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- New mine plan in place for New Luika
- Lihobong reaches the half-way point





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Mohini Singh - 11 years



Niel Lourens - 26 years

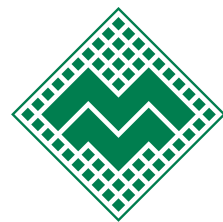


Bheka Majola - 19 years

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Cover

MCC Contract Mining & Plant Rental, one of South Africa's leading open-pit mining contractors, has landed the contract for the new Nsele open-cast coal mine in the Delmas area. See page 18 for full details.



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Straight talking on mining

by Randgold's Mark Bristow

The mining industry tends to be over-weight in senior executives who carefully weigh every word they say and who very rarely engage in straight talk – which is why it is so refreshing to listen to Mark Bristow, the dynamic (an over-used word but correctly applied in his case) CEO of Randgold Resources. Once a year he hosts a media lunch in Johannesburg and at this year's event he was in his usual top form, throwing out one quotable quote after another with a cheerful disregard for the conventions that normally govern discussions between members of the media and the mining industry's top management.

Not surprisingly, he painted a grim picture of the gold mining industry. He pointed out that when he created Randgold back in 1995, South Africa was still the world's top gold producer, producing nearly a quarter of global output, whereas today it ranked a lowly seventh and was responsible for just 5 % of world production. He said gold mining generally, and not just in South Africa, was in a bad state and in need of major restructuring. "It will not look the same in two years' time as it does today," he predicted. "It's definitely an industry that has to have something done to it."

He noted that collectively the world's top gold producers had not increased production over the past ten years despite raising US\$150 billion in debt and equity, which – as he put it – was a huge investment to make just to tread water.

Randgold – which reported record gold production in the second (June) quarter of this year – was one of the few exceptions to global trends in gold mining, he said. The group was debt free, had never in its history reported a single impairment and was continuing to invest heavily in exploration – to the tune of US\$50 million a year – at a time when most exploration budgets were being slashed.

On the outlook for resources generally, Bristow said commodity prices were unlikely to recover to the levels seen during the 'super-cycle' boom. "We're not going to get back to where we've come from," he said, adding that oil storage facilities around the world were full while China had enough iron ore stockpiled to last six years.

On the subject of social responsibility, he claimed that most mining companies had no 'social licence' to mine. He said that obtaining such a licence involved more than just upgrading the local clinic and was a task that had

to be worked on continuously. He noted that Randgold in Mali, apart from all its community initiatives, had contributed over a billion dollars to the Malian treasury over the years and that its operations currently accounted for 12 % of the country's GDP. "Our taxes pay the salaries of all the country's civil servants," he stated.

Perhaps Bristow's most interesting comments were on Obuasi in Ghana and Randgold's planned collaboration with AngloGold Ashanti to revive the more-than-100-year-old mine, which over the past ten years has consumed around US\$1 billion in new investment with little to show for it. Operations at Obuasi are currently curtailed – the only production is from tailings processing – while its future is being determined.

Bristow didn't mince his words about the state of Obuasi, saying it had no social licence to mine, was in conflict with virtually everyone and was hampered by a range of legacy problems. He stressed, however, that it had significant reserves (probably far more than had been declared). "The question is whether we can convert this world-class orebody into a world-class mine," he said.

In terms of its agreement with AngloGold Ashanti, Randgold has till the end of January next year to come up with a realistic, viable plan to convert the mine into a modern mechanised operation. Bristow said Randgold had made a start on this task, having just transferred the team that had worked on the Kibali underground mine in the DRC to the Obuasi site.

I can't help thinking that the revival of Obuasi will be the biggest test ever for Bristow. Even for a man with his abilities, the mine presents a huge challenge, as it has steadfastly defied the efforts of a succession of managers to get it right.

Randgold has a proven success record with underground mining, with its operations in Mali (and now Kibali as well) ranking as amongst the most efficient in Africa. But these are new mines, designed from the start for mechanisation. Can the same methods be 'retrofitted' to the maze of underground workings at Obuasi, which extend down to about a kilometre-and-a-half below surface? Certainly, if Randgold can chart a new course for Obuasi – and successfully implement it – then it would rank as a stunning achievement and confirm Bristow's reputation as one of the world's savviest gold miners.

Arthur Tassell



Bristow noted that collectively the world's top gold producers had not increased production over the past ten years despite raising US\$150 billion in debt and equity, which – as he put it – was a huge investment to make just to tread water.



The Asanko site showing the main Nkran pit. Dewatering of the pit is well advanced and should be complete by November (photo: Asanko Gold).

Asanko three quarters of the way to completion

Asanko Gold Inc, listed on the TSX and NYSE, has provided a construction update on Phase 1 of the Asanko Gold Mine (AGM) in Ghana. Phase 1 will be a low cost, long life mine producing 190 000 ounces of gold per annum at steady state, with the first gold pour on track for early Q1 2016.

