



Supplies, Mining and Exploration

South Africa

Supplies of platinum from South Africa are forecast to grow by 4.5 per cent in 2003, reaching 4.65 million oz. A substantial build-up of metal in processing pipelines occurred during the first half of the year due both to new plant construction and to the repair and rebuilding of existing facilities. Palladium output is expected to climb to 2.28 million oz, while rhodium sales should reach 520,000 oz.

Anglo Platinum

Anglo Platinum's production of platinum in concentrate grew significantly during the first half of 2003 but refined platinum production slid by 12 per cent year-on-year to 915,100 oz due to a 205,000 oz increase in pipeline stocks. This was a result of the simultaneous commissioning of the Anglo Platinum Converting Process (ACP), a slag cleaning furnace at Rustenburg, and the new smelter at Polokwane. A substantial proportion of the inventory should be released by the end of 2003 and refined platinum output for the full year is expected to reach 2.3 million oz. This, however, would be 100,000 oz short of the 2.4 million oz of production planned for the year.

Of Anglo Platinum's established mines, PPRust performed well during the first half of the year, recovering from the problems caused by mining a low grade intrusion in 2002. At Union, mining of UG2 boosted the tonnage of ore milled by 30 per cent, while there was an improvement in recoveries at Rustenburg. At Amandelbult, output of platinum in concentrate fell due to lower mill throughput and grades.

At the group's developing operations, grades and recoveries improved at the Bafokeng-Rasimone Platinum Mine and there was a jump in the tonnage milled from the Rustenburg UG2 Phase 1 project. On the eastern limb of the Bushveld Igneous Complex, the ramp up of production at Modikwa accelerated.

In June, Anglo Platinum concluded a Pool and Share Agreement with Aquarius Platinum under which the assets of the Kroondal Platinum mine will be combined with a proportion of Anglo Platinum's UG2 reserves to the north and east of Kroondal. This will enable production at Kroondal to be more than doubled to around 500,000 oz pgm per annum by 2006. Output will be split 50:50 between the two partners once Kroondal's existing offtake agreement with Impala Platinum expires.

Impala Platinum

Impala Platinum produced a total of 495,000 oz of refined platinum from its core lease area during the first six months of 2003, a 4.4 per cent decrease compared with the previous year. Mill throughput was affected by a 10-day strike in March, although the effects of this were partly offset by the mining of additional Merensky ore from opencast operations.

At the new Marula mine on the eastern Bushveld, production from stoping is expected to begin before the end of 2003. A feasibility study on the Two Rivers joint venture with Anglovaal Mining and the TISO consortium is in its final stages and a decision on the project's development is expected shortly.

The Crocodile River mine, in which Impala holds an 83 per cent interest, experienced numerous difficulties during the first half of 2003 as the operation moved to fully underground mining. Unstable hanging walls, undulating reef and poor ground conditions all hampered mining and increased costs. As a result, the operation yielded just 8,210 oz of platinum during the first six months of the year. A decision on the future of Crocodile River is expected by the end of 2003.

Impala raised its stake in Zimbabwe Platinum Mines Ltd (Zimplats) to 82.5 per cent (as of mid-September) via the acquisition of Absa Bank's 14.8 per cent shareholding and a subsequent offer to minority shareholders. Meanwhile, Impala has committed to the sale of its 27 per cent interest in the operations of Eastern Platinum Ltd and Western Platinum Ltd (Lonmin owning the balance). Under the proposal, Lonmin will acquire a further 9 per cent stake in the operations from Impala. The remaining 18 per cent will be vested into a new company in which a black economic empowerment partner will be sought to acquire a controlling share.

