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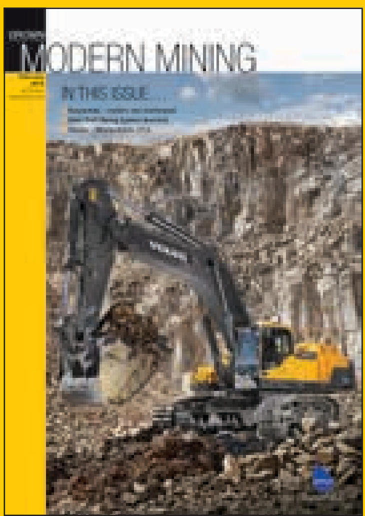

Cover

The new Volvo EC750D crawler excavator, available locally from Babcock, combines a robust design with a powerful engine for enhanced performance and a lower total cost of ownership. See page 18 for further details.

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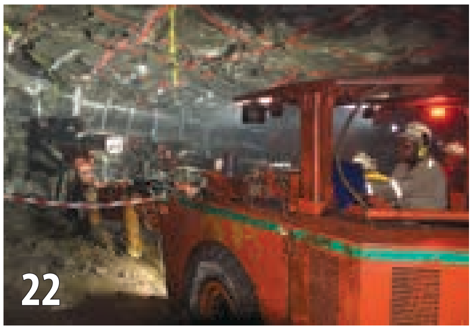

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New book highlights the **40-year history of SRK**

One of several functions that I attended at the recent Mining Indaba was hosted by SRK Consulting and saw the launch of *SRK: 40 years in the deep end*, a history of the group from its start up in the 1970s to its global presence today.

The event – held at the Shimmy Beach Club at the V&A Waterfront – was presided over by SRK's global chairman, Mike Armitage. None of the founding partners was able to be present but two of them, Hendrik Kirsten and Oskar Steffen, were on hand to sign copies of the book when it was launched internally to SRK staff late last year (see our photo). Andy Robertson, the third founding partner, left SRK in 1994 (and was last year inducted into International Mining magazine's Hall of Fame).

Mike was introduced, incidentally, by Graham Howell, who has just recently taken over the chairmanship of SRK Consulting (SA). A structural and geotechnical engineer who joined SRK in the mid-1980s, he succeeds the hugely respected Roger Dixon, who retired at the end of last year after six years as chairman but who remains at SRK as corporate consultant.

Although I cannot claim to have read the book yet, I did spend some time at the launch browsing through it and it looks like a wonderful read. It also has a fabulous selection of photos dating back to SRK's earliest days, both of the people who formed and shaped the group and of the many projects it has undertaken over the years.

I'm old enough to remember the formation of SRK – it was established in 1974 in Johannesburg – and can recall some of the early projects highlighted in the book. In those days I was editor of a civil engineering magazine and SRK was primarily a geotechnical specialist and hence I frequently found myself covering its activities. Of course, the group has subsequently diversified and become a true multi-disciplinary engineering, mining, environmental and scientific consultancy, with over 45 offices in 20 countries on six continents.

Addressing guests at the function at the Waterfront, Mike Armitage said, "Reliving SRK's past through the stories in this remarkable book has reminded us of the main reason for SRK's success – the high calibre of its people. Thrown in at the deep end and expected to swim, numerous individuals have risen to the challenge and performed at levels exceeding even their own aspirations."

One of the points that comes out in the book is that the founders were determined to break the mould with SRK. For a start, they decided that employees would own the company, being allowed to purchase shares when they joined the firm with the proviso that they would sell them back to SRK on leaving.

Then there was the relentless focus on recruiting only the best talent. "We set out to take on young people every year so that we could continually bring the latest technologies into the business," Hendrik Kirsten recalls. Oskar Steffen adds that what mattered was "getting the best people in their field … and keeping the best by giving them the freedom to grow."

I understand that *SRK: 40 years in the deep end* – which I should mention is authored by Ian Mulgrew – is very much an initiative of SRK's Vancouver office. In fact, its initial launch was in Vancouver in August last year, with Andy Robertson and other influential consultants from SRK's formative years in attendance.

Only a limited number of the books has been printed but interested readers can download a digital version from the SRK website (*www.srk.co.za*). Happy reading, if you do – I don't think you will be disappointed!

Arthur Tassell

"We set out to take on young people every year so that we could continually bring the latest technologies into the business."

SRK founders Hendrik Kirsten (left) and Oskar Steffen sign copies of the book.

Asanko starts producing a month ahead of schedule

Peter Breese (left), CEO and President of Asanko Gold, and Colin Steyn, Chairman, celebrate the production of the first gold bar (photo: Asanko Gold).

Asanko Gold Inc, listed on the TSX and NYSE, has announced first gold production of approximately 400 ounces from Phase 1 of the Asanko Gold Mine (AGM) in Ghana. This follows the successful commencement of operations of the entire processing facility one month ahead of schedule.

Commenting on this historic milestone, Peter Breese, President and CEO, said: "I am proud to announce that the Asanko Gold Mine is officially the newest producing gold mine in Ghana, with Phase 1 successfully built within our capital budget and commissioned one month ahead of schedule.

"As we embark on a new chapter for Asanko, I'd like to thank the Government and our stakeholders in Ghana for all their assistance in facilitating our transition from explorer to producer. In addition, I would like to commend my team, our EPCM contractor, DRA Global, and all the thousands of construction and service sub-contractors for delivering a well-executed project over the past 18 months.

"As we complete commissioning and ramp up to steady-state production rates, I am pleased to note the early gains that we have already achieved with respect to throughput rates and mill grind, which have exceeded our expectations. We remain confident of declaring commercial production during Q2 2016."

Commissioning of the processing facility is progressing well and is approximately one month ahead of the original schedule. The crusher was handed over by the EPCM contractor to Asanko in mid-December and was commissioned during the last half of the month. Ore was stockpiled ahead of the milling operations and introduced into the SAG and ball mills during the last week in December.

Commissioning of the mills was initially conducted on marginal grade ore until the mills achieved the designed hourly throughput rates and grind. The mills have had a number of days of continuous operations with daily milling rates matching or exceeding designed throughputs of 8 300 tonnes per day. In addition, both mills have also attained grinds that are in line with the plant design parameters.

The operations were fed low grade ores until the density built up in the fully erected and commissioned carbon-in-leach (CIL) circuit. Once this was achieved, cyanide was introduced into the CIL and gravity gold circuits and the entire operation from milling to the CIL circuit is now being run at planned feed grades. Gold inventory in the CIL circuit will continue to build up to steady-state levels over the next month, after which time full gold production rates are expected to be reached.

The development of the Nkran pit continues to advance well with full drill and blast operations continuing at long-term steady state levels. To date, over 22 Mt of material has been removed from the pit and various ore benches have been exposed. There are now enough working faces available in the pit to facilitate mining of the requisite quantities of ore at planned grades to feed the mill at designed throughput rates.

Grade control drilling is proceeding according to plan with the next six months of planned ore having been drilled and modelled into the medium term mine plan. The grade control-based mine plan for 2016 is expected to be in-line with the Definitive Project Plan, which was published in November 2014.

The Asanko plant area showing the pre-leach thickener (photo: Asanko Gold).

Maseve produces its first concentrate

Platinum Group Metals, listed on the TSX and NYSE, reports that Maseve (formerly the WBJV Project 1 Platinum Mine) near Sun City in the Western Bushveld has successfully completed its 72-hour run test during hot commissioning of its concentrator facility. The mine has produced its first concentrate for delivery to Anglo Platinum's Waterval smelter.

"It is very satisfying to see the first concentrate produced and to participate in the commissioning of mine systems from the underground conveyor, into the ore silo, through the mill, flotation and filter press to final product," comments R. Michael Jones, CEO and co-founder of Platinum Group. "Our focus now is to aggressively ramp up our production profile and we have a good team of qualified people in place to do this safely and efficiently."

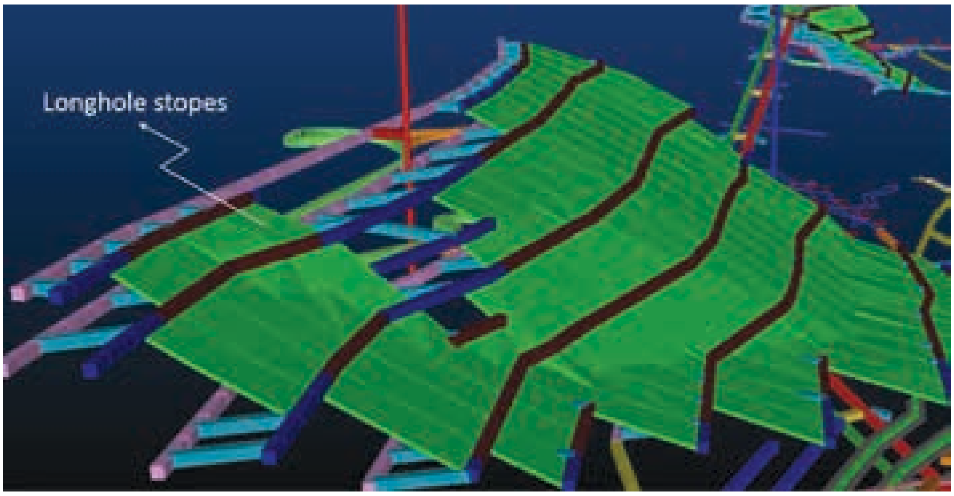
Approximately 2 226 people are on site and all key management roles for the oversight, training and safe operation of contract mining, mill and tailings have been filled. Surface infrastructure including warehouses, workshops, change houses, tailings facility and connections for power and water are all complete. Normal systems analysis, adjustments, and tuning work will be completed from the results of the 72-hour test run, after which the mill and concentrate recovery plant are expected to return to a 24-hour per day operation.

According to Jones, the mine management team, EPCM contractor DRA and all of the construction team are to be congratulated for a good safety record while construction was completed generally in line with the company's updated guidance over the past three years.

Mine development continues with approximately nine different headings accessing the Merensky Reef from both the North and South declines. Following the established mine plan, the focus over the next two to three months will be on expanding available stoping areas and mining.

Mining methods will vary per mining area with conventional, hybrid, longhole and bord and pillar methods all being employed. Some planned mining methods have changed as local conditions require. Grade and thickness correlations from underground development have been good and areas outside the resource model have been developed on reef. Changes in dip angles and minor faulting (less than 10 m) have slowed some of the ramp up profiles and new areas are being opened that may add to the ramp up profile.

"We all look forward to applying our experience in engineering and mine building to our new much larger discovery at Waterberg. The Waterberg deposit is very shallow, like the Maseve mine (140 m from surface), and can be accessed by declines and offers thicknesses of 3-60 m in the mine design," says Jones.



Maseve will be using four different mining methods. The longhole stoping mining layout is shown here. Note that the extraction ratio is variable depending on the length of the stope.

Turner & Townsend contributes to rehabilitation project

Global programme and construction consultancy Turner & Townsend is providing quantity surveying expertise as part of a major programme by the South African government to close and rehabilitate some 660 abandoned asbestos mines and shafts in various regions around the country.

"So far we have worked with the SRK Consulting team on nine abandoned asbestos mine sites in the Northern Cape, KwaZulu-Natal and Limpopo," says Gordon Bulmer, senior quantity surveyor of Turner & Townsend. "With three of these now closed and completed, we are currently involved on a further six mine sites, while we are preparing tenders on another three, with possible additional projects in the pipeline.

"It is a privilege to work on projects of this nature and scale, which will make a difference to the health and safety of communities and the environments surrounding the mines. Apart from the well-researched health issues of asbestosis, a chronic lung disease, some of the mines are located next to water courses which posed further environmental and health risks.

"The projects vary in complexity. Therefore a key requirement of being awarded the bid for the asbestos mines was our ability to provide the highest standard of quantity surveying expertise in a flexible and agile way. SRK Consulting's confidence in our professionalism is testimony to our global reputation in this field."

The rehabilitation programme falls under the Department of Mineral Resources, which appointed Mintek to provide the professional project management.

SRK Consulting has taken the engineering design lead on these projects over the past three years, as a sub-contractor to Mintek, delivering the conceptual design, final design, quality control and project management. Chosen for its international track record and world-leading expertise, Turner & Townsend has been selected by SRK as one of the teams supporting the ongoing government programme.

"We are involved in these projects from the very outset when the engineer draws up the preliminary design, from the point of preparing the tender document and putting a price to it for budgeting purposes, and again to financially manage the project. This includes making monthly payment assessments, evaluating any changes in design or unexpected site conditions, through to final project completion," says Bulmer.

Gem Diamonds 'downsizes' production at Ghaghoo

In its latest trading update (covering the three-month period to 31 December 2015), LSE-listed Gem Diamonds says that it is downsizing production at its Ghaghoo mine, located in the Central Kalahari Game Reserve in Botswana.

During the period, Ghaghoo treated 85 046 tonnes and recovered 24 294 carats, achieving a recovered grade of 28,6 cpht – which is above the reserve grade. The majority of the ore treated during the period was sourced from tunnels 1 to 5 on Level 1. During the period, 503 m of tunnelling was completed with development well advanced in the next series of tunnels on Level 1.

Following the sealing off of the water fissure on Level 1, the planned intersection on the decline to Level 2 has also been sealed.

As part of the treatment plant optimisation, a 100 tonne per hour surge bin, positioned ahead of the autogenous mill to enhance the mill's performance, was commissioned on 21 January 2016. Post commissioning, the plant achieved its targeted treatment rate of 2 000 tonnes per day, confirming the plant's ability to run at its nameplate capacity of 60 000 tonnes per month.

A parcel of 49 120 carats was sold for US$7,4 million in December 2015 (US$150 per carat), bringing the total average US$ per carat achieved for the year to US$162 per carat.

Based on the prices achieved in the December 2015 sale and the currently depressed state of the rough diamond market for Ghaghoo's production, Gem says that various options have been reviewed with the aim of minimising operating losses during 2016. "It is considered prudent to downsize current production to achieve a modified target of approximately 300 000 tonnes for 2016," says the company.

Gem also notes that underground mining conditions experienced during the development phase at Ghaghoo have continued to be difficult. At the end of November 2015, caving at the end of tunnels 2 and 3 propagated through to surface. Although this was anticipated to occur as the volume of ore extracted underground increased, it occurred some six months earlier than expected. Due to the safety procedures in place, no injuries were sustained nor was there any damage to equipment and operations at the mine continued. Actions required to create a buffer zone to limit sand dilution were put in place, and underground mining was then resumed.

It has now become apparent that the area subject to dilution risk is greater than originally advised and the buffer zone has been increased following reassessment by management, and confirmed by independent experts. This will result in the deferment of extraction of approximately 300 000 tonnes of ore.

Reverting back to the original Phase 1 production levels of 60 000 tonnes per month, or expanding beyond that production level, will be largely dependent upon an improvement in the diamond pricing environment. Options are being assessed to expand the operation in order to achieve acceptable financial returns, as and when diamond prices improve.

Workers exiting the Ghaghoo underground mine in Botswana's Central Kalahari (photo: Gem Diamonds).

New copper discovery near Kamoa in the DRC

TSX-listed Ivanhoe Mines has announced that the Kamoa exploration team has made what it describes as "a new tier-one, high-grade and flat-lying stratiform copper discovery, ideally situated for low-cost mechanised mining" in the Kakula exploration area, approximately 5 km south-west of the currently defined resources at the Kamoa copper deposit in Katanga in the DRC.

The Kakula discovery is situated within the 400 km^2 Kamoa mining licence area and represents a major extension of the Kamoa copper deposit, which the company discovered in 2008. The Kamoa copper project is a joint venture between Ivanhoe Mines and Zijin Mining.

Two exploration drill holes completed in late 2015 in the Kakula exploration area – DKMC_DD996 and DKMC_DD997 – rank among the highest-grade and highest-grade-thickness intersections drilled to date within the Kamoa copper deposit licence area.

DKMC_DD996 intersected 24,16 m (24,13 m true width) of 3,48 % copper at a 1 % copper cut off. At a higher cut-off of 2 % copper, the intersection was 13,16 m (13,14 m true width) of 5,26 % copper.

