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CREAMER MEDIA'S

# MINING WEEKLY

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# NEW POSSIBILITIES

## With launch of Africa's first nano computer tomography scanner, SA university opens way for 3D analysis of ores

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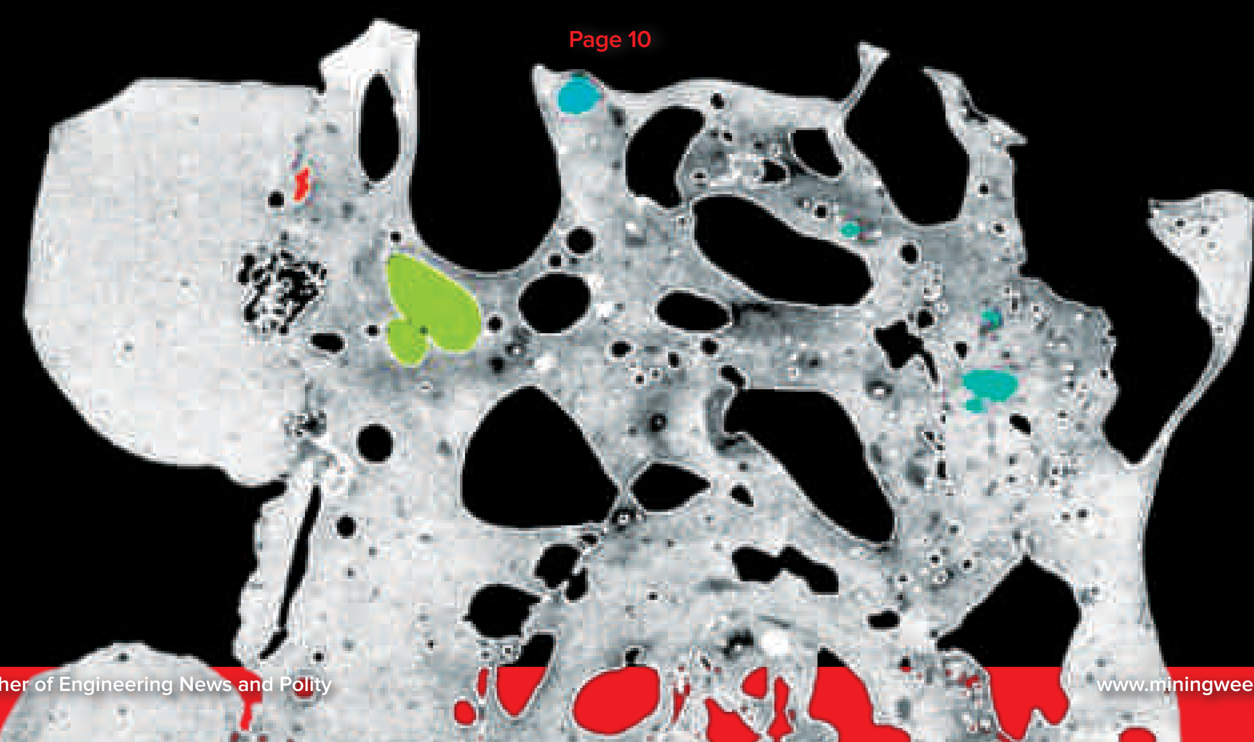

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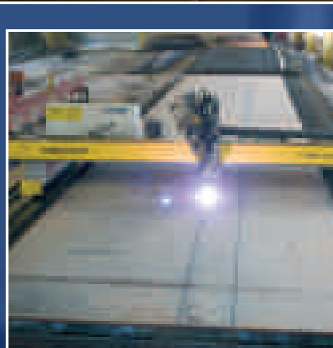

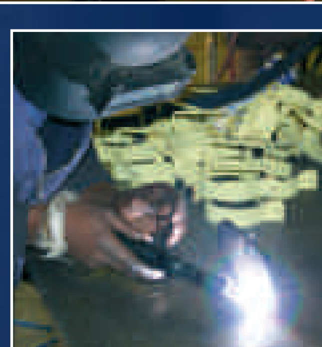

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Picture by Chief Photographer Duane Daws

**KANGALA PIT:** This opencast operation, the ASX-listed Universal Coal's Kangala Colliery, is located in South Africa's Witbank coalfield. The 2.4-million-ton-a-year run-of-mine operation has an installed plant capacity that can be expanded to 4.25-million tons a year if required. Most of Kangala's thermal coal is supplied to South Africa's State electricity utility, Eskom. Saleable tonnages averaging 2.1-million tons a year are planned from the 2.4-million yearly run-of-mine production rate. Kangala's defined and proven reserve of 21.55-million tons will sustain a life-of-mine (LoM) of more than eight-and-a-half years. An LoM offtake agreement has been concluded with JSE-listed Exxaro for the export of thermal coal.

## FACTS IN FIGURES

**31.6**

The percentage by which China's iron-ore imports from Australia rose to 584.4-million tonnes in 2014, as soaring production by miners drove prices down and eliminated some smaller players.

**10**

The amount in billion rands that South Africa's Department of Water and Sanitation has allocated to mitigate acid mine drainage in the Witwatersrand goldfields.

SHEILA BARRADAS | RESEARCH COORDINATOR & SENIOR DEPUTY EDITOR


**DIAMOND PRICE LAID BARE:** Diamond price weakness will continue until new sources of liquidity are found, say Liberum Capital mining analysts **Ben Davis** and **Richard Knights**. The share price of London-listed Gem Diamonds fell sharply after Petra Diamonds announced it was experiencing weak pricing and the analysts are encouraging investors to look beyond current negativities, given that diamonds have the advantage of being the most consolidated of all world commodities. To soften the illiquidity blow, De Beers is allowing its sightholder customers to defer 25% of their allocation and Alrosa is expected to follow suit.

## SPEAKOUT

"It's a number we want to beat."
**– South Africa's Richards Bay Coal Terminal CEO, Nosipho Siwisa-Damasane, referring to the 71.3-million tons of coal the terminal exported in 2014**

"We shall try as much as possible to balance your interests against those of our people."
**– Zambian President Edgar Lungu, explaining that his government wants to maintain an open dialogue with investors, while providing for its citizens**

"Declining oil prices? You take it and smile."
**– Chief executive of MMG, a subsidiary of China's State-owned Minmetals, Andrew Michaelmore, referring to declining oil prices as a boon for mining companies, such as MMG, which buy vast quantities of diesel**

SHEILA BARRADAS | RESEARCH COORDINATOR & SENIOR DEPUTY EDITOR

# Tax change in SA unlikely, Zambian tax sting to stay, Zimbabwe spews tax mess

**CONSULTING GROUP DELOITTE BELIEVES** it unlikely that South African Finance Minister **Nhlanhla Nene** will introduce new mining taxes or increase mining's prevailing tax burden in his upcoming maiden Budget speech on February 25. Read on page 7 of this edition of *Mining Weekly* of Deloitte instead expecting Nene to acknowledge mining's stagnation and indicate the future steps that government is likely to take to stimulate mining. It would, in any case, be folly to make changes ahead of the recommendations of the Davis Tax Committee, as well as the tweaking of the Mineral and Petroleum Resources Development Act Amendment Bill, which President **Jacob Zuma** last month referred back to the National Assembly, citing possible unconstitutionality.

Such fiscal foresight appears to have been lost on the countries north of South Africa, with incoming Zambian President **Edgar Lungu** blocking his ears to the warnings that his country's onerous new mineral royalty tax regime seriously threatened the economic viability of several mines. Read on page 19 of this edition of *Mining Weekly* of Zambia seemingly failing to have learnt from its 2008 windfall tax debacle, which left many out of work and which had to be ignominiously withdrawn a year later. Surely by now, everyone in Zambia must know that a tax burden on the mining industry, without taking into account the cost of production and unpredictability of the copper price trend, will inevitably lead to mine closure, job loss and adverse knock-on effects.

Also constantly failing to understand the destructive economic consequences of government uncertainty is the Zimbabwean government, which, at the time of going to press, had sowed confusion among the country's platinum mining companies around the issue of taxing the export of mined products. Platinum companies Impala Platinum (Implats) and Aquarius Platinum were chasing their tails last Friday as they put out Stock Exchange News Service announcements on the failure of Zimbabwe to defer the 15% revenue export tax on unrefined platinum, as had been expected. Investec Securities complained in a note that Zimbabwe was inflicting greater hardships on an already struggling industry and Liberum's mining analysts warned the tax would have a "disastrous" effect on profitability. At the time of going to press, Implats was seeking clarity from the authorities. For Aquarius Platinum's Mimosa mine, the implied impact on its second-quarter results would be to reduce cash margins from \$182/oz to \$17/oz. It appears, further, that the export tax will not necessarily be tax deductible against corporate tax. Aquarius cautioned that, if platinum mining companies complied by building processing plants within Zimbabwe, the risk of those assets being nationalised would be raised on the basis of it being far easier to sell a final product overseas than a raw product.

Martin Creamer

DIAMONDS

# Counting Down

## First output from Lace mine due in H2 despite AMCU strike

NATALIE GREVE | CONTRIBUTING EDITOR ONLINE

DiamondCorp's developing Lace diamond mine, in the Free State, is likely to come into production in the second half of this year, despite a six-week strike by members of the Association of Mineworkers and Construction Union (AMCU) in October and November.

Following the implementation of a revised underground development schedule by 74%-owned subsidiary Lace Diamond Mines (LDM) in early 2014, dual-listed DiamondCorp announced in July last year that the ramp-up of commercial production from underground kimberlite mining could be brought forward by six months to the first half of 2015.

TREASURE TROVE
The Lace diamond operation, in the Free State

Although LDM is no longer expected to start commercial production from underground kimberlite mining in the first half of this year, production will still start four months ahead of the original mine schedule.

DiamondCorp said last week that the strike by AMCU members had revealed several underground workplace inefficiencies, which were addressed when the workforce returned to work.

As a consequence of these changes, a 15% improvement in development productivity had, thus far, been achieved and first commercial production from underground kimberlite mining is expected in the second half of 2015.

The company had, meanwhile, continued with the implementation of a revised underground development schedule and budget in the three months ended December 31.

Tunnel development costs, to date, are averaging R40 764/m against a revised budget of R37 000/m.

"The overspend continues to be the result of increased operating costs on the company's underground mining fleet and delays resulting from the AMCU strike.

"The benefits of maintenance and repair cost-saving initiatives reported previously are currently being offset by cost increases on spare parts resulting from the weaker rand," DiamondCorp outlined in a statement.

It added that the mine had remained unaffected by the electricity supply constraints in South Africa, but cautioned that there had been a growing delay in value-added tax refunds from the South African Revenue Service.

Despite this, the overall mine development expenditure remained "close" to budget.

DiamondCorp, meanwhile, took delivery of its new Sandvik 421 drill rig over the quarter, which has the capacity to drill longholes up to 54 m in length and 127 mm in diameter and will be used to complete all the longhole drilling on the production levels in the Upper K4 (UK4) and 47L block cave.

Operator and artisan training is now under way, and the rig will shortly go underground, where it will be tested and commissioned ahead of drilling the slot drive and troughs for the first stope in the UK4 block.

Underground core drilling of the UK4 block continues to delineate significant volumes of high-grade kimberlite above the 365 m level.

The drilling, bulk testing and release of an updated resource statement will now be completed in the second quarter, rather than the first quarter, as previously planned.

### Tailings Retreatment

In the year ended December 31, the company processed 308 047 t of tailings and recovered 18 534 ct of diamonds at an average recovered grade of 5.96 carats per hundred tons (cpht), compared with a budgeted recovered grade of 5 cpht.

Tailings retreatment processing ceased in September, as the surface earthmoving fleet was relocated to build a 150 000 m$^3$ surface process water storage dam in preparation for kimberlite mining.

"This activity was successfully completed in the dry winter months ahead of the summer rains. The construction of the new dam, plus additional surface drains has allowed the mine to capture all of the water required for 2015 kimberlite processing," DiamondCorp outlined.

An additional large surface dam is planned for construction this year, which will store sufficient water for full production requirements during low rainfall years.

The timing of the restart of tailings retreatment this year will be determined by the dam building schedule.

### Diamond Sales, Market

Diamond sales for the 12 months totalled 21 700 ct for proceeds of $1.36-million at an average sales price of $63/ct – slightly ahead of the forecast for the year.

Profit share on two diamonds, which were beneficiated from a 15.2 ct stone recovered from tailings, and the sale of fine diamonds added a further $58 544 to income for the year.

"Short-term demand for rough diamonds continues to be soft in response to slower polished sales and tightening liquidity as a number of banks that finance the cutting and polishing sector reduce their exposure to the sector.

"[In the] longer term, the outlook remains positive as world economic growth recovers and demand for diamonds outstrips supply," said the group.

The company said it had not factored diamond price increases into its Lace project model since the 250 m level bulk test diamonds were valued at $160/ct in 2012.

Nonetheless, in light of the current market weakness, DiamondCorp is currently modelling the Lace project at $150/ct.

At the current rand/dollar exchange rate, this gives cash operating margins of 81% on the UK4 block and 71% on the deposit overall.



EG

TAXATION

# Holding Steady

## Treasury unlikely to raise, amend mining taxes in 2015/16 – Deloitte

NATALIE GREVE | CONTRIBUTING EDITOR ONLINE

Amid a growing appreciation by government of the challenges constraining the South African mining sector, consulting group Deloitte believes it is unlikely that Finance Minister **Nhlanhla Nene** will, during his 2015/16 National Budget speech later this month, introduce new mining taxes or increase the sector's prevailing tax burden.

"Our view is that he is unlikely to introduce or raise taxes in the mining sector [as a result of its] current performance. We do, however, expect him to acknowledge stagnation in the sector and intimate what future steps government will be taking to try [to] stimulate the sector.

"The discussion is no longer about how much revenue [government] can get from the industry, but rather how it can assist it," Deloitte mining tax specialist director **Alex Gwala** told a pre-Budget media roundtable last week.

Amendments to mining tax legislation were also unlikely to precede the Davis Tax Committee assessment of the regime and clarification of the Mineral and Petroleum Resources Development Act (MPRDA) Amendment Bill, which President **Jacob Zuma** this month referred back to the National Assembly, citing possible unconstitutionality.

Zuma stated on January 10: "This year, we must finalise amendments to the applicable laws to ensure that mineworkers and mining communities share equitably in South Africa's mineral wealth."

"We [thus] expect Nene to give clarity on whether these amendments [will] include any tax-related legislations. In my opinion, the MPRDA Bill [will be passed this year] – it's going to happen . . . it's positive," Gwala told *Mining Weekly*.

According to the National Treasury and the South African Revenue Service (Sars), income tax revenue from the mining sector had increased by an average of R1.5-billion a year, from R9-billion in 2009/10 to R15-billion in 2013/14.

"However, we are likely to see a reduction in this trend in 2014/15 as a result of reduced company profits in the face of weak commodity prices, unforeseen shocks to economic activity, labour disruptions, safety stoppages, as well as the impact of energy shortages," he noted.

