 5,66%
ANZ Nominees 6,31%

Annual turnover
$194, 85-million (June 2004)
$107,360-million (June 2003)
$94,9-million (June 2002)

Earnings
$28,70-million (June 2004)
$10,54-million (June 2003)
$21,77-million (June 2002)

Leadership
Stuart Murray (chief executive officer)

Directors
SA Murray, Bsc (Eng), Chief Executive Officer
Z Sisulu, Director
NT Sibley, fca, Chairman: Non-executive
DR Dix, Director: Non-executive
E Haslam, Director: Non-executive
CE Markus, Director: Non-executive
Sir W Purves, Director: Non-executive
PD Quirk, Bcom , Director: Non-executive

Share Performance

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African Rainbow Minerals (ARM)

Platinum

Brief history

African Rainbow Minerals & Exploration was established in 1997. The company invested in gold and platinum operations, and changed its name to African Rainbow Minerals (ARM) in 1999.

The company rose to prominence when it managed to turn a number of loss-making shafts acquired from AngloGold into profit earners and, in January 2002, entered into a joint venture with Harmony Gold to acquire further AngloGold assets and a Gold Fields operation. This joint venture was known as Freegold.

In April 2002, ARM's gold assets were consolidated into African Rainbow Minerals Gold (ARMGold). In September 2003, ARMGold and Harmony merged to create the largest gold producer in South Africa and the fifth-largest gold company in the world, and jointly acquired a 34,5% stake in Anglovaal Mining (Avmin). The merged company retained the name Harmony, and ARMGold was delisted.

In November 2003, Harmony, African Rainbow Minerals Investments (ARMI) and Avmin announced a deal – which, with all components included, was valued at over R10-billion – and saw the creation of the largest black-controlled diversified mineral resources company in South Africa, with 62,9% black equity.

A range of undividable transactions concerning certain of the assets of Avmin, African Rainbow Minerals and Exploration Investments (Pty) Ltd and Harmony Gold Mining Company Ltd became unconditional on May 3, 2004, when the name of the company was changed to African Rainbow Minerals Ltd. ARM is listed on the JSE Securities Exchange and on the London Stock Exchange.

Nature of business & market position

The new ARM controls gold assets through its majority shareholding of 16,2% in Harmony. Harmony, in turn, previously held 19,8% of the ARM control structure until April 2005, when it disposed of about 17,5% of its stake, including a 14% stake to the ARM Broad Based Empowerment Trust, which resulted in ARM's BEE shareholding increasing from 43% to 57%.

The new ARM also has four platinum assets – Nkomati, Two Rivers, Modikwa and Kalplats.

Platinum operations

ARM Platinum's portfolio consists of assets that have the potential to achieve significant attributable production in years to come. This includes a 41,5% indirect interest in the Modikwa joint venture, a 55% interest in the Two Rivers project, 100% in Kalplats and 50% in the Nkomati mine, which is contemplating a major expansion project that will boost PGM production from the operation.

The Modikwa joint venture with Anglo Platinum involves a R1,6-billion project to develop a greenfields mine on the farms Maandagshoek, Driekop South, Hendriksplaats, Winterveld and Onverwacht. The mine will produce 162 000 oz of platinum and 146 000 oz of palladium a year, and a 200 000 t/m concentrator will process run-of-mine UG2 ore from two shafts. The mine is currently ramping up to full production, and produced 91 000 oz in 2003, and 114 200 oz in 2004.

The 55% stake that ARM Platinum holds in the Two Rivers joint venture was originally held by Avmin, and entails the company teaming up with Impala Platinum for the development of a new underground mine. In June 2005, the JV partners announced their plans to proceed with the building of the Two Rivers platinum mine, a 220 000 oz/y PGM project, as a result of the successful trial mining phase. Capital expenditure is estimated at R1,2-billion, of which half will be financed by the partners themselves in their respective shareholding ratios. The project will see about 1 000 people being employed and will also include the construction of a concentrator plant on the site. ARM will manage the project, while IRS will toll-smelt and refine the concentrate and market the PGMs. The underground mine is expected to have a yearly run-of-mine output of 2,2-million tons, producing about 120 000 oz of platinum a year. Full production is scheduled for the second half of 2006.

The Kalplats project, originally held by Harmony, involves platinum exploration along the Kraaipan belt, where promising deposits of openpittable platinum and palladium have been discovered. Feasibility studies are currently under way. If the project goes ahead, a life-of-mine of approximately 10 years is indicated, at a mining rate of 150 000 t/m, with PGM production of about 90 000 oz a year, although underground mining

on high-grade sections of the reefs and new discoveries in the project area may extend the mine-life.