DKMC_DD997 intersected 18,75 m (18,47 m true width) of 4,64 % copper at a 1 % copper cut-off and 15,17 m (14,94 m true width) of 5,33 % copper at a 2 % copper cut-off.

"The Kamoa copper deposit already is distinguished as the world's largest, undeveloped, high-grade copper discovery," said Robert Friedland, Ivanhoe's Executive Chairman. "The Kakula discovery has the combination of significant thickness, high grades and strike length that holds promise for significant and rapid expansion of the Kamoa copper deposit.

"The Kakula discovery not only shows the potential to substantially increase the size of the Kamoa copper deposit but also highlights the potential for new discoveries to the west of Kolwezi in the Congolese copperbelt."

South African consultancy to assist in delivering Zambian gold project

Following its recent acquisition of the historic Matala and Dunrobin gold mines in Zambia and as part of its intention to move quickly towards becoming a gold producer, AIM-listed Alecto Minerals reports that it has entered into an agreement with South African-based consultancy group PenMin to assist in delivering the next stage of the Matala gold project. PenMin reportedly has extensive knowledge of Matala and Dunrobin.

PenMin will update and finalise the historic Definitive Feasibility Study (DFS) prepared by Coffey Mining and a works programme for Matala and will prepare the Design, Build and Operate (DBO) contract (to FIDIC Gold Book standards) for the project. This will exclude the mining elements of the project but will include the supply of the process plant and mining infrastructure components such as workshops, wellfield, earthworks and roads.

PenMin will also assist with the mining contract. It is anticipated that the mining contractor will finance the cost of supplying and operating the mine fleet, which will serve to reduce the initial capital required to begin mining operations at Matala.

The Matala and Dunrobin gold mines are located in a licence area of south-central Zambia dominated by the Mwembeshi Shear Zone, which incorporates the geologically complex Matala Dome, an elongated east-northeast dome parallel, or sub-parallel, to the trend of the shear.

Alecto has identified the potential to develop a low-cost, profitable, small-scale 400 000 t/a open-pit mine at Matala and satellite deposits, targeting the oxide and transitional ore and using a simple crushing, milling and gravity circuit with subsequent direct cyanidation. ■

Cupric Canyon appoints Exploration VP

Cupric Canyon Capital has promoted Catherine Knight to the position of Vice President of Exploration and Resource Development.

Dennis Bartlett, Cupric's CEO, said, "We believe that Cathy's technical expertise and achievements speak for themselves. Her increased responsibilities will be a definite asset to the company and will assist with the rapid progression of our ongoing exploration programmes."

Knight began her career in 2002 with Bema Gold as an exploration geologist. She has several years' experience as a senior geologist in mineral exploration, mining, feasibility and development working on projects located in Canada, Russia, Mexico, South Africa, Botswana and Namibia.

Since 2010, she has worked on the Khoemacau copper mining project in Botswana, which was acquired by Cupric Canyon Capital in February 2013. She was instrumental in the discovery of Khoemacau's Zone 5 deposit and actively involved in the recent acquisition of the neighbouring Boseto copper mine.

Knight graduated from the University of British Columbia in Vancouver, Canada with a combined honours degree in geology and geography. ■

AEL Mining expands in South America

AEL Mining Services is growing its already established base in South America by going direct to customers with explosive products, on-site support and blasting optimisation.

This is according to Alois Kwenda, AEL General Manager for Business Development for South America and West Central Africa, who says AEL's business model in the region previously provided for the supply of products to customers through distributors.

"We are now expanding by offering our full suite of products and technical expertise in South America directly to our customers to ensure quality throughout both the supply and application of explosives on site," states Kwenda.

Kwenda says the expansion in this region by AEL has exceeded expectations since it started offering direct supply in June. "We have already participated in three tenders in the region and are conducting several demonstrations of electronic blasting systems with potential customers," he says.

Kwenda and his team recently exhibited as part of AECI at one of the largest mining trade fairs in Latin America, the International Mining Exhibition (EXPOSIBRAM) 2015, between 14 and 17 September 2015. The annual exhibition was held in Belo Horizonte, Brazil and received over 50 000 visitors.

"This was a great opportunity to meet with existing and potential customers and to be able to demonstrate to them that we are increasing our presence in Latin America and are prepared to do business with them," notes Kwenda.

He adds that AEL aims to increase its supply of electronic blasting systems and bulk explosives to South American markets, particularly in Brazil and Chile, and that safety is the number one issue for these customers. ■

True Gold starts to stack ore on leach pads at Karma

True Gold Mining Inc, listed on the TSX-V, has provided an update on its Karma gold mine in Burkina Faso, West Africa.

According to the company, construction at Karma is approximately 94 % complete with commissioning being the major activity on site. Over 500 000 tonnes of stockpiled ore will provide the initial feed to the fully commissioned soft rock crusher, agglomeration and stacking circuit.

Ore has been introduced into the crushing and agglomerating circuits and agglomerated ore is being stacked on the leach pad.

Piping and solution collection systems for leach pad cells 1 to 3 have been completed with the installation of the last of the HDPE lining for the pad to pond interface. Cell 1 is receiving agglomerated ore, while Cells 2 and 3 will be completed in the coming weeks, with final placement of the drainage layer underway. Cells 4 through 9 are levelled and are ready for HDPE lining installation.

The ADR plant is very well advanced with the final installation of piping, electrical and instrumentation remaining. The main construction focus is now on finishing the gold room where all the equipment is in the building ready to be placed in position once the second floor brickwork and plastering is completed.

Site structural steel work is complete, and the remaining civil works are limited to the gold room and minor infrastructure items.

A recent view of the Karma site with cement silos in the foreground (photo: True Gold).

Galane files technical report on Galaxy assets

Galane Gold, which is listed on the TSX-V and owns the Mupane gold mine near Francistown in Botswana, has filed an NI 43-101 technical report – prepared by Minxcom – for its Galaxy gold mine in South Africa. The mine is owned by Galaxy Gold Reefs (Pty) Ltd, a wholly-owned subsidiary of Galaxy Gold Mining Limited. Galane recently acquired a 74 % ownership interest in Galaxy.

The Galaxy mine is located approximately 8 km west of the town of Barberton and 45 km west of the provincial capital of Nelspruit (Mbombela) in Mpumalanga Province and covers an area of 5 863 ha. The mine comprises 21 east-west trending gold orebodies and four prospects at 600 to 2 000 m depth.

Gold has been prospected at the mine since the 1880s and Agnes – one of the orebodies – has been exploited as an established mine since 1908. Currently, over 75 historical adits exist within the mining area, as well as tailings storage facilities consisting of previously mined and processed material. To date, the mining assets have produced over one million ounces of gold.

Galaxy's existing processing plants are in need of refurbishment and consist of crushing, milling, flotation, biological oxidation of flotation concentrate, CIL leaching, elution, smelting and tailings disposal facilities designed to treat 16 000 tonnes of ore per month. They can be expanded through refurbishment and the introduction of larger mills and flotation equipment.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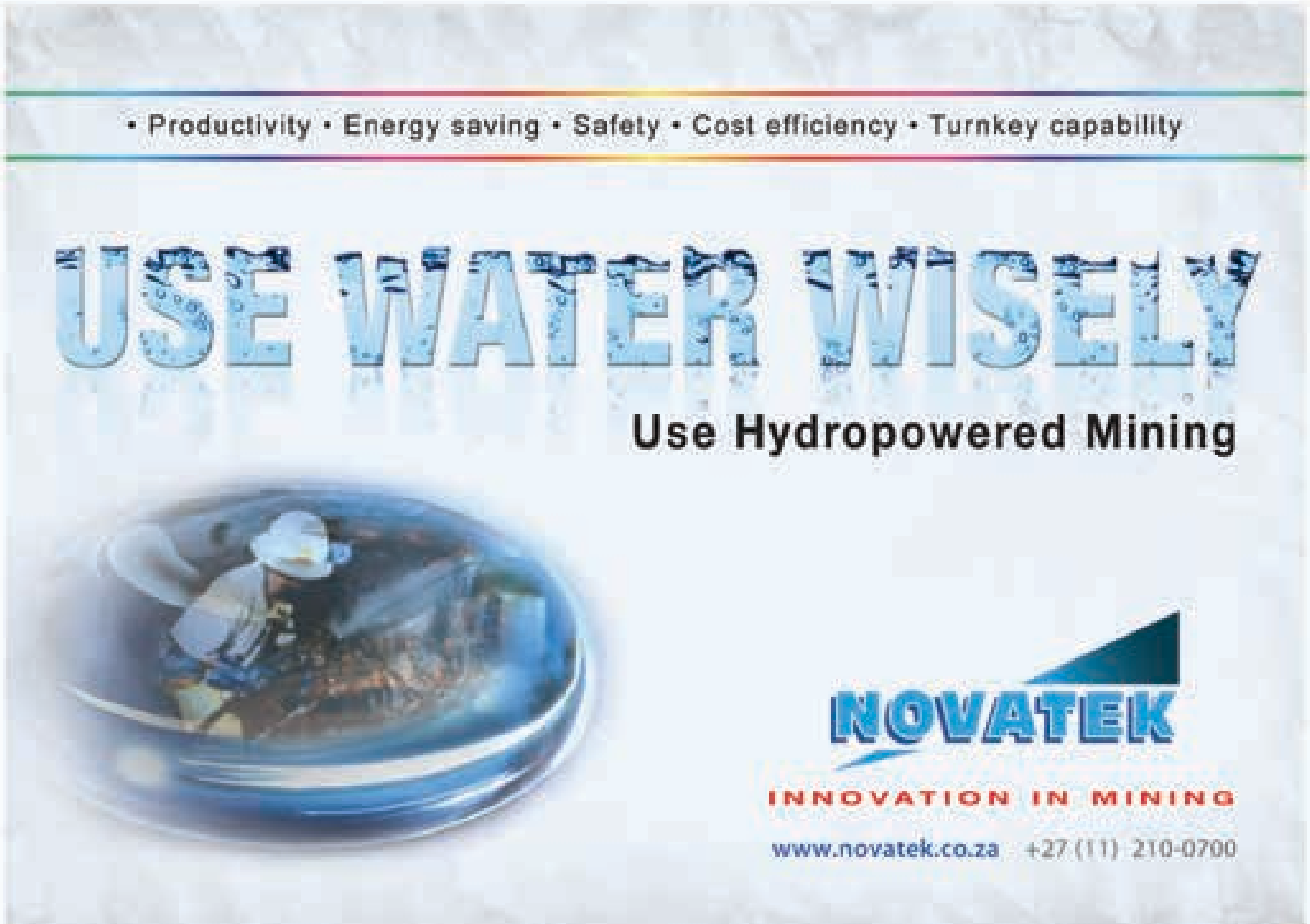
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Booming Kibali gold mine delivers on its business plan

The newly developed Kibali gold mine in the DRC continues to deliver on all aspects of its business plan and is likely to exceed its 2015 production target of 600 000 ounces, Mark Bristow, Chief Executive of operator Randgold Resources, said recently.

Speaking at a local media briefing in Kinshasa on 19 January, Bristow said the continuing expansion of the mine was also on target, with the development of its underground operation still ahead of schedule. The second of its hydropower stations, Ambarau, is scheduled for commissioning in the second quarter and work on the third, Azambi, has started. The first stage of Kibali's ISO 14001 environmental certification has been completed and the mine is working towards its ISO 45001 health and safety rating.

At the same time, exploration has continued to develop a number of targets along the KZ trend with strong trench results highlighting the potential for near mine oxide ounces at Tete Bakangwe and Sessengue SW. While greenfields exploration is an essential part of its long term strategy, brownfields success provides the mine with valuable optionality and the ability to protect its key assets in this low gold price environment.

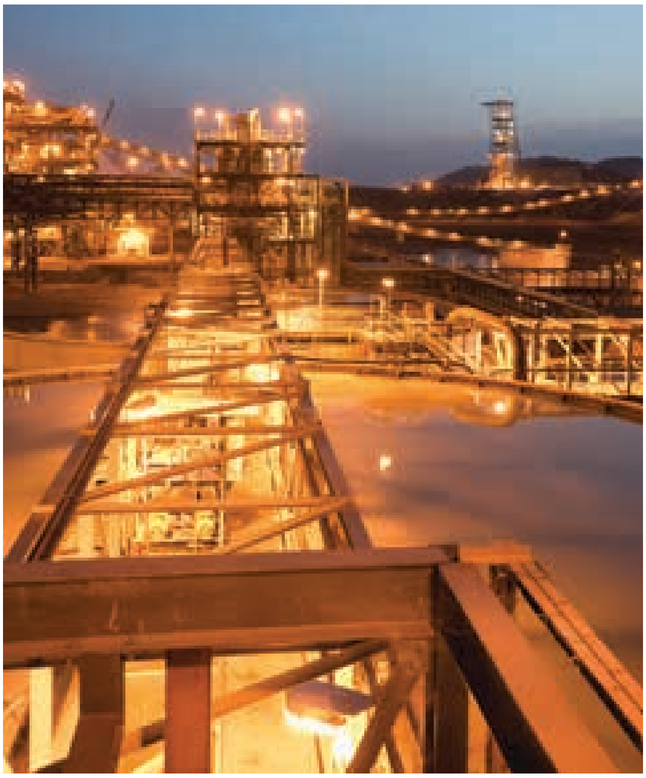
Bristow said Kibali's success had spurred Randgold to expand its footprint in the DRC and a number of new joint venture agreements had been concluded in the past quarter, bringing its ground-holding in the country to 6 539 km², covering most of the Ngayu greenstone belt in addition to the Randgold-managed Kibali JV on the Moto belt.

The new joint ventures are Loncor Resources' Ngayu project, Kilo Goldmines' Somituri permits and Devon Resources' permit package, also in the Ngayu belt. At Randgold and Kilo's existing joint venture, Isiro, a 10 km target has been identified at Yasua-Yambenda through soil sampling, pitting and trenching.

"Despite the challenging market conditions currently facing the gold mining industry, Randgold continues to invest in its future, in line with its strategy of creating value for all its stakeholders through the discovery of world-class gold deposits and their development into profitable mines. We believe the north-eastern DRC holds a rich potential for such discoveries, and we trust the country's government will partner us in our drive to develop a major gold mining frontier there, among other things by ensuring that the current negotiations about a new mining code result in one that will justify the capital already spent and attract further investment," said Bristow.

Bristow noted that Kibali was also continuing to invest in sustainability projects designed to provide an economic legacy for the local community. It was in discussion with the DRC government about an investment framework for a proposed palm oil project and had engaged with potential investors, while the first phase of the maize farming pilot project had been completed, with 82 ha currently being harvested.

As part of its commitment to promoting the growth of a robust local economy, Kibali also continues to support local suppliers, spending US$95 million last quarter with businesses ranging from a women's collective, which feeds more than 2 000 mine workers every day, to transport and construction contractors. ■



The processing plant at the Kibali gold mine (photo: Randgold Resources).

Senior appointments at Master Drilling

JSE-listed drilling solutions provider Master Drilling Ltd has announced the appointment of Louis Germishuys as Chief Operating Officer of its new Shaft Development division, and Chris O'Neill as Chief Operating Officer of Africa Operations, and as an Alternate Director.

Master Drilling CEO Danie Pretorius said, "We are pleased to welcome both Germishuys and O'Neill to Master Drilling during this exciting period of growth in our organisation. Their respective experience and industry insights will be instrumental in driving our business growth strategies forward, while cementing our ability to adapt and respond to a rapidly changing operational environment."

Germishuys' appointment comes at a time when the company is exploring areas of refining and diversifying its work performance, particularly in the shaft development market (see also page 28 of this issue). His strong track record in shaft sinking, mine development and construction will be invaluable as the organisation continues to drive innovation for clients in the mining, energy and civil industries.

With more than 25 years of experience in shaft sinking, mine development and construction, Germishuys will be bringing differentiated insights into the shaft development business. His role will encompass research and development of Master Drilling's new Blind Shaft Boring System (BSBS) and business development in markets across Africa, Europe and Asia. He will also be responsible for management of operational performance for the DRC, Mali as well as the Cullinan HRB project.

