

# impala platinum

## key features for the year

- Record production of 1.115 million ounces of platinum
- 1% increase in tonnes milled
- 1% improvement in recoveries
- Cost of production rose by 7.7% to R4,739 million
- Cost per platinum ounce of R4,251 – up by 5.3%
- Capital expenditure of R1.7 billion

Impala Platinum consists of the mining operations, Mineral Processes, comprising the concentrating and smelting plants, and Refineries, which incorporates both a Base Metals Refinery and a Precious Metals Refinery.

## SAFETY

Both the lost time injury frequency rate (LTIFR) and the fatal injury frequency rate (FIFR) improved markedly during the year. An LTIFR of 4.01 was recorded, down by 26%, while the FIFR improved by 50% to 0.048, the lowest levels ever. Both these rates have more than halved in the past four years. Despite this, there were regrettably four fatalities – three of which were fall-of-ground accidents and one a result of an underground locomotive collision.

Efforts to prevent falls of ground intensified and included the in-stope bolting as well as the new scraper winch programmes. This helped contribute to a 20% decline in the fall-of-ground injury rate. The in-stope bolting programme is now well established and early indications

are that it will be most successful in improving hangingwall conditions. All development ends are equipped with expandable bolts, as are a significant number of stope panels. The introduction of the in-stope bolting programme has coincided with that of drill jigs, which together are expected to improve the quality of the blast and result in less damage to the hangingwall.

The ground control districts introduced in May 2002 have been extended to include support and management systems, especially where there is greater potential for seismic activity.

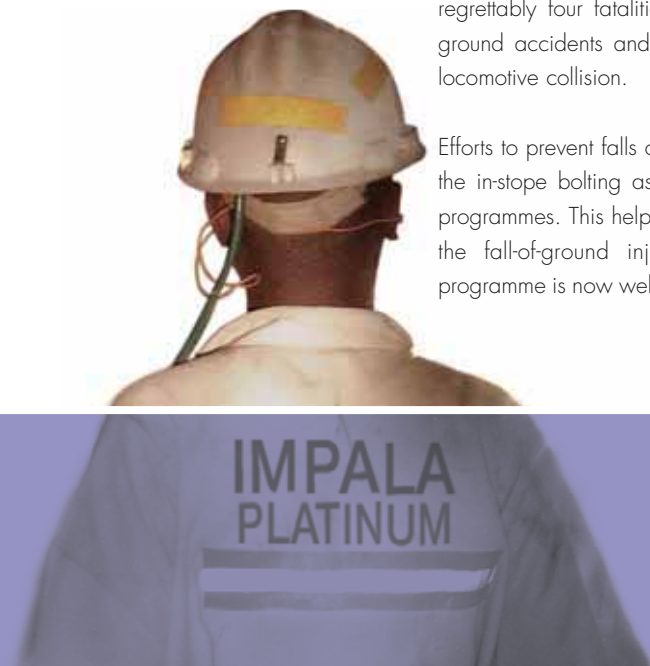
The behaviour-based safety management training programme, Tsiboga, continued with the focus on the training of frontline supervisors and ensuring that there is continued commitment from employees to safety.

At Mineral Processes, the Occupational Safety and Health Accreditation System (OSHAS 18000), which includes an all-encompassing safety management system, has been introduced.

Refineries maintained their zero fatality rate for a record nine years and four months. Seven lost-time injuries were recorded. The NOSCART rating was retained by Refineries for the seventh year, and the NOSA 5-star rating for 21 years.

## MINING

Impala Platinum's mining operation reported a 2% increase in production to an all time high of 1.115 million ounces



Impala produced 1.115 million ounces of platinum in FY2005 – an all time high

### Impala Platinum – platinum production (000 oz)

Fiscal Year	Production (000 oz)
FY01	1,002
FY02	1,025
FY03	1,040
FY04	1,090
FY05	1,115

### Impala Platinum – cost (R/platinum ounce)

Fiscal Year	Cost (R/ounce)
FY01	3,156
FY02	3,459
FY03	3,843
FY04	4,036
FY05	4,251