The Nkomati mine was originally 100% held by ARM Platinum as a result of the 25% acquisition by Avmin in the project, held by Anglo American, thereby making ARM the sole owner of South Africa's only primary nickel mine, which produces copper, cobalt and PGMs as by-products. However, with effect from January 2005, ARM announced its 50:50 joint venture with LionOre Mining International (LionOre) in a transaction valued at $48,5 million. This includes LionOre paying $20-million for participation in the significant Nkomati expansion project, if the two partners agree to proceed. A decision on the estimated R2,5-billion expansion project is expected to be made in the final quarter of 2005, pending the completion of the feasibility study review and pit optimisation study. In the year ended June 2004, Nkomati produced 4 920 t of nickel, 2 830 t of copper, 81 t of cobalt and 36 360 oz of platinum.

Annual turnover of ARM
R3,3-billion (June 2004)
R2,9-billion (June 2003)

Earnings
R214-million (June 2004)
R204-million (June 2003)

Leadership
Patrice Motsepe (executive chairman)
Andre Wilken (chief executive)

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Gold Fields

South Africa's second-largest gold miner, Gold Fields, is involved in PGM exploration in Finland, in the Arctic Platinum Project. Originally a joint venture between Gold Fields and Finnish technology company Outokumpu, the project is currently wholly owned by Gold Fields, which exercised its right to acquire Outokumpu's 49% stake in the project in August 2004.

Approximately 14-million ounces of PGM resources have been delineated at the project site, and it is thought that the deposits are part of a much bigger PGM complex covering hundreds of kilometres.

The latest feasibility study into the project, however, has indicated that Gold Fields will either delay or scale down the initial 10-million ton a year project, mainly due to the appreciation of the euro against the dollar. By the end of March 2005, Goldfields had invested a total of $90-million into the Arctic Platinum Project and intends holding on to the project for development in the future, pending favourable economic conditions.

Employees
48000

Directors
K Ansah, Bsc(Mech Eng), Ust Ghana, Msc(Metallurgy), Georgia Insitute Of Technology , Director: Independent Non-executive
Nj Holland, Bcomm, Bacc(Wits), Ca(Sa) , Chief Financial Officer British
Jm Mcmahon, Bsc (Mech Eng), Glasgow , Director: Non-executive British
R Pennant-rea, Ba, Ma , Director: Non-executive
Cmt Thompson, Ba, Msc Mgmt Studies , Chairman: Non-executive Canadian
Id Cockerill, Bsc Geology Hons (Uk), Msc Mining (Royal School Of Mines) , Chief Executive Officer British
Aj Wright, Ca(Sa) , Chairman Deputy: Non-executive
Jg Gerwel, Dlitt And Phil(Magna Cum Laude) , Director: Non-executive
Gr Parker, Bs, Ms, Mba , Director: Non-executive American
Pj Ryan, Phd Geology , Director: Non-executive
Tmg Sexwale, Cert Business Studies , Director: Non-executive
Ci Von Christierson, Bcomm, Ma , Director: Non-executive
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Share performance

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Royal Bafokeng Resources

Nature of business and market position

Royal Bafokeng Resources (RBR) was formed in November 2003 in order to corporatise the mining assets of the Royal Bafokeng Nation (RBN) – the 300 000-strong community owning land, and the associated rights to extensive mineral reserves, in South Africa's platinum-rich North West province. The company's interests include involvement with the world's number one and number two platinum producers, Anglo Platinum and Implats respectively.

Operations

Platinum RBR is involved in a 50:50 joint venture with the world's largest platinum producer, Anglo Platinum, at the Bafokeng Rasimone platinum mine, which the two partners jointly brought to production. The mine began operating in 1999, and reached full production in 2003, when it achieved an output of 183 500 oz of refined platinum. Approved and on schedule, the BRPM Phase 2 project involves the extension of the North and South shaft covered by an additional five levels from the already established five levels, and will see a continued output of 110 000 t/m per shaft system for an additional seven years. The joint venture is also currently conducting preliminary design and project engineering work on the Styldrift prospect, which has the potential to add 500 000 oz to yearly production.

In 2004, Bafokeng Rasimone produced 184 900 oz of platinum, slightly up on the previous year's 183 500 oz, mainly due to the increase in production at the South shafts.