Lonmin

Lonmin's expanding mining operations performed well during the first nine months of 2003, with production at the Newman shaft ramping up quickly and the introduction of opencast UG2 mining proving highly successful. Production of platinum in concentrate for the financial year ending 30th September was forecast to exceed Lonmin's target of 870,000 oz. After an explosion at its new smelter in December 2002, the company recommissioned four older furnaces to smelt a proportion of its concentrate output and signed a toll refining contract with Impala

PGM Supplies: South Africa '000 oz		
	2002	2003
Platinum	4,450	4,650
Palladium	2,160	2,280
Rhodium	490	520





Supplies

for the remainder. Lonmin's rebuilt and modified smelter is due to be brought back into service in December 2003, and the company intends to produce 910,000 oz of platinum in its 2004 financial year.

Northam Platinum

Northam Platinum produced just under 333,000 oz pgm in concentrate in the year ended 30th June 2003, a 22 per cent rise on the previous strike-hit year and the company's highest output to date. The availability of Merensky Reef ore reserves increased substantially and accounted for a greater proportion of output, while the total tonnage of ore milled climbed to 2.22 million tonnes. A scheduled rebuild of the company's smelter was completed during the first quarter of the year and the inventory accumulated during that time is steadily being released.

Aquarius Platinum

Aquarius Platinum's pgm output climbed to 150,727 oz during the first half of 2003, up by 25 per cent compared with the preceding six months. A fall in production at Kroondal was more than offset by the ramp up of mining at Marikana and the expansion of the Mimosa mine in Zimbabwe (operated by ZCE Platinum, a 50:50 joint venture with Impala).

Operations at the Kroondal mine were adversely affected during the first half of 2003 by geological problems but these difficulties had largely been overcome by the middle of the year. Aquarius is now targeting a 10 per cent increase in output to over 22,000 oz pgm per month. The Pool and Share Agreement with Anglo Platinum will see output at Kroondal rise to just over 500,000 oz pgm per annum by 2006, of which half will be attributable to Aquarius. The mine life will be extended by eight years to 2016.

At Marikana, the proportion of competent, unweathered ore mined is steadily rising and recoveries are expected to improve into 2004 as a result. Construction at the Everest South project is scheduled to start in early 2004, subject to financing, while in Zimbabwe the underground expansion at Mimosa is due for completion by the end of 2003.

SouthernEra

The rapidly developing Messina mine produced 16,500 oz of pgm plus gold during the first half of 2003. The mine will reach a production rate of 80,000 tonnes of ore per month during the fourth quarter, slightly



Banks of flotation cells at Norilsk Nickel's Talnakh operation on the Taimyr Peninsula in Siberia.

behind schedule, and is expected to hit planned capacity of 120,000 tonnes per month (around 200,000 oz per annum of pgm plus gold) during the second quarter of 2004. A feasibility study currently underway on possible joint development of phases 2 and 3 at Messina is due to be completed early in 2004.

Russia

Sales of platinum and palladium by Russia in 2003 are expected to be close to mine production. At an estimated 950,000 oz, platinum shipments will be similar to last year, but those of palladium are expected to climb by 53 per cent to 2.95 million oz. Norilsk Nickel was absent from the palladium spot market for much of 2002 but expects to sell all its output in 2003 through a mixture of contracts and spot sales. Shipments of rhodium, at 100,000 oz, are once again expected to exceed production.

In March 2003 the board of Norilsk Nickel approved a 'Production Plan to 2015' for its nickel-copper-pgm operations in the Taimyr and Kola Peninsulas. Under the plan Norilsk intends to adjust metal production in line with expected market demand; increase production and cost efficiencies; mitigate the environmental impact of its operations; and ensure their sustainability. Mine production in the Taimyr Peninsula, where the vast majority of the company's pgm originates, is forecast to remain at approximately 14 million tonnes of ore per year. Although the mix of ores mined will change, production of platinum and palladium are expected to stay close to current levels.

PGM Supplies: Russia '000 oz		
	2002	2003
Platinum	980	950
Palladium	1,930	2,950
Rhodium	90	100





PGM Supplies: North America '000 oz		
	2002	2003
Platinum	390	285
Palladium	990	850
Rhodium	25	21

However, Norilsk has the potential to expand pgm output by processing stored pyrrhotite and other concentrates, if market developments warrant it.