Optimistic about his appointment, O'Neill steps into his new role with vast experience as a MD of a number of automotive and other industrial companies. In addition, he has gained invaluable experience through his work exposure in the European, US and Asian markets. ■

Kipushi mineral resource estimate exceeds expectations

Ivanhoe Mines, listed on the TSX, has announced the receipt of a new, independent, mineral resource estimate for its historic, high-grade, Kipushi zinc-copper-germanium-lead-silver mine in the DRC. Kipushi is a joint venture between Ivanhoe Mines and Gécamines, the state-owned mining company.

Highlights of this initial estimate, prepared by the MSA Group, include measured and indicated (M&I) mineral resources in the Big Zinc Zone of 10,2 Mt at grades of 34,89 % zinc, 0,65 % copper, 19 g/t silver and 51 g/t germanium, at a 7 % zinc cut-off, containing an estimated 7,8 billion pounds of zinc.

The zinc grade of Kipushi's M&I mineral resources in the Big Zinc Zone is more than twice as high as the world's next-highest-grade zinc project, independently ranked by Wood Mackenzie, an international industry research and consulting group, based on contained zinc.

Zinc-rich inferred mineral resources total an additional 1,9 Mt at grades of 28,24 % zinc, 1,18 % copper, 10 g/t silver and 53 g/t germanium. The inferred resources are contained partially in the Big Zinc Zone and partially in the Southern Zinc Zone.

Kipushi's copper-rich M&I mineral resources contained in the adjacent Fault Zone, Fault Zone Splay and Série Récurrente Zone total an additional 1,63 Mt at grades of 4,01 % copper, 2,87 % zinc and 22 g/t silver, at a 1,5 % copper cut-off, containing 144 million pounds of copper. Copper-rich inferred resources in these zones total an additional 1,64 Mt at grades of 3,30 % copper, 6,97 % zinc and 19 g/t silver.

"This independent estimate of Kipushi's mineral resources has exceeded our expectations. We are convinced that significant additional mineral resources can be delineated at Kipushi," comments Robert Friedland, Executive Chairman of Ivanhoe.

"With a current resource now established, we are evaluating technical and infrastructure options to best advance the project. The exceptionally high grades that consistently are being discovered at Kipushi are unique in the international mining industry and provide further confirmation that this project has the potential to benefit the people of the Democratic Republic of Congo for decades to come when it returns to production."

The Kipushi mine is on the Central African Copperbelt in the DRC's southern Haut-Katanga province, one of Africa's major mining hubs. The mine, which began operations in 1924, is located approximately 30 km south-west of the provincial capital, Lubumbashi, and less than 1 km from the DRC-Zambia border.

Friedland noted that since Ivanhoe assumed responsibility at Kipushi, significant progress has been made in rehabilitating the surface and underground infrastructure. The dewatering programme, implemented by Ivanhoe in late 2011, has been successful and the water levels are now being maintained below Kipushi's main pumping station on the 1 210-m level. Three new, high-capacity Grifo pumps have been purchased and will be installed at the main pumping station alongside the five existing high-capacity Sulzer pumps that are being refurbished. The expected cost of the upgrade and refurbishment of the main pumping station is expected to be approximately US$3,8 million.

The new Grifo pumps are expected to be commissioned in the third quarter of this year and, in conjunction with the refurbished Sulzer pumps, will provide sufficient pumping capacity to keep the entire mine dewatered with a 100 % pumping redundancy.

Originally named the Prince Léopold mine, Kipushi is one of Katanga's most famous mines. Approximately 60 Mt grading 11 % zinc and 7 % copper were mined between 1924 and 1993, producing a total of 6,6 Mt of zinc and 4,0 Mt of copper. The mine also produced 12 673 tonnes of lead and approximately 278 tonnes of germanium between 1956 and 1978.

The lower levels of the mine flooded in early 2011 due to a lack of pumping maintenance over an extended period. Ivanhoe Mines (formerly Ivanplats) acquired a 68 % interest in Kipushi in November 2011 and has assumed responsibility for ongoing redevelopment, dewatering and drilling. ■

Two of three new high-volume Grifo pumps to be installed at the main pumping station 1 210 m below surface (photo: Ivanhoe).

"Unexpected challenges" at New Liberty

Aureus Mining Inc, listed on the TSX and AIM, has provided an operational update (issued 22 January) for its New Liberty Gold Mine in Liberia. The mine – commissioned in 2015 – suffered a crusher failure in October which halted production at the mine for a short period.

Since the resumption of processing operations at New Liberty on 30 October 2015, the ball mill has been operating at an average of 82 % for 81 days (to 22 January) of its designed capacity, including planned downtime for ongoing optimisation. While the criteria for the declaration of commercial production have been reached, Aureus has experienced issues during the final phase of commissioning in the gravity and CIL circuits of the plant, affecting plant recoveries and resulting in an impact on cash flow. It says it therefore does not feel it is prudent to officially declare commercial production at this point.

The company continues to focus on fine-tuning and improving the operational performance of the gravity circuit and further optimising CIL leach kinetics, with various options being evaluated and systematically implemented in order to improve overall plant performance to within design specifications.

Aureus say it is anticipated that plant performance will improve to design levels by the end of Q1 2016, when the company intends to declare full commercial production at New Liberty.

Mining operations at New Liberty are progressing, with fresh ore run of mine (ROM) stockpiles currently standing at 83 509 tonnes at a grade of 2,78 g/t and oxide and transitional stockpiles at 75 248 tonnes at a grade of 1,35 g/t.

To date, the process plant has processed 386 262 tonnes of ROM fresh sulphide ore and lower grade oxide material resulting in 19 shipments of gold doré from New Liberty for smelting and refining at the MKS PAMP refinery in Switzerland, totalling 20 835 ounces of gold.

Gold production achieved for the calendar year 2015 was 17 172 ounces, against a target of 27 000 ounces, and 3 663 ounces of gold have been produced to date in 2016, with production since mid-December hampered by issues experienced during the final phases of plant commissioning. Performance from the gravity circuit of the plant has not yet reached design specifications, resulting in overall gold recoveries of approximately 70 % throughout December 2015 and early January 2016.

Commenting, David Reading, President and Chief Executive Officer of Aureus Mining, said: "The commissioning phase of New Liberty has brought some unexpected challenges; however, the recent progress being made and improved performance of the process plant are encouraging. I am confident that the various process improvements that our experienced operations team are systematically implementing will continue to improve the overall plant performance towards design specifications."

Commissioning of Lerala to start in April 2016

Kimberley Diamonds Ltd (KDL), listed on the ASX and owner of the Lerala diamond mine located in north-eastern Botswana, reports that significant progress was made on the refurbishment of the Lerala processing plant during Q2 FY2016.

All major concrete footings and construction items (civils) for new plant modules were completed, the steel frameworks were installed for the primary crusher, primary scrubber and secondary cone crusher and the secondary cone crusher was installed and its surge bin relocated. Fabrication of all new components was nearly complete at the end of the quarter, and many of those components had been transported to site.

KDL says that all refurbishment activities continue to progress on schedule. However, as reported previously, the construction of the tailings dam was delayed while the assessment of the alluvial channel deposits was completed. Accordingly, and subject to funding, plant commissioning has been rescheduled and is currently anticipated to start in April 2016.

KDL has also just announced that Lerala Diamond Mines – its Botswanan subsidiary – has entered into a contract for the open-pit mining operations at the mine.

The mining contract has been awarded to Basil Read Botswana following a two-stage competitive tender process in which eight qualified companies competed for selection. The contract covers the initial five years of mining and may be extended further. The anticipated total value of the contract is around $A47 million at current exchange rates.

Opencut mining operations are expected to commence during March 2016 and production is scheduled to reach nominal output, in line with commissioning of the processing plant, around June 2016.

Lerala was acquired by Kimberley Diamonds in February 2014 when the company acquired 100 % of the issued share capital of Mantle Diamonds.

The mine comprises a cluster of five diamond-bearing kimberlite volcanic pipes, designated K2 to K6, and a processing plant with a nominal capacity of 200 t/h. The project area is covered by a 15-year fully permitted mining lease with an area of 21,86 km^2.

Mantle operated the mine between February and July 2012 but a range of technical factors in the processing plant resulted in poor recovery of diamonds.

Following its acquisition of Lerala, KDL engaged Consulmet, a leading South African mining engineering company with extensive diamond plant experience, to redesign sections of the processing plant to facilitate improved diamond recovery and throughput reliability. Consulmet is currently undertaking the refurbishment and upgrade of the processing plant under a lump sum turnkey contract.

The new Kawasaki secondary cone crusher (foreground) with the relocated surge bin and conveyor plinths in the background (photo: Kimberley Diamonds).

DRA acquires ports and harbour engineering specialist

In a recent acquisition, South African founded engineering company DRA has purchased Cape Town-based ports and harbour engineering business RLH Consulting Engineers. This is yet another step for DRA, headquartered in Johannesburg, towards achieving its global diversification strategy.

DRA says it will leverage the wealth of industry experience of key personnel in RLH, spanning more than 30 years, which focuses on international port and harbour developments and coastal engineering.

RLH will be integrated into DRA's new Cape Town office, servicing client projects in the Southern African region as well as up into West Africa.

"Diversification into marine engineering as offered by RLH, has been part of DRA's strategy for the past year and we are very excited about RLH forming part of our team. The RLH culture and diligent approach to projects align well with that of DRA and we expect a smooth integration. I am excited about the prospects of our Cape Town offering which supports our innovation drive," says Johann de Bruin, MD, DRA Africa.

Lucara names its record-breaking diamond

Lucara Diamond Corp has announced the winning name for the 1 111-carat gem quality diamond recovered at its Karowe mine in Botswana in November, 2015. The diamond has been named *Lesedi La Rona* which means 'Our Light'. The winner of the competition is Thembani Moitlhobogi, who will receive a prize of 25 000 Pula. The winning entry was announced at the Mining Indaba in Cape Town.

On January 18, 2016 Lucara launched a competition to name this spectacular Type IIa diamond, the biggest diamond ever recovered in Botswana and the second largest ever found in the world. The competition was open to all Botswanan citizens including the company's Batswana employees. Entrants were invited to submit their suggested name and their rationale for their choice. More than 11 000 entries were received.

To ensure transparency and independence during the name selection process, the audit firm of Ernst & Young was retained to oversee the competition. The judging panel consisted of a total of five executives from both Lucara and the Karowe mine. Entries were submitted to the judging panel on an anonymous basis with Ernst & Young retrieving the winner's name after the panel had selected the winning name for the diamond. ■

Blanket heads for 50 000 ounces of gold a year

Caledonia Mining Corporation reports that gold production from its 49 %-owned subsidiary, the Blanket mine near Gwanda in Zimbabwe, for the quarter (Q4) ended December 31, 2015 amounted to approximately 11 518 ounces, representing a 10,6 % increase on the gold produced in Q4 2014 (10 417 ounces) and a 5,4 % increase on the gold produced in Q3 2015 (10 927 ounces).

Total 2015 gold production was approximately 42 806 ounces, a 2,5 % increase over the annual gold production in 2014 of 41 771 ounces and 1,9 % higher than the production guidance of 42 000 ounces for 2015.

Targeted gold production for 2016 is approximately 50 000 ounces, unchanged from previous guidance. The rate of production is expected to increase over the course of 2016 as production from the No 6 Winze increases. The quarterly production profile is expected to be approximately 10 700 ounces of gold in the first quarter of 2016 increasing to approximately 14 000 ounces of gold by the fourth quarter of 2016. ■

Liqhobong now over 60 % complete

Firestone Diamonds, the AIM-quoted diamond development company, says that construction of its Liqhobong project in Lesotho (which is owned 75 % by Firestone and 25 % by the Government of Lesotho) was 61 % complete as at the end of December 2015 and on track for initial production in Q4 2016.

The project also maintained its zero lost time injury record, with over 1,8 million man hours worked to the end of December. Project expenditure is on track and within the revised capital budget of R2,1 billion, which remains within the original project financing budget of US$185,4 million. Project work streams are progressing according to schedule with over 90 % of all expenditure committed.

Firestone describes Liqhobong as a robust project with over 11 million carats in reserve. The total open-pit resource contains over 17 million carats down to 393 m. The new twin stream plant at the site is designed at 500 t/h to yield 1 million carats per annum over a 15-year life of mine.

Liqhobong showing the apron feeder spillage conveyor (photo: Firestone Diamonds).

DRA continues its involvement in Makhado project

International engineer and project delivery group DRA Global has announced that its South African company DRA Projects SA has been awarded the Optimisation Study and Front End Engineering and Design (FEED) package for Coal of Africa Limited (CoAL)'s Makhado coal project.

The project is located in Limpopo Province and is approximately 80 km from CoAL's existing Vele colliery. It is planned that both hard coking coal and thermal coal will be produced from the Makhado project for export and domestic consumption. Initially, the operation will be an opencast mine, with potential for expansion to an underground operation in future years.

DRA's recent award follows its earlier role on the Makhado project for CoAL in the preparation of the Definitive Feasibility Study of the coal processing and handling facilities, completed in early 2013.

The scope of the Optimisation and FEED assignment expands this earlier role by DRA to now include the infrastructure components of the project, and also the integration of the work of a number of specialist consultants.

Lace diamond mine ramp-up remains on target

Reporting on its Lace diamond mine near Kroonstad in the Free State, DiamondCorp – listed on London's AIM and the JSE Alt-X – says that during the three months ended 31 December 2015 its 74 %-owned subsidiary, Lace Diamond Mines (Pty) Limited (LDM), continued with the implementation of the revised development schedule and budget for the ramp up of commercial production from underground kimberlite mining.

The 400 t/h conveyor belt system was commissioned in November and production ramp up from the UK4 block commenced in December. The conveyor belt system is operating to design capacity and mining is progressing without any issues with respect to ground conditions. Following a two-week Christmas shutdown, mining resumed in January and remains on target to achieve production of 30 000 tonnes per month by July.

During tailings re-treatment, management determined that considerable operational efficiencies and water savings could be achieved in the Lace processing plant by increasing the bottom screen size from 1,00 mm to 1,25 mm. The change in bottom screen size has been applied to kimberlite processing, which will result in a reduced recovered grade but a higher average carat value for the diamonds recovered, as the smallest diamonds are the lowest value stones.

A final decision on the bottom screen size will be made following receipt of the microdiamond analysis being undertaken as part of the resource statement update and the first few diamond sales are concluded, which will provide pricing data for the different diamond size categories. Analysis of this data will allow the plant to be optimised for management's key financial metric which is operating margin per tonne.

DiamondCorp says it is pleased with the quality and colour of the diamonds being recovered, including three stones greater than 10 carats. One of the diamonds is an H coloured stone of 22,11 carats which management has decided to beneficiate locally. The stone has been sold into the company's beneficiation joint venture for US$5 000 per carat with a view to recovering an 8-carat emerald cut diamond after cutting and polishing.

In addition to the sale of the 22,11-carat stone, Diamondcorp recently prepared to export 3 577 carats of diamonds recovered from development and bulk testing activities in the second half of 2015. The diamonds will be sorted in Antwerp ahead of the commencement of diamond sales in the next few months. To date, a total of 7 449 carats has been produced towards the first sale.

Platinum Group steps up drilling of Waterberg deposit

Platinum Group Metals, listed on the TSX and NYSE, reports that the current budget for the Waterberg project has been expanded from US$8,0 million to US$8,5 million for the annual period ending March 31, 2016. The budget is fully funded by joint venture partner the Japan Oil, Gas and Metals National Corporation (JOGMEC). Platinum Group holds a direct and indirect interest of 58,62 % in Waterberg and is the project operator.

The current budget has been expanded by moving funding forward from the next budget period. This provides for immediate new drilling targeted to expand recently identified shallow areas of F Zone mineralisation of greater than 10 m in thickness. The objective is to delineate indicated category resources with the best grade thickness that are accessible early in the project from decline ramps.

Twelve drill rigs are being mobilised to the Waterberg site. The expanded drill programme is to be completed by March 31, 2016, followed shortly by an updated resource calculation, which will be incorporated into a pre-feasibility study already in progress for the project.