### Impala Platinum – capital expenditure (R million)

Fiscal Year	Capital Expenditure (R million)
FY01	978
FY02	1,009
FY03	1,079
FY04	1,197
FY05	1,693



### Impala Platinum key statistics

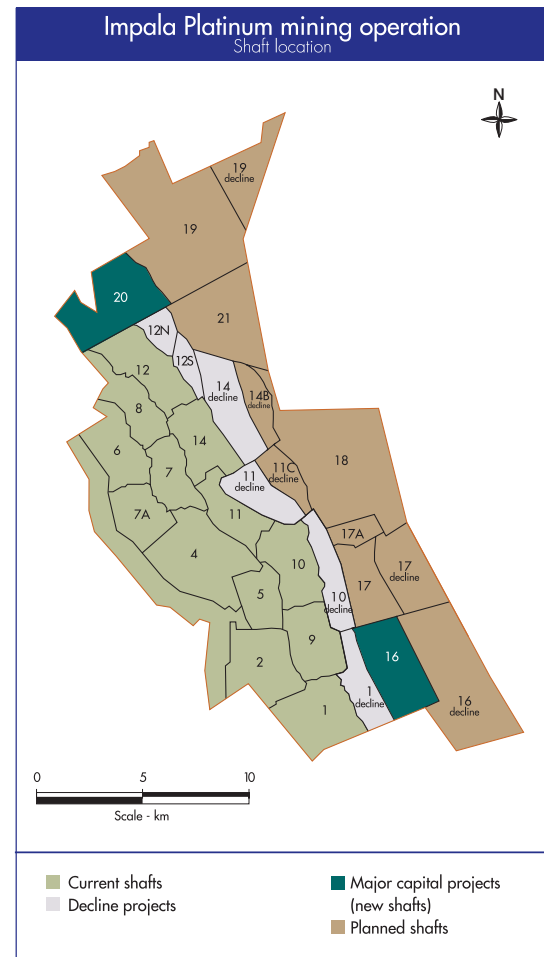
		FY2005	FY2004	% change
<b>Mining sales</b>	(Rm)	<b>8,396.8</b>	7,679.2	9.3
Platinum		5,745.0	5,667.6	1.4
Palladium		661.9	711.5	(7.0)
Rhodium		927.6	422.0	119.8
Nickel		722.0	575.2	25.5
Other		340.3	302.9	12.3
<b>Mining cost of sales</b>		<b>(4,875.7)</b>	(4,495.9)	(8.4)
On-mine operations		(3,346.3)	(3,122.4)	(7.2)
Concentrating and smelting operations		(764.0)	(715.6)	(6.8)
Refining operations		(376.8)	(337.3)	(11.7)
Amortisation of mining assets		(491.8)	(481.5)	(2.1)
Increase/(decrease) in metal inventories		103.2	160.9	(35.9)
<b>Mining gross profit (Loss)/profit from metal purchase transactions</b>	(Rm)	<b>11.7</b>	(1.7)	(788.2)
<b>Sales of metals purchased</b>		<b>3,643.8</b>	3,419.5	6.6
– IRS		3,640.4	3,187.5	14.2
– Other		3.4	232.0	(98.5)
<b>Cost of metals purchased</b>		<b>(3,632.1)</b>	(3,421.2)	(6.2)
– IRS		(3,630.7)	(3,176.8)	(14.3)
– Other		(1.4)	(244.4)	99.4
<b>Gross profit</b>		<b>3,532.8</b>	3,181.6	11.0
Gross margin ex mine	%	41.9	41.5	1.0
Other operating costs	(Rm)	(251.5)	(224.8)	(11.9)
Royalty expense		(388.8)	(397.4)	2.2
<b>Sales volumes ex-mine</b>				
Platinum	(000 oz)	1,103.1	1,070.5	3.0
Palladium	(000 oz)	512.2	471.9	8.5
Rhodium	(000 oz)	126.9	116.1	9.3
Nickel	(000 t)	7.9	7.1	11.3
<b>Sales volumes metals purchased – IRS</b>				
Platinum	(000 oz)	434.0	383.2	13.3
Palladium	(000 oz)	304.7	257.6	18.3
Rhodium	(000 oz)	57.5	49.0	17.3
Nickel	(000 t)	4.1	5.4	(24.1)
<b>Prices achieved ex-mine</b>				
Platinum	(\$/oz)	841	767	9.6
Palladium	(\$/oz)	208	219	(5.0)
Rhodium	(\$/oz)	1,168	519	125.0
Nickel	(\$/t)	14,598	11,758	24.2
<b>Exchange rate achieved ex-mine</b>	(R/\$)	<b>6.21</b>	6.92	(10.3)
<b>Production ex-mine</b>				
Tonnes milled ex-mine	(000 t)	15,778	15,639	0.9
Platinum refined	(000 oz)	1,114.6	1,090.3	2.2
Palladium refined	(000 oz)	515.2	501.2	2.8
Rhodium refined	(000 oz)	130.3	116.1	12.2
Nickel refined	(000 t)	7.9	6.9	14.5
PGM refined production	(000 oz)	2,061.9	1,975.5	4.4
<b>Total cost<sup>1</sup></b>		<b>4,738.6</b>	4,400.1	(7.7)
per tonne milled	(R/t)	300	281	(6.8)
	(\$/t)	49	41	(19.5)
per PGM ounce refined	(R/oz)	2,298	2,227	(3.2)
	(\$/oz)	371	324	(14.5)
per platinum ounce refined	(R/oz)	4,251	4,036	(5.3)
	(\$/oz)	687	588	(16.8)
net of revenue received for other metals	(R/oz)	1,872	2,195	14.7
	(\$/oz)	302	320	5.6
<b>Capital expenditure</b>	(Rm)	<b>1,693</b>	1,197	41.4
	(\$m)	274	174	57.5