The project continues to advance with three quarters of the overall project complete and around 2 400 employees and contractors on site, as at the end of August 2015. Concrete civils, steel erection, mechanical and platework are nearing completion whilst piping and Electrical and Instrumentation (E&I) are well underway.

Peter Breese, President and CEO, commented on the status of the construction of Phase 1: "The current level of activity and energy at the project site is tremendous and we have achieved some significant milestones since our last update, including the installation of the primary crusher and the mill shells.

"The completion and handover of 88 new houses as part of the partial village relocation is a major achievement and one that was done in close collaboration with, and support from, the local community.

"Overall, the project is currently on budget and tracking a few weeks ahead of the original schedule. As such, the focus is now shifting to the commissioning plan to

ensure the successful start-up and ramp-up of Phase 1 operations."

Pre-stripping of the Nkran pit, the main mineral resource for Phase 1, continues to advance according to schedule. Hard rock was reached in August, when drill and blast operations commenced. Mining operations are running at planned production levels of 80 000 to 90 000 tonnes per day which are in line with the long-term, steady state, life of mine plan. The on-site explosives magazine was commissioned in early September and is now fully

operational. Blasting has been limited to the western and southern sides of the pit pending the partial relocation of the Nkran village which is now complete.

The contractor had mined 12 Mt from the pit as at the end of August, representing over 60 % of the planned pre-strip. Approximately 53 000 tonnes of ore at a grade of 1,62 g/t have been mined during the pre-strip and placed on the run-of-mine pad. This ore mined was previously categorised as inferred resources that were not included in the Mineral Reserve



Pre-leach thickener under construction at Asanko (photo: Asanko Gold).

Estimate. Prior to milling operations commencing, it is planned to have over 400 000 tonnes of ore at reserve grade on the stockpiles, which is in excess of one month's production requirements.

Pit dewatering has continued to advance ahead of the mining operations with 4,6 million m³ of the expected 6 million m³ of water now pumped from the Nkran pit (approximately 77 %). The pit is expected to be empty in November. Pit dewatering boreholes are currently being drilled and will be operational as required during Q4 2015.

Installation of the primary crusher has been completed, with work focusing on the structural, mechanical and platemwork. The concrete work for the run-of-mine tip wall and erection of the primary tip bin at the primary crusher have also been completed. Installation of the apron feeder and other mechanical equipment is underway. The stockpile feed conveyor was due to be finished by the end of September. The stockpile tunnel is complete and the mill feed conveyor is being assembled. It is expected that the crusher and stockpile will be ready for commissioning on low-grade ore in Q4 2015.

In the milling section, the shells for both the SAG and ball mills have been installed and the associated steelwork is nearing completion. The SAG mill discharge sump is in place, as well as the vibrating screens.

The carbon-in-leach circuit is continuing to progress with all seven tanks fully erected and interconnecting steel and platemwork also in place.

The Tailings Storage Facility (TSF) is over 95 % complete and will be inspected by an independent third party this month (October). The final inspection report will allow the company to meet its last permit condition and the TSF will be ready to

accept tailings. It is expected that the TSF will be utilised for storing water for use in the start-up and commissioning.

In June 2015 Asanko signed a life of mine, fixed-priced power purchase agreement with the independent power producer Genser Energy Ghana for the supply of 17 MW to Phase 1. Commissioning of the power plant is targeted for April 2016. Until the main power plant is operational, Genser will provide temporary power to Phase 1 via five 5 MW semi-mobile, liquid natural gas-fired generator units. The five generators are expected to arrive on site this month (October) and will take approximately two

weeks to install and commission.

In addition to the dedicated power plant, the company has also constructed a 161 kV power line which connects to the main power grid. The line will be used to deliver excess power from the dedicated power plant into the grid, or to provide a back-up source of power for the operations. All the power line towers over the 30 km line length have been erected and stringing of the power line is 80 % complete.

The main EPCM contractor, DRA Global, continued its excellent safety record with a recent achievement of 2,4 million lost time injury free man hours. ■

Peer Review validates process route for Kabwe project

AIM-listed BMR Mining has reported the principal conclusion of a Peer Review of its Kabwe treatment project in Zambia.

BMR engaged the services of Tony Francis of Francis Minerals Consulting Limited to undertake a Peer Review of the company's proposed processing methodology for producing lead and zinc from the Kabwe tailings. Francis visited BMR's Kabwe operation between 27 and 31 August 2015.

According to BMR, the Peer Review has confirmed the suitability of BMR's acid/brine leach process for the recovery of these metals. BMR is currently finalising both its processing plans, which will be submitted to ZEMA (Zambia Environmental Management Agency) in the near future, and its costings of the pilot plant.

BMR plans that the treatment rate for the pilot plant will be a minimum of 5 t/h. It intends that it will be operated on a 24/7 basis, initially processing the wash plant tailings.