The world's second-largest producer of platinum, Impala Platinum, conducts mining on RBN land and, in terms of an agreement signed between the RBN and Impala in 1999, Impala pays the RBN a royalty amounting to 22% of its pretax profit. In 2004, this amounted to R414,4-million. The RBN also owns a 1,5% equity stake in Impala and RBR has attempted to increase this stake by converting the 40-year royalty agreement into equity. The company was seeking equity of about 20% in exchange for the cancellation of the royalty agreement, but talks failed and the royalty agreement remains in place.

Leadership
Chris Molefe (chief executive officer)

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This section contains brief profiles of the junior players in the platinum industry.

Junior Platinum Companies and Explorers

African Platinum (Afplats)

Activity

Afplats, formerly Southern African Resources, is an exploration and development company currently aiming to establish a resource base of over 100-million ounces 4E, by exploring various projects in Africa. It is listed on the London Stock Exchange's Alternative Market and is planning a secondary listing on the American Stock Exchange.

The Leeuwkop project involves the establishment of a platinum-mine at the 4 600 ha property, on the western limb of the Bushveld Complex in South Africa. Afplats recently gave the go-ahead to a bankable feasibility study following a favourable prefeasibilty report.

Afplats has also acquired prospecting rights over various neighbouring countries of South Africa, including Botswana, Mozambique and Zimbabwe.

Leadership
Roy Pitchford (chief executive officer)

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Mmakau Mining

Activity

Mmakau Mining is a 100% black-owned company involved in the mining sector through the provision of contract mining and consultation services and as a partner in a significant platinum project. Negotiations for additional mining partnerships are under way.

Mmakau Mining's entry into mine ownership came in 2001 when it signed a deal with the world's second-largest producer of platinum, Impala Platinum, for a 10% stake in the major company's Marula project (formerly known as Winnaarshoek), which has the potential to producer 400 000 oz of platinum a year.

Mmakau Mining and Ridge Mining plc (formerly known as Cluff Mining) recently formed a partnership for the development of the Madibeng platinum prospect in the North West Province. Mmakau has a 30% stake in Madibeng Platinum.

Leadership

Bridgette Radebe (chairperson)

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Nkwe Platinum

Activity

Nkwe Platinum, an Australian-listed platinum group, incorporated in October 2002 with the intention of acquiring and developing platinum properties in South Africa. Nkwe is 28% held by BEE investors, making it fully compliant with the BEE charter.

Nkwe has five project areas with a combined reserve of some 15-million oz of PGMs and plans to develop a R450-million to R500-million mine in the Bushveld Complex. The first project will be at the De Wildt property, where a R20-million feasibility study will begin as from March 2005. Nkwe anticipates that construction of the mine will begin in the second half of 2006. The Rooderand project is the next project scheduled for feasibility stage in 2006.

Leadership
Craig Oliver (managing director)

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Platinum Group Metals (PTM)

Activity

Platinum Group Metals (PTM) is a Canadian company that was incorporated at the beginning of 2002. The company is involved in various exploration projects, mainly in Canada and South Africa. PTM is listed on the Toronto Stock Exchange and is currently deciding on a secondary listing on the JSE Securities Exchange.

In October 2004, PTM entered into a joint venture with Anglo Platinum and Africa Wide to explore the western limb of South Africa's Bushveld Complex. PTM and Anglo Platinum each have a 37% stake in the JV, with Africa Wide having 26%, thereby immediately satisfying the ten-year target set in the mining charter. The JV's exploration programme will be operated and entirely funded to the amount of R35-million over the next five years by PTM, by the end of which the company hopes to be producing platinum.

Leadership
John Gould (managing director)

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Wesizwe Platinum

Activity

Estabished in 2004, Wesizwe is a PGM exploration company currently involved in exploration on properties on the highly-prospective Western Limb of South Africa's Bushveld.

The company, which is also the investment vehicle for the Bakubung-ba-Ratheo tribe of the platinum-rich North West province, is currently being constructed using an innovative business model that embraces upfront community participation. The Bakubung-Ba-Ratheo community is the largest shareholder of Wesizwe, holding 33% of the shares and contributing to the company's total BEE shareholding of 52%. In May 2005, the company announced its intention to proceed with a listing on the JSE securities exchange.

Projects

Wesizwe has started exploration on four properties and has raised R115-million, which it plans to deploy in proving up its reserves on the Zandrivierspoort, Ledig,

Frischgewaagd and Mimosa farms. The prospective orebodies are reportedly shallower than 1 100 m and the farms are contiguous to properties currently being explored by Anglo Platinum and the Bafokeng. They are also in the vicinity of Anglo Platinum's Bafokeng Rasimone mine.