According to 2014 tax statistics, while value-added tax (Vat) remained the second-largest source of tax revenue for the fiscus – contributing 3.8% – the mining industry negatively contributed to the overall Vat collections owing to the large volume of zero-rated mineral exports, the funds of which accounted for 22% of the total

NHLANHLA NENE
Mining tax changes not expected in his Budget speech

Vat refunds by Sars. "Since introduction in 2010, mining royalty collections have remained insignificant in comparison with the collection of other taxes. The poor performance of this sector is also reducing these collections further, as the royalty is calculated on [dwindling] gross sales," Gwala said.

Commenting more broadly on the firm's Budget speech expectations, Deloitte Africa Taxation Services managing partner **Nazrien Kader** told the roundtable that Nene would be under "intense scrutiny" during his February 25 address, and would take to the podium against the backdrop of a much-debated electricity crisis, moderating inflation, a volatile rand, subdued economic growth and a rising government wage bill.

Globally, ratings agencies would also be watching closely, with at least one major rating agency having South Africa's current sovereign rating on a 'negative' watch.

"Given the Presidential commitment to an ambitious mandate involving a significant investment in infrastructure to revitalise the economy, all eyes will be on Nene as he tries to balance expansionary measures with austerity ones . . . while staying the course set by his predecessor to limit spending and hold real noninterest expenditure growth to a yearly average of 1.8% over the three-year spending period," she said.

Moreover, while raising personal taxes may be "unwise and unpopular", Kader said, it was conceivable that Nene would increase the marginal tax for individuals to 45%, while maintaining a robust approach to the alignment of tax policy with global standards. Focus would also likely intensify on compliance by high-net-worth individuals and companies to counteract tax-base erosion and profit shifting.

GLOBAL MINING

# Growth Spur

## Mining boosts world's poorest regions – ICMM

MARTIN CREAMER | EDITOR

The global mining industry makes its biggest contribution in the world's poorest regions, an International Council on Mining & Metals (ICMM) study has found.

The study, which became available in published form last week, finds that mining spurs the growth and development of national economies in general and impoverished economies in particular.

Created to catalyse strong environmental and social performance in mining, ICMM shows in its latest report that it is both possible and essential to strengthen the contribution of mining to economic and social development to make the world an economically stronger place.

Mining can account for as much as 60% to 90% of foreign direct investment (FDI) in low- and middle-income countries and 30% to 60% of total exports.

Like the first edition in 2012, ICMM's new report also assesses the different ways that mining brings growth to national economies, with the most important channels being FDI when foreign corporations invest in mining and metals operations and exports of the mining products.

"This report increases our ability to strengthen the contribution of mining and metals to development," says **Anthony Hodge**, the president of ICMM, which has among its 21 major mining and metals members indigenous South African mining company African Rainbow Minerals, headed by executive chairperson **Patrice Motsepe**, Anglo American, AngloGold Ashanti, Antofagasta, Glencore, Gold Fields,

Picture by Chief Photographer Duane Daws

ANTHONY HODGE
It is both possible and essential to strengthen the contribution of mining to economic and social development

Lonmin, BHP Billiton, Rio Tinto, Mitsubishi and Sumitomo.

Taxes and other fiscal revenues from mining typically bring in only 3% to 20% of a government's total revenues in low-income countries.

Some very low-income countries, however, do rely heavily on mining for fiscal revenues, for example, the Democratic Republic of Congo, which relies on mining for 25% of its fiscal revenues, and Guinea, which relies on mining for 23%.

Botswana, a middle-income country, draws 44% of its revenues from mining.

"If mining makes a major contribution to a small economy, national decision-making will be driven by the development opportunities that can flow from the mining and metals industry," Hodge adds.

Of the 35 countries most dependent on mining, all but Australia and South Korea are developing countries, and of the top 70 countries, 63 are low-income countries that stand to expand their national economies through mining-linked investment, exports, taxes and employment.

The report notes that the critical focus is not on how mining can be sustainable, but on how mining, minerals and metals can contribute to sustainable development.

The traditional approach to understanding the economic importance of mining has been to focus on the percentage that any single country accounts for in total world mining production and, from that perspective, the five Brics countries of Brazil, Russia, India, China and South Africa have the biggest share of world production value, while Uzbekistan and Turkey are rising up the production value rankings to join emerging countries like Chile, Indonesia and Mexico.

The ancient mining industry has fostered economic development since the dramatic evolutions of humankind in the bronze and iron ages.

In contemporary society, the critical need for mining and metals across all societies is undisputed. But this report dramatically illustrates that mining in today's world is also a potentially powerful engine of development.

The research underpins the priority of ICMM members to foster sustainable development based on a strong understanding of the role of mining and evidence of what works.

While global mining companies have the potential to generate significant economic benefits and also have disruptive economic, social and environmental impacts, the report says that positive impact is best assured by companies working together with governments and communities, using evidence and experience to plan well, and basing strategic decisions on long-term sustainability and the multiplier effects mining can have throughout the economy.

DIVERSIFIED MINERS

# Glencore mulls closure of some South African coal operations

MARTIN CREAMER
EDITOR

DIVERSIFIED mining major Glencore is considering the closure of some of its coal mining operations in South Africa, which would reduce its overall South African production by at least five-million saleable tons of coal a year and affect more than 1 000 employees.

This announcement by the London-, Hong Kong- and Johannesburg-listed company, headed by CEO **Ivan Glasenberg**, follows a detailed review of its Optimum Coal subsidiary, which was initiated because of ongoing financial hardship at Optimum, arising from difficult market conditions and the continued deterioration of the export coal price.

The company said in a media release that the affected operations included the Optimum opencast operations, large portions of the coal processing plants and associated support services, which would be placed on care and maintenance and considered for reopening should economic conditions improve.

Optimum produces 10-million tons of saleable coal a year from opencast and underground mines, half of it bought domestically by State-owned power utility Eskom and half of it exported.

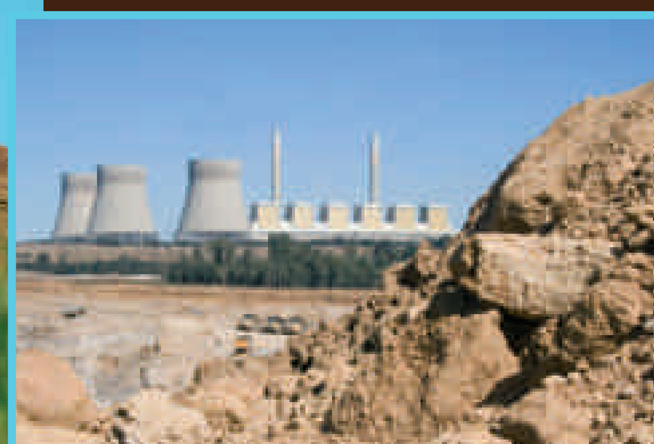
Optimum intends retaining the underground mining operations as well as sufficient processing capacity at Optimum to ensure the continued supply of coal to Eskom's coal-fired Hendrina power station. Outlining that the proposed closure would affect about 1 070 employees, Glencore said that Optimum had informed the Department of Mineral Resources and relevant unions of the potential closures and would now enter into a Section 189 process with the recognised unions and employees to determine the settlement for all affected employees.

In addition, Optimum would ensure that the employee engagement process was conducted in line with applicable labour legislation.

Optimum would explore options for redeployment across the Glencore South African coal operations as well as putting in place support services for affected employees and their families.

The company added that it was continuing to review all of its coal operations in light of the prevailing negative economic climate.





NANOTECHNOLOGY

# NEW POSSIBILITIES

## With launch of Africa's first nano computer tomography scanner, SA university opens the way for 3D analysis of ores

ZANDILE MAVUSO | SENIOR STAFF WRITER

**TRAILBLAZER**
Stellenbosch University's central analytical facility is the only facility in Africa that has the NanoCT scanner at their disposal

Stellenbosch University's (SU's) Central Analytical Facilities department launched the first and only nano computer tomography (CT) scanner in Africa in September last year, with the technology having the potential to benefit the mining industry in a cost-effective and time-efficient way.

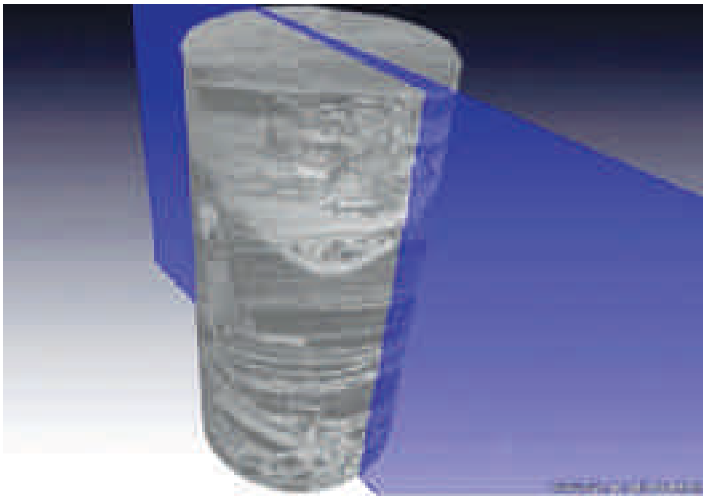
Small samples – such as a rock chip or a small stone – can be analysed at a very high resolution of up to 500 nm using the NanoCT scanner, enabling scientists and engineers to visualise the inner structure of an intact object, seeing shapes and connectivity in three dimension (3D).

As a result of its precision and increasing awareness of the power of the technology, SU CT scanner facility manager Dr **Anton du Plessis** says that, in Europe and the US, many mining companies are using the technology to investigate orebodies to better analyse their deposits in 3D and two-dimensional (2D) slice images or virtual thin sections. In the oil and gas industry, the porosity and pore connectivity of rocks can be investigated in 3D.

"This has proven to work well for many mining companies internationally, owing to the technology using a nondestructive technique. As a result, it provides useful and fast structural information about the inside of the rock, which, in many cases, allows for more selective analysis to take place," says Du Plessis.

Being aware of its ability to affect the mining industry positively, consulting firm SRK Consulting corporate consultant and partner **Hennie Theart** notes that the nano CT scanner provides a new method to determine the 3D size distribution of minerals.

This will be possible in cases where the desired mineral has an atomic density that contrasts with that of the surrounding minerals in the rock and there are no complex assemblies of ore minerals with a similar atomic density.



**SLICED ORE**
The technology allows for orebodies to be investigated in 3D slice images

He adds that, while this method is more suitable for initial mineralogical studies for mineral extraction purposes than for direct exploration work, "there might be some applications where such information can be useful in exploration, such as to determine the grain size fraction that needs to be sampled in stream-sediment regional geochemical surveys".

SU CT facility analyst **Stephen le Roux** indicates that, in South Africa, most analyses in exploration are currently conducted using field mapping and drilling programmes. As these methods entail only visual analysis of the surface, only 2D analysis of a project can be obtained.

HENNIE THEART
The availability of the NanoCT scanner to the mining industry can affect exploration positively

However, exploration and mineralogical investigations can be done in 3D using the NanoCT scanner, allowing for not only the minerals to be viewed in accurate dimensions but also the findings to be revisited at anytime after leaving site, as the data can be stored in a laboratory.

"The scanner is more of a preprocessing type of tool that enables you to see if all the mineral samples that you bring into the plant are in actual fact what you need," says Le Roux.

Theart states that using the scanner becomes pivotal during the initial phases of mineralogical investigations of some types of orebody samples when they are collected and submitted for mineralogical studies.

"Also, when the economic mineral is disseminated in trace amounts, such as in the case of gold deposits, the mineralogist has to study a large number of polished sections using either conventional microscopic studies or advanced equipment, such as the quantitative evaluation of minerals by the scanning electron microscopy method," Le Roux explains.

Theart says the NanoCT scanner could, therefore, provide an alternative and cost-effective method of scanning such minerals. However, he warns that it should be noted that the observations on the grain size of a specific mineral has to be considered in combination with observations on whether the mineral is situated on the boundary between other minerals or occurs as inclusions in other minerals.

Illustrating the effectiveness of the NanoCT scanner in the diamond industry, exploration and mining consulting services company Mineral Services Group chairperson **John Gurney** says using the scanner has demonstrated that some diamonds are formed by metasomatic – the chemical alteration of a rock by hydrothermal and other fluids – processes in veins that have crystallised in the cratonic upper mantle roots of peridotite and eclogite.

Peridotite is a dense, coarse-grained igneous rock comprising olivine and pyroxene minerals and eclogite is a metamorphic rock comprising pyroxene omphacite and pyrope-rich garnet.

Moreover, this has indicated that the concentration of diamonds in a metasomatic vein can be extremely high and a greater bulk of these mantle rocks are barren of diamonds and have either not been metasomatised or have not been metasomatised by the correct diamond-producing fluids.

"Once the understanding of this notion is accepted, it conceptually enables one to develop an understanding of what the problems are in the establishment of diamond distribution throughout a kimberlite pipe," Gurney explains.

Gurney states that, for the mining industry holistically, there are a lot of other applications for which the scanner would be useful. These include assessing beach sand, silicate deposits and platinum or gold distribution in drill core spring, as well as many other applications where the distribution of a primary ore or the detection of minor phases is of interest and commercially important.

Theart adds that the scanner will be useful for those elements and associated minerals that have a relatively high atomic mass, compared with the enclosing silicate minerals and relatively monomineralic ore mineralogy. Silicate minerals include gold ores, tin, tungsten, niobium, certain types of molybdenum, uranium ores, platinum-group element ores and rare-earth minerals.

## Skills Development

Although the scanner enables the mining industry to use an effective method that could affect the industry positively, Du Plessis highlights that, in some cases, where the investigation is not routine, there is a need for skills development for all personnel using the scanner, especially in 3D image analysis techniques, in order to make the most of the technology.

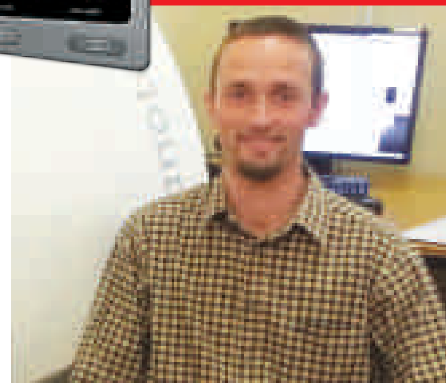
"In as much as the scanner is useful for the sector, companies still need someone who can set up the scanner correctly to view the desired samples. Secondly, the person viewing the sample has to know which software procedures are needed for the samples so that this yields positive results for the investigations or analysis," he explains.

The SU CT facility offers analytical and consulting services to mining companies, where it conducts samples to mitigate the current lack of skills to operate the NanoCT scanner. Everything is effectively provided to make best use of this technology.

For more information on the scanner, log on to http://www.sun.ac.za/ctscanner.



## THE TWO-MINUTE INTERVIEW



ANTON DU PLESSIS
The NanoCT scanner at Stellenbosch University is the first in Africa and aims to service the mining industry through sample scanning of orebodies

**Stellenbosch University CT Scanner Facility manager Anton Du Plessis tells *Mining Weekly* about how the NanoCT scanner works in order to bring about desired results and also indicates the different orebody sizes that can be scanned with the scanner. He points out the different analysing methods used in the scanning of different samples, making particular distinction between the extended release (XR) and the inductively coupled plasma mass spectrometry (ICPMS) methods.**

**What makes the NanoCT scanner effective regarding drill cores in the mining sector?**
Full three-dimensional (3D) X-ray imaging of drill cores is a fast, nondestructive method that can fit into the drill core analysis workflow, enabling a geologist to get images quickly and 3D information of each drill core nondestructively.