Additional drilling will also be focused on expanding upon an intercept of the T Zone grading 5,84 g/t platinum, palladium and gold (3E) (1,80 g/t Pt, 2,86 g/t Pd, 1,18 g/t Au) over 19 m (15 m true width) at a depth of 812 m to 831 m. These thicker F and T zones are in contrast to typical South African platinum deposits with a thickness of 1 m that are mined manually.

The current deposit scale is more than 360 Mt. The objective of the current drilling is to target the best grade thickness in the shallowest locations. The deposit has shallow regions where grid areas measuring 250 m by 250 m are estimated to host more than 0,5 million 3E resource ounces each. Targeting the best areas of shallow mineralisation within these regions along the 13 km open strike length of the Waterberg project is critical to optimising the pre-feasibility design. Additional resources above 200 m deep may play an important role in the initial years of the ramp-up profile of the pre-feasibility mine design.

Pre-feasibility engineering on the Waterberg deposit, including optimisation of the metallurgical flow sheet using South African and Japanese expertise, is continuing. Engagement with utilities for the delivery of bulk services continues and mine planning and optimisation using fully mechanised methods is also ongoing. ■

B2Gold to earn in at Ondundu

Canada's Forsys Metals Corp has announced that an earn-in agreement has been executed with B2Gold Namibia (B2Gold) whereby B2Gold can earn up to a 100 % interest in the Ondundu gold project in Namibia.

Forsys Chief Executive Marcel Hilmer said the earn-in with B2Gold would ensure that there is a strong financial commitment to developing Ondundu. "We look forward to working with B2Gold to successfully progress the Ondundu project."

Forsys is an emerging uranium producer with 100 % ownership of the Norasa project that comprises the fully permitted Valencia uranium project and the Namibplaas uranium project in Namibia. B2Gold is the owner and operator of the Otjikoto gold mine near Otjiwarongo, one of only two gold mines – the other is Navachab – in Namibia. ■

New machines set to strengthen **Babcock's 'footprint' in mining**

There are exciting developments underway at Babcock. The company, which is the Southern African dealer for Volvo Construction Equipment (Volvo CE), has introduced to the local market the Volvo EC750D excavator, Volvo's biggest excavator yet, and expects to be launching more Volvo machines in the coming months, including a new 60-tonne articulated hauler. In addition, it was recently appointed as the official Southern African dealer for Terex Trucks, which means that it can now supply its customers – for the first time – with rigid dump trucks. ***Modern Mining*** *recently spoke to David Vaughan, Babcock's Sales Director – Equipment, to learn more about the new products and how they fit into the Babcock line-up.*

Already two EC750D excavators have been sold and are working in the field, one in a coal mining operation in the Middelburg area, and the other in an alluvial diamond mining application in the Northern Cape. "We've secured several further orders for the EC750D and are expecting to deliver these additional machines shortly," says Vaughan. "As we all know, the mining industry is currently in a severe downturn but we're nevertheless seeing huge interest in the EC750D from our mining customers as it is the perfect match for the heavier articulated haulers typically used in mining, including the Volvo A40F."

Dave Vaughan, Babcock's Sales Director – Equipment, pictured at the company's Johannesburg premises with an EC750D in the background.

The EC750D –which is a 75-tonne class machine – replaces the popular EC700CL. "We have over 140 of these units in the field, which is testament to the EC700CL's high production capabilities, general reliability and low fuel burn," says Vaughan. "The new machine is an upgraded version, which offers even greater productivity while retaining all that was best in its predecessor. Digging force has been improved by 9 % compared to the EC700 and engine output by 11 % and the unit comes equipped – as standard – with a 4,6 m^3 bucket as opposed to the 4,2 m^3 bucket used on the EC700. Our estimate is that the EC750D will deliver an overall 14 % increase in productivity."

The new excavator is specifically designed for demanding mining and quarrying applications and its design and construction reflect this. For example, the reinforced heavy-duty boom and arm are built from high-strength tensile steel – with steel strips being welded under the arm to further increase protection. Built-in heavy-duty plates provide additional protection to the underside of the machine to

Babcock's state-of-the-art Middelburg branch has recently been officially opened.

prevent damage from rocks and debris while the strengthened idler frame, track links and bottom rollers are designed for constant impact.

The EC750D is equipped with a new Volvo D16 Tier 3 engine able to deliver 374 kW. This works in harmony with an improved, Volvo-designed electro-hydraulic system which uses intelligent technology to control on-demand flow and reduce internal losses in the hydraulic circuit.

According to Vaughan, the Volvo excavator range will soon be expanded. "Volvo CE has confirmed that it will be launching 16 new products at the upcoming bauma 2016 show in Munich, including several new excavators," he explains. "At this stage it is keeping the details of its presence at bauma largely under wraps but it has promised that some flagship models will be introduced, including the largest machines the company has ever made."

On the articulated hauler side, these flagship models will include the Volvo A60H, a giant 60-tonne class articulated hauler. "The development of this machine was a closely guarded

Seen at the opening of the Middelburg branch are (from left): Peter Rogers, Chief Executive, Babcock International Group; Dame Judith Macgregor, British High Commissioner to South Africa; Bill Tame, Chief Executive – International Division, Babcock International Group; Emma Wade-Smith, Regional Trade Director – Southern Africa, UK Trade & Investment; and Roger O'Callaghan, CEO – Africa, Babcock International Group.

A TR60 Terex truck in the workshops at the Middelburg branch.

secret till very recently," says Vaughan. "Volvo CE, however, has now announced that it will be launched at bauma 2016. It is certainly the biggest Volvo articulated hauler yet made as the current flagship of the hauler range is the A40F, which is a 40-tonne class machine. Its introduction comes 50 years after the launch of Volvo's very first articulated hauler, the DR631, in 1966. Popularly known as 'Gravel Charlie', the DR631 was the first commercial articulated hauler in the world. I understand that this original model – which only had a 10-tonne capacity – will be on show at bauma on the Volvo CE stand."

Moving on from the Volvo CE range, Vaughan says that Babcock's recent appointment as the Terex Trucks dealer in Southern Africa is highly significant inasmuch as it opens up an entire new customer base. "Until now, we've never had a rigid hauler and this was always a gap in our product range," he states. "We now have a four-model line-up of these machines from the 45-ton (41-tonne) capacity TR45 through to the 100-ton (91-tonne) capacity TR100. There is already a substantial population of Terex rigids out in the field and the machines are well liked for being rugged and reliable and for their straightforward design. Moreover, they are noted for having high rimpull and torque, which means that they can work on steep inclines. The TR100 has proven particularly popular in mining, where it has established a reputation as a dependable and productive workhorse."

Terex Trucks is based in Motherwell, Scotland, but is now, of course, part of Volvo CE, which acquired Terex's hauler business in 2014. At that stage, distribution of the Terex truck range in Southern Africa was in the hands of Eqstra. "When the agreement between Eqstra and Terex expired, it made sense for Babcock – as the Volvo CE dealer in Southern Africa – to take over the dealership and the new arrangement became effective in October last year," says Vaughan. "We have just received a consignment of the trucks, including the TR100, from Terex Trucks and are ready to supply the new machines to customers."

Vaughan says that Babcock is paying particular attention to the Terex Trucks aftermarket. "There is a substantial population of Terex trucks in our region and our intention is to provide the high quality backup for which Babcock is renowned to the owners of these machines."

Apart from its rigid trucks, Terex Trucks also produces a well-regarded range of articulated haulers and these too are being marketed by Babcock. There are currently three models in the line-up – the 25-tonne capacity TA250, the 28-tonne capacity TA300 and the flagship TA400, which has a payload of 38 tonnes. Terex Trucks is currently investing heavily in a major product renewal programme for its articulated haulers and will be displaying the 'new generation' TA400 at bauma 2016 (where it will be exhibiting separately from its parent, Volvo CE).

"We see the Volvo and Terex articulated haulers as being complementary to each other, as they meet different market needs," says Vaughan.

To support both its Volvo CE and Terex Trucks ranges, Babcock can boast a network of 25 branches and four independent dealers across the Southern African region (including in Zambia, Botswana, Namibia and Mozambique). "None of our customers is very far from support by one of our branches and we believe the backup we provide is industry leading," says Vaughan. "We are also able to provide top notch support well outside the SADC region – and, for that matter, in the most remote of areas. For example, one of our South African customers recently worked on a rail contract – part of an iron ore development – in Sierra Leone in West Africa. We provided spares and maintenance support throughout the contract and had two employees based full time on site."

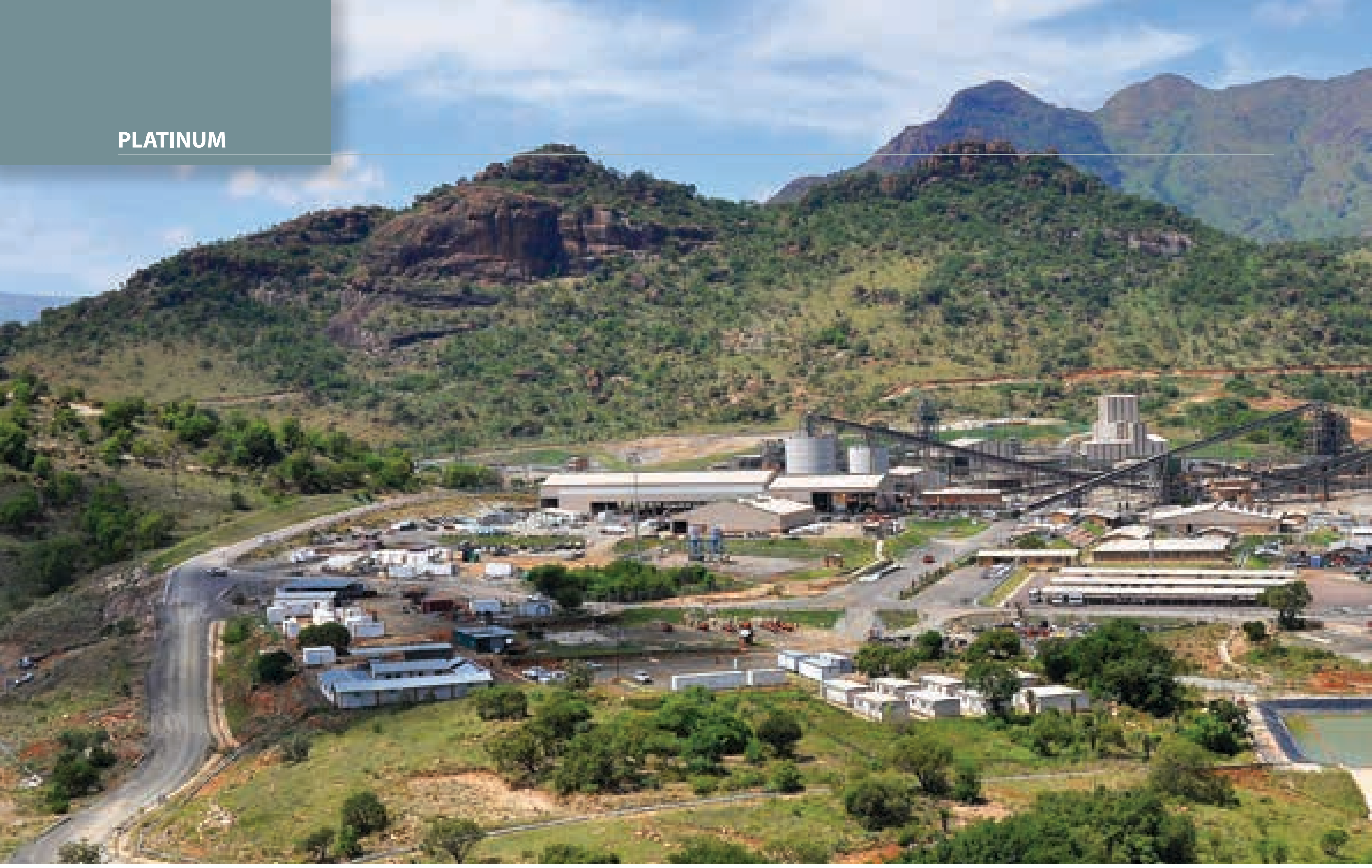
An important development in terms of the branch network is the new Middelburg branch, which has just been officially opened (although Babcock moved into it late last year). "This represents a major R100 million investment by Babcock," notes Vaughan. "We have a huge machine population in the Middelburg area – with many of our customers being involved in coal mining – and the new facility, which is on a 30 000 m² site, was necessary as we had outgrown the previous premises we occupied. It's a purpose-built, state-of-the-art facility which not only meets our current requirements but has been sized for future growth. I would venture to say that it is a world-beating development – certainly, I've seen nothing that matches it, either locally or overseas."

The energy-efficient complex includes 12 large 9 m wide workshop bays (able to accommodate trucks of up to 100 tons such as the Terex TR100), overhead craneage of up to 40 tons, dedicated washing bays for yellow metal vehicles, an industrial spray booth, a steel fabrication section for dump truck repairs and 900 m² of office space.

"The branch is now able to handle full rebuilds," says Vaughan. "Previously machines requiring rebuilding would have to be brought up to Johannesburg, so this is a real plus for our customers."

Looking ahead, Vaughan says that 2016 is shaping up to be a difficult year for all equipment suppliers. "Major markets such as mining and construction are struggling, particularly mining, and it seems to be the consensus of economists that we're unlikely to see a revival in the short term," he observes. "Having said this, Babcock is more than holding its own. We're profitable and far from retrenching we've actually grown our employee complement in recent months. We're excited by the addition of new machines from Volvo CE to our range and by the acquisition of the Terex Trucks dealership and look forward to further building both these famous brands in the Southern African region."

An EC750D at the new Middelburg branch. The machine, currently Volvo's flagship excavator, is equipped with a new Volvo D16 Tier 3 engine able to deliver 374 kW.



Booysendal – modern and

Northam Platinum's new Booysendal mine is a fully mechanised room and pillar operation which is not only performing strongly in terms of achieving its mining targets but is also (as of this writing) operating very safely, with its Lost Time Injury Incidence Rate (LTIIR) being significantly lower than the industry average. "Booysendal is a model mine which is setting new benchmarks for the industry and which has the potential to become the biggest PGM producer on the Eastern Limb of the Bushveld Complex," says its GM, Willie Theron, who is a strong proponent of the benefits of mechanisation.

Development of Booysendal started in mid-2011 and the concentrator plant was commissioned in mid-2013. It has now ramped up to its initial production level of 187 500 reef tonnes a month – which translates into approximately 160 000 4E PGM ounces per annum. Murray & Roberts Cementation has played a key role in getting Booysendal to this point. The company was awarded a contract in 2010 to develop and equip two sets of declines (one being an unusual reverse decline cluster and the other the on-reef decline cluster) and to also undertake initial stoping. This original contract was for 36 months but Murray & Roberts Cementation is still on site today and in terms of a recent three-year contract extension will continue with mining development and stoping for just under another two years until the end of December 2017.

While the capital footprint of the mine is now all but complete in terms of what is known as the Phase 1 project, there is plenty of 'blue sky' at Booysendal as the property has a strike length of 14,5 km and hosts a resource of 103,6 Moz. To put this in perspective, this is way ahead of all other Eastern limb properties with only Der Brochen (with a strike length of 8,5 km and a resource of 79,3 Moz) being at all comparable.

Elaborating on the expansion potential, Theron says that the Phase 1 (or UG2 North) mine is being deepened to allow Booysendal to increase production to 215 kt/month. "We're also planning to exploit the Merensky reef from the existing footprint," he says. "To test the viability of a Merensky operation, we've established a boxcut and two declines to access the orebody.

"A bulk sample has now been extracted for metallurgical testwork and we're also

mechanised

undertaking trial mining to see if we can successfully apply the same mechanised mining methods and equipment that we're using in the UG2 North mine to the narrower Merensky reef. The conventional wisdom is that the Merensky horizon is best mined conventionally but we believe that mechanisation will work and that its advantages – notably a higher production rate – will outweigh negatives such as increased ore dilution.

"Should the trial mining be successful, we envisage the Merensky North mine producing 75 000 kt/month at steady state spanning a build up period of four years. The combination of the Merensky and UG2 North mines would allow Booysendal to produce up to 250 000 4E PGM ounces a year."