The principal objective of the pilot plant

will be to finalise the design parameters of the proposed main plant, which is planned to come into operation in 2016, to enable it to process different combinations of tailings. Nevertheless, BMR's intention is to operate the pilot plant as a semi-production unit to simulate actual operating conditions, thereby enabling the company to generate revenues from sales of the end product.

BMR also reports that it has entered into an agreement with Sable Zinc Kabwe, a subsidiary of Glencore, in respect of land adjacent to BMR's tailings dumps and certain key items of equipment.

The agreement, which has an initial term of 12 months, provides for the lease by BMR, at a cost of US\$1 000 per month, of a concrete apron on which the pilot plant will be sited. The plant will include a 300 m³ partially rubber-lined reservoir suitable for the storage of re-cycled water, three 90 m³ rubber-lined leach tanks, a 60 m³ rubber-lined clarifier and rake mechanism, and a filter press. ■



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Acacia production lower than expected in September quarter

London-listed gold miner Acacia, which operates three mines in Tanzania, has reported a lower than expected output of approximately 164 000 ounces for the quarter ended 30 September 2015. It attributes this to several short-term factors negatively impacting output at the Bulyanhulu and Buzwagi mines over the period. The North Mara mine performed in line with expectations.

As a result of the lower levels of production, cash cost per ounce sold and all-in sustaining cost per ounce sold (AISC) for the quarter will be above US\$800 per ounce and US\$1 200 per ounce respectively. Acacia predicts, however, a stronger fourth quarter performance, with production increases at all three mines.

With the increase in fourth quarter production, the company expects to deliver full year production at around the level achieved in 2014 (718 851 ounces), compared to the initial guidance range of 750 000-800 000 ounces.

Commenting on the update, Brad Gordon, CEO of Acacia, said: "I am personally very disappointed in the operational performance in the third quarter, which saw a succession of small issues impact Buzwagi and the ramp up at Bulyanhulu. We have addressed each of these to ensure they do not impact future performance. Importantly, key underlying metrics at Bulyanhulu, such as underground devel-



Bulyanhulu – which was commissioned in 2001 – is an underground mine with shaft access, which is transitioning to long-hole and drift and fill as its principal mining methods (photo: Acacia).

opment rates, mining widths and stope availability are on track to sustain a step-up in production in Q4 2015."

At Bulyanhulu, the anticipated production ramp up did not materialise during the quarter, leading to production of approximately 62 000 ounces, with run-of-mine production of 55 000 ounces and reclaimed tailings production of 7 000 ounces. The reduced output was primarily due to delays in opening new high grade long-hole stopes, which led to lower ore tonnes mined than planned and reduced head grade together with lower plant recoveries. A specialist contractor has been brought in to undertake the stope opening

process, which will ensure that sufficient long-hole stopes are available as the mine moves into Q4 2015.

Recoveries have been impacted by the lower grade together with instability in the plant caused by power interruptions and contamination of the elution circuit, which have both now largely been resolved. Furthermore, in order to better manage long term recoveries and processing costs, the mine is looking at options to separate the run of mine and the reclaimed tailings streams within the CIL circuit.

At Buzwagi, production of approximately 34 000 ounces for the quarter was impacted by the mining of lower than planned grades together with reduced mill throughput as a result of extended crusher downtime in September and an unplanned SAG mill re-line. Mining during the quarter was primarily focused on lower grade splay areas within the open pit; however, negative grade reconciliations from a higher grade zone, combined with limited flexibility resulting from slower than planned waste movement, led to mining below reserve grade for the quarter. The mine focused on additional waste movement in late September which will continue into early Q4 2015.

At North Mara, production of approximately 68 000 ounces was in line with plan. As expected, mined grade from the underground operation increased. This was due to the proportion of stoping ore of total underground ore production increasing over the quarter, and Acacia expects this trend to continue into the fourth quarter. ■



Acacia's Buzwagi mine is a low grade bulk deposit with a single large open pit. The process plant is designed with a throughput capacity of 12 000 tonnes of ore per day (photo: Acacia).

Master Drilling lifts profits by 11 %

Reporting its interim results for the six months ended 30 June 2015, JSE-listed Master Drilling Group, a provider of specialised drilling services worldwide, has announced a 22,9 % increase in ZAR headline earnings per share from 61,0 cents to 75,0 cents. Profits were up by 11 % to US\$10,4 million, from US\$9,3 million, and the Group saw a 10,4 % increase in US\$ headline earnings per share to 6,3 cents from 5,7 cents.

Master Drilling reports that while its order book is stable, it is mindful of the current difficult economic landscape. It says the four strategic pillars of the Group hedged it against the economic downturn in commodities.

Strategic progress in various areas was delivered as follows during the first half of the year:

- ❑ commissioning of the RD8-1500, the largest raise bore rig in the world;
- ❑ expansion of the Group's geographical footprint into Ecuador and Colombia;
- ❑ service offerings in the energy sector on hydro projects;
- ❑ the continuation of the drill rig fleet automation programme to enhance safety and efficiencies; and
- ❑ the expansion of the fleet size to 145 rigs.