Recent exploration drilling results, at encouraging values of 5g/t and 7g/t PGE (4E), confirmed the presence of platinum reef on the property of the Bakubung. These results are still too early to confirm the potential of a future mine, and Wesizwe plans to obtain a bankable feasibility from the exploration programme by 2008.

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This section contains the capital projects of various platinum companies featured in this report.

Capital Projects

Rustenburg UG2 Phase 2 Project, North West Province

Project description
The project would produce 234 000 oz of platinum and 128 000 oz of palladium a year. This development and its associated capital expenditure forms part of a suite of projects to both maintain Anglo Platinum's baseline production and to expand to an annual production rate of 2,9-million ounces of refined platinum by the end of 2006. The initiative would exploit the UG2 Reef, firstly by using existing infrastructure at the Frank and Townlands vertical shafts to produce 255 000 t of ore a month. A new decline shaft with a production capacity of 50 000 t of ore would be established at Boschfontein to accelerate production in the early years of the project. The project would also include the doubling of the capacity of the UG2 Waterval concentrator to process an additional 400 000t/m of ore. However, following Anglo Platinum's strategic review of its projects, the Boschfontein East portion of the project has been slowed down, and the Boschfontein West development has been modified to make use of pre-existing Merensky Reef infrastructure in place of two of the three originally-proposed declines in the cluster. The proportion of UG2 reef that was to be accessed from Frank and Townlands shafts has been reduced in favour of Merensky reef, and mining methods at these shafts have been adjusted in order to maximise head grade and extraction ratios. In light of the revised exploitation strategy, the need for the 400 000 t/m concentrator capacity expansion was revisited, and it appears that further debottlenecking of the existing plant and a possible upgrade may make the additional capacity unnecessary.

Value
An estimated R2,4-billion (2003 monetary terms).

Duration
The revised phase two project is expected to reach steady-state production in 2008.

Breakdown of main contracts
Work for this project will entail the construction of surface infrastructure, provision of potable water, disposal of excess water, sewage treatment plant, upgrading of rail infrastructure, upgrading of tailings impoundment facilities and the provision of additional power.

Client
Anglo Platinum.

Latest developments
Suspension of the of the Boschfontein East Shaft system, due to economic non-viability, together with the reduction of UG2 output from the Frank Shaft by 40 000 t/m, has allowed for an increase in Merensky production capacity. This has reduced capital expenditure and improved project returns under the prevailing market conditions. The concentrator strategy is being aligned with the revised mining strategy. The Townlands and the re-scoped Frank sections have been completed and have successfully ramped-up to steady-state production levels. The Boschfontein West section is ahead on the development of its capital footprint and still in the ramp-up phase to steady state production. Full production is expected during 2005.

Participants
Not stated.

Contact details for project information
Anglo Platinum, (011) 373 6413.

Unki Platinum-mine, Zimbabwe

Project description
Anglo Platinum is developing its first platinum-mine in Zimbabwe, along the Unki deposit. There are also plans to upgrade the project from 85 000 t/m to 120 000 t/m. The establishment of the new mine will create 1 300 jobs. The ore will be refined by Anglo Platinum in South Africa.

Value
$92-million.

Duration
First production is expected in 2007.

Breakdown of main contracts
Not stated.

Client
Anglo Platinum.

Latest developments
The feasibility of upgrading the project from an 85 000 t/m operation to 120 000 t/m is continuing and subject to approval, first production is forecast in 2008.
Development of the mine surface infrastructure has continued with good progress on the establishment of the Lucilliapoort dam, road and housing infrastructure.
The project is still subject to certain Zimbabwean and South African regulatory and fiscal approvals, and the development costs are under review in light of the economic and exchange rate environment in Zimbabwe.

Participants
The project will be developed by Anglo Platinum and its subsidiary, Anglo American Zimbabwe (Amzim).
The mining contractors for the project are SMRD, which consists of aconsortium of Shaft Sinkers, Mmakau Mining, JS Redpath and Dielmann Haniel. The contractors will not only be carrying out the project but will also be involved in the feasibility study and design of the mine.
Trucking and Construction (construction of the bridge), Stewart Scott engineers (dam design) and JR Goddard Construction (construction of the dam).

Will any structural steel be used and if so how much?
No.

On budget and on time?
Too early to state.

Contact details for project information
Anglo American Corporation Zimbabwe, tel 09 263 470 4461 or fax 09 263 470 3734.

