

SUPPLIES, MINING & EXPLORATION

After a poor year in 2008, platinum supplies will recover somewhat in 2009, increasing to 6.06 million ounces as sales of South African metal rise, offsetting lower Russian and North American production. Palladium supplies will fall to 7.18 million ounces despite the anticipated sale of 960,000 oz of Russian state stocks. Rhodium supplies will rise to 719,000 oz.

SOUTH AFRICA

Supplies of platinum from South Africa are set to increase by 210,000 oz to 4.73 million ounces in 2009. Refined production is expected to fall but will be augmented by sales of metal produced in late 2008 but not sold until 2009. Palladium supplies should climb to 2.53 million ounces while sales of rhodium are forecast to reach 620,000 oz.

Anglo Platinum

Production of platinum in concentrate from Anglo Platinum's mines rose by 10 per cent to 1.24 million ounces in the first half of 2009. However, output from the group's refinery was up only 6 per cent, at 1.06 million ounces, as in-process inventories grew by 187,000 oz of platinum following maintenance at the Polokwane and Waterval smelters. This pipeline build-up should be drawn down in the second half, and for the year as a whole the group expects refined platinum production to reach 2.4 million ounces. Our forecast assumes that supplies to the market will exceed this: in the first half, sales were augmented by some 164,000 oz of platinum which was produced, but not sold, in late 2008.

In February 2009, Anglo Platinum announced a restructuring of its mining operations which will involve the closure of some high-cost shafts and will reduce output by some 140,000 oz of platinum annually.

The company also confirmed delays to some of its capital projects in response to lower prices and the global economic downturn. The Twickenham mine is now expected to reach full production in 2018 (a delay of 2 years) and Styldrift in 2017.

PGM Supplies: South Africa
'000 oz

	2008	2009
Platinum	4,515	4,725
Palladium	2,430	2,530
Rhodium	574	620



However, despite these delays, Anglo Platinum believes that it has the potential to adjust annual production by up to 500,000 oz of platinum, by ramping up or down mining activities at the large Mogalakwena open pit and by managing its in-process inventories of pgm. It also believes that its underground mines could raise production by around 10 per cent if required.

Impala Platinum

Impala Platinum refined 435,000 oz of platinum from its lease area in the first six months of 2009, down 7 per cent on the same period in 2008. The decline was largely due to a fall in the amount of Merensky ore mined and milled, due to lack of face availability; UG2 production was stable.

Production in the second half is likely to be weaker than in the first half of the year. In July, nine miners lost their lives in a major fall of ground at 14 shaft. The shaft shut-down and subsequent alterations to mining practices are expected to result in the loss of an estimated 50,000 oz of platinum production in the company's financial year to June 2010. This was followed by a two-week strike in late August, costing the company a further 40-50,000 oz of platinum output. Impala has suggested that production in its 2010 financial year could fall as low as 850,000 oz.

Impala's Marula mine on the Eastern Bushveld produced 38,000 oz of platinum in the first half of 2009. The ramp-up in production has been delayed by factors including labour unrest, poor productivity and safety stoppages. Currently, Marula is expected to achieve steady-state production of 125,000 oz of platinum per annum within 5 years. However, Impala has suggested that in order for this mine to remain viable, it will need higher Rand pgm prices along with improvements in safety, productivity and cost control.

Production from Impala's Zimbabwe operations is discussed on page 14, and from the Two Rivers joint venture on page 13.

Lonmin

At Lonmin's main Marikana division, mill throughput fell by 3 per cent in the first half of 2009, reflecting the decision to terminate open-cast mining at the end of last year, and the removal of some uneconomic

underground production. To compensate for lower output from the mines, some low-grade stockpiles of open-cast ore were treated with an impact on overall grades and recoveries. As a result, production of platinum in concentrate totalled 292,000 oz in the January to June period, a decline of 7 per cent.

At the Pandora joint venture, ore is sourced from open pits and via Marikana shaft infrastructure: milled tonnage was up 16 per cent in the first half, while output of platinum in concentrate rose by 43 per cent to 26,000 oz.

Lonmin has once again been hit by smelter issues. The Number One furnace was shut down for a month following a matte run-out in mid-June. However, slag leaks subsequently occurred and remedial work is scheduled for the last quarter of 2009, with in-process inventories of pgm likely to increase in the second half of the year. The company currently expects platinum sales to total 680-700,000 oz during its financial year to September 2009, but supplies for the calendar year may be lower due to the planned furnace rebuild.

Other Producers

The Northam mine milled some 940,000 tonnes of ore between January and June, a decrease of 6 per cent. This was largely due to difficult mining conditions on the Merensky Reef; UG2 production was largely unchanged and now accounts for 50 per cent of all ore mined. In contrast, sales of platinum climbed 32 per cent in the first half of 2009 to 113,000 oz; this metal is sourced from its own mine on the Western Bushveld and from concentrate purchase agreements. We estimate that 5,000-10,000 oz of this total came from Platmin's Pilanesberg project, which treated its first ore in April, and is one of three new platinum mines to commence concentrate shipments in 2009.

Platinum Australia's Smokey Hills mine also began concentrate production in early 2009, and during the first half delivered 7,000 oz of pgm to Impala Refining Services (IRS) under an off-take agreement. The company expects to achieve design production levels (95,000 oz of pgm annually) from January 2010.

The third of the new mines is Blue Ridge, which shipped its first concentrate to IRS in April. In July 2009, Aquarius Platinum took charge of operations at Blue Ridge as part of its acquisition of Ridge Mining.