The utilisation of the Group's raise bore rigs declined from 76 % (H1 2014) to 68 % (H1 2015) due to the economic environment. However, revenue generated per operating rig increased from US\$111 303 to US\$122 732. According to Master Drilling, this was attributable to additional capital invested in adding machines with



The RD8-1500, the largest raise bore rig in the world, was unveiled at Master Drilling's premises in Fochville on the West Rand earlier this year. The machine is now working at Palabora Mining Company's Palabora mine, where Master Drilling has a contract to deliver two 6,1 m diameter, 1,2 km deep ventilation shafts (photo: Arthur Tassell).

larger capabilities to the current fleet.

With 50 % of Master Drilling's revenue generated in US dollars, the risk of further devaluation of the rand against other currencies, particularly the US dollar, is largely countered.

Commenting on the interim results, Master Drilling CEO Danie Pretorius said, "We continue to lead as a world-class supplier of technologically advanced mine drilling operations, as well as delivering on value-added services. Our results reflect the merit of our diversification and organic growth strategies." ■

Joint venture will progress Tanzanian gold project

LSE-listed Acacia, Tanzania's largest gold producer, has announced an earn-in joint venture with ASX-listed OreCorp to progress the Nyanzaga project in Tanzania. OreCorp will act as manager of the project and will be able to earn up to a 25 % ownership through the completion of various work programme milestones over a three-year period for an aggregate project investment of US\$15 million, including an up-front payment to Acacia of US\$1 million.

Brad Gordon, CEO of Acacia, said: "We are pleased to have reached an agreement with OreCorp for them to earn-in to and progress the Nyanzaga project. The structure of the joint venture allows us to continue our focus of delivery from our existing mines whilst retaining the optionality to participate in the potential future development of a large-scale gold mine. We believe that the team at OreCorp, having previously run large-scale projects in Tanzania, are well placed to advance the project to a development decision and look forward to working with them to further develop the Tanzanian mining industry."

Nyanzaga is located in north-west Tanzania in the Lake Victoria Goldfields region, which is also host to all three of Acacia's producing mines.

Since increasing its ownership of the project to 100 % in May 2010, Acacia has undertaken an extensive step-out and infill drilling programme with a total of 120 088 m being drilled. This programme has extended the known gold mineralisation and, as a result, Nyanzaga is now host to an indicated and inferred in-pit resource of 4,2 million ounces at a grade of 1,3 g/t. ■



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Kagem emerald mine increases output by 49 %



Mining operations in the Chama pit at the Kagem emerald mine (photo: Arthur Tassell).

In his Chairman's Statement in Gemfields' final audited results for the year ended 30 June 2015, the company's Non-executive Chairman, Graham Mascall, writes that the company's Kagem emerald mine in Zambia achieved a remarkable 49 % increase year-on-year in emerald and beryl production to 30,1 million carats.

"This is the second highest annual production achieved since we first took over operational control at Kagem in 2008 and is an outstanding result for the Gemfields team," he notes. "Zambian emeralds continue to enjoy firm demand and have

become highly sought after in the international markets, underpinned by further increases in per carat prices for both lower and higher quality emeralds from Kagem during the year. The company's 19 auctions of emeralds and beryl mined at Kagem since July 2009 have generated US\$360 million in total revenues.

"The SRK Competent Persons Report announced in September 2015 includes the first recorded Measured Mineral Resource and Proven Ore Reserve Statement for the Kagem mine (and possibly the first classification of this nature for the entire coloured gemstone sector) and further underlines the importance of the Kagem mine to the global supply of emeralds. The report confirmed a 25-year life of mine with a measured, indicated and inferred mineral resource of 1,8 billion carats of emerald and beryl at an in-situ grade of 281 carats per tonne for the Kagem mine as a whole."

Kagem is believed to be the world's largest producing emerald mine and is 75 % owned by AIM-listed Gemfields, with 25 % owned by the Zambian government. The mine is located in the Ndola Rural Emerald Restricted Area and lies south of Kitwe and west of Ndola in Zambia's Copperbelt Province. Kagem's licence area comprises almost 41 km² and the mine's Chama pit supplies approximately 20 % of global emerald production.

During the year, Kagem progressed its

fourth high wall pushback programme at the Chama pit. The programme commenced in 2014 and was designed to expose the emerald and beryl mineralisation at the south-eastern edge by 75 m for open-pit ore production for at least two to three years at the current rate of operations. The programme has progressed well and was completed in September 2015.

Following the updated Resource and Reserve Statement from SRK completed in September 2015, Kagem has updated its mine plan and is now planning for a continued waste stripping of the Chama pit over the life of mine. The accelerated waste stripping will provide for approximately two to three years of ore available for mining at any given point in time.

Production during the year at Kagem was realised from the Chama pit (27,8 million carats) and the bulk sampling projects (2,3 million carats). The increased gemstone production is predominantly as a result of improved volumes of ore mined throughout the year.