Theron adds that this figure could eventually

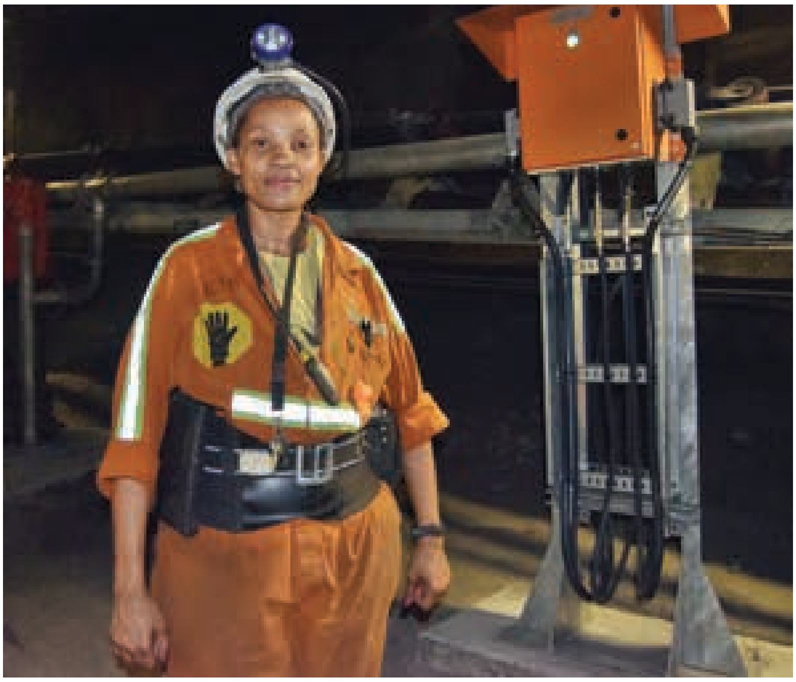
***Above:** Willie Theron (left), GM of Booysendal, with Braam Blom, Project Executive, Murray & Roberts Cementation (photo: Arthur Tassell).*

***Left:** The Booysendal mine is situated in mountainous surroundings approximately 86 km west by road of Mashishing (previously Lydenburg).*

***Below:** A twin boom Sandvik rig at work in the UG2 North mine.*

LHD working on the Merensky project (photo: Arthur Tassell).

Queen Fana, a Shift Supervisor with Murray & Roberts Cementation. Women constitute 20 % of the workforce on the mine (photo: Arthur Tassell).



double. "We're currently undertaking a pre-feasibility study on exploiting the Booysendal South orebody," he explains. "If we do develop the South orebody, the project will incorporate the infrastructure of the former Everest mine which we acquired recently from Aquarius Platinum for R450 million. The Everest assets include a 250 000 tonne/month concentrator, which is capable of handling all the requirements of the Booysendal South project.

"With both Booysendal North and South in operation, PGM production from the Booysendal property could potentially reach half a million ounces a year – with the resource being sufficient to maintain this level of production for a significant number of years assuming favourable market conditions. Obviously any decision to proceed with the South mine will be subject to positive feasibility. We envisage roughly a five-year development and build up phase for the project."

Turning back to the current mining operation at the UG2 North mine, Theron says a mechanised approach was adopted for a number of reasons. "The method is well proven and is used at several platinum and chrome mines on the Eastern Limb," he says. "The UG2 reef lends itself to mechanised mining given its average width of 180 cm compared to 80 cm for the Merensky package. Moreover, mechanisation is inherently much safer than conventional methods and this is reflected in the fact that the operation has been fatality-free since inception. The mine recently achieved 2 million fatality-free shifts. In addition, our LTIIR to the end of October last year was 0,43 per 200 000 hours worked, which is a very creditable achievement."

Theron – who spent his earlier career with Anglo American Platinum prior to joining Northam in 2010 – is a recognised expert on mechanised mining. He says Booysendal has taken the method to a new level. "There are several mines that are described as 'mechanised' but perhaps the more appropriate term would be 'semi-mechanised' as some operations are still carried out using conventional methods," he maintains. "By contrast, Booysendal is fully mechanised through the entire mining cycle, with drill rigs on the face, LHDs deployed for cleaning and loading and fully mechanised roof bolters installing support. Most other mines

– the only exception I can think of is Bathopele – do not achieve this level of mechanisation."

The mining fleet used at Booysendal is owned by the mine but maintained and operated by Murray & Roberts Cementation. It now consists of approximately 130 units, including 27 LHDs. Most of the equipment is from Sandvik although machines from AARD Mining Equipment and GHH Mining Machines are progressively being added to the fleet. Initially, a surface workshop provided all repair and maintenance needs but a new underground workshop has now been commissioned to deliver substantial time and cost benefits.

According to Braam Blom, Project Executive at Murray & Roberts Cementation, the company is well experienced in mechanised mining operations but is nevertheless adding to its expertise and refining its methods as it proceeds with the Booysendal contract. "To take one example, we started off using double boom drill rigs but – over time – concluded that they were not ideal for the conditions we have at Booysendal," he says. "We've now started to convert them to a single boom configuration which makes them easier to manoeuvre and speeds up tramming between sections. It's all about maintaining the cycle."

With Northam Platinum having a policy of employing locally to the fullest extent possible (it wants 100 % of the unskilled workforce and at least 75 % of the semi-skilled workforce at Booysendal to be recruited locally), Murray & Roberts Cementation – as the biggest single employer at the site – is having to undertake considerable training to ensure that these objectives are met. "Fortunately, this is not a problem for us," says Blom. "We have excellent training programmes in place on site while our group training facilities include our Bentley Park Training Academy on the West Rand which – among other things – is equipped with state-of-the-art machine simulators, while Northam has a fully functional training centre with a site-specific trackless equipment simulator on site."

Detailing the progress made by Murray & Roberts Cementation at Booysendal, Blom says that up till the end of October last year the company had completed 14 006 m of development and 360 000 m^2 of stoping and had produced 4,6 Mt of ore. At that point, 13 out 14 strike belt sections were complete and operational and seven out of eight boxes commissioned, with all permanent main fans operational to meet steady-state requirements.

"We now have all infrastructure in place to achieve ore production targets and this will be the focus of our efforts moving forward," he says.

While the UG2 North mine is the main focus for Murray & Roberts Cementation, the company has also been busy over the past eight months with the Merensky North project (where it will soon have two crews working on continuing development and trial mining). Establishing the boxcut to allow declines to be developed was a particularly challenging operation, given that it required blasting in close proximity to existing infrastructure including offices, the processing plant, a water storage facility and an Eskom substation which is the main substation for the entire mine. In addition, cognisance had to be taken of historical adits close to the boxcut site.

The Merensky boxcut with chairlift decline on the left and conveyor decline on the right (photo: Arthur Tassell).

"With both Booysendal North and South in operation, PGM production from the Booysendal property could potentially reach half a million ounces a year ... ."

Willie Theron, GM, Booysendal

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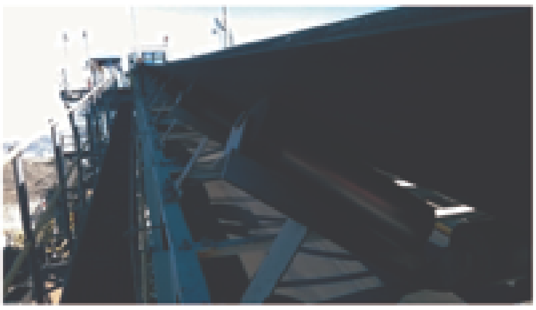
PROBLEM

- Severe conveyor belt misalignment and conveyor belt edge damage originating from side loading of material through the load chute.
- Damaged and misaligned idler frame sets.



SOLUTION

- 1x Belt Tracking Troughing System was installed between the head chute and load chute. This was installed ± 6 metres before the load chute
- 1x Belt Tracking Return System ± 8 metres before the tail pulley to align the belt as it passes through the load point.
- Existing idler frame sets before and after the load chute were also aligned to improve the overall conveyor belt alignment.

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These were excavated into the mountainside by famed geologist Hans Merensky – the Merensky reef, of course, is named after him – when he explored the area in the 1920s and it was important that they remained undisturbed.

In the event, the blasting operation was executed successfully, with no damage to either infrastructure or the historical sites. For interested readers, the precise methods used to achieve this outcome were the subject of a technical paper by Eddie Badenhorst of DRA Global which was published recently by the Association of Mine Managers of South Africa.

Summing up Murray & Roberts Cementation's involvement with Booysendal, Blom says that the company is proud of its association with the mine. "Booysendal now ranks as one of our flagship contracts – with our employee complement on site numbering in the region of 1 200 people (excluding sub-contractors)," he says. "We enjoy an excellent relationship with the mine's management team and are fully committed to achieving the mine's goals – not just in respect of production but also, of course, safety, environmental care, training, employment equity, and social and labour objectives. Even though our current contract only runs until the end of 2017, we are hoping that we will continue as part of the Booysendal team for many years to come."

Photos courtesy of Northam Platinum unless otherwise acknowledged

The Merensky boxcut during construction. Note the proximity of the Eskom substation.

Booysendal's world-class infrastructure

The Booysendal underground infrastructure incorporates a reverse decline system consisting of two barrels (excluding the Merensky reef access barrel). The main barrel contains the conveyor belt and chairlift for the transfer of rock and personnel. The other barrel is for the movement of mechanised equipment into and out of the mine.

Unique to the Booysendal design is the footwall decline which is placed some 24 m below the reef horizon. This decline is connected to the reverse decline and contains the conveyor and chairlift for the conveyance of rock and personnel respectively. The placement of the conveyor in the footwall (ore pass capacity) generally allows for rock hoisting to surface to take place during off peak periods.

On surface, the Booysendal concentrator plant is a typical MF2 circuit type plant and has a nameplate capacity of 187 500 ROM tonnes per month (although in practice it has proved quite capable of handling 200 000 tonnes per month). The processing facilities include a DMS plant – commissioned but not yet operational – designed to remove approximately 20 % of waste from the ROM material and improve the head grade to the primary mill and a spirals plant which removes the saleable chrome fraction from the ore prior to the tails thickener.

The concentrator plant has a nameplate capacity of 187 500 tonnes per month.

New shaft boring system could be a 'game changer' for mining

Master Drilling, a JSE-listed drilling solutions provider which ranks as the world's largest raise boring contractor, used this year's Mining Indaba as the platform to unveil its new Blind Shaft Boring System (BSBS), an innovative combination of established technologies with the potential to revolutionise the field of shaft sinking.

The BSBS was introduced at the Mining Indaba by Louis Germishuys, COO – Shaft Development at Master Drilling, who said the system offered numerous advantages over conventional sinking methods including vastly enhanced safety and an advance rate of up to 7 m per day – roughly twice what is normally achieved with traditional methods – with a total crew of just 40 workers. He added that the BSBS, which can be deployed on both greenfield and brownfield projects, obviated the need for pre-sinking operations and also eliminated the need for blasting.

The system can be used to create shafts of between 10 and 14 m in diameter in hard rock (of up to 300 MPa compressive strength) to depths of up to 2 000 m and is a combination of proven best practice in slurry drilling, rock cutting (TBM) technology and hoisting systems. It offers minimum exposure to the unlined shaft sidewall with the shaft lining operation (using precast concrete segments) following close behind the boring of the shaft. While it uses established technologies, it is revolutionary in the sense that – unlike current mechanised raise boring services used to bore shafts – it requires no bottom access underground.

Elaborating on the timeline to bring the BSBS to market, Germishuys said the conceptual stage of the project was now complete and the initial design in place. Master Drilling was now in the process of producing the first unit, he said, and had pre-qualified manufacturers and issued enquiry documents. The award of a contract was expected in Q2 2016, he said. The manufacturing phase would extend through from Q3 2016 to Q4 2017, with the machine – which will weigh several hundred tons – being ready for service by the first quarter of 2018.

Although the BSBS has been developed in-house by Master Drilling, there has been some input from WorleyParsons, the EPCM contracting and mining consultancy group, which has 'double checked' the initial design and assessed the time and cost savings the system can deliver over conventional blind shaft sinking. The IP around the system is owned by Master Drilling.

The first rig is being produced 'at risk' by Master Drilling and will involve the company in a substantial investment. The company believes that the money will be well spent, as it will give it a competitive advantage in the market. Shaft sinking times will be cut by up to half, resulting in a dramatic impact on project NPVs and IRRs – and also enabling previously marginal projects to be profitably developed. The

Pictured at the Mining Indaba with a model of the BSBS are (from left) Danie Pretorius, founder and CEO of Master Drilling; Louis Germishuys, COO – Shaft Development, Master Drilling; Murray Macnab, Global Director Mining and Mine Development, and Steve Gouws, National Discipline Manager Mining Engineering, both of WorleyParsons; and Koos Jordaan, Technical Director, Master Drilling (photo: Arthur Tassell).

company will be not be selling the machine. It will operate it itself and – depending on the reception of the market – could ultimately have several machines in its fleet.

In operation, the BSBS will involve two phases of boring. The first phase will be through applying slurry drilling techniques to create a pilot shaft with a diameter of 4,8 m. The slurry will be pumped to a separation unit where the water and solids will be separated with the water returning to the slurry head and the solids being hoisted to surface. State-of-the-art technology is located within the slurry head to ensure verticality of the shaft.

The second phase of boring will be when this pilot shaft is reamed to the actual shaft diameter which can be varied, as mentioned, between 10 m and 14 m. Rock cuttings created during this process will be hoisted to surface by means of kibbles and two single-drum winders.

The shaft lining will be done by lowering pre-cast concrete segments which are then placed into position by means of a manipulator located on the boring machine. This technique is common practice in tunnel boring operations and enables the system to minimise the length of the unlined shaft sidewall to a maximum 1,5 m.

Hoisting of the cuttings will be carried out by single drum winders with kibbles – this is also a tried and trusted method of removing rock vertically. A working platform is part of the system and is lowered and raised by means of stage winders. This enables shaft inspections and maintenance operations to be done in the shaft barrel and also provides the guide ropes for the kibbles running in the shaft.

The BSBS is just the latest of a series of innovations by Master Drilling, a company established in 1986 by Danie Pretorius, who is the current CEO. Last year it commissioned its RD8, one of the largest raise bore rigs in the world, and the unit is now working on the Palabora Lift II project where it is boring two 6,1 m diameter, 1,2 km deep ventilation shafts. The directional pilot drilling of the first shaft has been completed and was achieved to a high level of accuracy with the deflection from the theoretical shaft centre line being a mere 0,5 m over the 1 200 m depth in steep dipping/varying rock formations.

Master Drilling has also recently developed a Remotely Operated Shotcrete System (ROSS) and a Remotely Operated Shaft Inspection (ROSI) unit. The company has a gripper tunnelling machine and on reef drilling on trial at Sibanye's operations while a Horizontal Raisebore Machine (HRB) is on trial at Petra's Cullinan diamond mine.

Master Drilling's RD8 on site at Palabora where it is boring two 6,1 m diameter, 1,2 km deep ventilation shafts (photo: Master Drilling).

In another development, Master Drilling has established an office in St Louis, Missouri in the US. The company has been awarded a contract to establish a 350 m x 3,1 m vertical shaft for a mining client in the US. The ground conditions require the shaft to be lined by means of steel casings and boring of the shaft will be carried out using the reverse circulation drilling method. The company believes there is an attractive market for this technology, not only in the USA but in other parts of the world as well.

Based in Fochville on the West Rand, Master Drilling has a fleet of 145 machines, comprising 97 raise bore rigs (more than twice the number of its nearest competitors) and 48 slim drilling rigs. It operates not only in South Africa but also in several other African countries (notably Zambia) and also has a strong presence in South and Central America, a region which accounts for roughly half of its revenues. The company designs and manufactures its own machines, cutters and drill pipes.

Its international arm, Master Drilling International Limited (MDI), recently announced the acquisition of a 40 % stake in a major raisebore drilling operator in Scandinavia, Bergteamet Raiseboring Europe AB, effective 1 December 2015. The deal provides a platform to diversify into the Scandinavian region and brings an additional 18 raise bore machines into Master Drilling's fleet.