This further enables a geologist to select good samples for further analysis using traditional methods such as assay, XR and ICPMS.

**With the availability of micro CT scans, how does this work well with the XR analysing method?**
In this new service to exploration and mining companies, we offer a fast analysis of rock drill core samples using microCT scans to visualise the minerals of interest, based on density and atomic composition differences, and then confirm the composition of different materials of interest using a portable XR analyser. So they correlate with each other.

**Can the scan apply to all types of orebodies irrespective of their density?**
Even a dense iron-ore core can be scanned in a very short time to provide visual information of the core in 3D and measure void volume, for example. This type of scan can cover four samples an hour over 120 mm.

GOLD

# Glittering Outlook

## Record-quarter Sibanye forecasting best ever 2015 gold output

MARTIN CREAMER | EDITOR

South Africa-focused gold mining company Sibanye Gold, which achieved record latest quarter production, is forecasting best ever output for the new year.

Sibanye, headed by CEO **Neal Froneman**, which hit the 452 700 oz (14 079 kg) quarterly high spot in the three months to December 31, is guiding a best ever 1.67-million ounces (52 000 kg) for 2015.

"We've been increasing production year-on-year since listing," Sibanye senior VP investor relations **James Wellsted** commented to *Mining Weekly* on the production performance of the Johannesburg- and New York-listed company, which bills itself as South Africa's largest individual gold producer and a top-ten player globally.

Sibanye's total latest quarter cash cost was an impressive $790/oz (R285 000/kg), with $1 040/oz (R375 000/kg) its all-in chalk up.

Last year's gold production hit the 1.59-million ounces (49 432 kg) guided, despite an underground fire at the Driefontein gold mine and load-shedding by troubled State power utility Eskom, in the December quarter.

Its cost guidance was also on target, with total 2014 cash costs at $850/oz (R295 000/kg) and the all-in cost at $1 080/oz (R376 000/kg).

Sibanye's Kloof, Driefontein and Beatrix mines produced 1.45-million gold ounces (45 127 kg) in 2014, just over 1% more than in 2013.

Underperformance necessitated a Section 189 restructuring process at the Coke 4 shaft and a slower-than-anticipated build-up at the Cooke Operation overall contributed 138 400 oz (4 305 kg) of gold in the seven months of incorporation of the company's newly acquired asset outside Randfontein.

Uranium production from Cooke, which continued uninterrupted from May 2014, gave rise to a stockpile of 180 000 lb of uranium by year-end at an average cost in the December quarter of $24/lb. Uranium production of 250 000 lb is forecast for 2015.

Capital expenditure (capex) of R3.3-billion ($300-million) in 2014 was marginally lower than guided. However, 2015 capex is set to rise 10% to R3.6-billion ($320-million) on the back of the expenditure needs at the Burnstone gold project and the life-extension plans for the company's operating mines.

Dollar estimates for 2015 are based on an average yearly exchange rate of R11.20 to the dollar. The average exchange rate for 2014 was R10.82 to the dollar.


Picture by Chief Photographer Duane Daws

**NEAL FRONEMAN**
We have been increasing production year-on-year since listing



PLATINUM-GROUP METALS

## Lonmin's refined platinum output plummets on smelter shutdowns

MARTIN CREAMER
EDITOR

SMELTER shutdowns cut a big chunk of refined platinum out of Lonmin's production in the three months to December 31, when the company's overall platinum-group metals (PGM) output slumped by 31.1%.

The world's third-largest platinum producer managed, however, to record 9% higher sales to 146 890 oz and 11.7% higher overall PGM production to 274 425 oz.

The London- and Johannesburg-listed platinum major is maintaining its forecast of 730 000 oz for the year and reducing its capital expenditure from $250-million to $185-million, which has won analyst applause.

But Investec Securities mining analysts **Hunter Hillcoat** and **Marc Elliott** made it clear in a note that they were not enamoured with the company's current business plan. "It'll require drastic surgery," they said.

Q1 underground production was the highest since 2011 and saleable metal-in-concentrate of 200 170 oz is the highest since 2007. Lonmin expects to be able to process the concentrate build-up by the end of September.

Concentrator recoveries in Q1 were lower at 87.1%.

The closure of the leaking Number One furnace for repair lowered refined Q1 output by 28.8% to 139 823 oz and total PGM production fell to 265 128 oz.

The Number Two furnace is also down because of electrode breaks. "We're making good progress with repairs," the company, headed by CEO **Ben Magara**, said in a media release. While the dollar basket price was 7.1% lower at $1 033/oz in Q1, the rand basket price of R11 488/oz was 1.7% higher on currency weakness.

Lonmin has been fatality free for the fourth successive



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DIVERSIFIED MINERS

# Price Impact

## Anglo may record noncash impairment charges in price plunge parry

MARTIN CREAMER | EDITOR

**MARK CUTIFANI**
At the helm of Anglo American

Given the sharply lower commodity price environment, particularly for bulk commodities, Anglo American said last week that it expected to record noncash impairment charges in its 2014 results.

The London- and Johannesburg-listed diversified major, headed by CEO **Mark Cutifani**, added in a media release that full details of the 2014 financial year impairment charges would be provided when the company published its preliminary results on February 13.

On the production front, higher platinum, iron-ore, coal output for the three months to December 31 saw the company's shares rise by more than 2.6% in Johannesburg before mid afternoon.

The company also outlined in its quarter-four (Q4) production report that exploration and evaluation expenditure had been cut by 34% to $110-million, 52% out of evaluation expenditure, which fell to $49-million, and $2-million out of mainly nickel exploration expenditure, reducing the overall Q4 exploration spend to $61-million.

Equivalent refined platinum production rose 14% to 593 900 oz mainly on higher output at the Amandelbult, Rustenburg and Union underground mines. The opencast Mogalakwena mine also lifted Q4 production on higher concentrator throughput and better mining productivity.

Kumba Iron Ore's Q4 output rose 10% to 12.4-million tons on the implementation of the group's operating model and a production recovery plan, with waste removal at the Sishen iron-ore mine continuing to be the operational focus. The fourth quarter also saw iron-ore production beginning at the Minas-Rio iron-ore project in Brazil.

Production of export metallurgical coal rose 4% to 4.9-million tons in Q4 on a performance step change at the Grasstree colliery in Australia and on longwall moves made a year prior.

Export thermal coal production increased 2% to 9.7-million tons mainly as a result of upped Australian and South African output.

Copper production was down 18% to 174 800 t as a result of the decline of grade at Los Bronces and Collahuasi in South America.

In light of the rebuilding of the line two furnace at the Barro Alto nickel operation in Brazil, nickel production fell 34% to 6 700 t.

Diamond production decreased 8% to 8.4-million carats, owing to lower grades at the Orapa mine in Botswana and the Venetia mine in South Africa's Limpopo province. Snap Lake in Canada also produced fewer diamonds as a result of a mandatory safety stoppage.

Picture by Chief Photographer Duane Daws

**BEN MAGARA**
We are making good progress with repairs

quarter and its lost-time-injury frequency rate for the 12 months to December 31 improved by 2.7% to 3.58 incidents a million person hours, compared with 3.69 in 2013.

The Marikana underground mining operations produced 2.7-million tons during the first quarter, an increase of 7.9%, or 0.2-million tons, on the prior year period.

Production at Karee was 1 124 000 t, with the biggest K3 shaft increasing production by 8.2%. Production at Westerns was 1 045 000 t, an increase of 3%, and the second largest Rowland shaft, increased production by 1.4%.

The Newman shaft delivered a 9% increase and the Hossy shaft a 4.9% increase.

Production at Easterns rose 22.3% and production at Saffy shaft rose 30.1%. Production at Pandora rose 30.5% and production at Merensky opencast operations was 28.2% lower than the prior year period as this operation is reaching the end of its life.

Total tons milled in Q1 increased by 9.5% to 3.1-million tons and the underground milled head grade increased slightly to 4.55 g/t.

Lonmin expects its net borrowings to be higher at the end of March as a direct result of the lower sales volume. The company is confident of managing its working capital requirements through cost conservation measures and capital discipline.

ELECTRICITY – 1

# Power Woes

## Eskom must go for stability before improvement – GE

MARTIN CREAMER | EDITOR

Troubled South African State power utility Eskom should place emphasis on stability ahead of improvement, GE chairperson and CEO **Jeffrey Immelt** suggested.

Speaking at the Gordon Institute of Business Science (GIBS) in Johannesburg, the head of the 137-year-old, 350 000-employee US company said his experience of business turnarounds had made it clear that stability should always come first.

"So I would put an emphasis on stability in the short term," Immelt said in response to a Creamer Media question on how GE, which has a market capitalisation of $240-billion – some two-thirds of South Africa's gross domestic product – could help Eskom to be more efficient.

Tough decisions would have to be taken to remove day-to-day pressures so that a time-framed plan could be embarked upon.

The CEO of the world's largest infrastructure technology company said Eskom's problems had taken long to create and would take long to put right.

"They won't be fixed overnight," Immelt commented.

Stability had to come first and tough choices had to be made to first stabilise Eskom's current installed base.

Immelt was also of the view that it would be inappropriate for countries in Africa to opt for nuclear power at this stage.

"In the long term, nuclear is going to have its day but it's a really hard thing to do. On a scale of 1 to10, the building of a nuclear power plant is a 12," he said.

Rather than implementing challenging nuclear power, he believed in always trying to do the easy things first as providing nuclear would be hard.

"Always start with those things that can be managed, done and grasped.

"Do the really hard stuff as time goes on," said the man who gave the exact same answer when he was on the panel of the Africa Summit in Washington DC.

He viewed the South African market on its own as being insufficiently large to attract significant volumes of foreign investment and advocated the creation of an enlarged Southern African regional market.

"The South African market on its own is not big enough to do things to scale," he commented at question time.

GE South Africa, which employs more than 450 people at its South African office, in Midrand, has its electrical distribution equipment in nine Eskom power stations and is reportedly investing R700-million to develop critical skills and small businesses locally.

JEFFREY IMMELT
I would put an emphasis on stability in the short term



ELECTRICITY – 2

## WCC advances Eskom talks, export coal project

NATALIE GREVE
CONTRIBUTING EDITOR ONLINE

COAL producer Waterberg Coal Company (WCC) and State energy utility Eskom remain in discussions to resolve the "outstanding requirements" to convert the Waterberg coal project's (WCP's) offtake memorandum of understanding into a coal supply agreement (CSA).

The outstanding requirements included coal specification finalisation, final pricing, delivery dates and providing Eskom with a satisfactory due diligence report on the definitive feasibility study (DFS).

The proposed CSA would see the WCP deliver coal to Eskom for an initial 30-year term.

WCC sought to resolve all outstanding requirements early this year.

The coal development company last week also said that an extension of its convertible secured facility remained on an on-demand basis, with the revised balance on October 17, including accumulated interest, at A$39.3-million.

Further elaborating on its developing export project, the company reiterated that infrastructure engineer Ardbel had been commissioned to complete a DFS on the viability of a standalone export project, located in the south of the WCP area.

Stage 1 of the project would likely see the build-up to two-million tons a year of export product, with first coal to be produced during the first quarter of 2016.

Based on the draft DFS, the project team was currently undertaking an optimisation exercise on the mine and production plan to increase production to four-million tons of coal over a six-year period by adding additional plant modules.

"Based on the draft DFS and the optimisation exercise for the export project, the WCP partners are in discussions with certain banks and potential coal offtake partners with respect to funding arrangements for the proposed project development," said WCC.



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GOLD

# Conflict Gold

## Gold from DRC rebel-controlled areas being sold on international markets

ANINE VERMEULEN | SENIOR STAFF WRITER

Gold smuggled out of the Democratic Republic of Congo (DRC), some of it from rebel-controlled areas, has been sold on the international market through Uganda and the United Arab Emirates (UAE) in the past year, according to a report published last month by the United Nations (UN).

The report, titled 'Final Report of the Group of Experts on the Democratic Republic of the Congo' and based on a year's research by the UN, found evidence that gold produced in mines controlled by rebel groups was sold to traders in Uganda.

Nonprofit organisation Global Witness states that the report documents that one of these traders officially exported the precious metal last year to Dubai, in the UAE, where gold from the DRC is sold "without any difficulty".

"The UN report lifts the lid on the dirty mineral trade that helps prop up rebels in the DRC. It brings fresh, detailed evidence of individuals and companies that are profiting from the illegal trade. It is a scandal that the country's mineral wealth continues to fund conflict more than a decade after hard evidence of this came to light," says Global Witness resource campaigner **Nathaniel Dyer**.

Global Witness previously revealed major failures in Dubai's regulation of the minerals sector, which subsequently increased the risk of money laundering and of 'dirty' gold from the DRC and other conflict zones entering the global supply chain in 2012.

The UAE has taken measures to correct the situation in the gold trade, but these "fall short" of what is needed, according to the UN report.

Dyer notes that, compared with tantalum, tin and tungsten from the DRC, there are no operational traceability or due diligence systems for the country's gold sector.

"The UN report says that gold smuggled into Uganda in the past year included metal from mines controlled by rebel groups such as NDC, headed by **Ntabo Ntaberi Sheka**, who is wanted for crimes against humanity, and the Democratic Forces for the Liberation of Rwanda, a group linked to Rwanda's 1994 genocide," he says.

Further the report says that coltan, a tantalum ore found in eastern DRC, is also smuggled into Rwanda, indicating flaws in responsible sourcing schemes.

A UN investigation highlighted two cases of "suspected smuggling" – involving two Rwandan companies – of white coltan, which is produced only the DRC.

**HARD TO TRACE**
Compared with tantalum, tin and tungsten from the DRC, there are no operational traceability or due diligence systems for the country's gold sector

The companies were suspended for six months from the supply chain initiative run by the International Tin Research Institute at the request of the Rwandan government.

"The US has legislation in place that requires US-listed companies to check that their purchases of metals have not funded warring parties, and the European Union is developing regulations on conflict minerals, although the current proposal is only for a voluntary scheme," he concludes.

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COAL

## CoAL's Vele colliery receives enviro nod for plant upgrade

NATALIE GREVE
CONTRIBUTING EDITOR ONLINE

THE Department of Environmental Affairs (DEA) has granted Coal of Africa Limited's (CoAL's) Vele colliery, in Limpopo, an amendment to the environmental authorisation in terms of the National Environmental Management Act and the Environmental Impact Assessment Regulations.

### Planned Modifications

This amendment was the first of several required to allow the company to make planned modifications to the colliery's processing plant and was a step closer to the project achieving the full regulatory compliance required for construction to start.

CoAL CEO **David Brown** welcomed the DEA's decision, adding that the group would await the receipt of all regulatory approvals before starting with the modification of the plant.