Kagem has the potential to increase production to around 40 to 45 million carats of emerald and beryl in the future, subject to the required level of investment and finalisation of the upgrades to the open-pit mine plan.

The Kagem wash plant achieved a total of 5 247 hours of operation (2014: 4 788 hours). As part of the ongoing efficiency drive at Kagem, the wash plant processing capacity and its security arrangements are being upgraded with a view to increasing the plant output from 33 t/h to a potential 66 t/h. This will lead to an increase in optimisation of the process flows, increased operating flexibility and enhanced overall production capacity and productivity at Kagem. The upgrade is expected to be completed by the end of the 2015 calendar year.

The modified and new picking belts are located within an improved washing facility, leading to a better working environment with enhanced levels of ventilation, lighting and noise reduction, resulting in fewer distractions and better overall control. These improvements will also result in reduced maintenance costs, more efficient gemstone selection from the belts and enhanced overall security, says Gemfields. ■

Bulk sampling at diamond property to restart

Tango Mining, listed on the Toronto Venture Exchange, says that an operational assessment of its Oena project has been completed with a positive recommendation for the restart of the bulk-sampling programme.

Oena consists of an 8 800-ha mining right along the Orange River in a well-established alluvial diamond-mining province known to produce high quality and large sized diamonds. It is located 50 km upstream of Namdeb's Auchas and Daberas alluvial diamond mines, which are on the Namibian bank of the river, and 60 km upstream of Trans Hex's Baken alluvial diamond mine on the South African bank of the river. ■



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DRA Global awarded feasibility study for Ivanplats' Platreef project

International engineering and project delivery group DRA Global was awarded the feasibility study for Ivanplats' Platreef project in August 2015. Ivanplats is the South African subsidiary of TSX-listed Ivanhoe Mines.

The project includes the underground Flatreef deposit of platinum group metals, together with gold, nickel and copper, and is located in the Northern Limb of the Bushveld Complex, approximately 280 km north-east of Johannesburg.

Award of the feasibility study follows the completion of the pre-feasibility study in January 2015, which was also carried out by DRA and successfully demonstrated a sound business case for further investigation of the project.

DRA's role will be the management and coordination of the all-encompassing feasibility study of the greenfield project, in addition to providing a wide range of engineering services in its own right. The scope to be covered by DRA includes the highly mechanised underground mine design, processing facilities and associated project infrastructure. Among the external consultants to be managed by DRA will be specialists covering geology, life of mine planning, geotechnical, ground water, environmental aspects and the tailings storage facility.

Mining will be conducted by a large,

state-of-the-art mechanised underground operation, approximately 700 to 1 100 m below surface via a vertical production shaft which will be 10 m in diameter. The process plant is initially planned to consist of two parallel streams, each of 2 Mt/a capacity, with comminution, flotation, concentrate dewatering and tailings disposal. A full suite of infrastructure will be covered in the feasibility study, including bulk power supply, bulk water supply, internal and external roads, and on-site buildings and systems.

DRA's CEO, Paul Thomson, comments: "We are extremely pleased to have been awarded the feasibility study of the Platreef project. This is a world-class PGM project and we are very proud to have had the opportunity of completing the earlier pre-feasibility study. Its award is a testament to the good work already carried out by the DRA team, and to the sound relationship developed between our company and Ivanplats.

"The scope of the project being managed by DRA is also a clear demonstration of our 'Pit-to-Port' capability. Our in-house engineers and project services personnel will be responsible for all major aspects of the project – for the mining engineering, the processing facilities and the associated infrastructure, in addition to coordinating the input of a number of external specialists." ■



A recent view of the Platreef site, where the sinking of one of the shafts required for the project has already started.

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Community turns out in support of diamond mine



Members of the local Lerala community, visiting pastors and KDL senior management at the blessing ceremony held on site recently (photo: KDL).

ASX-listed Kimberley Diamonds Ltd (KDL) has announced that its Botswana subsidiary, Lerala Diamond Mines Limited, recently held a site 'blessing ceremony' with the local community at the Lerala diamond mine. The ceremony was held at the request of the local community and was aimed at mobilising the community to provide its support and best wishes for the success of the mine.

KDL is in the process of re-establishing Lerala, located in Botswana close to the Martins Drift border post with South Africa. The process plant is currently undergoing a major refurbishment and re-engineering, prior to recommissioning.

Approximately 400 people attended the blessing ceremony, which was led

by Lerala's Chief Moroka. Also in attendance were his 16 sub-chiefs, several pastors and chairpersons from the Village Development Community. Several members of KDL's leadership team were also present, including Noel Halgreen, KDL's Managing Director.

KDL has also provided an update on its preparation for the resumption of mining operations at Lerala. The mine has five diamond bearing kimberlite pipes to be mined, K2, K3, K4, K5 and K6. Mining is currently scheduled to start early in 2016 in the K3 pit. During the time Lerala was on care and maintenance, the K3 pit was allowed to fill with groundwater and act as a water storage facility. With the planned commencement of mining activities in

the K3 pit, a dewatering exercise began in February 2015 to pump all water from the K3 pit out to the K6 pit, where it will be stored until potentially required for processing operations.