Norilsk completed the acquisition of a majority shareholding in Stillwater Mining during the first half of the year. Under the terms of the deal, the two companies may subsequently negotiate an agreement under which Stillwater would market up to 1 million oz per annum of Norilsk's pgm output to North American consumers. However, no progress on this had been reported by October 2003.

The two other main sources of platinum in Russia are the alluvial operations at Kondyor and Koryak in the Far East region. Both operations have already mined the richest parts of their deposits, but production at Kondyor, at least, is being sustained by treating larger volumes of slightly lower grade materials than in the past.

North America

North American shipments of platinum will fall substantially in 2003, due primarily to exhaustion of a high pgm-grade ore zone and a three-month strike at Inco's Ontario operations. Production is likely to increase at North American Palladium but will fall at Stillwater Mining. The overall result is forecast to be a 27 per cent slide in platinum output to 285,000 oz and a 14 per cent decrease in palladium production to 850,000 oz.

The acquisition by Norilsk Nickel of a 50.8 per cent shareholding in Stillwater Mining in exchange for \$100 million and approximately 877,000 oz of palladium was completed in June. Norilsk, through its subsidiary Norimet, subsequently increased its holding to 55.5 per cent via a cash offer to shareholders.

Over the first nine months of 2003, Stillwater produced a total of 337,000 oz palladium and 100,000 oz platinum, down by around 7 per cent year-on-year. At the Stillwater mine, emphasis has been placed on reducing costs and improving profitability rather than on maximising volumes. The mine produced 322,000 oz of palladium plus platinum during the first three quarters of 2003 compared to 380,000 oz in the same period of 2002 as mill throughput fell. The developing East Boulder mine produced 115,000 oz of pgm over the first nine months of 2003, a 28 per cent increase year-on-year.

As of October, Stillwater was continuing to seek

long-term sales contracts with North American consumers for the 877,000 oz of palladium inventory it gained under the Norilsk deal.

North American Palladium's Lac des Isles mine produced 195,000 oz palladium during the first nine months of 2003, with platinum output reaching 16,000 oz. The company's new primary crusher was commissioned in June and as a result, mill throughput in the third quarter was the mine's highest ever.

Inco's production of by-product pgm from its nickel mining and smelting operations will fall substantially in 2003 from the record 431,000 oz pgm produced last year. The company had expected output to drop to around 355,000 oz of pgm in 2003 following the exhaustion of a high grade ore zone at its Copper Cliff North Mine. However, the 13-week strike that affected Inco's Ontario operations during the summer will reduce annual output by around a further 85,000 oz. The company predicts that pgm output will recover to around 400,000 oz in 2004.

At Falconbridge's Sudbury nickel mines, lower tonnages and grades during the first half of the year were offset by improved recoveries at the company's smelter. Overall output at the Raglan mine in northern Quebec improved year-on-year as higher grades and recoveries outweighed lower mine output.

Zimbabwe

The Zimbabwean pgm industry is expanding rapidly as the operations of ZCE Platinum (Mimosa) and Zimplats (Ngezi) build towards capacity. Total platinum production is forecast to almost double this year to 141,000 oz.

Zimplats, in which Impala Platinum now holds an 82.5 per cent interest, continued to build production from its open pit operations at Ngezi during the first half of 2003, with total output of pgm in matte from the Selous metallurgical complex expected to reach 170,000 oz for the year. Trial underground mining is well underway and a bankable feasibility study based on a decline shaft capable of producing an additional 190,000 oz pgm plus gold per annum is due for completion before the end of the year.

At Mimosa the volume of ore produced and milled has expanded rapidly since a new crusher and concentrator were commissioned in the second half of last year. In the first six months of 2003, the operation milled 566,000 tonnes of ore yielding 26,600 oz platinum and 18,450 oz palladium.

PGM Supplies: Zimbabwe & Others '000 oz		
	2002	2003
Platinum	150	225
Palladium	170	240
Rhodium	9	14