### Licence Renewal

The company had also sought renewal of its integrated water use licence (IWUL) and its amendment.

The current IWUL will expire in March 2016 and the company feels it prudent to renew this licence prior to committing further shareholder funds to the project.

The approval of the renewal is expected in the second quarter of this year.

"We will continue to engage with the regulatory authorities and other stakeholders at Vele as we continue to set a new benchmark for the coexistence between mining, agriculture and heritage land uses within the area in which we operate.

"This period also gives the company further time to assess the outlook for coal prices. Discussions continue with appropriate end-users regarding offtake agreements," he commented.



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MINERALS ADMINISTRATION

# Kudos All Round

## Industry pleased with new environmental system – DMR

ILAN SOLOMONS | STAFF WRITER

The Department of Mineral Resources (DMR) says it has received only positive comments regarding its new One Environmental Management System from parties applying for prospecting or mining rights. DMR media liaison officer **Phuti Mabelebele** says the DMR and the Department of Environmental Affairs (DEA) started discussions in 2010 about the system, which came into effect last month.

The system was publicly announced by President **Jacob Zuma** during his State of the Nation address in February 2014 and aims to highlight government's commitment to improving the ease of doing business in mining and enhancing South Africa's global competitiveness as a mining investment jurisdiction.

Mabelebele tells *Mining Weekly* that the system provides an integrated licensing regime for the granting of rights, the issuing of water use licences and the approval of environmental authorisations, thereby ensuring that environmental management in South Africa is governed by a single piece of legislation.

"The system entails the synchronised processing, granting and issuing of the respective licences and authorisations by the DMR, the DEA and the Department of Water Affairs."

Mabelebele asserts that the integrated licensing regime "will enable improved turnaround times, create regulatory certainty and further enhance the ease of doing business".

Under this environmental system, the Minister of Mineral Resources will issue environmental authorisations and waste management licences in accordance with the provisions of the National Environmental Management Act (Nema) and the National Environmental Management Waste Act for mining and related activities. Environmental Affairs Minister **Edna Molewa** will be the appeals authority for these authorisations.

Mabelebele notes that the Ministers of Environmental Affairs and Mineral Resources, as well as Water and Sanitation, have agreed on fixed timeframes for the consideration and issuing of permits, licences and authorisations in their respective legislation.

They have also agreed to synchronise the process involving the issuing of permits, licences and authorisations to within 300 days. Should a decision to issue a licence be appealed, an additional maximum period of 90 days is provided for to finalise the process.

Until all the requisite legislative amendments have been effected to formalise these timeframes, those stipulated in Nema will apply. Mineral Resources Minister **Ngoako Ramatlhodi** is authorised to appoint environmental mineral resource inspectors, who will have the same powers as environmental management inspectors to enforce the provisions and regulations of Nema regarding mining and related activities.

The finalisation of the regulations governing the development of residue stockpiles and residue deposits, as well as the financial provision for rehabilitation regulations in terms of Nema, is still pending.

Until these regulations have been finalised, the Mineral and Petroleum Resources Development Act (MPRDA) regulations will remain in force.

All environmental management plans or programmes approved in terms of the MPRDA prior to December 8, 2014, will remain effective in terms of Nema.

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FERROUS METALS

# Negative Impact

## Chinese slowdown affecting viability of new West African iron-ore projects

ILAN SOLOMONS | STAFF WRITER

The slowdown in the growth of Chinese steel production has resulted in a large-scale reduction in its iron-ore requirements, which has had a significant impact on the viability of new West Africa-based iron-ore projects and the expansion of existing projects, says international research firm Wood Mackenzie.

Wood Mackenzie's gross domestic product growth outlook for China this year is 7.1%.

"China would have been a key destination for West African iron-ore as Chinese entities were involved in financing and signing offtake agreements for a number of iron-ore projects," Wood Mackenzie principal iron-ore markets analyst **Paul Gray** tells *Mining Weekly*.

Wood Mackenzie also highlights that several of these projects are based in Liberia, Sierra Leone and Guinea, which have been severely affected by the Ebola virus that has claimed more than 7 500 lives to date.

"We never had very high expectations for West African iron-ore production, or exports; however, our expectations are now even lower.

"The price of iron-ore has been negatively affected by not only lower Chinese demand growth but also the rapid growth in Australian iron-ore supply," states Gray.

Wood Mackenzie points out that China accounts for two-thirds of global iron-ore imports, but that most other metals and minerals depend less on Chinese demand than iron-ore.

"Following iron-ore and coal, copper is arguably the next most significantly China-dependent commodity, with the [bulk] of production stemming from the Copperbelt region of Zambia and the Democratic Republic of Congo," adds Wood Mackenzie global copper mine costs principal analyst **Nick Pickens**.

Wood Mackenzie says the appetite for investing in new projects and exploration has waned, which is reflected in the decrease in the share price performance of the junior mining companies listed on the London Stock Exchange and the JSE.

Nonetheless, the company states that, in contrast to the iron-ore projects in West Africa, much of the supply growth in the Copperbelt has been brownfield developments of existing operations, with much of the capital for these projects already invested.

"However, existing higher-cost copper producers are faced with surviving the current lower price environment."

Pickens points out that gold mining major Barrick Gold has initiated procedures to suspend operations at its openpit copper-producing Lumwana mine, in Zambia, following the increase of royalty rates last month on openpit mining operations in the country.

The company estimates that Zambia's mines are, on average, in the top quartile of the cost curve; therefore, further price weakness could result in more closures of some of Zambia's older, high-cost mines.

Meanwhile, Wood Mackenzie also forecasts China's total oil demand to grow by 3.3% year-on-year, or by 350 000 barrels of oil a day, reaching 11.03-million barrels a day by year-end.

The company believes that lower oil prices in the long term will negatively impact on oil supplies sourced from Africa.

"The biggest impact will be on oilfield developments that have not been sanctioned. If prices remain low, then those with marginal economics will be postponed."

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COAL

# Big Plans

## Indian company mulls major developments at its Mozambique mine

KEITH CAMPBELL | SENIOR DEPUTY EDITOR

**STORY HIGHLIGHTS**

- ICVL plans to invest some $1.9-billion in and around its Benga operation.
- Botswana coal will be exported through South Africa and Mozambique until the Trans-Kalahari Railway is built.

Indian State-owned company International Coal Ventures Limited (ICVL) is to invest some $1.9-billion in Mozambique. This has been revealed by ICVL Mozambique director-general **Nirmal Chandra Jha** to The Indian Express newspaper. The company now owns 65% of the Benga coal operation, and 100% of the Zambeze and Tete East coal projects, in the African country's Tete province, having bought them from Rio Tinto (reportedly for $50-million) last year.

ICVL will use the money to construct a 300 MW thermal power station at the mine, increase Benga's output to 13-million tons by 2017 and set up a coal-to-liquids (CTL) plant. On January 12, the company invited expressions of interest for the construction of the CTL plant. This is expected to cost more than $300-million, the thermal power station about $830-million and the expansion of the Benga operation around $800-million.

ICVL is a special purpose vehicle created at the initiative of the Indian Ministry of Steel, with the purpose of obtaining metallurgical and thermal coal assets in foreign countries, in order to assure the supply of imported coal. It is a partnership between the Steel Authority of India Limited (SAIL), Coal of India Limited, Rashtriya Ispat Nigam Limited (RINL – a steel company), the National Mineral Development Corporation and NTPC (India's largest power producer). All these companies are wholly or predominantly State-owned. India cannot domestically produce enough metallurgical or coking coal to meet the current needs of its steel industry. These needs are increasing, as both SAIL and RINL are in the middle of major production capacity expansion programmes.

So far, ICVL has exported three shipments of coking coal from Benga to India to feed blast furnaces at both SAIL and RINL steelworks. Five more such export shipments are planned for this year. Jha expects the "crisis" regarding the supply of coking coal to India's State-owned steel-makers to come to an end in the near future.

He affirmed that the Benga and (once they had entered operation) Zambeze and Tete East mines would be apply to supply these steel plants with their required metallurgical coal for, at a minimum, the next 35 years.

The decisions to set up the thermal power station and CTL plants at Benga were taken in order to achieve economies of scale at the operation. While 70% of Benga's reserves of 2.6-million tons are metallurgical coal, the remaining 30% is thermal coal.

Meanwhile, the executive director of the Botswana Chamber of Mines, **Charles Siwawa**, has told the O País newspaper in Maputo that coal miners in his country intend to start exporting their output through South Africa, using the Port of Richards Bay, and Mozambique, using the Port of Maputo. These routes will be used until the completion of the Trans-Kalahari Railway. This will run for 1 500 km and connect the mines of Botswana's Mmamabula coalfields to the Namibian port of Walvis Bay. The Trans-Kalahari is expected to cost some $9.2-billion, which will be raised from private investors.

The feasibility study for the project, that has been agreed by the Botswanan and Namibian governments, is expected to be published early this year.

Siwawa observed that any delay in the completion of the new railway and/or the associated coal terminal at Walvis Bay could be disastrous for Botswana's economic ambitions, which include becoming a coal supplier to India and China. (It should be noted that there has been a proposal that, once built, the Trans-Kalahari could be extended to reach the Waterberg coalfield in South Africa.)

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BASE METALS

## Chinese breathe life back into Uganda's Kilembe copper/cobalt mine

JOHN MUCHIRA
CORRESPONDENT

THE machines at Uganda's Kilembe mine, which fell silent more than three decades ago, are set to roar into life again, after the Chinese consortium that bought the mines announced copper production would restart in May.

Tibet Hima Mining, a consortium of Chinese companies that won a 25-year concession for the mine, in south-western Uganda, in 2013, says it is gearing up to restart copper and cobalt production and smelting after completing the rehabilitation of the operations.

Tibet Hima Mining deputy CEO **Lu Guo** says the consortium has completed the rehabilitation of the smelting, refining and production plants.

The consortium is investing $175-million in the project which was once a major economic backbone of the region before production came to an abrupt halt in 1982 owing to deteriorating security and a decline in copper prices. The investment also includes increasing power production at the Maluku power plant from 5 MW to 12 MW.

"We have been executing technical work on the mines and have completed most of the necessary rehabilitation of facilities.

"We project to start production in May," says Guo.

He adds that, besides rehabilitating some of the machines at the mine, the company has installed newer machines with a life span of at least 30 years and is in the process of renovating the roads and tunnels leading up to the mines, located on the foothills of the Rwenzori mountains, about 370 km south of the capital, Kampala.

According to Uganda's Department Geological Survey and Mines, Kilembe had 4-million tons of copper and 5.5-million tons of cobalt reserves when it ceased production in 1982. By then, only 10% of the area believed to hold copper ore deposits had been explored.

The consortium, which includes Shanghai Baosteel Group and Chinalco Luoyang


Copper, paid the Uganda government a signature fee of $4-million and will pay a yearly fee of $1.5-million for the next 25 years. Uganda will also benefit from statutory payments and taxes.

MINERALS LEGISLATION

# Staying Put

## Minerals royalty tax regime to remain in force – Zambia's new leader

ILAN SOLOMONS | STAFF WRITER

Incoming Zambian President **Edgar Lungu** has averred that the country's controversial new minerals royalty tax regime is there to stay.

"Government's desire to ensure companies pay the correct taxes will continue," he said shortly after being sworn in last month. He was elected to complete the term of **Michael Sata**, who died in October and was replaced in an acting capacity by **Guy Scott**.

However, during a panel discussion at research and investment advisory firm Frontier Advisory's 2015 Africa Outlook conference, held in Johannesburg last month, investment banking firm Renaissance Capital sub-Saharan Africa economist **Yvonne Mhango** warned that legislative uncertainty and increased minerals royalty taxes, such as those implemented in Zambia, during a time of low commodity prices, would jeopardise the economic viability of many mining operations.

The new royalty tax regime, which came into effect on January 1, increased underground mining royalties from 6% to 8%, with opencast mining operations being charged a 20% minerals royalty.

She pointed out that, in 2008, the Zambia government passed the Mines and Minerals Act, which subsequently introduced a tax windfall regime that significantly increased the tax rate on mines from 31% to 47%.

However, the windfall tax regime was withdrawn in the 2009 Budget, after the policy had been heavily criticised by mining companies, with thousands of Zambians left without work owing to mines closing down and significant reductions in staff at the operations that did manage to continue operating during this period.

According to government authorities, the decision to revoke the tax windfall regime was largely a result of the adverse impacts of the global financial crisis that started in 2008 and that threatened more job losses and mine closures.

"I hope that Zambia will learn from this experience and ensure that it does not repeat previous mistakes, which could once again result in mine closures and many Zambians being unemployed," stated Mhango.

Additionally, the Zambia Chamber of Mines (ZCM) issued a statement highlighting that more than half of Zambia's copper production was lossmaking following a consistent decline in the international copper price.

"As of January 14, 2015, the base metal was trading at $5 353.25/t, its lowest since July 2009," according to business news agency Bloomberg.

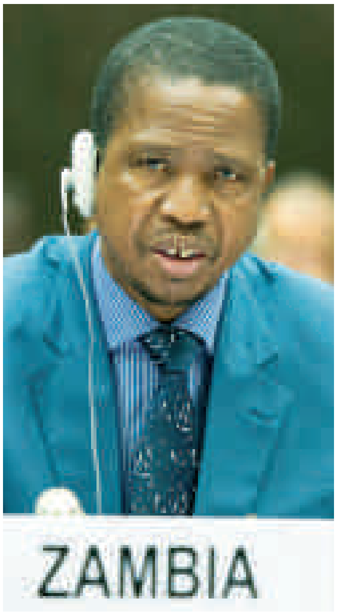
ZCM economist **Shula Shula** added at the conference that the commodity price slump, in addition to structural factors, legacy issues and the new tax regime, "will severely penalise the vast majority of Zambia's mining operations".

"Profitability is derived from total revenue minus total costs. Most of Zambia's mines are high-cost operations, significantly higher than other copper mining provinces in the world. At the current copper price, nine out of eleven of the country's large mines, both opencast and underground, are uneconomical to operate," he stated.

Shula said, considering that the mining industry accounted for more than 86% of Zambia's foreign direct investment and about 80% of exports, "these figures are alarming for the state of the country's economy".

He said government's taxation of the mining industry must take into account the collection of equitable revenue required for national development while ensuring the sustainability of the sector as a contributor to national development.

"An excessive tax burden on the mining industry, without taking into account the cost of production and unpredictability of the copper price trend, will inevitably lead to mine closures in the short and medium term," stated Shula. He noted that the trend in copper prices was, had been and would most likely remain highly unpredictable.




EDGAR LUNGU
Government's desire to ensure companies pay the correct taxes will continue

"This is because copper is a base metal which is heavy, plentiful and cheap, when, . . . compared with precious metals such as gold and silver. As such, it is purchased by consumers when required, making it difficult to speculate on future prices," Shula added.

Moreover, he emphasised that the new tax regime would be very complex to administer, as mines often have openpit, underground and processing operations at the same site.

[With] declining copper prices and a new tax regime, Zambia will move into unexplored fiscal territory.