Pumping has been ongoing for the past seven months and water is now sufficiently cleared so that mining operations can commence as soon as required.

With the water cleared from the K3 pit, this has facilitated better access and enabled a detailed geotechnical mapping exercise to be undertaken in this pit by a consulting geotechnical engineer, who will confirm the slope stability parameters to provide for updated open-pit designs.

Geotechnical mapping was conducted in the K2 and K5 pits, which are scheduled to be mined early in the mining schedule at Lerala. The preliminary geotechnical assessment results suggest that there is scope for improving the design parameters and reducing pit stripping ratios, which KDL anticipates will reduce overall mining costs.

Once the preliminary report with recommended slope design parameters for each pit is received from the geotechnical consultant, KDL plans to undertake a mining optimisation exercise.

According to KDL, all aspects of the Lerala project are progressing very well to date and remain on schedule. KDL believes that if this progress can be maintained and barring any unforeseen delays, this will see the project well prepared for re-commissioning early in 2016. ■

Clean energy power plant at Waterval opened

Anglo American Platinum, together with Vuselela Energy and H1 Holdings, recently officially opened a clean energy power plant, Eternity Power, at its Waterval Smelting Complex in Rustenburg.

The project was made possible by the Department of Trade and Industry (DTI) providing a R30-million grant as part of its Infrastructure Development Support which leverages investments to the South African economy by providing infrastructure critical to industrial development. The incentive programme is part of the Critical Infrastructure Programme (CIP).

The Eternity Power Thermal Harvesting™ project was commissioned in June 2015

and developed by Vuselela Energy in collaboration with Anglo American Platinum at a total project cost of R150 million.

This ground-breaking initiative uses waste heat from the Anglo Converter Plant (ACP) convertor cooling circuit to evaporate an organic liquid and drive an expansion turbine. The plant has an installed capacity of 5 MW of which 4,3 MW is available to the grid, reducing Anglo American Platinum's capacity bought from Eskom. The amount of power generated also results in a reduction of the smelter's carbon footprint and a more efficient use of energy.

Jacques Malan, Director at Eternity Power and Vuselela Energy, said: "The set

of technologies used at the Eternity Power clean energy plant had not previously been used in a smelter environment and a significant amount of novel work was done to design the integration of the technology into the smelter complex and to establish the technical feasibility of the process.

"These patents were developed specifically for the purpose of capturing and harnessing waste thermal energies from metallurgical and chemical processes for the purpose of power generation and are likely also patentable worldwide. The result is that the Eternity Power Thermal Harvesting™ power plant is the first of its kind in the world in terms of being connected to a convertor at a metallurgical smelter." ■

Omnia appoints new Managing Director of BME



JSE-listed Omnia Holdings has appointed Joseph Keenan as the new MD of its mining explosives division, BME, as from 1 September 2015. BME is one of the leading suppliers of explosives and services to the African mining, quarrying and construction industries and has operations in 14 countries across the African continent.

Says Rod Humphris, CEO of the Omnia Group: "Keenan is an accomplished international executive who

brings over 20 years of global experience in the explosives industry to our Group. He has held executive and non-executive positions in North and South America, Africa and Australia. He has a successful track record in the explosives sector of managing high performance teams, being involved in start-up projects, developments, listings, strategic alliances, investments and global equity holdings."

Keenan's most recent roles have been at Columbine Group in the USA, Pacific Hydro in Australia and, prior to that, Orica in Chile. He has chaired the ANU Centre for Latin American Studies in Australia and Peru Nitrates in Latin America, as well as serving on the boards of PHC Energy Advisory Board, and two explosives JVs in Venezuela and Panama.

He has a BSc Geology from Laurentian University in Canada, an MBA from Edinburgh Business School in the UK, and has completed post graduate programmes at Insead Singapore and Harvard USA Business Schools. ■

Positive report on Dugbe hydropower options

UK-based, AIM-listed Hummingbird Resources, which is developing gold projects in West Africa, has announced a positive preliminary report from Knight Piesold Consulting (KP) for the proposed hydroelectric power (HEP) plant in south-east Liberia, which would be located approximately 10 km from its 4.2 Moz Dugbe gold project. Dugbe is forecast to have an average power demand of 16 MW.

This significant development follows the signature of a Collaboration Agreement for the funding and development of the HEP signed in April 2015 with IFC InfraVentures, the IFC Global Infrastructure Project Development Fund, and Aldwych International, a leading energy company active in Africa.

The report demonstrates a range of hydropower options that would be highly beneficial in the development of a sustainable and low-cost source of power for the Dugbe project, as well as the south-east Liberian region. It assessed four run-of-river hydropower options ranging from 15 MW to 30 MW with varying intakes.