Mining's global downturn casts

Reflecting the impact of the commodities downturn, this year's Mining Indaba was noticeably quieter than its recent predecessors, with the number of delegates and exhibitors down on previous years. The ingredients which have made the Mining Indaba the premier mining conference in Africa were nevertheless still present, with industry leaders expressing their views in a variety of forums, including main stage presentations, ministerial forums, workshops and panel discussions, and with networking opportunities almost as strong as ever. In this review of the event, ***Modern Mining's*** *Arthur Tassell looks at just some of the highlights of the formal presentations.*

Centre: *Mosebenzi Zwane, Minister of Mineral Resources, gives his keynote address.*

Below: *Alan Davies, Chief Executive, Diamonds & Minerals, Rio Tinto, addresses delegates.*

As one would expect, the speech by Mosebenzi Joseph Zwane, Minister of Mineral Resources, attracted keen interest, particularly as he is something of an unknown in the mining community (having only been appointed in September last year with one of his recent previous positions having been MEC for Agriculture and Rural Development in the Free State). He said the Mining indaba "comes at a time when the mining industry is in its winter season, a season which some have characterised as a crisis." He added, "After much reflection, I am convinced that during our summer season, as an industry, we have failed ourselves in not preparing better for this winter."

Addressing a key industry concern, Zwane told delegates that he appreciated the problems posed by regulatory and policy uncertainty. "I assure you that the democratic government as led by the ANC has prioritised the processing and finalisation of the MPRD Amendment Bill as a matter of urgency in order to entrench the necessary certainty," he said.

"We are also in the process of reviewing the Mining Charter. It is an important transformation tool and its targets remain applicable beyond 2014. The social and labour plan commitments constitute a critical component of restoring and sustaining the dignity of mineworkers and communities."

The response to the Minister's address was on the lukewarm side. Jacques Barradas of Grant Thornton, for example, said it was the speech of a person still finding his feet and described it as "non-committal and non-specific". This view was echoed by Peter Leon of international law firm Herbert Smith Freehills who commented that the Minister had "made all the right noises" on issues such as regulatory

a shadow over the Mining Indaba

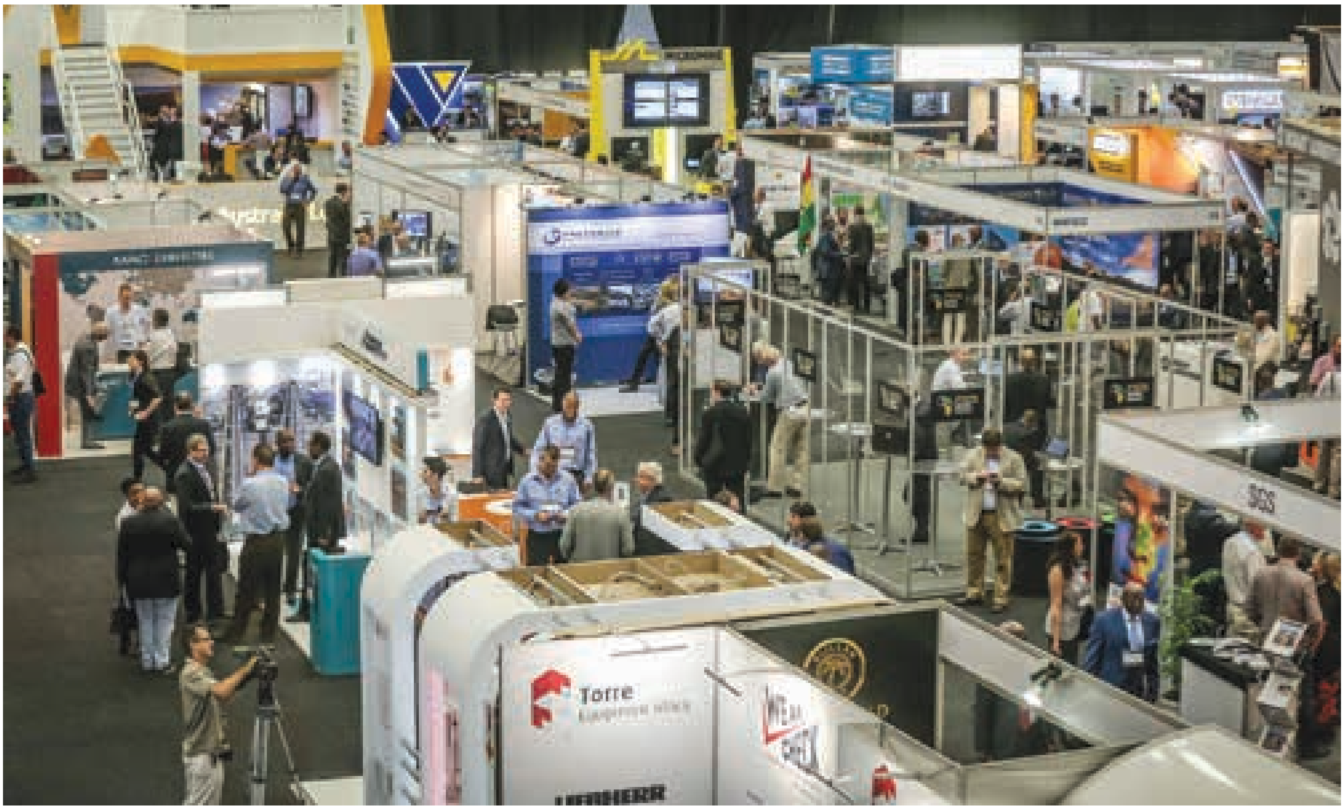
uncertainty and the MPRDA Amendment Bill. "Unfortunately, the Minister provided very little detail as to how he was going to give effect to any of these undertakings, leaving investors as uncertain as ever," he said, adding that he believed the South African mining industry was in the middle of an existential crisis and faced "a potent cocktail of ever increasing costs and declining revenues."

As is the case every year, many of the industry's heavyweights presented at the Indaba or participated in the many panel discussions that were held. They included Anglo American's Mark Cutifani, AngloGold Ashanti's Srinivasan Venkatakrishnan (universally known as Venkat), Ivanhoe's Robert Friedland, Rio Tinto's Alan Davies, South32's Graham Kerr, Lonmin's Ben Magara, Vedanta's Tom Albanese and Randgold Resources' Mark Bristow.

Many executives of junior and mid-tier miners also addressed delegates, among them Clive Johnson of B2Gold (which has developed the Otjikjoto gold mine in Namibia and is building the Fekola mine in Mali), Dr John Clarke of Banro, which has two gold mines in the DRC, R Michael Jones of Platinum Group Metals (which has just produced the first concentrate at its new Maseve platinum mine) and Brad Gordon of Acacia Mining, the biggest player in Tanzania's gold mining sector.

Space does not allow an exhaustive discussion of these presentations but a common

The scene in the exhibition area. There were roughly 230 exhibitors at this year's event.



Anglo American's Mark Cutifani at the podium. The theme of his presentation was 'Making the right choices in the face of accelerating change'.

theme, of course, was the commodities collapse and the changing role of China as a driver of world mining. Rio Tinto's Davies, for example, who heads its Diamonds and Minerals business, while acknowledging all the negatives of the present mining environment, expressed confidence that China would remain "an engine of demand in our sector" in the longer term. "I visited China many times last year and I'm optimistic about the long-term economic story: consumption is contributing to about 60 per cent of China's economic growth and new areas of growth are emerging," he said.

Davies also reaffirmed Rio Tinto's commitment to Africa, telling delegates that the global drivers of long-term demand in Africa all pointed in the right direction. "That is why Rio Tinto, which currently has nearly 5 000 employees and contractors in Africa, continues to invest and explore the continent for future opportunities," he said. "In particular, our exploration team is looking at potential projects in Botswana and Namibia." He noted that even in the face of lower commodity prices, Africa remained a global growth hub.

Another believer in Africa is TSX-listed Ivanhoe Mining, which is pressing ahead with its Platreef project in South Africa and its Kamoa copper project in the DRC (as well as continuing its rehabilitation of the historic Kipushi copper-zinc mine, also in the DRC). The company's Chief Executive, Robert Friedland, a regular – and popular – speaker at the Indaba gave his normal upbeat presentation, arguing that there was a (relatively) positive outlook for PGMs, copper and zinc and describing Ivanhoe's African assets as world class.

Friedland – who last month was inducted into the Canadian Mining Hall of Fame – said the Platreef underground mine in South Africa, already under construction and due for initial production in 2019, would be the biggest platinum mine in the world, which would eventually exceed in size even its near neighbor Mogalakwena. He also noted it would be a highly mechanised and automated operation and said – with characteristic hyperbole – that workers at the mine would be professionals who would never have to lift anything heavier than a pen.

Anglo American's Cutifani gave some interesting facts on the parlous state of the mining industry, pointing out that the aggregated market cap of mining stocks in the FTSE All-share index had declined from US$555 billion at the start of 2013 to just US$169 billion on 1 January this year, adding that global mining stocks had lost US$1,4 trillion of market value since 2011 – more than the combined value of Apple, Exxon/Mobil and Google. He put forward the view that – at least on the supply side – the industry was largely to blame for its predicament, particularly in the case of certain commodities, having failed to adjust supply to align with decreasing demand growth.

"There is no doubt that the downturn in mining commodities is having a major detrimental impact on people, supply chains and governments at every level. From Western Australia, to South Africa, to Brazil, Chile and the US, resource-rich countries had grown used to the fruits of healthy taxes and royalties in all their planning and budgeting. They now have difficult choices to make, as they've squeezed the pips dry on mining's golden goose – if you'll allow an Aussie miner to horribly mix his metaphors," he said.

"Moreover, we can't rely on a reversal of this price slump any time soon. For many of us in the industry, 2016 is already shaping up to be the most challenging yet. Opinions are divided on whether we have reached the bottom of the cycle … so things may still get worse before they get better."

Wrapping up his presentation, Cutifani said tremendous changes were taking place in the world, and particularly the depth and length of this commodity downturn. This was forcing mining companies to look at themselves in a different light, and to respond accordingly. "No mining company is untouched and each has its own distinct issues to address; to use a wonderful South African turn of phrase – everybody has to make a plan," he concluded.

The problems of copper mining were addressed by – among others – Vedanta's CEO Tom Albanese, who said that Vedanta's Zambian subsidiary, Konkola Copper Mines (KCM), one of the mainstays of the Copperbelt (and of the towns of Chililabombwe and Chingola), faced a range of challenges at its Konkola and Nchanga mines, including a declining copper price, declining grades and high strip ratios, escalating power costs (up threefold over 10 years) and a new mineral royalty tax regime. "It is now inevitable that there must be significant restructuring of KCM's business in order to achieve breakeven cash flows and to return to profitability," he stated.

Turning to Vedanta's big growth project in South Africa, the Gamsberg zinc project in the Northern Cape, Albanese said the first phase

Jonathan Moore, MD of Investing in African Mining Indaba, welcomes delegates.

of implementation (a 4,4 Mt/a operation) was underway, with first concentrate scheduled to be delivered to the market by early 2018. He said the vision of the company was to grow Gamsberg production to 250 kt/a and then to 450 kt/a and beyond in three phases.

Another player in the Northern Cape is the BHP Billiton spin-off, South32, the world's largest producer of manganese ore. The company's CEO, Graham Kerr, said the challenge for the metal had been the fragmented growth in South Africa's Kalahari Basin over the past five years, which had led to sub-optimal outcomes in the resource, rail allocation, the export supply chain and, ultimately, shareholder capital. "This lack of industry discipline has led us to the painful consequences of a world where manganese is materially over-supplied," he observed.

Kerr told delegates that South32 was responding to the difficult conditions facing manganese producers with a number of initiatives. These included accelerating the second phase of the Central Block development project at Wessels, the reduction of saleable production at Wessels, the optimisation of the mining and processing footprint at Mamatwan and continuing operation of only one of four furnaces at the Metalloys smelter. He concluded by saying that the industry needed to make rational decisions and take a disciplined supply approach.

Finally, although the mood at the Mining Indaba was overwhelmingly negative, it was not all doom and gloom. Kerr, for example, noted that while China's growth had moderated and continued to rebalance, demand for the majority of commodities – while no longer exponential – was still strong versus historical norms and variations of this view were expressed by a number of speakers. Many individual companies were also able to report positive news despite the stresses in the mining sector, perhaps the most notable example being Randgold Resources, which reported excellent results at the Indaba, with its CEO Mark Bristow describing 2015 as one of the best years in the company's history. Overall, there was enough good news around to suggest that there is still plenty of life in the African mining industry despite the horrendous downturn of the past year.

Photos courtesy of 2016 Mining Indaba

"This lack of industry discipline has led us to the painful consequences of a world where manganese is materially over-supplied."

Graham Kerr, CEO, South32

Experienced hand at the helm of WorleyParsons RSA

The new head of WorleyParsons RSA, Francis McNiff, is no stranger to the South African operation as he is already Regional Managing Director, Sub Saharan Africa for WorleyParsons and has been based in South Africa for the past three-and-a-half years. He takes over at a challenging time, with mining activity – which has traditionally been the mainstay of the South African business – currently at a low ebb. He is confident, however, that WorleyParsons RSA will continue to cope with market conditions very successfully and strengthen its reputation as one of the leading engineering groups operating in the Sub Saharan Africa region.

Francis McNiff, who heads WorleyParsons RSA.

McNiff's appointment makes for strong continuity, as he has had overall responsibility for WorleyParsons RSA for some time, with the ex-CEO Digby Glover having reported to him over the past couple of years. "In essence, I'm just extending my current role as Head of Sub Saharan Africa to also include the day-to-day management of the South African operation," he says.

Glover, of course, was a capable CEO and McNiff says WorleyParsons is sorry to lose him. "He leaves with our best wishes and our thanks for the sterling work he did in overseeing the integration of the TWP organisation into the WorleyParsons Group, a process which effectively started in 2013 – when WorleyParsons acquired TWP – and which was successfully completed during his tenure," he notes.

Scottish by birth and a structural engineer by training (his degree is from Heriot-Watt University), McNiff has spent a major part of his career with WorleyParsons, having joined one of the predecessor companies of the Group in 1989, after having started his career with the UK arm of American engineering company, Brown & Root (as it was then known).

During his time with WorleyParsons he has been based in a number of geographic locations, including the US, the UK, the Middle East, Asia and, of course, South Africa. "I was involved in the set-up of the WorleyParsons operations in Nigeria, Ghana, Angola, Mozambique and South Africa and I've been involved with the South African business since it started up," he relates. "Our entry point to South Africa was the acquisition of Pangaea in 2008, followed by our takeover of KV3 in 2011 and, of course, TWP in 2013."

On the subject of the current recession in mining, he says that WorleyParsons RSA is not immune to the market situation and – like all its peers – is having to find ways of taking cost out of the business and working more efficiently.

"Fortunately, we operate not only in the metals and minerals space but also the hydrocarbons and infrastructure sectors, so we are well diversified," he explains. "Being part of a global group also helps as the resources of the South African operation – which, incidentally, is our global centre of excellence when it comes to mining and precious metals – are being increasingly deployed outside of Africa, which means that we are not solely dependent for business on the African resources market. Our people in South Africa are currently contributing their skills to projects in Europe, South America and Asia and this involvement overseas will only grow in the future."

"Our people in South Africa are currently contributing their skills to projects in Europe, South America and Asia and this involvement overseas will only grow in the future."

He adds that one of WorleyParsons' strengths is its ability to workshare seamlessly over multiple locations. "Our projects are typically executed from more than one location which means that clients are able to tap into our huge depth of global expertise, wherever their projects are situated. This is not at the expense, however, of a deep understanding of local markets and conditions. Our credo is 'Local Delivery of Global Capability', which means that our clients effectively get the best of both worlds."

Looking specifically at the Southern African mining market (the one of most interest to *Modern Mining's* readers), McNiff concedes that new capex has all but dried up but says the need for mine owners to extract the maximum value from existing assets has opened up opportunities for WorleyParsons' Improve business, one of its four business lines. "Improve focuses on providing customers with global best practice solutions for the optimisation of assets and is positioned to do well in the current mining environment," he says.