<sup>1</sup> Restatement in FY2004 as a result of the adoption of IFRS2 (share-based payments).

in FY2005. Overall production of PGMs rose by 4.4% to 2.06 million ounces. This was despite the strike during the first half of the year and the associated loss of 44,000 ounces of platinum production.

The increase in production was the result of a rise in the quantity of tonnes milled (up by 0.9%) to 15.78 million tonnes, also a record level. The primary contributor to this was the increased volumes of output from the mechanised section at 12 shaft. For FY2005, mechanised production amounted to 1.4 million tonnes, 8.6% of total production at Impala. Continued mining of white areas (unmined remnants in old mining areas) again helped to support volumes. Ore mined from white areas amounted to 19% of total production this year and is planned to increase to 24% next year. Extensive investigations have been undertaken to identify and estimate resources still contained in these areas and on converting them into proven reserves.

Higher tonnages were mined despite the 10 days of industrial action that occurred in October 2004, delays in the implementation of the new in-stope technology and a 1.8% decline in headgrade to 4.82g/t. The decline in headgrade was a consequence of increased levels of ore sourced through mechanisation. The new minerals resource management system currently being implemented at Impala will enable improved grade control and more accurate mine planning.



### Impala Platinum – five-year operating statistics

		FY2005	FY2004	FY2003	FY2002	FY2001
Tonnes milled ex-mine	(000 t)	15,778	15,639	15,042	14,850	14,840
UG2 milled	(%)	45.5	46.1	45.7	53.6	49.6
Headgrade	(g/t 5PGE+Au)	4.82	4.91	5.06	5.05	4.90
Platinum refined production	(000 oz)	1,115	1,090	1,040	1,025	1,002
PGM refined production	(000 oz)	2,062	1,976	1,924	1,895	1,877
Total cost/tonne milled	(R/t)	300	281	266	239	213
	(\$/t)	48.5	40.9	29.5	23.6	28.0
Cost/PGM ounce refined	(R/oz)	2,298	2,227	2,078	1,872	1,685
	(\$/oz)	371	324	230	185	221
Cost/platinum ounce refined	(R/oz)	4,251	4,036	3,843	3,459	3,156
	(\$/oz)	687	588	426	341	415
Net of revenue received for other metals	(R/Pt oz)	1,872	2,195	909	(708)	(1,879)
	(\$/Pt oz)	302	320	101	(70)	(247)
Capital expenditure	(Rm)	1,693	1,197	1,079	1,009	978
	(\$m)	274	174	120	100	129
Labour complement*	(000)	26.9	27.5	28.4	27.9	28.0
Productivity	(m <sup>2</sup> /panel man)	40.1	39.2	40.7	40.2	40.7
	(Pt oz/employee)	41	40	37	37	36

\* Average in service for the year (excluding capital projects).