The Dugbe project is located within the Birimian Basin, the world's second largest gold producing region, characterised by exceptionally large, homogenous grade deposits. ■



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The Tantalite Valley site in southern Namibia (photo: Kennedy Ventures).

Aftan purchases remaining 40 % stake in Tantalum Valley

Kennedy Ventures, which is focused on tantalite production in Namibia through its 75 % holding in African Tantalum (Aftan), reports that Aftan has entered into a purchase agreement with Magnum Mining and Exploration Limited to acquire the remaining 40 % interest in the Tantalite Valley project in Namibia for a cash consideration of R7 million.

The Tantalite Valley project will be Aftan's first mine to come into operation. Mining from the high grade ores at the mine site in southern Namibia is on track to commence in Q3 2015, with first delivery of production from Aftan to its offtake partner, a leading manufacturer of electronic components, on track for the beginning of Q4 2015.

Peter Hibberd, Chief Executive Officer

of Kennedy Ventures, commented: "We are pleased to conclude this agreement at this time as the Tantalite Valley mine is being prepared for production. The recommissioning of the mine is on track and within budget to commence production in the current quarter. This agreement enables Aftan to become sole owners of the operating and title companies and will create further value for Kennedy Ventures' shareholders."

Hibberd is a qualified geologist and mining engineer from the Royal School of Mines, Imperial College, and has over 30 years' experience in the mining industry, including with De Beers, RTZ and JCI. The Chairman of Kennedy Ventures is Giles Clarke, a businessman who is also well-known in cricket circles (he was, until

earlier this year, Chairman of the England and Wales Cricket Board and is currently the Board's President).

The plant recommissioning at Tantalite Valley was started in July this year. Phase one involves ramping up through the coarse recovery plant to treat 10.5 kt/month and produce 5 000 lb of Ta₂O₅ per month. Phase two will see the implementation of the fines recovery section which will lift throughput to 15 kt/month, recovery to 75 % and output to 9 200 lb Ta₂O₅ by mid-2017.

An independent study has confirmed the estimated resource at Tantalite Valley of 843 000 tonnes grading 490 ppm Ta₂O₅. The licence area is estimated to hold a global ore resource of 2 Mt, sufficient for 15 years of operation. ■

Independent studies confirm Mothae's potential

Paragon Diamonds Limited, the AIM-quoted diamond development company, has announced the results of two independent studies carried out by The MSA Group on the Mothae kimberlite project, located in Lesotho, that Paragon is in the process of acquiring.

Paragon says the conclusions confirm – and exceed – management's initial expectations that Mothae represents a low cost opportunity for Paragon to generate significant value for shareholders through the potential recovery of large high value diamonds.

Mothae is only 5 km from the world class Letšeng diamond mine in Lesotho which is located within a cluster of kimberlites, including Paragon's Lemphane kimberlite pipe project.

These technical reports are intended as components of a future Preliminary Economic Assessment (PEA) and Pre-feasibility Study (PFS) and review multiple mining scenarios and simulated progressive cutting of processing costs, which will now be explored during final plant and open-pit design work.

Highlights of the studies include the potential to significantly increase Mothae's NPV from management's original estimates; the identification of an improved strip ratio at <1:1 compared to <1.5:1 previously assumed; and the potential for average diamond values up to US\$2 000/carat. In addition, several mining scenarios exceed 20 Mt at US\$40+/t ore value in a low operating cost mine exceeding 2 Mt and 40 000 carats per year.

These studies focused on determining both the trade-off between maximum diamond value recovery against processing costs (using a range of bottom cut-off screen sizes), as well as optimum opencast mining scenarios at the Mothae kimberlite based on the mining of the Main Pipe only, which comprises the South-West (SW), South-East (SE) and South-Central (SC) domains of the kimberlite. The basis for both studies was the NI 43-101 Technical Report completed by Lucara Diamond Corporation in February 2013.

The revenue scenarios compiled by The MSA Group come from a sample of 23 738 carats that were used to model the average diamond value per size class for each of the four kimberlite domains. Average diamond values were calculated for three bottom cut-off screens (+2 mm; +3 mm; +4 mm) using three revenue models. ■

Tungsten plant throughput exceeds design expectations

Premier African Minerals (Premier), whose shares are traded on London's AIM, says that the process plant at its newly commissioned RHA tungsten project in north-western Zimbabwe is achieving a throughput 25 % higher than initial design expectations. Optimisation of the recovery circuits is underway and is expected to be completed following upgrading of certain material circulating pumps.

The process plant now has the ability to process in excess of 20 t/h into the recovery circuits. Appropriate Process Technologies (APTech), the supplier and designer of the plant, has reportedly acknowledged that additional modifications are necessary to improve material flows between certain components of the recovery circuits. These modifications will be undertaken by APTech at its expense.

Regarding the planned underground operation at the project, Premier has previously reported 100 000 tonnes grading 0,75 % WO_3 non-compliant developed reserves in situ on the 865 level in the

historic underground workings. With the excess capacity available in the plant and with projected reduced opex from underground operations forecast in previous studies, Premier has initiated an investigation into the fast-track development of the required infrastructure to mine this orebody.