He also notes that WorleyParsons is still seeing a healthy number of studies coming through from clients across all the sectors in which it operates. "These are now handled by our new advisory services business line, Advisian, which is designed – amongst other things – to allow us to dominate the front end of the project cycle," he explains.

Advisian – which now employs over 3 000 people in 19 countries and which offers a unique combination of technical, business and strategic consulting services – has been deliberately positioned to have a degree of independence from the rest of the WorleyParsons Group. "Advisian in Africa, for example, does not report to me but to its own global CEO. Obviously, though, WorleyParsons' involvement in projects will sometimes start with Advisian so it will be a key driver of growth within the Group and the key of course is to convert some of the Advisian studies into actual work on the ground which can be executed by our Services or Major Projects business lines."

Looking at WorleyParsons globally, McNiff says the Group – which employs approximately 30 000 people around the globe – has thus far managed to remain resilient, posting aggregated revenue of $7,23 billion in FY 2015 and securing 105 significant contracts in 2015. "The Group has been undergoing a restructuring since 2014 to align it with market shifts and this has seen the establishment of the current business line structure, which will position it for sustainable growth in a very fast changing business environment," he says. ■

The steel headgears of the Venetia Underground Project (VUP). WorleyParsons has been involved with the project since the feasibility stage (photo: De Beers).

Scania targets the mining sector

Notwithstanding its reputation as one of the world's leading truck and bus manufacturers, Scania globally has historically not had a strong presence in mining. This began to change in 2012 when the group decided to target the mining industry. Since then its penetration of the mining market has grown strongly, particularly in Sweden, Brazil, India and the Philippines. Scania South Africa is looking to emulate this success and has now established a fully-fledged mining division, headed by Becky Smith, GM Mining, who was appointed in September last year.

Smith, notes that mining profitability is heavily dependent on carefully controlling capital and operating costs. "We know that transportation costs make up at least 30 % of the total and this is where we can add huge value. The message we want to get across to South Africa's mining sector is that Scania has a solution for every stage of mining; from exploration to reclamation and everything in between," she says.

"Our range includes both on- and off-road vehicles, all built to a demanding mining specification, which can provide capacities up to 50 tonnes in the case of in-pit rigid dump trucks and up to 150 tonnes in the case of longer distance haulers. Regardless of the application, we are highly focused on delivering uptime through best in class parts availability, network coverage, flexible services set-up, in-house breakdown assistance 24-7 (Scania Assist), and driver training and coaching to name a few."

Becky Smith (left), Scania South Africa's GM Mining, is seen here with key account managers Reuben Govender and Charnie-Lee Kruger. In the background is a Scania mining bus.

Smith acknowledges that Scania trucks – while able to handle extremely tough conditions – are not the answer to every single application in mining. "Obviously, there are areas where one needs traditional specialist mining equipment," she says. "Having said this, there are many situations in which ADTs are being used where Scania trucks could provide a far more cost efficient alternative, given their lower capital cost and excellent fuel efficiency."

Smith stresses that Scania is in the business of providing fully specified solutions and not just selling vehicles. "We are able to offer qualified mining advisory services in logistics and site optimisation which may include optimising loading time and overall equipment utilisation, and monitoring ongoing operations," she notes. "Specifically, we will create a haulage solution that is tailored to each customer's situation and provide advice on how to maximise equipment efficiency and productivity and minimise downtime, which are crucial factors in any mining application."

She adds that Scania can provide aftermarket backup through its extensive dealer network throughout Southern Africa, extending as far north as Tanzania. "Our 'footprint' and regional structure keep us close to our customers and improve our ability to solve problems and provide support quickly. We can also put field workshops on mine sites with varying levels of service depending on what the customer needs. In fact, globally we now have them operating on 15 mines in 10 countries. These workshops are a container-based solution and can consist of as many as eight types of containers, each dedicated to a specific purpose such as lubrication or parts storage."

Tailored, full-service contracts for preventive maintenance and full repair and maintenance are offered by Scania South Africa, with the full maintenance contracts providing the convenience of paying a fixed, predictable amount that can be calculated per kilometre, per hour or per tonne of material being transported.

Scania builds its vehicles according to a 70-year tradition of modular design – which makes for tremendous flexibility and also contributes to shorter lead times for delivery. “We import the knocked-down chassis kits from our production plants overseas and, together with the bodies, they are assembled here in South Africa to the customer’s specification,” Smith explains. “This means that we can also supply specialist vehicles such as lubrication trucks, water tankers, staff transporters, stemming units and service vehicles.”

Smith, a Canadian who started her career with Lafarge Canada, has been in South Africa for 12 years. Based at Scania South Africa’s headquarters in Aeroton, Johannesburg, she reports to Steve Wager, the Managing Director of Scania South Africa. She is assisted by two newly appointed key account managers, Reuben Govender and Charnie-Lee Kruger, who will focus on clients in the mining and quarrying industries. The mining team is still building up with the next key appointment being a services manager dedicated to mining.

A Scania tipper working in a demanding mining application (photo: Scania).

Scania South Africa was established in 1995 as a wholly owned subsidiary of Scania CV AB in Sweden. It initially assembled vehicles in Elandsfontein but – following increased demand – opened a new purpose-built plant in 2003 alongside the head office complex in Aeroton. The South African assembly plant is Scania’s largest knocked-down kit assembly operation outside Brazil and is seen as a model for all future facilities of this type within the worldwide Scania organisation. ■

New technology on display at Open Day

The recently launched semi-mobile Bradford Breaker was welcomed by delegates at the Tenova TAKRAF Africa Open Day held recently at the company's regional Client Support Services office in Middelburg, South Africa.

The Open Day showcased a range of advanced technologies supplied by Tenova TAKRAF Africa, highlighting its ability to provide innovative solutions from pit to port. These include the 'monster machines' for opencast mining, stockyards and ship loading/unloading, which are to be found in major operations throughout the globe, crushing and screening systems, the ingenious Tenova TAKRAF Africa developed modular overland conveyor, and the Dust Solutions Incorporated (DSI) and Magaldi Superbelt® technology.

Mounted on skids, the semi-mobile Bradford Breaker was highlighted at the Tenova TAKRAF Africa Client Open Day in Middelburg.

Bradford Breakers, sold under licence from Terrasource Global in the USA, have been extensively applied on South African coal mines since being introduced to the local market in the 1980s, proving highly effective in simultaneously sizing and cleaning raw coal. Developed originally for the American market and its softer coal, Tenova TAKRAF Africa has drawn on its wealth of experience in the local industry to modify and enhance the Bradford Breaker to make it an appropriate choice for the difficult coal of the South African market.

Particularly suitable for the junior and small miners who are increasingly exploiting the small coal resources that remain, the most recent development, the semi-mobile Bradford Breaker, offers the benefits of the breaker in a more compact machine mounted on a skid. This allows for ease of transport to move the Bradford Breaker as mining progresses to another block or resource, the ability to position the Bradford Breaker as close as possible to mining operations, therefore reducing conveying costs, and reduced civil works as the unit can be placed directly into position on the skid.

Based on an ingenious design, the Tenova TAKRAF Africa modular overland conveyor is a breakthrough in conveying, consisting of concrete modules precast at the project site and fitted with idler frames and brackets. These are easily and quickly placed into position after the conveyor line has been surveyed, with only a prepared terrace required and no civil footings.

"The positive response we received from our customers at the Open Day in Middelburg underlines the importance the industry places on Tenova TAKRAF Africa's innovative technology offering, as well as our commitment to staying close to our customers, " says Riccardo Tonini, Managing Director, Tenova TAKRAF Africa. "Our network of offices, which covers our headquarters in Spartan, Gauteng, and regional offices in the Northern Cape and Mpumalanga, ensures we provide a comprehensive service from equipment supply to aftermarket support, based on an in-depth understanding of the specific requirements of the local mining operations."

Tenova TAKRAF Africa, tel (+27 11) 201-2300

Field tests on fuel filter exceed expectations

Advanced nano-fibre technology exclusively developed by Cummins has –says the company – been proven to dramatically extend oil drain intervals, improve overall efficiency and decrease the total cost of ownership on OEM machinery and equipment operating in the harsh South African mining conditions.

The latest breakthrough from the company's filtration division is the Fleetguard FH239 Series Industrial Pro diesel fuel filtration system and all-in-one fuel/water separator, which was launched locally at last year's Mining Indaba, following successful trial runs at mine sites over an 18-month period.

According to Cummins Fleetguard Technical Sales Manager Gerald Annandale, the product has been tested at numerous mine sites across South Africa and has exceeded all expectations. "In line with ISO 4406 cleanliness standards, fuel must be inspected in laboratory conditions to determine its cleanliness before it is discharged. The minimum level is 18/16/13, although mining operations prefer 16/14/12," he says.

"During extensive testing, the Fleetguard FH239 Series Industrial Pro diesel fuel filtration system achieved its objective of 12/9/6, before eventually going down to an incredible 10/9/5. This is the cleanest fuel I have ever seen, which will prove highly beneficial to machine productivity."

Cummins tested 200, 250 and 300-ton trucks operating on different coal mines. The objective was to achieve 1 000 hour service intervals, as many mines were only achieving between 250 and 750 hours. Annandale reveals that the product comfortably got to 1 000 hours for all filtration, and even achieved 2 600 hours on one truck at first stage filtration.

According to Annandale, a traditional engine has a 25 000-hour life expectancy before a total rebuild is required. "This new technology can extend this number to over 33 000 hours," he says. "This results in greater productivity, less money spent on labour, while downtime for servicing is also reduced."

The FH239 provides easy maintenance with its self-priming port. By simply spinning off the cap, users can pour in fuel and restart the engine with clean, filtered fuel. The clear cover tells users when not to change their filter and offers a window into the system to see fuel condition and flow. This is Cummins' patented 'Seeing-is-Believing' technology, which is said to offer superior effectiveness in removing water and contaminants from the fuel system, while ensuring that filters can be changed within a matter of minutes.

Cummins, tel (+27 11) 589-8400

Roll crushers prove themselves in coal

Double roll crushers manufactured locally by Osborn are proving their mettle in the tough coal industry, where they are increasingly being chosen for their low fines generation, says product sales specialist Etienne Swanepoel.

He reports that Elandsfontein-based Osborn has netted an order for a 4848 double roll crusher from a long-standing client near Delmas. This follows on the heels of the supply of two 3054 Osborn double roll crushers, manufactured and delivered within a testing time frame, to a different coal operation in the vicinity of Lephalale.

"Our durable and reliable double roll crushers have earned a reputation for less fines generation due to a lower roller speed versus a rolling ring crusher. Other features that are contributing to their burgeoning success in the coal industry include their unique hexagonal drum design and lower power usage," Swanepoel comments.

He notes that Osborn double roll crushers can be used for primary, secondary and tertiary crushing, depending on the feed size and the product size required. "The one 3054 unit delivered to Lephalale is being used in a primary application and the other as a secondary crusher. The feed reporting to the primary 3054 is 450 t/h at a -150 mm lump size. Our crusher reduces it to -40 mm and this then reports to a single deck screen and thereafter to the secondary 3054 double roll, which yields a final product of -25 mm."

Osborn 3054 double roll crusher working at a coal operation near Lephalale.

Swanepoel says the Osborn double roll crusher is generally regarded as a 4:1 feed-to-product ratio crusher but that in some instances, dependent upon material friability and hardness, it is possible to achieve a 6:1 crushing ratio.

Each roll assembly comprises renewable and reversible toothed segments, bolted and keyed to a robust hexagonal hub with the nuts inside the hub, Swanepoel explains. He says that when the correct crushing ratio is used and the optimum roll diameters selected, the segments will grip the feed material more efficiently and will not allow pieces to roll on top of the segments due to the incorrect nip angle.

He notes that the crusher's locking nuts are securely located in fabricated pockets in the drum, which allows for the removal and replacement of segments from the outside using only one tool (an Allen key).

Osborn Engineered Products, tel (+27 11) 820-7600

Umzamo sets its sights on expansion

After experiencing 400 % growth in the local market over the past year, Umzamo Analytical Services (UAS) says it has set its sights on clients beyond South Africa's borders.

UAS will focus on expanding its business into Southern Africa in the coming year. CEO Audrey Ndlovu, who will be spearheading the process of targeting clients in the region, says that everyone in the company is ready for the expansion.

"Yes, there is competition for us in this region but with our expertise and professionalism in place we are ready to face it. We have the expertise and capacity and we use the latest technology and equipment. We also have the ability to be flexible and efficient without compromising the quality of our services," she says.

She credits the growth experienced by the company over the past twelve months while working within the South African market to its hands-on approach, its passion for the industry, and its extensive knowledge in coal sampling and testing. "We have become synonymous with providing uncompromised, accurate, analytical results which bodes well for expansion as we have the opportunity to build on a solid reputation," she explains.

UAS has the capacity to offer the coal mining industry in Southern Africa coal analytical services that have quick turnaround times enabling factual, financially stable decision making for its clients. "We offer convenience and greater efficiency," says Ndlovu. "We are able to set up on-site laboratories for our clients' convenience."

UAS, website: www.u-a-s.co.za

Multotec Rubber to market CITIC steel liners

Multotec Rubber has concluded an agreement with CITIC Heavy Industries to market its steel liners in Africa. This is a significant move by CITIC as Multotec Rubber has an extensive representative footprint on the continent and this, together with its value add services, will see the footprint of CITIC steel liners grow exponentially throughout Africa.

A trial assembly of the discharge system can be done on a steel jig if this is a request from the customer. This ensures fitment will be correct during the installation.

Michael Rauscher, GM – Africa & Europe for CITIC Heavy Industries, says there are numerous synergies between Multotec Rubber and CITIC. "Both companies have strong established reputations for product quality and performance, and both have a depth of technical expertise and applications experience.

"It was considered essential that the CITIC steel liner product be distributed by a company that could offer the requisite skills levels and in-field experience to be able to assess individual customer applications, install and monitor the performance of the liners," Rauscher says.

CITIC Heavy Industries, the largest company of its kind in China, was established in 1958 and can produce over 200 000 tons of quality equipment for the mining, metallurgical and cement industries annually. It is also a major supplier of steel mill liners and grinding media globally. Rauscher says there are currently over 45 CITIC comminution installations in the region and hundreds globally.

The CITIC steel mill liner distributorship will allow Multotec to participate across the full spectrum of mills, especially with the growing trend towards mills with larger diameters.

"New projects coming on line include very large diameter mills that are outside of the scope of rubber and rubber composite liners due to the energy generated by the grinding ball trajectory from close to the top of the mill. In these applications only steel mill liners are feasible," says Sam Hearn, Sales Manager at Multotec Rubber.

Rauscher says that while some operators may believe that a steel liner is simply a steel liner this is not the case as the manufacturing methodologies do differ from liner manufacturer to liner manufacturer. An advantage of considering steel mill liners from CITIC is that – as a mill OEM – the company considers the performance of the entire circuit and not just the liners as an isolated component.

CITIC is currently producing and installing single piece liners of up to 6 tons and there is no reason why larger single piece liners cannot be produced. The only limiting factor will be the capability of mill handling equipment and trunnion diameter. According to Hearn, mill liner handling machines are being designed and manufactured to handle larger and heavier liners and this will enable the casting of larger liners which will significantly reduce the downtime to reline mills leading to higher productivity.

Bernadette Wilson, Multotec Group, tel (+27 11) 923-6193

Rockwell Automation awarded Letlhakane contract

Rockwell Automation has been awarded the contract to supply low and medium voltage equipment and automation solutions for the Letlhakane Mine Tailings Resource Treatment Project (LMTRTP) in Botswana. The project includes a treatment plant, a 66 kV power line and other infrastructure and services. Letlhakane mine is owned by Debswana.

Rockwell Automation has been assigned to install a number of low and medium voltage variable speed drives into the plant's E-Houses to drive various pumps, belt feeders and crusher units, and mineral processing equipment. "We proposed our PowerFlex series which will be fitted to customised drive panels, installed in E-Houses, and controlled by a Rockwell Automation solution in accordance with the Debswana standards," says Pat Colarossi, Account Manager – Mining & Metals, Sub Saharan Africa, Rockwell Automation.