Restatement of previous year's unit cost was as a result of the adoption of IFRS2 (share-based payments).



Production by source (000 t)

	FY2005	FY2004	% change
Conventional mining	13,889	14,304	(2.9)
Merensky	6,711	7,087	(5.3)
UG2	7,178	7,217	(0.5)
Mechanized mining (Merensky)	1,362	624	118.3
Opencast mining (Merensky)	527	711	(25.9)
Total production	15,778	15,639	0.9

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Cash operating cost per refined platinum ounce rose by 5.3% to R4,251 while the total cash cost per tonne milled was 6.8% higher, despite an 8% increase in wages that came into effect from 1 July 2004. This compares with an inflation rate (CPIX) of 3.5% for the period. On-mine costs rose by 6% from R200/tonne to R212/tonne, again boosted by increases in the prices of steel balls, fuel and water.

Productivity as measured by centares per panel employee increased from 39.2 in the last financial year to 40.1 in FY2005. This is largely attributable to the policy of implementing best practice as well as to the implementation of new technology. The 2% decline in the number of employees to 26,900, the increased volumes mined from mechanised areas and improved metallurgical recoveries all contributed to an increase in the number of platinum ounces produced per employee to 41 from 40 the previous financial year.

Impala Platinum has submitted all applications for the conversion of its old order mining rights to new order mining rights, and is in ongoing discussions with the relevant authorities.

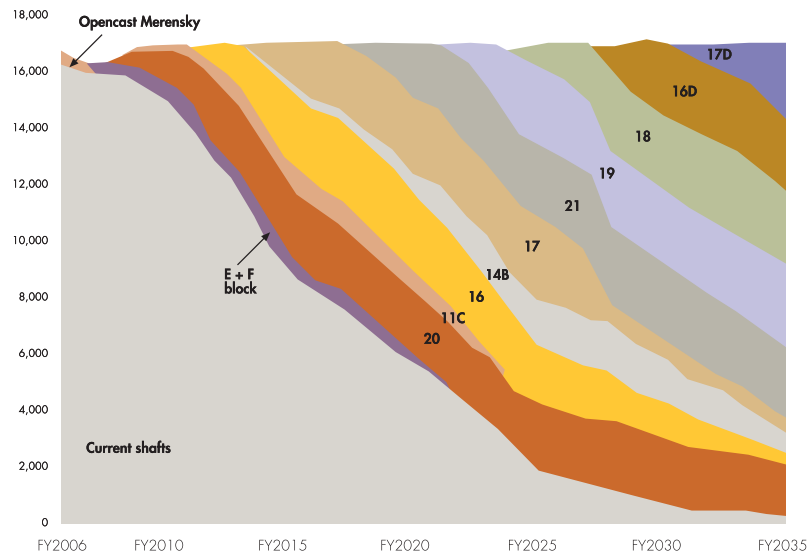
### New technology and mechanisation

Impala's strategy to develop and implement new technology aims to improve both safety and productivity and to reduce costs so as to give the operation a sustained competitive advantage. Impala is investing R45 million annually for three years (from FY2004 to FY2006) on new technology and mechanised mining. During FY2005, just over 1.4 million tonnes or 8.6% of total production from the Impala mining operation was from mechanised mining, primarily from 12 and 14 shafts. There is scope to increase the proportion of ore mined using mechanised methods to a maximum of 12%.

These technologies, which remove people from high-risk areas, are in line with global trends to create work environments that have a more skilled and less physically arduous profile. Two new technologies are currently being implemented, the drill jig, referred to as dynamic drilling technology, and extra low-profile trackless mining vehicles (mechanised mining).

The drill jigs have been designed to improve drilling accuracy and have the potential to increase the advance per blast by 10 – 15% to 1 metre. Drill jigs were

Impala 30-year production profile (000 tonnes)



implemented at 48 panels on the mine by the end of the 2005 financial year and a total of 300 Merensky panels by FY2007. Currently this technology is best suited to Merensky panels but steps are underway to adapt it for use on the narrower UG2 reef.