Twickenham project, Limpopo Province

Project description
The project originally entailed the development of a platinum and palladium mine on the farms Twickenham, Paschaskraal and Hackney. The mine would have consisted of two decline-shaft systems, an adit-hill system, a 250 000 t/m concentrator and extensive infrastructure. It would produce 160 000 oz of refined platinum and 176 000 oz of refined palladium a year by 2005. However, the mining areas have since been changed in pursuit of the aims of the Mineral and Petroleum Resources Development Act and the mining charter, and the Twickenham Platinum Mine, to be 100% owned by Anglo Platinum, will exploit only the Twickenham and Hackney areas. Paschaskraal has been combined with the farm Klipfontein and with the down-dip State-owned mineral rights on the farms of Avoca and De Kamp, and will be exploited by a 50:50 joint venture between Anglo Platinum and a BEE consortium. This project is known as the Ga-Pasha PGM project. The project is currently at the trial-mining stage, but is progressing at a very slow rate, and could possibly be put on hold altogether until the economic conditions look more favourable.

Value
R2,3-billion.

Duration
The project was approved in September 2001 and steady-state production is expected to be reached by 2009.

Breakdown of main contracts
Not stated.

Client
Anglo Platinum.

Latest developments
The project is on hold, but there is some market speculation that Anglo Platinum may move on some of its mothballed projects, including a restructured Twickenham, given the recent weakening in the rand against the US dollar. However, there are also empowerment and palladium considerations, which could complicate matters.

Participants
Not stated.

Will any structural steel be used and if so how much?
Not stated.

On budget on time?
No.

Contact details for project information
Anglo Platinum, tel (011) 373 6111

Impala No 16 shaft, Rustenburg

Project description
Situated on the south-east corner of the Impala mining lease down-dip of No 1 Shaft, the development of No 16 Shaft forms part of Impala Platinum's (Implats) R6,6-billion expansion of its Rustenburg operations.
No 16 Shaft is expected to produce 226,5 kt of reef a month from seven operational levels. The shaft will access both the Merensky and Upper-Group Two (UG2) reef horizons.
No 16 Shaft ore reserves will be accessed by a down-cast rock and man-material shaft and an upcast ventilation shaft.
The rock and man-material shaft will be lined to an inside diameter of 10 m and sunk to 1 648 m, while the ventilation shaft will be a 6,8-m-diameter inside-concrete lining shaft, sunk to 1 437 m below surface.
Being a shaft that will access reef below 1 000 m, full-time refrigeration will be required for the underground workings, introduced through the rock and man-material shaft. The refrigeration is designed to ventilate a maximum of 900 kg/s of cooled air from the surface.
At No 16 Shaft the world's tallest headgear, with a structural height of 108 m, will be built to house two Koepe winders. One will hoist personnel and material, while the other will only hoist rock. The rock hoist tipping arrangement will be located inside the concrete headgear to reduce noise pollution.
A conveyor will transfer reef and waste from the headgear bins to a transfer tower, from where reef will be transferred into two concrete silos – one for Merensky and one for UG2.
The power requirements for the new shaft will be met from a new Eskom 88/33 kV yard at No 15 Shaft.

Value
R4,5-billion.

Duration
No 16 Shaft is scheduled to start producing platinum in August 2011, and reach full output in September 2014.

Breakdown of main contracts
Read, Swatman & Voigt (RSV) is responsible for the engineering, procurement, construction and management contract for the project.

Client
Implats.

Latest developments
Project manager Dave Lundertedt reports that the presink for the rock and man-material shaft was completed on schedule and that the presinking for the ventilation shaft is well advanced and on schedule.
The forecast is that the main sinking mode for the ventilation shaft should start in August, while the man-material shaft's main sinking will start during December – slightly ahead of schedule.
Preparation for the 35 days of sliding headgear is also in progress.

Participants
RSV.

Will any structural steel be used and if so how much?
The headgear will have about 1 360 t of reinforcing steel and another 800 t of structural steel inside the headgear upon completion.

On budget and on time?
Yes.

Contact details for project information
Implats, tel: (011) 481 3900 or fax: (011) 484 0254.

Impala Platinum No 20 shaft project, Rustenburg

Project description
The project involves sinking two vertical shafts and then developing three 2,5-km declines to access and transport the reef. Two trackless declines will be situated between the Merensky and UG2 reef planes, allowing access across ramps to the reef planes and the footwall-strike drives. Conventional underground railways in the footwall-strike drives will transport the rock to central ore-passes. A conveyor system, situated below the ore-passes in the third decline, will convey the rock to the main shaft for hoisting to the surface.

Value
R2,1-billion.

Duration
The project is already in the construction phase and is scheduled to achieve full production in May 2011.