At steady-state, this mine is set to contribute around 75,000 oz of platinum (125,000 oz of pgm) annually.

Aquarius Platinum also operates the Kroondal and Marikana mines, concentrate from which is refined by Anglo Platinum and IRS. At Kroondal, production of platinum in concentrate rose 11 per cent to 122,000 oz in the first half, while output from Marikana climbed to 47,000 oz as production ramped up.

Operations at Aquarius' Everest mine have been suspended since December 2008 following subsidence affecting the upper levels of the decline shaft. The company intends to establish two new decline shafts to access stoping areas: work began in July 2009 and is expected to take around 16 months to complete.

The Two Rivers mine, a joint venture between African Rainbow Minerals (ARM) and Impala, produced 118,000 oz of platinum in the year to June 2009, an increase of 20 per cent over the previous financial year. Plant optimisation and improvements in recoveries are expected to boost platinum output to around 130,000 oz in 2010. ARM is also in a joint venture with Norilsk Nickel at the Nkomati Nickel mine, where the mining of lower-grade ores resulted in lower pgm output of only 11,000 oz in the first half of 2009.

Eastplats' Crocodile River mine reported higher grades and recovery rates in the first half of 2009, and production of platinum in concentrate rose by 14 per cent to 33,000 oz. The development of the Crocette and Kareespruit sections at Crocodile River has been put on hold, as have the company's Eastern limb projects at Spitzkop, Kennedy's Vale and Mareesburg.

Sales of metal from South Africa should increase this year despite a decrease in refined production.

RUSSIA

Supplies of palladium from primary mining in Russia are forecast to decline to 2.60 million ounces in 2009. We expect palladium sales from Russian state stocks to be flat at 960,000 oz. Platinum supplies are expected to fall to 745,000 oz.

Norilsk Nickel's production of platinum group metals fell by over 8 per cent in the first six months of 2009 compared to the first half of the previous year, despite the interruptions to production which had occurred in early 2008. Ore pgm grades have been falling for a number of years and palladium output therefore dropped from 1.40 million ounces to 1.28 million ounces and platinum production decreased from 327,000 oz to 300,000 oz.

PGM Supplies: Russia '000 oz		
	2008	2009
Platinum	810	745
Palladium:		
Primary Production	2,700	2,600
State Sales	960	960
Rhodium	85	65

For the year as a whole, while nickel output is set to be flat, palladium production is forecast to drop to roughly 2.60 million ounces – down from 2.70 million ounces in 2008 – and platinum production is expected to decline to roughly 600,000 oz.

Production of platinum from alluvial mining at Amur and

Korjak is likely to fall to 140,000 oz due to lower output at Korjak. Sales of platinum from the placer deposits in the Ural mountains are expected to be below 10,000 oz. Mining of the placer deposit at Inagli, South of Yakutsk in Eastern Siberia, ceased in 2008.

Although there do not seem to have been any significant shipments of palladium from Russian state stocks during 2009, we believe that 960,000 oz of metal which was shipped outside Russia during 2008 is likely to be sold to investors this year.

NORTH AMERICA

Palladium supplies from North America are set to decrease by 17.6 per cent to 750,000 oz in 2009, due to the closure of the Lac des Iles operations and a number of nickel mines. Sales of platinum should fall by 21.5 per cent to 255,000 oz.

North American Palladium placed its Lac des Iles mine on care and maintenance in October 2008. Although no ore was mined or milled in the first three

quarters of 2009, our forecast includes the sale of metal which entered the refining circuit too late in 2008 to be delivered to the market until this year.

At Stillwater, production of platinum group metals is forecast to fall by 4,000 oz

to 495,000 oz in 2009. In the first half of the year, production at its Stillwater mine rose 11.9 per cent to 150,000 oz of palladium and 15.0 per cent to 46,000 oz of platinum, reflecting an increase in the weight of ore mined – due to the reallocation of miners from the East Boulder operation – and an increase in head grade. At East Boulder, pgm production dropped from 81,000 oz in the first half of 2008 to 67,000 oz.

PGM Supplies: North America '000 oz		
	2008	2009
Platinum	325	255
Palladium	910	750
Rhodium	18	12

ZIMBABWE

Supplies of platinum from Zimbabwe are forecast to rise to 225,000 oz in 2009. Annual sales of palladium are expected to increase to 175,000 oz.

Production of platinum group metals in concentrate at Zimplats rose to 98,000 oz in the first half of 2009. The open pit at its Ngezi site closed ahead of schedule in late 2008 in response to low prevailing metal prices. However, the Number 1 portal reached full production in June 2009. As a result, additional tonnes of ore from underground made up for some of the decline in open pit tonnage. Additionally, the move towards more underground mining saw head grades improve, boosting pgm production over this period. The development of Portal 4 remains on schedule to reach full production in May 2011.

At the Mimosa mine, the Wedza phase 5.5 expansion was completed in the second quarter of 2009, raising annual production capacity to 200,000 oz of pgm in concentrate. The amount of ore mined in the first half of 2009 climbed by 16.3 per cent from a year earlier. Production of platinum in concentrate in the same period increased from 37,000 oz to 48,000 oz, reflecting lower mill availability in the first half of 2008. Production of palladium in concentrate rose by a similar 28.6 per cent to 36,000 oz.

PGM Supplies: Zimbabwe and Others '000 oz		
	2008	2009
Platinum	295	330
Palladium	310	335
Rhodium	18	22