"Government must, therefore, reverse its decision to introduce the new tax regime that places a higher minerals royalty as a final tax and instead institute dialogue with all stakeholders to come up with an equitable fiscal policy which is consistent with promoting mining investment and generating adequate revenues for the treasury on a sustainable basis," Shula concluded.

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AFRICA & MINING – 1

# Diminishing Relevance

## African growth tied to trade, not mining – consultant

ILAN SOLOMONS | STAFF WRITER

**ARRESTED DEVELOPMENT**
African countries benefited from high commodity prices, but mines were not able to significantly increase product output and export volumes

Mineral commodities would become less relevant to the development of African countries in the long term as they diversified their economies away from raw resource extraction, said local mining consultancy The MSA Group MD **Keith Scott** during a panel discussion at research and investment advisory firm Frontier Advisory's 2015 Africa Outlook conference, held in Johannesburg last month.

Fellow panellist and fleet management services provider Skais SPRL MD **Salim Dewji** concurred with Scott, adding that African countries that could not decouple themselves from dependence in commodities would find 2015 very challenging.

"If countries like Angola can stop depending on oil and focus . . . on increasing trade with neighbouring countries, such as the Democratic Republic of Congo (DRC), there are incredible opportunities to be had," Dewji asserted.

Further, Scott pointed out that The MSA Group had noted a rapid decrease in capital available to develop exploration projects. Companies were also unable to raise sufficient funds to not only develop new projects but also recapitalise existing projects.

"During the commodity boom . . . from 2002 to 2012, African countries benefited from high commodity prices, but mines were not able to significantly increase product output and export volumes," he added.

Scott cited Africa's largest copper producers, the DRC and Zambia, as examples of countries that did not capitalise the way they should have from the high copper prices, as they only marginally increased their outputs.

"Simultaneously, during this ten-year period, mining giant Rio Tinto managed to increase iron-ore outputs tenfold at its operations in Australia. South Africa increased its iron-ore output by 20% and increases were also recorded in platinum production," he highlighted. However, Scott said South Africa's coal production volumes remained static, while gold output decreased significantly.

He attributed Africa's failure to increase export volumes to a lack of developed infrastructure in most countries, while South Africa's mining sector was hampered by the country's ageing infrastructure.

Scott lamented that, amid the current low commodity prices, "it is very difficult to see" how Africa is going to attract the investment required to develop new infrastructure that will assist in improving mining export volumes in the long term, "when commodity prices invariably rise once more".

He added that large iron-ore development projects in West Africa were particularly vulnerable, as they relied heavily on major infrastructure, such as railway lines, roads and port terminals, being built.

Cairo-headquartered international financial institution African Export-Import Bank finance banking and administrative services executive VP **Denys Denya** added that the infrastructure challenges that African countries faced had to be addressed at regional level.

He pointed out that Chinese investments were playing a critically important role in connecting regions of Africa.

For example, China is financing the bulk of the $5.2-billion East Africa railway project currently under construction, and will, on completion of the first stage in 2017, link Nairobi to Mombasa, Kenya.

The second phase of the project will link the Kenyan section of the railway line to South Sudan, the DRC and Burundi.

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AFRICA & MINING – 2

## Resource prices source of adversities and opportunities for Africa

ILAN SOLOMONS
STAFF WRITER

THE significant and potentially persistent decline in oil and other commodity prices, as well as slower-than-projected growth in the eurozone, China, Japan and Russia, has substantially altered the economic prospects for most African countries, according to the International Monetary Fund's (IMF's) recently released regional and world economic outlook update.

Addressing research and investment advisory firm Frontier Advisory's 2015 Africa Outlook conference, held in Johannesburg last month, IMF South Africa senior resident representative Dr **Axel Schimmelpfennig** noted that exports accounted for about 27% of sub-Saharan Africa countries' gross domestic product (GDP).

He highlighted that this was seven percentage points more than what it was for the region in the 1990s, or a one-third increase in export volumes.

Most of the increased trade involved new trading partners such as China and India.

"However, the exports were fairly concentrated in raw materials and commodities."

Schimmelpfennig pointed out that, for Gabon and Angola, oil exports accounted for about 50% of their respective countries' GDP, while it accounted for about 80% of Equatorial Guinea's GDP.

Frontier Advisory CEO Dr **Martyn Davies** added that many African countries' development prospects were inversely proportional to their natural resource endowment.

"The so-called resource curse is an endemic challenge across Africa," he lamented.

Davies said it was likely that this year would be a catalyst for change in terms of African countries actively seeking to diversify away from purely resource extraction to manufacturing and service-based economies.

"At policy level, for Africa to mimic Asia's developmental trajectory, sub-Saharan Africa States will need to forge proactive, business-friendly growth models, rather than aid-supported, reactive and commodity-price-driven ones that result in nothing more than dependence," he emphasised.

Meanwhile, local mining consultancy The MSA Group MD **Keith Scott** stated at the conference that bulk commodity prices had bottomed out, but that it would take at least two to three years before they would start to rise again.

"The mining sector is a cyclical sector and it takes many years for projects to be developed. Therefore, it is important that mining companies have a long-term vision to ensure that they invest in and develop projects now, so as not to miss out on the next [commodity price] upswing in years to come," he concluded.

To watch a video in which Dr Axel Schimmelpfennig, Dr Martyn Davies and Keith Scott provide insights into the global economy and its impact on Africa, scan the barcode with your phone's QR reader, or go to Video Reports on www.miningweekly.com.

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DIAMONDS

# Growth Focus

## De Beers aiming to grow Forevermark brand in SA this year

ANINE VERMEULEN | SENIOR STAFF WRITER

Diamond major De Beers will be focused on growing its Forevermark brand in South Africa this year by promoting the Promise campaign, which it launched in mid-2014.

The Forevermark brand is distributed in South Africa through the local diamond business Caratco, under whose initiative the brand is expanding in Southern Africa to Namibia and Botswana.

De Beers CEO **Philippe Mellier** says the group is committed to Forevermark and to growing the 'diamond dream', and that there is great potential in the bridal market worldwide.

He notes that the Forevermark brand answered consumers' increasing desire for branded products that could provide assurance of their ethical credentials.

In 2014, the company inscribed its millionth Forevermark diamond.

"Forevermark provides the opportunity for additional margin to be captured and, to date, Forevermark jewellers are consistently achieving about 10% premium above equivalent generic diamond jewellery," Mellier states.

Forevermark brand manager at Caratco **Anna Russo** states that the new Promise campaign reinforces the value of the 'diamond dream', adding that Forevermark will drive that dream in South Africa.

"At the core of the 'diamond dream' is the idea that the diamond carries a timeless promise. Customers can feel proud to make their most important promise of love with a Forevermark diamond. At Caratco, we intend to grow Forevermark in the local bridal market, in line with the global goals."

She adds that Forevermark is a diamond brand and not a jewellery brand, and that countries and businesses involved – such as Caratco – that are licensed to distribute Forevermark, are encouraged to create their own Forevermark collections for their own market and customers.

"At Caratco, we created a new Forevermark collection last year. It is a collection designed to meet the demand of the South African market and we are developing it in the bridal market especially," Russo says.

Russo comments that, with the new Promise campaign, Forevermark aims to drive awareness of the brand's own promises, which include a commitment to beautiful, rare and responsibly sourced diamonds.

Caratco's new Forevermark collection is a collection of classic designs for engagement and anniversaries. The inspiration behind the new collection is "timeless".

"The primary goal of the De Beers group is to establish Forevermark as the biggest diamond brand in the world. Globally, the goal is to strengthen the existing markets and to acquire new ones," she says.

She adds that, locally, Caratco's goal is to grow both the local and tourist markets.

"Visitors from all over the world understand that South Africa is a global diamond hub and tourists want to buy diamonds here, so we must be able to meet the tourist demand by offering a premium diamond brand such as Forevermark," says Russo. To expand the tourist offering in Southern Africa, Caratco opened an outlet at Maun International Airport, in Botswana, last year.

Caratco also arranged a Forevermark jewellery display at the thirteenth Confederation of Commerce, Industry and Manpower conference in Maun last year, in support of the De Beers group, which sponsored the conference.

ANNA RUSSO
Locally, Caratco's goal is to grow both the local and tourist markets

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## COMING UP

Global mining company Rio Tinto has formally approved the development of the fourth pipe, known as A21, at the remote subarctic Diavik mine, in Canada. The A21 production will provide an important source of incremental supply for Diavik, ensuring the continuation of existing production levels

## COMING UP

The prefeasibility study on the Winchester magnesite direct shipping ore project, in Australia's Northern Territory, proposes a low-cost, opencut mining operation. The study was based on a mine that could operate at various capacities: 250 000 t/y of run-of-mine (RoM), 500 000 t/y RoM and 1 000 000 t/y RoM

# PROJECTS IN PROGRESS

By Sheila Barradas

## PLATREEF PGM, NICKEL, COPPER AND GOLD MINE

**Name and Location**
Platreef platinum-group elements, nickel, copper and gold mine, Limpopo, South Africa.

**Client**
Ivanhoe Mines owns 64% of the Platreef project through its subsidiary, Ivanplats, and is managing all mine development work. The South African beneficiaries of the approved broad-based, black economic empowerment structure have a 26% stake in the project and the remaining 10% is owned by a Japanese consortium of ITOCHU Corporation; Japan Oil, Gas and Metals National Corporation; ITC Platinum Development, an ITOCHU affiliate; and Japan Gas Corporation.

**Project Description**
The Platreef project is a Tier 1 discovery, which contains the Flatreef deposit, located on the northern limb of South Africa's Bushveld Igneous Complex, the world's premier platinum-producing region. Ivanhoe has declared an initial probable mineral reserve of 15.5-million ounces of platinum, palladium, rhodium and gold. The mineral reserve is expected to support a 31-year mine life at a steady-state production rate of four-million tonnes a year.

An independent prefeasibility study (PFS) proposes the development of the mine in three phases.

The first phase involves the development of a large, mechanised, underground mine with an initial four-million-tonne-a-year concentrator and associated infrastructure to establish an operating platform to support future expansions.

The second phase will double production to eight-million tonnes a year.

The third phase involves the expansion of the mine to a steady state of 12-million tonnes a year, making it among the largest platinum group metals mines in the world.

Mining zones in the current Platreef mine plan occur at depths ranging from about 700 m to 1 200 m below surface. Access to the mine will be through four vertical shafts. Shaft No 2 will have the main personnel, material and ore-handling system, while Shaft No 1, 3 and 4 are designated ventilation shafts. Shaft No 1 is under development and will be used for initial access, bulk-sample collection and early underground development.

Mining will be performed using highly productive mechanised methods, including long-hole stoping and drift-and-fill mining. The ore will be hauled from the stopes to the bottom of Shaft No 2, where it will be crushed and hoisted to surface.

**Net Present Value/Internal Rate of Return**
The project has an after-tax net present value at an 8% discount rate of $972-million, and an after-tax internal rate of return of 13%, with a project payback of seven years.

**Value**
Preproduction capital is estimated at $1.17-billion, including $114-million in contingencies.

**Duration**
According to the previously released preliminary economic assessment, Phase 1, which will establish an operating platform to support the start of production at a nominal plant capacity of four-million tonnes a year is expected by 2020. Phase 2, which includes a ramp-up to a plant capacity of eight-million tonnes a year, is expected by 2024. Phase 3, to a steady-state plant capacity of 12-million tonnes a year, is expected by 2028.

**Latest Developments**
Ivanhoe has retained Australia-based Whittle Consulting to conduct an optimisation study based on the Platreef PFS. The work is progressing and recommendations from the study are intended to provide guidance for the feasibility study and subsequent expansion phases.

The development work at Platreef in 2015 will focus on the Shaft No 1 sinking programme, which is expected to be covered by existing dedicated working capital. The funds were provided by an investment of $280-million made by the Japanese consortium, which holds a 10% interest in the project, in 2011.

As at December 31, 2014, $109-million remained available for development work at Platreef. The cumulative investment by Ivanhoe on the Platreef project to date total about $241-million.

**Key Contracts and Suppliers**
Whittle Consulting (optimisation study).

**On Budget and on Time?**
Not stated.

**Contact Details for Project Information**
Ivanhoe Mines (South Africa),
**Jeremy Michaels**, tel +27 11 088 4300 or jeremy.michaels@ivanplats.com.
Whittle Consulting, tel +61 3 9898 1755, fax +61 3 9898 1855 or email info@whittleconsulting.com.au.

## JAY KIMBERLITE PIPE PROJECT

**Name and Location**
Jay kimberlite pipe project, Northwest Territories, Canada.

**Client**
Dominion Diamond Corporation.

**Project Description**
The Jay kimberlite pipe is located in the south-eastern portion of the Ekati mine property, about 25 km south-east of the Ekati main facilities and about 7 km to the north-east of the Misery pit, in the Lac de Gras watershed. The Jay project is an extension of the Ekati mining operation and can potentially extend the mine life to about 2030, more than ten years beyond the current closure date. The facilities required to support the development of the project and to process the kimberlite already exist at the Ekati operation. The project entails the construction of a water-retention dike following a horse-shoe-





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shaped alignment from the shoreline into Lac du Savage to isolate the portion of the lake overlying the Jay pipe. The dike would be 5 km long with an average water depth of 5 m.

**Net Present Value/Internal Rate of Return**

Not stated.

**Value**

Not stated.

**Duration**

The project timeline currently envisions the construction of the dike to start in mid-2016 and to continue until 2019. Dewatering and prestripping will then take place, followed by conventional openpit mining, with production currently expected to begin in 2020.

**Latest Developments**

Dominion announced in November 2014 that it had filed the developer's assessment report (DAR) with the Mackenzie Valley Environmental Impact Review Board for the Jay kimberlite pipe. The purpose of the DAR is to meet the requirements set out by the review board for the environmental assessment process. The submission of the DAR is the next step in the permitting process to develop the largest diamondiferous resource in North America. Following the submission of the DAR, the analytical and hearing phases of the environmental assessment process are expected to result in a Ministerial decision in late 2015. Once this decision is issued, the water licence and land-use permitting process will take about a further six months.

**Key Contracts and Suppliers**

None stated.

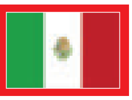
**On Budget and on Time?**

Not stated.

**Contact Details for Project Information**

Dominion diamond corporation VP – corporate development **Richard Chetwode**, tel +44 7720 970 762 or email rchetwode@ddcorp.ca.

## SAN MIGUEL GOLD AND SILVER PROJECT



**Name and Location**

San Miguel gold and silver project, Chihuahua, Mexico.

**Client**

Paramount Gold and Silver Corp.

**Project Description**

The new preliminary economic assessment (PEA) on the San Miguel project has confirmed that the project represents a potentially robust economic opportunity to develop a low-cost mine in the prolific Sierra Madre belt in Mexico.

The new PEA adds an efficient, inexpensive openpit, heap-leach operation to the front-end of the production scenario, which helps fund underground mining and related mill construction from cash flow. The new PEA also features a very substantial increase in measured, indicated and inferred resources, compared with the 2013 PEA.

The PEA proposes a 4 000 t/d mill with a heap-leaching facility fed by openpits and underground mines, resulting in a projected 17-year operation, with a total metal production of 933 000 oz of gold and 47.1-million ounces of silver.