Breakdown of main contracts
TWP Consulting was awarded the contract for the engineering, procurement, construction and management (EPCM) of the project, Murray & Roberts is the civil contractor, M&R Cementation is the sinking contractor, DSE Structural Engineers and Contractors are responsible for the structural headgear and Grinaker LTA will install dual-redundant supply lines to the shaft site.

Client
Impala Platinum.

Latest developments
The project is currently in construction phase one, of which 92% has been completed. TWP Consulting's director and project manager, Murray Macnab, reports that the shaft collars, subbanks, service ducts, rock-winder foundations, service-winder foundations, kibble-winder foundations, two-stage winder foundations, settling dams, terrace and site offices have all been completed. The 33 kV and 6,6 kV substations are also completed. To complete construction of phase one, only the cable trenches and tarring of the road still must be completed.
The presinking and equipping of the ventilation shaft for sinking are completed, while the main shaft's presinking is already 80 m deep.
Erecting, equipping and preparation of the ventilation shaft's headgear for main sinking have started and the ventilation shaft's main sinking is currently 100 m deep, with 950 m still to go.
The erection of the headgear is scheduled to be completed by the start of August, whereby a permanent rock winder will be commissioned as a kibble winder for the sinking phase, which will restart in mid-August.
A 100-t sinking stage was delivered, erected and installed in the shaft in June.
Sinking is currently scheduled at 3 m a day with plans to increase it to 3,6 m a day.
Both shafts will be in full sink mode from August 10, after which the surface activities will be quieter when the focus turns to sinking and underground developments.
The refrigeration plant is required only in 2011 and that will be built after both shafts have been completed.
The final major component of the project to ensure that TWP meets Impala's key dates and the replacement tonnage build-up, is the second outlet from No 12 Shaft on 20 level. The development of the second outlet has started and it is scheduled to hole with the decline development in September 2007.

Participants
TWP Consulting, Murray & Roberts M&R Cementation, DSE Structural Engineers and Contractors Grinaker LTA.

Will any structural steel be used and if so how much?
A total of 550 t of headgear structural steel has been delivered to the site, with 250 t to be delivered in July month.

On budget and on time?
The project is currently ahead of schedule.

Contact details for project information
Implats, tel: (011) 481 3900 or fax: (011) 484 0254.

Lonmin's Saffy shaft
Project description The development of the Saffy shaft complex at the Eastern Platinum mine will see the replacement of three incline shafts, which currently produce 190 000 t of UG2 reef a month, with a shaft that will hoist some 240 000 t of rock a month of which 200 000 t will be reef.
Value R665-million.
Duration The project is complete and the mine is ramping up to full production.
Breakdown of main contracts Shaftsinking of an 850-m-deep shaft with ten operating levels as well as establishing a complete surface infrastructure.
Client Lonmin Platinum.
Latest developments Lonmin has reported that Saffy Shaft will reach full production in 2009.
Participants Shaft Sinkers, Grinaker-LTA, METS, Davis Langdon Farrow Laing and Master Drilling.
On budget and on time? Yes.
Contact details for project information Lonplats, tel: (012) 318 3676.

Messina platinum-mine, Limpopo Province.

Project description
The Messina project area has four sections – Voorspoed, Doornvlei, Dwaalkop and Zebediela. The phase 1 mine (Voorspoed) has been commissioned and the Department of Minerals and Energy has awarded a mining licence for the phase 2 (Doornvlei) section. A prospecting permit has been awarded for the Zebediela section.

Value
R486-million.

Duration
Studies are currently underway to evaluate alternatives to begin the Phase 2 project in the current strong rand environment.

Breakdown of main contracts
Not stated.

Client
SouthernEra Platinum, for phases 1, 2 and 4, and a joint venture of Southern Platinum and Mvelaphanda for phase 3.

Latest developments
In April, Lonmin announced that it would acquire Southern Platinum in a $263-million deal. Lonmin is progressing well in terms of gaining competition clearance in South Africa and is expecting to complete the acquisition by July 1, 2005.
Lonmin believes that the current platinum production at the Messina mine can be increased to 75 000 oz a year by 2007. CEO Bradford Mills has reported that this will form part of Phase I of the project and that new mining methods will have to be employed. Lonmin plans to spend $75-million over the next three years on the development of the Messina Phase I projects.
The current view is that there is further potential upside of an additional 150 000 oz a year from Phase II expansion and a further 50 000 oz from Phase III. Phase II and III are both subject to completing satisfactory feasibility studies.
It is expected that it will take a year to 18 months to complete the details of Phase II.
Lonmin has also reported that it plans to convert Messina to 100% mechanised operations in the next two years, dramatically reducing costs and improving productivity.
Lonmin has agreed with Impala Platinum to buy out the Messina Smelter contract and will recapture the toll-smelting margins.