With regards to the automation solution, Rockwell Automation has proposed a Mining Solution, which combines plant-wide control technologies and unmatched scalability. This, it says, "will be achieved by using Rockwell Automation Integrated Architecture with all the core capabilities of a world-class distributed control system using the Internet of Things."

Pat Colarossi, Rockwell Automation, tel (+27 11) 654-9700

Entry-level vibration checker from BMG

BMG offers the full portfolio of SPM condition monitoring equipment, from basic hand held instruments to high level online systems. Included in this range is the entry-level VibChecker portable instrument, designed for reliable on-site vibration measurement and assessment.

"The VibChecker requires minimal operator training and supports BMG's BearingChecker which is used to accurately assess the condition of rolling element bearings during operation in equipment such as motors, fans, pumps and gearboxes," says Carlo Beukes, GM: Drives Belts & Ironware divisions, BMG – Bearing Man Group.

"The VibChecker gives early warning signs of developing machine problems in order to prevent premature replacement of machine parts. Vibration monitoring is the most widely used preventative maintenance technique for the accurate assessment of the condition of machinery elements – like pump rotors, fan impellors, gearbox gears and housing mountings.

"Both these instruments are instantly usable and require little training for efficient operation."

The lightweight user-friendly VibChecker has an ergonomic design, an easy button operation and user-friendly interface. It is designed for simple vibration checks and with built in FFT (Fast Fourier Transform) capabilities, it is also an efficient device for troubleshooting.

The entry-level VibChecker portable instrument, designed for reliable on-site vibration measurement and assessment.

Periodic vibration checks are easily done and reliable and accurate vibration information is delivered in seconds. Readings are immediately and automatically evaluated according to established ISO standards.

Accessories include a comfort grip protective sleeve and a small portable MEMS transducer with magnetic foot, convenient for measurement in narrow spaces.

BMG – Bearing Man Group, tel (+27 31) 576-6300

New fall protection solutions launched

Reliable fall protection systems are imperative when working at height, as they provide workers with the confidence to complete challenging tasks without limitations. The latest additions to the MSA Africa range are the Workman Rescuer and the Workman Mini Personal Fall Limiter (PFL).

MSA Africa Customer Call Centre Manager Bernice Mackay says that MSA launched the Workman Rescuer and the Workman Mini Personal Fall Limiter (PFL) solutions after listening to customer needs.

The Workman Rescuer provides fast and easy fall protection with integral bi-directional retrieval capability. "Not only does the Workman Rescuer arrest the fall, its retrieval capability allows the fallen worker to ascend or descend to a safe location," says Mackay.

This durable, economical addition to the Workman series of products offers fast installation and setup. The Workman Rescuer is also a stand-alone retractable device, as the carrying handle can be used as an anchorage attachment.

The Workman Rescuer can be used for two applications – as a component of a confined space system and as a standard self-retracting lanyard. It has a maximum arresting force of 6 kN and a user capacity of 140 kg.

Turning to the Mini PFL, Mackay says this is the most versatile, compact and self-retracting device on the market. "It boasts an internal fast-acting pawl lock mechanism, which provides many lower level tie-off points for a wide range of applications."

The Mini PFL is available in both single and twin leg, tie-back and non-tie-back configurations. "With a user capacity of up to 140 kg, and the option of replacing standard 1,8 m shock-absorbing lanyards, the Mini PFL is ideal for all types of work-at-height tasks," Mackay concludes.

MSA Africa, tel (+27 11) 610-2637

SlurrySucker helps to optimise use of water resources

Sediment in process ponds and reservoirs is a serious concern, especially with the current drought conditions that are afflicting South Africa. Lee Vine, MD of Integrated Pump Rental, says severely silted up process water dams and ponds negatively impact the water storage capacities on a plant or mine, and affect all downstream processes.

"Use of water resources needs to be optimised and a greater focus must be directed to desilting water storage facilities. We have started to see this happening and there is an increased interest from the market for our SlurrySucker," he says.

Launched less than twelve months ago, the innovative SlurrySucker dredge unit is capable of extracting high tonnages of silt and built-up sediments at a fraction of the money required to shut down downstream and upstream processes to clean out these types of water storage facilities.

Available on either short or long-term hire contracts, or as an outright purchase, the SlurrySucker is simple to use and two standard units are available. The SlurrySucker Mini is capable of extracting 120 m^3 per hour of slurry/water mixture, equating to 30 to 40 dry tons per hour, while the larger SlurrySucker Maxi will remove between 70 to 80 dry tons per hour. The SlurrySucker Mini has a 100 mm discharge and the SlurrySucker Maxi has a 150 mm discharge.

The innovative SlurrySucker dredge unit is capable of extracting high tonnages of silt and built-up sediments at a fraction of the cost required to shut down downstream and upstream processes.

The SlurrySucker units are manufactured using locally produced components and incorporate pumps from the respected Grindex slurry and dewatering range. During the development of the innovative dredging system, use was made of computational fluid dynamics (CFD) to optimise and validate the design.

Engineered as a robust, compact dredging unit, the SlurrySucker can be easily transported on a standard road trailer, making it simple to move from pond to pond on a mine site. The units are engineered to be operated by a single person and where the necessary manpower is not freely available Integrated Pump Rental undertakes the pond or dam cleaning on a turnkey contract basis.

Vine says that Integrated Pump Rental has the necessary technical skill to ensure that the pump selection matches the dredging operation requirement, and it could include either Grindex dewatering pumps where agitation of the slurry is required, or Grindex slurry pumps where there is a need to remove slurry from ponds or dams.

Another very significant advantage is that the SlurrySucker Dredge Unit can be used on plastic-lined dams without any damage to liners. This is very important from an environmental perspective as there is no risk of the liner being cut and water leaking out.

Lee Vine, Integrated Pump Rental, tel (+27 72) 627-6350, e-mail: lee@pumprental.co.za

Air filter service indicator reduces wastage

When working in highly contaminated air, typically experienced in very dusty conditions, maintenance personnel may need to change filters earlier than scheduled to ensure full airflow and engine power. However, since it is not possible to visually determine when a filter reaches capacity, one of the best ways to determine its effective performance and expected life is via a Cat air filter service indicator, which accurately reads its condition.

This easy-to-install indicator shows maintenance personnel how much filter life remains and indicates airflow resistance even when the machine is not running.

"Knowing when to change the filter will reduce wastage, as well as the risk of unnecessarily introducing contaminants during in-field fitment outside of scheduled service intervals," explains Barloworld Equipment group product application specialist, Reuben Phasha.

To make sure the service indicator is operating properly, Caterpillar recommends changing it once a year. It should be checked every 250 hours in normal conditions or daily if dust is severe.

Where the indicator readings regularly show operating conditions with a high percentage of fine dust particles or exhaust soot, one of the best options for fleet managers is to install Cat UHE (Ultra High Efficiency) air filters to ensure optimum availability and reduced engine wear.

"Particles collect on the UHE filter's surface layer of very fine fibres, quickly building a cake that allows less dust to reach the engine," Phasha expands. "This surface particle cake is more porous than comparable dust-coated media fibres, causing less restriction throughout the filter life."

The lower restriction allows the engine to breathe more easily, and fuel economy improves because it takes less power to pull in air. Typically, UHE's unique surface helps extend air filter life up to six times as long as standard filters.

Barloworld Equipment, tel (+27 11) 929-0000

Animated videos provide marketing tool

In December 2015, Equipment Simulation Suite (ESS) completed a project for Manitou Southern Africa, producing nine 3D animated videos to be used for the marketing of Manitou's telehandler mining attachments range.

The primary aim of the project was to produce stimulating marketing material with a strong emphasis on demonstrating the operation and application of the attachments, as well as their capabilities.

The videos were produced in full HD resolution and are suitable for all electronic communication platforms, including the internet (company website), mobile devices (uploads) and mobile apps.

"3D visualisation is fast becoming the preferred communication channel for industrial products. The stories of these products are being told visually to a global audience in a high-tech, sophisticated manner using innovative and limitless design concepts. This is resulting in enhanced understanding of these products, creating value using a cost-effective medium," says Craig Bowes of ESS.

Craig Bowes, ESS, tel (+27 82) 885-3526, e-mail: craig@equipmentsimulation.co.za

LED lighting solution for dragline

BEKA Schréder has supplied an LED lighting solution to upgrade the boom and machine house lighting on an Anglo American Coal dragline. Due to the machine's excessive vibrations and the fact that it is continuously operational, ease of maintenance at long maintenance intervals was an important requirement for this lighting project.

OMNIstar LED floodlights illuminate the pit area.

BEKA Schréder proposed an LED lighting solution due to the clear benefits of LED technology. Sixteen OMNIstar 322 W high-power LED floodlights replaced the boom's sixteen 1 000 W high-pressure sodium floodlights. BEKA Schréder managed to achieve the required lighting levels, despite the lower wattage.

The OMNIstar offers a real alternative to luminaires equipped with high-power traditional light sources, with the added advantages of an LED solution: low energy consumption, improved visibility with a colour temperature close to daylight, limited maintenance and longer life.

The boom is 100 m long, 19 m wide, with a tip height of 62 m, and is installed at an angle of 39 deg.

The machine house lighting was also upgraded. The LEDnova 85 W LED industrial bulkhead replaced the 150 W high-pressure sodium bulkhead inside the machine house. On the exterior, LEDflood 136 W floodlights were installed.

All the necessary specified lighting level requirements were achieved in all areas.

In such harsh environments as mines, BEKA Schréder's LED luminaires offer a range of benefits over traditional industrial and floodlight luminaires. These include energy efficiency, a long useful operating lifespan with low maintenance requirements, surge protection and resistance to impacts and excessive vibrations. To ensure long lasting performance, electronic temperature monitoring prevents overheating of LEDs and power supply (ThermiX®). Additionally, the units are designed for easy technology upgrade.

The luminaires supplied for this project all have a housing made from high-pressure die-cast aluminium to ensure the luminaires' long lasting performance, even when exposed to extremely harsh environments.

BEKA Schréder locally develops and manufactures LED lighting products designed for local conditions.

Beka Schréder, tel (+27 11) 238- 0000

Kwikspace supports powerline project

Heavy rains and major flooding left areas of Mozambique in a dismal state last year, having damaged major infrastructure such as roads, bridges and rail networks. In addition, significant damage to the powerline leading to a well-known minerals mine occurred, leaving it in a situation where it had to rely on diesel generators and product inventory to counteract the negative effect of the resultant power cuts.

Now, as the repair of infrastructure is carried out, South African-based company Kwikspace Modular Buildings has played a supporting role in the progress of this project through the provision of prefabricated buildings ordered by Conco. A company responsible for electrical power distribution system construction, Conco required four prefabricated units for various purposes at a remote location on the mine site, where it is contracted to install new overhead power towers.

Comments Nick Alexander, Director of Business Development for Kwikspace Modular Buildings in Africa: "The conditions were tough; bridges we needed to cross had been washed away and roads were impassable. Despite the challenges we were faced with, we went in armed with a wealth of experience in delivering units to remote locations."

Kwikspace was contracted to supply a 12 m x 3 m four-room residential unit, a 9 m x 3 m two-room residential unit, a 9 m x 3 m open-plan office and a 9 m x 3 m ablution unit to the site at the Meluli River near Angoche Island, about 250 km south of Nacala, for the 10-man Conco team, on a rental basis spanning the duration of their project.

"In order to get our units to the site, road repairs had to be done, trees needed to be trimmed with the help of local community members, and eventually an alternative route needed to be devised to allow for our delivery vehicles to continue to site," continues Alexander. "We worked closely with our client to find suitable solutions to the obstacles we encountered during this project as we had no access to resources or local services in this very remote location. The successful outcome proved the flexible nature of Kwikspace and our ability to act on the spot to ensure that our client's requirements are met."

Kwikspace Modular Buildings, tel (+27 11) 617-8000

Bridges that needed to be crossed had been washed away and roads were impassable, complicating the delivery of Kwikspace's units to site.

Latest version of point cloud package released

The Geological Module in I-Site Studio 6 allows users to define geology directly from 3D point cloud data.

The latest I-Site point cloud processing tools from Maptek – which form part of the recently released I-Site Studio 6 – focus on the everyday needs of mine surveyors for fast, accurate volumes, conformance reporting, geotechnical analysis and CAD design.

New CAD design tools include user friendly preferences for snapping to angles and points. Other in-demand items include auto registration and alignment of scans, complex surface modelling, waviness analysis for geotechnical modelling and analysis.

"Surveyors are under pressure from all departments to quickly and safely survey active mining areas. This is on top of recurrent stockpile volumes and active mining face updates," says Jason Richards, Global Business Development Manager for Laser Imaging Solutions at Maptek.

"With I-Site Studio 6 they have access to geotechnical analysis, conformance reporting, CAD and geology tools in one package. Surveyors can respond to virtually any request, with accurate results and timely reports that are used by all mining departments to meet operational objectives."

Survey data plays a vital role in safety management programmes. Accurate information is mandatory for identifying areas of structural weakness that can affect mine planning and operational decisions.

New and enhanced geotechnical options in I-Site Studio 6 provide powerful analysis tools for understanding structural relationships, says Maptek. Creating solids from discontinuities helps determine wedge shape, size and volume. Dynamic adjustment extends discontinuities to assess the potential persistence across pits or structural domains.

Stereonet improvements include new tools, preferences and workflows. A direct link between the interactive stereonet and 3D views allows users to select discontinuities in the 3D view window in order to highlight them on the stereonet.

Kinematic analysis has been overhauled in I-Site Studio 6. Defaults for failure types have been added, and failure zones are automatically shaded to highlight areas of potential failure on the stereonet. Dragging and dropping the discontinuity of the slope face onto the kinematic slope orientation fields automatically displays failure zones.

New CAD tools allow users to create CAD design outlines direct from 3D point cloud data, streamlining everyday survey and engineering tasks.

"Snapping preferences streamline CAD workflow and allow users to digitise from real world to CAD environment," says Richards. "It's easy to draft haul roads and ROM pad layouts, add strings for stockpile shadow zones and create CAD footprints of structures on site."

A new 3D complex surface modelling tool produces a 3D surface that honours the original point cloud data, conforming around walls, curves and tunnels, as well as creating another surface by averaging the point set.

A new volume reporting tool applies a base surface, stockpile surfaces and polygons to generate volumes for multiple regions in one pass. Design conformance reporting allows users to compare a design surface to as-built and other surfaces, summarising sections, underdig, overdig, and percentage of volume variance.

Maptek, tel (+27 11) 750-9660, website: www.maptek.com

XRF analysers on show at Mining Indaba

Oxford Instruments, a leading provider of X-ray fluorescence (XRF) analysers for mining and exploration professionals worldwide, along with its partner United Scientific, exhibited its range of products at this year's Investing in African Mining Indaba.

The Oxford Instruments comprehensive range of high performance, rugged, user friendly XRF analysers is suitable for the strictest analysis requirements from front end exploration and core logging to mine mapping, grade control and environmental testing.

Included in the range is the X-MET7500 handheld XRF analyser which can be used for the direct measurement of a wide range of elements from magnesium (Mg) to uranium (U) in drill cores, cuttings, rock, powders and more providing field analysis results in seconds.

The X-MET7500 is easy to use meaning that minimal training is required. Optimised to work with Trimble® and other brands of GPS receivers, the X-MET7500 enables the user to combine location data with analysis results for mine mapping for convenient and powerful data management.

Oxford Instruments, website: www.oxford-instruments.com/mining

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The OMNIstar has been designed to provide an unrivalled combination of performance and flexibility for lighting areas where high lumen packages are needed while offering maximum savings in energy and maintenance costs with a short payback time.

This modular luminaire can be installed on a high mast with a bracket of one, two or three luminaires to provide the lighting distribution and lumen package needed to meet the specifications of the area to be lit.
It offers a real alternative to luminaires equipped with high-power traditional sources, with the added advantages of an LED solution:
low energy consumption, improved visibility with white light, limited maintenance and longer life.

www.beka-schreder.co.za/OMNIstar

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