The PEA has determined that the most suitable mining scenario for the project is an underground operation for the high-grade Don Ese deposit, a combination of openpit and underground mining for the La Union and San Miguel deposits, and openpit extraction for the San Antonio, La Veronica, Monte Cristo and San Francisco deposits.

The recommended openpit mining method is conventional drilling and blasting with mineralised material and overburden loaded into rigid-frame haul trucks. Mechanised underground mining will be from sublevel open stoping with delayed backfilling.

The development of mining and processing infrastructure has been defined in a conceptual plan, based on a central process facility with a tailings storage facility and a heap-leaching facility. Individual openpit mines will be developed as satellite production operations, with haul trucks transporting the mineralised material to the process site by haul truck.

A main electrical power line and power centre will be developed at the process facility, with individual power lines linked to the underground mining operations at Don Ese, San Miguel and La Union.

Don Ese's distance from the main mining and processing facilities will require it to have its own facilities and infrastructure, whereas San Miguel and La Union will be able to use shared facilities and most of their infrastructure.

The underground mines will have separate ventilation and dewatering systems because of their remote locations from each other. Access/haul roads to each mining operation will be developed.

It is assumed that personnel for the mining operation will live in the local communities of Temoris and that no camp facility will be built.

**Net Present Value/Internal Rate of Return**

The project has an estimated base case pretax net present value of $472.6-million at a 5% discount rate and an internal rate of return of 23.2%, with a quick payback of initial capital in the third year of production.

**Value**

Total capital expenditure is estimated at $439.5-million.

**Duration**

Not stated.

**Latest Developments**

In December 2014, Paramount announced results from three additional core holes drilled at the high-grade Don Ese deposit, located on the San Miguel project site. Exceptional grades and widths from these infill holes are likely to upgrade resources to the measured and indicated categories and potentially increase the resource size and grade. Paramount is drilling the Don Ese and Dana structures using three core rigs as part of its programme to move the San Miguel project towards a prefeasibility study.

**Key Contracts and Suppliers**

None stated.

**On Budget and on Time?**

Not stated.

**Contact Details for Project Information**

Paramount Gold and Silver Corp investor relations, **Chris Theodossiou**, tel +1 866 481 2233.

**Readers of *Mining Weekly* are requested to email details of projects to Sheila Barradas at sheila@engineeringnews.co.za**

Platinum-based fuel cell technology successfully powers 34 houses Page 27

Mechanisation, automation only answer Page 29



# PGMs demand remains high, despite 2014 losses

DAVID OLIVEIRA | STAFF WRITER

Picture by Chief Photographer Duane Daws

PRODUCTION RECOVERY
Platinum production in 2015 could outstrip the 2013 total of 4.21-million ounces

Platinum-group metals (PGMs) demand remains strong, despite the industry having lost more than one-million ounces of platinum production in 2014, owing to the five-month Association of Mineworkers and Construction Union strike, which pushed the global market into a significant deficit, says PGMs market researcher Johnson Matthey principal analyst **Alison Cowley**.

"Assuming that strike losses in South Africa are lower in 2015 than they were last year, Johnson Matthey believes that production losses in 2015 are likely to be lower than those of 2012 and 2014, which would result in the recovery of underlying South African platinum mining output."

She states that platinum production in 2015 could outstrip the 2013 total of 4.21-million ounces, despite shaft closures in the intervening period, but that "this will depend on the extent to which mining is disrupted by safety, as well as technical and geological factors".

Platinum production from the strike-affected mines, owned by platinum majors Anglo American Platinum (Amplats), Lonmin and Impala Platinum (Implats) resumed in July 2014 and the "post-strike ramp-up has proceeded more rapidly than many industry observers expected," Cowley notes.

She highlights that Amplats and Lonmin reported production close to planned levels at the close of the third quarter of 2014.

However, Implats' build-up was stalled by a series of accidents at its Rustenburg lease area, resulting in four fatalities and the mine being closed for two days in September 2014. However, Implats had said that it expected to improve production in the final quarter.

"Recent shaft closures, combined with delays in the ramp-up of replacement projects, mean that capacity at these operations is now considerably lower than it was five years ago," Cowley states.

Meanwhile, she notes that the local production of rhodium is likely to increase at a higher rate than that of palladium that was affected by the performance of mines on the eastern and northern limbs of the Bushveld Complex.

Cowley adds that production recovery by strike-affected mines on the western limb of the Bushveld Complex is forecast for this year, as these mines produce significant quantities of platinum- and rhodium-rich upper group two ore.

However, she notes that there are uncertainties regarding platinum supply in 2015 and "any decisions to rationalise mining operations, by existing or future owners, have the potential to trigger industrial action".

Cowley highlights that the uncertainties pertaining to supply are because of Amplats' intention to either sell its Union and Rustenburg tenements, in the North West, or consolidate them into a separate company; Implats is reviewing its operations, with the results to be disclosed this month.

Rumours that diversified miner Glencore intends to sell its platinum interests, which include the Eland mine, in the North West;

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XOLISA HADEBE IS A ROCK DRILLER. HE CARRIES A 25 KG ROCK DRILL 2,7 KM UNDERGROUND FOR 8-HOUR SHIFTS. HE'S LOGGED MORE THAN 12 000 HOURS UNDERGROUND. WHEN HE FINISHES HIS SHIFT, HE SLEEPS FOR 9 HOURS STRAIGHT. THEN HE GETS UP AND DOES IT ALL AGAIN. HE'S TOUGH.
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# Further platinum wage strikes unlikely – law firm

DAVID OLIVEIRA | WRITER

It is unlikely that there will be further strike action over wages and working conditions in the South African platinum sector this year, as the agreements reached by the Association of Mineworkers and Construction Union (AMCU) and the country's top platinum producers last year are valid for a three-year period, making any strikes over wages or working conditions before 2017 unprotected, law firm Bowman Gilfillan partner **Graham Damant** tells *Mining Weekly*.

However, he states that there might, in the next couple of years, be wildcat strikes in the sector, as evidenced by the six-day strike at platinum-group metals producer Northam Platinum's Zondereinde mine, in Limpopo, last month.

Damant states that last year's protracted strike, organised by AMCU, had a material and significant impact on labour relations in not only the platinum sector but also the larger South African mining industry, and "highlighted serious weaknesses in the way in which organisational rights and collective bargaining rights are regulated in South Africa".

He states that the strike, which ended in June, makes it evident that better regulation is needed to control rivalries between competing unions, as well as the interplay between centralised and decentralised collective bargaining.

In addition, mining houses also need to focus more on workplace relationships to enable them to deal with the disparate interests of workers in-house.

> Collective bargaining needs to be brought closer to the coalface
>
> – JOHN BRAND

Damant points out that unions operating in South Africa can acquire organisational rights only when it represents 30% or more of the workers employed by a company. "With tens of thousands of employees at mining companies this means that very important interest groups might be neglected."

Bowman Gilfillan consultant **John Brand** notes that "collective bargaining also needs to be brought closer to the coalface", attributing this to a need to recognise specific bargaining units with an identity of worker interest, and to permit union representatives to represent those interests at company level.

He points out that there is also a need to promote the tenets of industrial democracy in companies. Employers need not wait for legislation to achieve these goals, as employers can change "the way they structure organisational rights and the structures that they engage in during collective bargaining".

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## ZONDEREINDE STRIKE

- About 5 200 National Union of Mineworkers (NUM) members embarked on an unprotected strike at Northam Platinum's Zondereinde mine last month.
- The NUM members were protesting against what they claimed was a transgression of employment equity policies and the unfair dismissal of several workers, in addition to demands relating to disruptions and sick leave issues.
- Northam obtained an urgent Labour Court interdict to force the striking employees to return to work or risk dismissal; however, the next day, only 40% of the striking workforce returned.
- NUM spokesperson **Livhuwani Mammburu** told *Mining Weekly* that the striking workers had been briefed at a mass meeting on the implications of extending the strike action in light of the interdict, but had elected to continue with the industrial action.
- The six-day strike, which ended after the workers accepted a draft memorandum, cost the company 1 000 oz/d in platinum-group metals production – equating to a revenue loss of R11.5-million a day – with workers forfeiting some R2.4-million a day in wages and benefits.

Pictures by Chief Photographer Duane Daws

**NO STRIKES FOR 2015?**
Any strikes over wages or working conditions in the platinum sector before 2017 will be unprotected

# Platinum-based fuel cell technology successfully powers 34 houses

DAVID OLIVEIRA | WRITER

Platinum mining major Anglo American Platinum's (Amplats') platinum-based fuel cell, 12-month mini-grid trial in the Naledi Trust community, in the Moqhaka municipality of the Free State, has successfully supplied low-cost electricity to the 34 participating households.

Amplats precious metals market development head **Kleantha Pillay** notes that the 15 kW system has made about 99% of its capacity available to the community since the inception of the project in July last year.

The system comprises three 5 kW fuel cells, which are manufactured by Canada-based Ballard Power Systems and integrated into a power generation system that includes batteries, direct- to alternating-current inverters, controls and a methanol fuel supply tank.

Fuel cell mini-grid systems offer several benefits to communities with low- to medium-density energy requirements

– KLEANTHA PILLAY

Each fuel cell also has its own methanol reformer and about 6 g of platinum, which acts as a catalyst to generate electricity from the methanol fuel source.

Pillay states that, with the aid of batteries, the solution can generate up to 70 kW.

The fuel cell mini grid is a complete off-grid and automatic solution, the first of its kind in the world, Amplats says.

The technology employs a telemetric data-logging and warehousing solution, which allows for near-real-time remote monitoring of system operations from three continents.

The telemetric system can also be programmed to schedule maintenance, detect faults and schedule fuel supply delivery.

Amplats states that the fuel cell mini grid provides the households forming part of the pilot project with sufficient electricity for lighting, cooking, refrigeration and charging laptops and cellphones, as well as using radios and television sets.

Pictures by Chief Photographer Duane Daws

NALEDI TRUST COMMUNITY
Thirty-four participating households in the community, in the Moqhaka municipality of the Free State, have been receiving low-cost electricity

Pillay notes that fuel cell mini-grid systems offer several benefits to communities who have low- to medium-density energy requirements, with the systems specifically suited to communities comprising 50 to 200 households that are between 8 km and 22 km from existing power infrastructure.

"Despite government's aggressive plans for expanding power capacity and extending transmission lines in South Africa, there are still about 1.3-million rural households without access to electricity.

"Extending an existing grid comes at significant costs, particularly in difficult terrain. Add to this the power capacity issues that the country is facing and it is clear that both grid and nongrid technologies will have to play a part in rural electrification," she elaborates.

Platinum-based fuel cell mini grids have a more attractive levelised cost of electricity, compared with diesel-fuelled power generation, as the cost of diesel is about twice as much as the HydroPlus methanol fuel used at the Naledi Trust project.

Diesel generators also have a relatively short life, compared with an equivalent fuel cell system, as diesel generators require more frequent replacement. In addition, fuel cells are significantly cleaner and environment friendly.

Pillay points out that platinum-based fuel cell technology offers Amplats a means of developing a new market for the precious metal, which will help improve demand for platinum-group metals (PGMs).

"Ensuring that PGM producers have sustainable markets for the metals is key to ensuring a sustainable PGM mining industry. Developing markets helps ensure the future of PGM mining operations and secures tens of thousands of direct mining jobs that the industry supports."

Amplats and its partner, Ballard, have invested $20-million in the development of mini-grid fuel cell technology.

Pillay highlights that the success of the Naledi Trust trial will go a long way towards helping government realise its objectives, particularly regarding beneficiation, local manufacturing and job creation.

"The window of opportunity to establish South Africa as a fuel cell manufacturing hub is open now," she avers, pointing out that the fuel cell system operating in the Naledi Trust was designed and integrated by South African engineers, while the site work and the installation of the system were contracted out to local suppliers.

Further, the mini grid and reticulation work was also carried out in South Africa and the methanol tanks were locally sourced. Local companies will handle operations, maintenance and refuelling for the duration of the trial.

Pillay suggests that public procurement or government commitment to the use of fuel cell systems, as an alternative to electricity supplied from the national grid, is key to the successful deployment of the technology and the creation of a local fuel cell industry.

"The most important step now is for the country to develop a procurement strategy for fuel cell mini grids and to recognise how implementation can lead to the establishment of the desired outcomes," she concludes.

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• From page 24
a 50% share in the Mototolo mine, in Limpopo; and a 25% stake in Lonmin, also in the North West, have also contributed to the uncertainty of platinum supply.

Further, Cowley states that the age and depth of many existing mines, poor productivity and complex labour relations are major challenges faced by the PGMs sector, but that new infrastructure development, combined with the implementation of methods to improve productivity, such as mechanisation and changes in shift patterns, might help to mitigate these challenges.

Meanwhile, she tells *Mining Weekly* that, despite the platinum production losses in 2014, the dollar price of a typical basket of South African PGMs fell last year, as the depreciating rand acted as a hedge for the local PGMs sector against the dropping dollar price. However, she asserts that any gains incurred from rand-denominated prices have been cancelled out by increased labour and other costs.

"PGM destocking by producers helped to mitigate the impact of the strike on PGM supplies to the market and we estimate that during the first half of 2014, producers shipped more than 500 000 oz of platinum and smaller amounts of other PGMs from in-process and refined inventories," Cowley notes.

She points out that industrial demand for PGMs remained firm in 2014, owing to unusually high demand from the global chemicals industry.

Further, platinum sales to the automotive industry were positive, resulting from increased diesel car sales in Europe and the implementation of Euro VI legislation on light- and heavy-duty vehicles. The demand for platinum jewellery dipped slightly last year, compared with record levels achieved in 2013, however, the Chinese market remains robust.

Cowley states that, in 2014, there were temporary shortages of palladium sponge, which is used for autocatalyst production and other industrial applications. To meet demand from automotive and industrial customers, fabricators and refiners converted several hundred thousand ounces of palladium ingot into sponge in the same year.

She warns that the platinum market is likely to be in deficit again this year, regardless of improvements in primary supply. "Gross demand for platinum totalled 8.5-million ounces last year and we expect this figure to increase in 2015 as a reflection of gains in the autocatalyst sector, particularly in Europe, and as we expect further improvements in industrial purchasing."

Cowley asserts that platinum miners will be hard pressed to make sufficient returns from mining output, owing to current platinum prices, which were at about $1 270/oz at the time of going to print.

## Upcoming Projects

Cowley avers that, despite the difficulties facing the industry, several PGM mining projects are under development in South Africa. "In the short to medium term, the largest potential for expansion is on the western limb of the Bushveld Complex."

Platinum projects currently under way on the western limb of the Bushveld Complex include midtier platinum miner Platinum Group Metals' Western Bushveld Joint Venture (WBJV) mine, which it owns in conjunction with Amplats and management consultancy Africa Wide. The WBJV mine has a production target date of 2016.

Other upcoming projects include Chinese-backed emerging platinum producer Wesizwe Platinum's Bakubung mine, in Rustenburg, which will start production in 2019, and the construction of the Styldrift mine by midtier platinum miner Royal Bafokeng Platinum, adjacent to its existing Bafokeng Rasimone operation, in Rustenburg.