Participants
Rand Merchant Bank provided financing for the project and SRK Consulting prepared the bankable feasibility study. Mintek handled the underground bulk sample.

Will the project require the use of structural steel and if so how much?
Not stated.

On budget and on time?
Yes.

Contact details for project information
Lonplats, tel: (012) 318 3676

K4 shaft, North West Province.

Project description
To be rolled out in three phases, the K4 shaft project is an endeavour that ultimately aims to replace ore reserves for Lonmin's Karee mine. The No 4 shaft is a twin-shaft complex that consists of a 1 356-m-deep main shaft and a 1 078-m-deep ventilation shaft. The main shaft will access Merensky and UG2 reef, both bearing platinum-group metals. In addition to hoisting ore, this shaft will serve as the primary means of transport for all personnel, while the ventilation shaft will be equipped with a winder, to serve as a secondary outlet in case of emergency. The design capacity of the shaft system is 230 000 t/m of ore and 35 000 t/m of waste.

Value
The total value of the project is R1,662-billion. Phase one alone is valued at some R1-billion (August 2000 terms).

Duration
The project is scheduled for completion in December 2006.

Breakdown of main contracts
Shaft sinking, civil construction, winder mechanical and electrical. During phase one, both the main shaft and the ventilation shaft will be sunk conventionally. The ventilation shaft, some 80 m north-east of the main shaft, will be sunk conventionally, as opposed to raiseboring, to allow the project team to develop the ends to the ore reserves for a period of 20 months, while the main shaft is still being sunk. This will provide a quicker ramp-up to full production. Phases two and three will include the capital required to bring the shaft system to full production, as well as the future refrigeration requirements of the No 4 shaft. There will be some degree of overlap between the phases.

Client
Lonmin Platinum.

Latest developments
The main shaft on 34 level has reached some 1 186 m below collar. The ventilation shaft on 31 level, some 1 077 m below collar which is the final depth, will be completed in November 2004. The development towards the Merensky reef horizon will begin in February 2005.
Concurrent surface and underground construction and civil work is progressing at the required rate for completion on time.
Preparation for the development phase is well under way and on schedule.

Participants
Lonmin is sinking the K4 shaft complex with the main sinking contractor Murray & Roberts Cementation Mining and with Read, Swatman & Voigt (RSV) on project management and design.
Turner & Townsend provides the cost and engineering and cost control services.
The subcontractors for the project were: Louwill Engineering; Braam Staal, Steffanutti & Bressan; WBHO; Howdens; Turbo-Rep; Letab, Concor; Platinum Electric; Dillinger; Coilmech; Fuller Vecor.

On budget and on time?
Project is still within escalated budget and on schedule.

Contact details for project information
J Kannemeyer, Lonplats, tel (014) 571 5500.

Everest Platinum Mine, Mpumalanga

Project description
The project involves the establishment of a 225 000 oz platinum-group metals (PGMs) mine. It is planned that the reef will be accessed from a terrace, and will be mined underground towards the Dwarsrivier valley. About 165 000 oz of PGMs will be produced during ramp-up. The predicted life-of-mine is 12 years.

Value
Capital budget is R819-million.

Duration
Construction is expected to begin soon and full production should be reached in 2006.

Breakdown of main contracts
Dowding Reynard & Associates has assisted the mining company in its feasibility study and will guide Aquarius Platinum through the engineering and construction phases of the project.

Client
Aquarius Platinum.

Latest developments
Aquarius Platinum has reported that the construction of the mine is proceeding as planned and should achieve full production in 2006. In its quarterly report for the quarter ending March 31, the group said that opencast mining activity had started during the period under review, and that 192 000-cubic metres was removed from the south pit.
First reef production is expected to take place in the next quarter.
Underground mining contractor Shaft Sinkers started with site establishment in preparation for the decline development, which began in April.
Aquarius also reported that the implementation of social upliftment and sustainable livelihood projects are ongoing, with the removal of alien plants and a nutritional feeding scheme implemented during the period.
The opencast mining will have a maximum highwall of 50 m and the underground mine an ultimate depth of 250 m, with reef expected to be accessed by August after completion of the decline footwall development. The topsoil, which is now being stripped, is kept aside for eventual rehabilitation of the mine upon closure.