Low-profile trackless mining vehicles are used in stoping widths of 1.8 metres and trials are presently underway to test extra-low profile vehicles to operate in stoping widths of 1.2 metres. This mechanised equipment, which is suited for selected areas where the dips are flat and there is likely to be minimal dilution, enables a faster build-up to full production. The low-profile trackless equipment is being employed at 12 shaft. Currently, 57% of production at 12 shaft comes from mechanised mining, increasing to and stabilising at around 77% by FY2007. At 14 shaft, the current level of tonnage from mechanised mining is 21%. This is scheduled to rise to 24% in FY2006, after which it will decline and be maintained at 17% by FY2008.

Also under development and evaluation is a new cutting machine, the Alpine Reef Miner (ARM) 1,100 which cuts Merensky ore (as opposed to conventional drilling and blasting). In tandem, systems to clean the cutter's path and pick up ore are also being developed. Cutters generate copious amounts of dust and a scrubbing system has been devised and implemented to reduce this problem. Other technologies being tested at Impala include a locomotive drill-rig, a trackless sweeping machine, gas-based blasting systems, an invert drop raiser and an oil-less drill.

## Mining projects

In line with the mining strategy, the capital programme is designed to ensure production of 1.1 million ounces of platinum annually from the Impala Platinum mining operation over the next 30 years. The first of these capital projects is the declines project which involves developing decline shafts below the current third generation shafts, thereby extending the lives of existing shaft systems and establishing access to deeper reserves. Production from the decline shafts will replace the mineral reserves from the first and second generation shafts which are nearing depletion. To date, three of the declines are at full production with most of the planned increase in tonnes milled to come from the 11, 12 and 14 shaft declines. The remaining two declines are still in the build-up phase.

The second major mining project is a greenfields one involving the construction of two new shafts. In September 2004, the Implats Board approved capital expenditure of R6.6 billion (in nominal terms) for the development of 16 and 20 shafts, the first of the new fourth generation shafts. At full production these two shafts will together produce 355,000 ounces of platinum annually; 20 shaft is scheduled to come into production in 2009 and 16 shaft in 2012. Construction work on the two shafts began in October 2004.

Work on the E & F Block (between 2 and 4 shafts) began in July 2004. Site establishment, earthworks, the office layout area and installation of a service winder have been completed. The equipping of the incline shaft and



refurbishment of the headgear steel structure started during January 2005 and the winder will be installed by August 2005. Production is scheduled to begin in December 2006.

The 11 shaft decline project is nearing completion and a feasibility study exploring a further extension to this decline has been completed. This study will be presented to the Board for approval in August 2005.

14 shaft decline (which is a four-level decline) project is also nearing completion. Production from the first level has begun. A feasibility study is currently underway to extend this decline to access reserves below the fourth level.

With seven operational levels, 16 shaft will be 1,657 metres deep and will produce an estimated 226,500 tonnes of reef a month. The shaft will access both the Merensky and UG2 orebodies, although initially the focus will be on the former. There will be a down-cast shaft for the transport of rock, material and men, which will be the deepest, largest diameter, and highest tonnage shaft at Impala Platinum, as well as an up-cast ventilation shaft. As the virgin rock temperature will be 57°C at the deepest level, the refrigeration requirements will be extensive. The concrete headgear will be 108 metres high, the tallest in the world, and will house two winders, one to hoist men and material and the other rock. Conventional methods will be applied and all Merensky panels will be equipped with drill jigs.

Although it will be shallower than 16 shaft, 20 shaft will have a depth of 1,058 metres. 20 shaft, which is adjacent to 12 North shaft, will have a single large station below surface, with one decline system feeding upwards and another one feeding downwards. The focus initially will be on the mining of the Merensky Reef and once this has been depleted, the focus will shift to the UG2. Initial tonnage capacity forecasts are that 20 shaft will produce 185,000 tonnes per month of reef.

The development of the fourth generation shafts will be extended with investigations and the pre-feasibility study on 17 shaft due to begin shortly.