Cowley notes that there are also plans to increase production at mines on the northern limb of the Bushveld Complex, including the expansion of Amplats' Mogalakwena opencast mine, in Limpopo.

MINING WEEKLY COUPON ON PAGE 19 E357585

# Mechanisation, automation only answer

DAVID OLIVEIRA | STAFF WRITER

Mining companies should consider more carefully the way in which they operate to ensure that mineworkers are out of harm's way, says resource consultancy VCI partner **Gideon Malherbe**, adding that embracing new and better mining methods, particularly mechanisation and automation, is the only real structural answer to a safe and low-cost mining system.

**HUMAN INVOLVEMENT**
The majority of platinum mines are labour intensive, raising safety concerns for the people working underground

He cites platinum miner Anglo American Platinum's (Amplats') Mogalakwena openpit mine, in Limpopo, as the "sector's leader in forward-leaning mining development", as production at the mine "shows the value of pursuing advanced technology solutions to mining challenges". The mine has an ore resource of 1.1-billion tons and produces 11-million tons of platinum a year.

Amplats reported last month that the average daily tons mined at the operation, which has been mechanised since inception, increased by 79%, to 297 t, in the fourth quarter of 2014, compared with the average daily tons mined in the first quarter of that year.

The dramatic increase in production can be attributed to the ramp-up after the five-month-long platinum-sector strike, organised by the Association of Mineworkers and Construction Union, which stalled South African platinum production last year.

Mogalakwena is the lowest-cost producer of platinum-group metals (PGMs) in the world and has generated an operating-free cash flow of R10-billion over 5.5 years at margins of up to 40%.

Malherbe notes that, despite the economic success of Mogalakwena, the majority of platinum mines are still labour intensive, which raises safety concerns, owing to the significant amount of human involvement in mining activities.

"Technology has progressed to a point where we can use autonomous equipment instead of humans without endangering any lives."

• To page 30

# Platreef PFS underpins 'excellent' economics – Ivanhoe

NATASHA ODENDAAL | SENIOR CONTRIBUTING EDITOR ONLINE

The prefeasibility study (PFS) of TSX-listed Ivanhoe Mines' Platreef project demonstrates the robust nature of the latest major new mechanised underground platinum mine, near Mokopane, in Limpopo, Ivanhoe executive chairperson **Robert Friedland** stated last month.

Ivanhoe aims to develop the Platreef platinum, palladium, rhodium, gold, nickel and copper mine in three phases, with an initial production rate of four-million tonnes a year to establish an operating platform to support future expansions.

The latest study confirms the "excellent" economics and technical viability of the low-cost operation, Friedland says of the mine that will eventually expand production to eight-million tonnes a year, before reaching a steady-state 12-million tonnes a year in the third phase.

The PFS – an important milestone in Ivanhoe's planned transformation of the Platreef discovery into one of the pre-eminent South African platinum-



**MOGALAKWENA**
The mine is the lowest-cost producer of platinum-group metals in the world, generating an operating-free cash flow of R10-billion over 5.5 years

• From page 29

Further, he states that the costs of efficiently operating labour-intensive shafts are "beyond the time and social parameters of a modern mining industry. People cannot be expected to work even harder in the current underground mining conditions".

Malherbe points out that European and US mining houses are considering the development of digital intensity measurement technology to gauge mining productivity. However, some PGM producers are still focused on resolving labour-intensity challenges, further impacting on mine safety. He attributes this to the focus of PGM producers on improving worker safety, instead of trying to limit the number of people exposed to dangerous structures and equipment underground.



MINING WEEKLY COUPON ON PAGE 19 E357583

Picture by Chief Photographer Duane Daws

**ROBERT FRIEDLAND**
The prefeasibility study of Ivanhoe Mines' Platreef project demonstrates the robust nature of the new mechanised underground mine

group metals producers – covers the first phase of development, including the construction of an underground mine, concentrator and other associated infrastructure to support initial concentrate production by 2019.

Ivanhoe estimates a preproduction capital cost of $1.2-billion, including $114-million in contingencies, to deliver the first phase operation of 433 000 oz of platinum, palladium, rhodium and gold (3PE+Au), in addition to 19-million pounds of nickel and 12-million pounds of copper a year. The PFS, which shows Platreef ranked at the bottom of the cash-cost curve, at an estimated $322/oz of 3PE+Au, net of by-products, indicates that the project would deliver an after-tax internal rate of return of 13% and a payback period of less than seven years.

The expected after-tax net present value is $972-million, at an 8% discount rate.

The group will kick off a feasibility study on the four-million-tonne-a-year Phase 1 and a PFS on the eight-million-tonne-a-year Phase 2 in the near future.

Ivanhoe notes that, as Phase 1 is developed and commissioned, there will be opportunities to refine the timing and scope of subsequent phases of expanded production.

## Skills Training

Over the next five years, Ivanhoe plans to inject R160-million into its social and labour plan, with R67.2-million allocated for the development of job skills among local residents and R87.7-million set aside for local economic development projects.

The planned Platreef mine will require about 2 200 workers over the first four years of operations.

"We will run training programmes to prepare young people to qualify for jobs in what will be a world-scale, mechanised mine," the company states, adding that Ivanhoe will build a R26-million community skills development and training facility in Mokopane to establish a base of qualified, local candidates for jobs at the mine and its associated minerals processing plant.

The Mining Qualifications Authority of South Africa will accredit the facility, which will also equip learners with portable skills to help enable them to become self-employed or to be productively employed in sectors other than mining, such as construction or agriculture.

There are also plans to launch five local economic development projects, which will result in the creation of 820 jobs – 660 of which are for unskilled and semiskilled candidates.

# Platinum production to be supported by global automotive sales

DAVID OLIVEIRA | WRITER

Demand for platinum-group metals (PGMs) remains highest from the catalytic converter and jewellery markets, says resource consultancy VCI partner **Gideon Malherbe**, pointing out that China's automotive sector is expected to have another record-breaking year in 2015 and car sales in the US are expected to maintain a growth trajectory, based on data from US-based automotive industry body National Automobile Dealers Association and US automakers, such as Ford, GM and Chrysler.

He notes that the automotive sales in these countries maintained momentum throughout 2014, with the trend expected to continue in 2015.

"Automotive sales will keep growing in 2015 on the back of favourable economic conditions, particularly with automotive production increasing in the US and Europe."

He highlights that China's market share of global vehicle production, which was under 4% in 2000, increased to 25% in 2013, adding that the country's automotive sector will continue to expand as wealth distribution reaches more of its citizens, enabling them to enter the market by buying new automotives.

"The new Euro VI emissions standards that came into effect last year are forcing Chinese automotive manufacturers to increase the amount of platinum used to manufacture catalytic converters, a trend I expect to continue as the Chinese government tries to tackle the country's critical pollution crisis," Malherbe states.

He adds that China's demand for platinum jewellery represents about 65% of the world's total demand and, as disposable income becomes more available to Chinese consumers, gold and platinum jewellery sales will increase.

**CHALLENGING**
The year 2014 was tough for platinum producers, with falling prices testing miners' profit margins

Meanwhile, demand for South African-produced platinum is also expected to increase this year, owing to increased sanctions on Russia and stricter carbon-emission restrictions in Europe, states Malherbe.

Malherbe asserts that the increased economic sanctions imposed on Russia – the world's second-largest producer of platinum – by the US and European nations, could result in supply shortages of PGMs.

However, he suggests that hidden stockpiles of palladium could surface, should such a supply shortage become a reality.

PGMs demand will further increase because of more stringent European Commission emission restrictions, particularly with the adoption of Euro VI standards last year, which Malherbe notes "substantially tightens nitrogen oxide (NOx) emission limits for diesel vehicles", resulting in the need for improved platinum-based auto catalyst technology.

Euro VI standard technology reduces NOx emissions by 75%, compared with Euro V standard engines.

### Platinum-Sector Strike

Malherbe tells *Mining Weekly* that, despite platinum supply losses of 1.2-million ounces, valued at about R2-billion, owing to the five-month-long platinum strike organised by the Association of Mineworkers and Construction Union in January last year, the price of the precious metal surprisingly dropped sharply in the second half of 2014, ending the year slightly above the $1 200/oz mark.

He explains that, although platinum prices increased, the improved platinum price was capped, owing to larger-than-expected platinum stockpiles, which were secured during previous years of weak demand and held by platinum mining companies.

Meanwhile, the significant drop in platinum production contributed to South Africa's contracted gross domestic product growth in the first quarter of last year, which decreased at a yearly rate of 0.6%, notes Malherbe.

"South Africa has 80% of the world's platinum reserves and produces about two-thirds of the world's platinum supply; therefore, platinum mining majors Anglo American Platinum (Amplats), Impala Platinum and Lonmin not producing platinum for five months during the strike caused a significant drop in supply." Malherbe points out that the strike adversely impacted on not only mining companies and the South African economy but also local small business owners and mineworkers who lost close to $1-billion in wages.

"Overall, 2014 was a tough year for platinum producers, with falling prices testing miners' profit margins. Even strong sales in the global automotive sector did little to raise platinum prices," he states, noting that platinum mining major Amplats estimated that it had lost more than $1-billion in revenue, notwithstanding the overhead costs the company incurred during mine closures caused by the strike. Despite the significant production losses incurred last year, Malherbe remains positive, stating that the platinum sector is on the road to recovery. "The opportunity cost of the strike was too high to recover in such a short period. However, risks still remain, as slower economic growth or a drop in the gold price could drag platinum down with it," he warns.

MINING WEEKLY COUPON ON PAGE 19 E357581

The young man knows the rules, but the old man knows the exceptions.

# Bakubung closes 2014 with another milestone

Picture by Chief Photographer Duane Daws

**BAKUBUNG MINE**
During 2015, Bakubung will start its waste development programme and Phase 2 of the power supply project, commission the bulk-water supply and embark on key shaft bank installations

JSE-listed Wesizwe Platinum reached another milestone at its flagship Bakubung platinum mine project, in the North West, in December last year, despite facing labour tensions in the platinum belt during 2014.

Continual progress was made in sinking the main and ventilation shafts at the project, with the intersection of the Merensky reef a mere 11 m away from the current level of the main shaft.

The intersection of the secondary upper group two reef was expected to be reached soon.

Meanwhile, the ventilation shaft, which will reach its final depth of 880 m in September 2016, is almost five months ahead of schedule.

The implementation of an adopted optimisation plan early in 2014 ensured that the mine, boasting a 30-year life-of-mine, will undergo its main commissioning in the fourth quarter of 2018, before being ramped up to full production in 2020.

A feasibility study has also started on the first phase of the housing project, which will consider off-balance-sheet funding options.

Bakubung will also shortly start construction of the access roads for the mine.

During 2015, Bakubung will start its waste development programme and Phase 2 of the power supply project, commission the bulk-water supply and embark on key shaft bank installations.

The Bakubung platinum mine project, formerly known as the Frischgewaagd-Ledig project, is located in the western limb of the Bushveld Igneous Complex, north of Rustenburg.

The project entails the construction of a platinum-group metals mine on Wesizwe's core assets.

The project will consist of an underground mine and takes into account the establishment of all surface infrastructure, servitudes for bulk power and water supply, the sinking and equipping of ventilation and main shafts, the associated underground infrastructure, the ancillary excavations and the access development to establish a footprint for full production.

The mine is specifically designed for optimum flexibility in terms of mining method – conventional, mechanised or hybrid – and allows for fast production build-up to enhance the project's shareholder value.

An optimisation study has increased mine capacity by 8.7% to 255 000 t/m of run-of-mine ore at full capacity.

According to the optimisation study, the control budget estimate of nominal capital expenditure is also expected to decrease from R12.03-billion to R10.69-billion.

# Mupfuti to reach production early 2015

ZIMBABWE-based platinum producer Zimplats' Mupfuti mine was on schedule to reach design production capacity early this year, the company said in October last year, reporting that its Ngezi Phase 2 expansion project was progressing well.

The $460-million, Phase 2 expansion, which involves the development of Portal 3 – Mupfuti, was approved in May 2010 and consists of a two-million-tonne-a-year underground mine, a concentrator module of the same capacity and related infrastructure. It is expected to increase the operation's production to 6.2-million tonnes a year.

The Phase 1 expansion project, valued at $340-million, was completed in 2009 and allowed for the simultaneous development of the 1.2-million-tonne-a-year mining Portal 1, called Ngwarati; the one-million-tonne-a-year Portal 2, called Rukodzi; the two-million-tonne-a-year Portal 4, called Bimha, at the Ngezi platinum mine; the construction of a new two-million-tonne-a-year concentrator; 715 new staff houses near Ngezi; and the upgrade of amenities in the area.

The expansion had increased the mine's overall throughput from 2.2-million tonnes a year to 4.2-million tonnes a year.

**NGEZI MINE EXPANSION**
The $340-million Phase 1 expansion project was completed in 2009 and allowed for the simultaneous development of mining Portals 1, 2 and 3

Cat philosophy: It doesn't hurt to ask for what you want.



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# Brucejack mine

**Name:** Brucejack mine.
**Location:** The Brucejack mine project is located about 65 km north of Stewart, in north-western British Columbia, Canada.
**Controlling Company:** Pretium Resources (Pretivm).
**Brief History:** The Brucejack property and surrounding region have a history rich in exploration for precious and base metals dating back to the late 1800s. In 2009, Silver Standard began work on the property. The 2009 programme included drilling, rock-chip and channel sampling, and resampling of historical drill core. In 2010, pursuant to a purchase and sale agreement between Silver Standard (as the seller) and Pretivm (as the buyer), Silver Standard sold to Pretivm all of the issued shares of 0890693 BC – the owner of the project – and the adjacent Snowfield project.
**Brief Description:** Brucejack is part of a largely unexplored land package of more than 103 000 ha. The focus of the project is the Valley of the Kings (VOK), which comprises high-grade visible gold stringers within a lower-grade gold quartz stockwork system. The mine is expected to produce 7.27-million ounces of gold over an 18-year mine life, and commercial production is scheduled for 2017.
**Geology/Mineralisation:** The Brucejack deposit is considered to be a transitional to intermediate sulphidation epithermal stockwork vein system-hosted gold/silver deposit that was developed in a dynamic extensional basin. It is likely associated with a deeper porphyry system that developed within an active island arc tectonic setting.

The property is largely underlain by volcano-sedimentary rocks of the Lower Jurassic Hazelton group. These rocks unconformably overlie volcanic arc sedimentary rocks of the Upper Triassic Stuhini group along the westernmost part of the property.

Gold/silver mineralisation is hosted in predominantly subvertical vein, vein stockwork, and subordinate vein breccia systems of variable intensity. The vein/stockwork systems display parallel and discordant relationships to stratigraphy. These systems are relatively continuous along strike, from tens of metres to several hundreds of metres.

Several mineralisation zones have been explored to varying degrees, including (from south to north): the Bridge zone, the VOK zone, the West zone, Gossan Hill, the Shore zone, and the SG zone.