Participants
Dowding Reynard & Associates (engineering procurement construction management contractor) is currently managing the project.
The opencast mining is outsourced to MCC.
Shaft Sinkers will be responsible for the underground mining contract.

On budget and on time?
Yes.

Contact details for project information
Aquarius Platinum, tel (011) 455 2050 or fax (011) 455 2095 email: info@aquariussa.co.za.

Two Rivers Platinum, Mpumalanga, South Africa

Project description
African Rainbow Minerals (Arm) and Impala Platinum (Implats) have formed a joint-venture company, Two Rivers Platinum, to develop, manage and operate a new platinum-group metals (PGMs) mine. It is envisaged that the mine will have a yearly run-of-mine output of about 2,2-million tons.
The underground mine will be accessed using a decline mineshaft comprising a footwall conveyor decline and two on-reef declines: one for vehicle access and the other a chairlift installation for the transportation of employees. The underground mining operations will be fully mechanised.
Following test-work conducted in 2002, with independent laboratory verification, the concentrator plant will be a standard MF2 design as generally used in the industry.
All project assumptions indicate that Two Rivers will be one of the lowest-cost PGM producers at less that R200 a ton.

Value
R1,2-billion.

Duration
Full production is forecast during the second half of 2006.

Breakdown of main contracts
A concentrator plant will be erected on site, and Impala Refining Services (IRS) will toll-smelt and refine concentrate and market the PGMs. The base metals in concentrate will be toll-refined by IRS and marketed by Arm.

Client
Two Rivers Platinum is a joint venture between Arm (55%) and Implats (45%).

Latest developments
Arm and Implats have given the green light for the building of the R1,2-billion Two Rivers platinum-mine. The decision to proceed follows a successful mining phase to test all critical project assumptions. The mining and stockpiling of nearly 240 000 t of UG2 ore, as well as extensive access development, has substantially validated geological and mining feasibility parameters.
Nedbank and Absa have put up R600-million in project finance, with the balance of the funding being contributed by the two partners in their respective shareholding ratios (Arm R330-million and Implats R270-million).
Implats' chief executive Keith Rumble reported that the current expansions at the refinery complex were proceeding well and that the necessary capacity would be available well ahead of the planned commissioning date.
The necessary environmental and mining authorisations for the project release have been approved by the Department of Minerals and Energy.

Participants
Feasibility study participants – Badger Mining & Consulting (mining), DRA (concentrator and infrastructure), GCS (environmental) and ECMP (tailings dam).
SRK audited the Two Rivers reserves and resources in January 2003.
Under Two Rivers management, Grinaker LTA is responsible for the ongoing trial mining and preliminary access development work.
Ecorex and Msole a Thalago conducted a plant and animal relocation program at the 2002 / 2003 year end.
The critical path contractors (mills, float, e.t.c.) have been identified through open tender in 2003. Award of these contracts is on hold pending project release.
Nedbank and Absa have put up R600-million in project finance.

On budget and on time?
Yes.

Contact details for project information
Arm, Investor Relations, Pieter Rörich (011) 779 1476or e-mail: pieter.rorich@arm.co.za

Nkomati nickel-mine expansion project Mpumalanga
Project description The project will involve the expansion of the highly-mechanised Nkomati mine and will add to its nickel output. The mineral rights stretch over the farms Slaaihoek and Uitkomst.
Value R2,5-billion (estimate).
Duration Two years.
Breakdown of main contracts The expansion involves exploiting the larger adjacent Uitkomst deposit through a 200 000 t/m openpit and a 100 000 t/m underground operation. It will also require construction of a new concentrator.
Client African Rainbow Minerals (Arm) & LionOre Mining International.
Latest developments Arm and LionOre Mining International announced in February the acquisition by LionOre of a 50% share in the Nkomati nickel-mine for a total consideration of $48,5-million. The transaction included LionOre paying $20-million if both parties agreed to proceed with the expansion project. Arm has reported that the transaction announced in February has been given the go-ahead. All conditions precedent to the agreement have been met, including unconditional approval from the South African Competition Commission on the formation of the joint venture. The partners plan to carry out a further expansion study to assess pit optimisation, concentrator design, use of proprietary Activox technology, the recovery processes and reviews of project economics. The partners expect to present the expansion project to the board of directors by late 2005.
Participants None as yet.
On budget and on time? Project has not started.
Contact details for project information Arm, (011) 779 1300.

Listing of main sources used in the compilation of this report.

Main Sources

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Business Day
Business report
Department of Minerals and Energy
Johnson Matthey
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Mining Web
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South Africa's Platinum Industry 2005

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