## MINERAL PROCESSES

Impala Platinum's Mineral Processes incorporates the concentrating and smelting plants which process the ore mined at Impala's mining operations as well as concentrate sourced on behalf of IRS. Mineral Processes is currently running at peak performance with, for the second year in a row, tonnes milled, smelter throughputs and recoveries at record levels.

During the year, tonnes milled rose by 1% to 15.78 million tonnes. Overall concentrator recoveries rose again to a record level of 84.3% despite the increase in throughput. The increase in these recoveries, which was equivalent to 13,500 ounces of platinum for the year, was largely a result of the high-energy flotation technology implemented at the UG2 plant at a cost of R26 million. Recovery rates at the UG2 plant rose to 78% for the year. The tails scavenging plant, commissioned in December 2003,



continued to deliver and contributed more than 1% to overall recoveries. The smelter was again in a position to benefit from the spot business arising from Lonplats.

Overall, operating costs at Mineral Processes remain below R50 per tonne milled.

Over the next 12 months, planned capital expenditure will be primarily on the implementation of high-energy flotation technology at the MF2 plant, which treats about 30% of the UG2 ore mined. This will help to increase recoveries to 79%, in line with those of the UG2 plant.

## REFINERIES

Impala Platinum's Refineries, which consists of the Base Metal Refinery (BMR) and the Precious Metals Refinery (PMR), continued to perform in line with expectations. Total output decreased by 6% to 1.848 million platinum ounces, a consequence of the once-off processing of material from Lonplats (232,000 ounces) in the previous financial year. If the once-off Lonplats material is excluded, then Impala Refineries reported record levels of production for all the platinum group metals produced, with the exception of ruthenium. Net of the Lonplats material, headline platinum production rose by 5% or 86,000 ounces.

The use of high-purity pipeline hydrogen from Sasol has been successfully incorporated into operations with better-than-expected efficiency gains (regarding the metallisation of nickel and cobalt), and an elimination of associated CO<sub>2</sub> (greenhouse gas) emissions, of 3,000 tonnes per month, a by-product of the old, on-site reforming.

Metal recovery levels were maintained as were efficiencies and costs, and there was no deterioration in metal pipelines, despite the extensive expansion work undertaken during the course of the year.

Major capital projects at both the BMR and PMR have progressed successfully and will position Refineries well, both in terms of the broader Implats growth vision and in terms of current and future environmental legislation.

At the BMR, the major issue is the expansion project which is scheduled for completion in September 2005 and which will take the plant to a capacity of over 2 million ounces of platinum. Additional work in the 2006 financial year will progress plant capacity towards 2.3 million ounces. The ball mill, expanded second-stage (copper) leach, nickel sintering furnace (and



associated nickel product handling circuit) and the ammonium sulphate crystalliser are all operational and providing relief to previously capacity-constrained areas.

The Ambatovy nickel project is an exciting development, which will involve a significant expansion to the BMR. The project has great potential to realise economies of scale and further improve base metal processing efficiencies.

At the PMR, the capital programme which is scheduled for completion at the end of FY2006 will increase the capacity to 2.3 million ounces of platinum. The processing expansion areas of base metal removal, ruthenium distillation and palladium ion exchange have all been successfully commissioned. Various pieces of gas scrubbing and liquid effluent handling equipment are well-advanced in construction, for commissioning early in the 2006 financial year. This will be followed by a full and detailed performance assessment to ensure that the requirements of the Environmental Impact Assessment (which incorporates the future anticipated permit conditions) are being, and will be met, on a continuous basis.

The research and development programme into ion-exchange technology has produced significant results

in the further optimisation of existing, resin-based technology, leading to operational cost reductions in key processing areas. Investigations into alternate ion exchange methods have advanced to preliminary commercial-scale trials. New generation refining technology is being examined at bench scale with appreciable potential benefits in terms of both unit cost and pipeline performance anticipated.

The ability to recycle secondary materials within Refineries (as opposed to incurring significant external toll fees and exposing the operation to rand volatility) was further enhanced during the year with a dramatic improvement in the processing ability to purge certain minor metals and deleterious elements. This creates a far more robust process and allows for sustained, low-cost recycling.