High-grade gold mineralisation in the VOK, the current focus of the project, occurs in a series of west-north-west and subordinate west-southwest-trending subvertical corridors of structurally reorientated vein stockworks and vein breccias. Stockwork mineralisation displays discordant and concordant relationships to the volcanic pile stratigraphy. Gold is typically present as gold-rich electrum within deformed quartz-carbonate vein stockworks, veins and subordinate vein breccias.

Recent underground exploration conducted as part of the bulk sample programme confirmed the location of corridors of stock-work-style mineralisation and the lithological contacts in this part of the deposit within the VOK.
The VOK deposit is currently defined over 1 200 m in east-west extent, 600 m in north-south extent and up to 650 m in depth below the topographic surface. The West zone appears to form the northern limb of an anticline that links up with the VOK in the south, and the southern limb of a syncline that extends further to the north. This zone, which is currently defined over 590 m along its north-west strike, 560 m across strike and down to 650 m in depth, is open to the north-west, south-east and at depth to the north-east.
**Reserves:** Total proven and probable reserves as at June 2014 were estimated at 16.5-million tonnes grading 14.1 g/t of gold and 57.7 g/t of silver.
**Products:** Gold and silver.
**Mining Method:** Long-hole stoping and cemented paste backfill.
**Major Infrastructure and Equipment:** The process flowsheet developed for the Brucejack mineralisation is a combination of conventional bulk sulphide flotation and gravity concentration to recover gold and silver.

The process plant will produce a gold-silver-bearing flotation concentrate and gold/silver doré by melting the gravity concentrate produced from the gravity concentration circuits. It will comprise primary crushing underground; a conveying system for crushed ore; primary grinding gravity concentration; rougher/scavenger flotation; bulk flotation concentrate regrinding and gravity concentration; cleaner flotation; gravity concentrate smelting to produce dore; flotation concentrate dewatering, bagging and load out; and tailings disposal to the tailings impoundment or to the underground mine for backfilling.
**Prospects:** Pretivm has contracted AMEC Americas to provide the engineering, procurement and construction management services for the Brucejack mine project.
**Contact Person:** VP, corporate relations Michelle Romero.
**Contact Details:**
Pretivm Resources,
tel +1 604 558 1784,
email invest@pretivm.com,
website http://www.pretivm.com.

Compiled by Sheila Barradas

GOLD

# Trial Run

## Australian company starts trial reef residue mining in Pilgrim's Rest

JADE DAVENPORT | CORRESPONDENT

Junior gold miner Stonewall Mining, a wholly owned subsidiary of ASX-listed Stonewall Resources, has started bulk trial mining at its historic Beta mine, in Pilgrim's Rest, Mpumulanaga.

This forms part of an ambitious premined residue (PMR) project, which aims to extract and process between 17-million tons and 35-million tons of reef residue with an average grade of 1.7 g/t that was left behind by the original Pilgrim's Rest miners during the previous century.

According to the conceptual ounces calculated by the independent competent person, Stonewall's PMR project has a minimum target of 720 000 oz of gold, but could produce as much as 2.4-million ounces. Further, the figures released estimate that the cost of executing the project will be $753/t, significantly lower than conventional underground mining costs.

Stonewall Mining CEO **Lloyd Birrell** explains that he low cost of production is a result of the fact that the reef residue is pre-explored, predeveloped, has been drilled and blasted and is oxisidised.

"We are currently using scraper winches to extract the reef residue from the stopes. We will then vacuum out the remaining fine material. That material is being transported a short distance to our Donald Liston plant, in Pilgrim's Rest, for processing and smelting," says Birrell.

The bulk trial mining phase of the PMR project will run to the end of March, when Stonewall intends to ramp up production from 10 000 t/m to 30 000 t/m. It is expected that the company will transition to full-scale production of 80 000 t/m in the second half of the year. Following this initial mining stage, the proposed expansion of the project later in the year will give Stonewall an equivalent annual production rate of about 30 000 oz.

Birrell states that the perception that the Pilgrim's Rest goldfield is marginal, complex and largely mined out is inaccurate.

"The reef residue that was left behind in the stopes of the mines by the original miners represents the last large and easily accessible oxisidised gold resource in South Africa. If our mining capability is equal to the task, there is absolutely no reason why we could not target significant ounces at a low cost," states Birrell.

Stonewall Mining, which Birrell founded in April 2010, acquired the mining rights for the Pilgrim's Rest area when it bought the historic subsidiaries of Transvaal Gold Mining Estates (TGME) and Sabie Mines from Simmers & Jack in September 2010. Through that purchase, Stonewall Mining acquired seven mining rights and six prospecting rights extending over an area of 62 000 ha from Bourkes Luck, in the north, to Sabie, in the south. This extensive mining right area, which has a Joint Ore Reserves Committee- (Jorc-) compliant resource of 2.99-million ounces, includes 43 historically productive mines, which produced well over six-million ounces of gold in the last century.

Birrell elaborates that, when Stonewall Mining bought TGME, the company spent much time and effort exploring the old mining operations that dot the Pilgrim's Rest Valley. The company soon realised that, because of limited technology, infrastructure and accessibility, the original miners had to focus on high-grade mining, whereby visible reef would be hand-sorted and extracted, while the remaining residue would be pushed back into the stopes to act as support.

"Because the miners would pick the richest reef under very difficult conditions underground, it is estimated that they only extracted 20% of the run-of-mine and left the remainder in the horizontal stopes. However, what the old miners considered as 'waste' contains all the fine-fraction gold that could not be seen or be easily extracted with their limited technology and is a valuable resource in its own right," says Birrell. Over the past year, Stonewall Mining has taken more than 1 500 samples and assays of the premined residue from various sections within eight of its 43 mines to determine a resource estimate.

While all eight of the historical mines investigated thus far would prove payable at a working cost of $753 g/t, Stonewall Mining has opted to start the PMR project with a specific focus on the Beta mine, which is the closest to the processing plant. Beta was first mined in 1940 and production ceased in 1972. It is estimated that the mine produced 225 000 oz of gold during that time. The mine has a current Jorc-compliant mineral resource of some 531 000 oz at a grade of between 3.10 g/t and 4.86 g/t, which is independent of the reef residue material.

DIAMONDS

# Petra declares dividend, ups diamond production guidance

MARTIN CREAMER
EDITOR

LONDON-listed diamond mining company Petra Diamonds, which last week declared its first dividend, has pushed up production guidance to 3.3-million carats for the year to June 30.

Petra, which operates the Finsch, Cullinan, Koffiefontein and Kimberley Underground diamond mines, in South Africa, and the Williamson diamond mine, in Tanzania, declared a 2p a share dividend for the full 2015 financial year.

The independent diamond mining company said it intended paying a progressive dividend as it moved through its current phase of significant capital expenditure (capex) and increasing free cash flow. Capex of $125.2-million was well up on the $85.3-million in the corresponding previous half-year (H1) and net debt well down at $45.8-million.

The company has cash in hand of $129.6-million and undrawn available debt facilities of $66.9-million.

The power issues of South Africa's State electricity utility Eskom did not represent a material risk at this point, owing to Eskom's approach of consulting prior to load-shedding, which allowed Petra to use curtailed tailings production to minimise higher-value underground production. "This strategy has ensured that there has been no material impact," CEO **Johan Dippenaar** commented.

Petra produced 1 601 069 ct in the six months to December 31, 2% less than in the corresponding previous H1.

However, revenue was up 16% to $214.8-million, boosted by the weaker rand and the sale of two exceptional diamonds for $38.7-million, which cushioned a weaker-than-usual rough diamond market.

The company achieved an average H1 value of $154/ct, compared with $130/ct in the previous corresponding H1 period.

Dippenaar said that, although there was short-term "indigestion" in the diamond pipeline, caused by liquidity, polished inventory and strong US dollar-denominated diamond prices, the Chinese New Year on February 19 would likely help firm up pricing towards June.

Expansion projects at Finsch, Cullinan and Koffiefontein were continuing to progress in line with expectations.

Increased run-of-mine (RoM) production from Finsch, Koffiefontein, Kimberley Underground and Williamson was offset by lower RoM from Cullinan and lower tailings production from Finsch and Koffiefontein.

H1 production at Finsch rose 4% to 1 013 117 ct, driven by increased throughput and grades and the higher recovery of smaller diamonds, allowing H2 guidance to be lifted by 200 000 ct.

H1 production at Cullinan fell 15% to 391 398 ct and grades below guidance to 25.8 ct per 100 t as a result of the absence of separate waste-handling facilities.

RoM production at Koffiefontein increased 6% to 9 709 ct, but overall production fell by 30%.



RA

DIGGING DEEP

# Trendy market gives new lease of life to historic Joburg mining warehouses

Jade Davenport

Johannesburg is, and has been, many things but 'historically sentimental' is not one of them. From its very establishment, the quintessential city of gold was a dynamic, constantly evolving urban settlement entirely fixated on industrial progress and wealth creation. Indeed, for the most part, the attitude of the pioneers and the many generations that have inhabited the city has been: Why waste valuable time and effort preserving the history and heritage of the city when there is gold to be mined and money to be made?

If you think this is an overly harsh description of Joburgers' attitude to their city, it should be pointed out that, at the establishment of the village back in October 1886, had a pioneer taken a brief respite from the absolute fixation on gold mining and lust for profit and accurately recorded Johannesburg's founding history, we might know, for certain, for which 'Johannes' the settlement was actually named.

Having said that, for the past few years, there have been signs that the attitude and, dare one say, pride of the city's residents to its heritage, at least as far as the preservation and reuse of historical buildings are concerned, are taking a step in a positive direction.

One need only look at the revamping of the Maboneng precinct, in the neighbourhood of Jeppestown, as a prime example of such urban renewal and the reuse of once prime industrial complexes.

The latest in this spate of urban industrial renewal, and one that is of particular relevance to this column, is The Sheds, at 1 Fox street. Located on the western limits of the city, The Sheds comprises an entire block of warehouses that were historically used for mining and industrial purposes, which have now been refurbished to create a marketplace, showcasing local goods and artisanal food and produce, surrounded by trendy eateries and bars.

What is of particular interest is the fact that The Sheds is believed to be one of Johannesburg's oldest industrial structures. According to The Shed's website, while most of the buildings on site date from the 1920s and 1940s, the centre part of the main warehouse is possibly the oldest industrial structure in the entire city, as oregon pine posts and trusses suggest that this part was built before the South African War of 1899 to 1902.

It is understood that the original shed was constructed in 1893 by **Hubert Davies** – the most renowned South African electrical engineer of the day and a man who played a central role in developing the city's power infrastructure and industrial capabilities – for storing wares for the gold mines located along the Main Reef, just a few kilometres to the south.

The warehouses are not only some of the oldest structures in the city, but they are also located in the oldest, most original area of Johannesburg – Ferreirastown, originally known as Ferreira's Camp.

One will recall that, following **George Walker** and **George Harrison**'s era-changing discovery of gold on the farm Langlaagte in February 1886, prospectors began flocking to the Witwatersrand in droves to try their luck. One of the first to arrive was Colonel **Ignatius Philip Ferreira**, a veteran prospector and one of the most renowned gold diggers in South Africa. When he arrived in April of that year, he outspanned on the farm Turffontein, not far from the site of the original discovery.

Because of his respected reputation, many of the younger prospectors, lacking experience and leadership, set up their own little campsites in the vicinity of Ferreira's own makeshift lodgings and tactically accepted his authority by referring to the settlement as Ferreira's Camp. And thus began the first settlement of Johannesburg.

The site of the mining warehouses is also believed to be the location of one of the city's original bars: a liquor licence was granted for Ferreira's Bar on this site in 1893 and for Good Luck Bar in 1895. In deference to this special piece of urban history, Good Luck Bar has been re-established within The Sheds, close to its original site. However, this trendy new watering hole will be far different in character and appearance to the original rough and ready saloon of 120 years ago. Nonetheless, it is a very nice touch.

It is understood that the warehouses, being conveniently located, were used by mining companies for over a century, with the most recent occupant being Anglo American Corporation. However, according to The Shed's website, during the last decade, most of the buildings at 1 Fox street stood vacant, awaiting redevelopment as office space. That was until two local entrepreneurs, **Jan Roode** and **Gerald Garner**, saw the potential of the buildings owned by private property developer the Johannesburg Land Company (JLC). In 2014, through their company, JoburgPlaces, they signed a long-term lease with JLC as part of their initiative to reimagine the old warehouses. Indeed, JoburgPlaces has done a superb job in refurbishing and giving a new lease on life to these quintessentially historic buildings.

Located close to the confluence of the M1 and M2 highways, just off the Selby offramp into town, and a short distance south of the Nelson Mandela Bridge, The Sheds@1Fox is accessible from all corners of Johannesburg and is proving to be a popular new attraction for locals.

It is open Thursday to Sunday every week and plans for a Phase 2 of the project, which will include permanent retail, production and entertainment spaces in the surrounding buildings, are in place.

Kudos should be given for this initiative of preserving an aspect of the city's inherent history that might otherwise crumble into oblivion.

The Sheds@1Fox is accessible from all corners of Johannesburg and is proving to be a popular new attraction for locals

*Davenport, MA(UCT), is a freelance journalist and mining historian – jade@engineeringnews.co.za*

# MININGPERSONALITY

# Anthony Bruce

## Immersive Technologies

**Full Name:** Anthony Craig Bruce
**Position:** Regional VP: Africa, Europe and the Commonwealth of Independent States, Immersive Technologies, since January 2014
**Main Activity of the Company:** Supplier of surface and underground mining equipment simulators to mitigate risk
**Date and Place of Birth:** June 18, 1965, Bedfordview, Gauteng
**Education:** Parktown Boys High, Grade 12, 1983; marketing and business management, part-time, IMM Graduate School of Marketing, Johannesburg, 1989 to 1991
**First Job:** Officer in the South African Army, 1984 to 1986
**Size of First Pay Packet:** R720 a month
**Number of People under Your Leadership:** 16
**Management Style:** Collaborative
**Personal Best Achievement:** Being MD of digital printing company Omnigraphics
**Person Who Has Had the Biggest Influence on Your Career:** My wife, who has supported my drive and ambition to succeed and is accepting of my long hours and onerous travel commitments
**Person You Would Most Like to Meet:** Richard Branson
**Businessperson Who Has Impressed You Most:** Patrice Motsepe
**Philosophy of Life:** Work hard, play hard and have no regrets
**Biggest Ever Opportunity:** Business activities with Immersive Technologies have taken me to places around the world that I would otherwise not have experienced
**Biggest Ever Disappointment:** Not studying law
**Hope for the Future:** That we can pull together as South African citizens in eradicating corruption and reducing violent crime
**Favourite Reading:** Novels by John Grisham and James Patterson
**Favourite TV Programme:** *The Good Wife* and *Game of Thrones*
**Favourite Food/Drink:** Lamb curry and good red wine
**Favourite Music:** 1980s
**Favourite Sport:** Rugby
**Hobbies:** Playing golf, watching sport, outdoor cooking on my Weber gas braai
**Car:** Audi Q5
**Pets:** Two small dogs
**Miscellaneous Dislikes:** Procrastination
**Married:** To Lee-Ann (née Backman), since 1995
**Children:** Tayla, 20; Ross, 17
**Clubs:** Kyalami Country Club

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