Required infrastructure may include laying 150 m of reclaimed rail tracks on the 926 level. The 926 level exits close to the plant ROM pad, which will simplify material handling.

Apart from this, RHA has approximately two months of mined ore on the ROM pads ready to feed the plant. Mining from the open pit was initially accelerated to access the unweathered near surface ore described in the mining resource model that is anticipated to carry higher grade with depth.

Apart from the mineralisation on the 865 level mentioned above, Premier has direct and immediate access to visible ore on the 926 adit level. It was this material

that was used in the original RHA metallurgical test work. This ore is immediately available and, as some infrastructure required to mine and deliver this to the ROM pad is already available at site, the company intends to mine this material and blend it with the existing open-pit material already on the ROM pad.

First delivery of this ore is targeted in Q4. The effect is expected to be both an upgrade of the present plant feed and an extension of the use of ore already on the ROM pad with significant cost savings on open-pit mining costs.

Work in the developing open pit has provided valuable geological information and this is particularly evident in the eastern sections of the 955 m benches where crosscutting shearing and faulting has led to the offset of the Lode 2W. These shears are often mineralised with visible mineralisation and have been mined in the past by previous workers. This is expected to support additional resource definition in the underground developments. ■


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Caledonia Mining makes good progress at Blanket



A concrete pour in progress at the Central Shaft site at Blanket (photo: Caledonia Mining).

Caledonia Mining Corporation, which operates the Blanket gold mine in Zimbabwe, says it is making good progress on the capital works required for the Revised Investment Plan for the mine. As Caledonia announced last year, the plan involves developing a 'Tramming Loop' 750 m below surface; the continued sinking of the No 6 winze to provide access to deeper level resources; and the sinking of a new 6-m diameter Central Shaft from surface to 1 080 m.

The Central Shaft will provide access to the current inferred mineral resources below 750 m and allow for further exploration, development and mining in these sections along the known Blanket strike,

which is approximately 3 km in length.

The Tramming Loop was completed ahead of schedule in June 2015 and will allow for an increase in development which is expected to result in increased production towards the end of 2015, as reflected in the 2015 production guidance of approximately 42 000 ounces of gold.

Sinking the No 6 winze was completed in June and the shaft is currently being equipped after which horizontal development towards the two main resource bodies will commence. The project remains on target for first production in

January 2016; production is expected to reach the target rate of 500 tonnes per day in May 2017.

At the Central Shaft, most of the equipment that is required for the sinking phase of the project has been acquired and is either on-site or in transit to site. The Scotch derrick that will be used in the early stages of sinking down to 90 m has been commissioned. The kibble winder that will continue the sink from 90 m to 1 080 m has been refurbished and is expected to be commissioned in January 2016. Five generator units have been acquired which have a combined generating capacity of 2 MVA as a back-up power supply to the kibble winder in the full sink phase, which is expected to commence in January.

"We are pleased with the ongoing implementation of the Revised Plan, which is proceeding as scheduled," comments Steve Curtis, Caledonia's CEO. "The completion of the Tramming Loop and sinking of the No 6 winze earlier in the year were significant steps towards progressively increasing production from 2016 onwards to achieve an annual rate of 80 000 ounces of gold by 2021." ■

Prospecting licence awarded to joint venture

AIM-listed Botswana Diamonds (BOD) reports that the Botswana government has awarded prospecting licence PL260/2015 to Sunland Minerals. Sunland Minerals is the 50/50 joint venture exploration company owned by BOD and Alrosa.

PL260/2015, covers ground which is the highest priority for the BOD/Alrosa joint venture. It contains three previously-discovered kimberlite bodies, AK21, AK22 and AK23.

As the joint venture exploration team is currently active in the area, work has commenced immediately on reviewing the block with a view to defining new anomalies and drill targets. The existing kimberlites are being reviewed as part of this work to verify if they warrant further evaluation.

The new licence covers 25 km² in the Orapa region of Botswana and is valid for three years. ■

Lucapa makes kimberlite find in Angola

ASX-listed Lucapa Diamond Company has identified a confirmed kimberlite (L259) next to the prolific Mining Block 8 alluvial diamond field at Lulo in Angola. Lulo is located within 150 km of Catoca, the world's fourth biggest kimberlite mine, and on the same favourable trend.

L259 is shaping up as a large kimberlite structure, with kimberlite material so far discovered in pits more than 1 km apart. Lucapa believes that it could be a primary source of the large alluvial diamonds being mined at Mining Block 8, which include rare D-colour Type IIa gems and fancy colours.

The company also reports that pitting has been successful in significantly expanding the Mining Block 8 alluvial diamond field.

Lucapa Chief Executive Stephen Wetherall said the latest kimberlite and alluvial mining developments represented major new milestones for Lucapa and its partners as the company sought to unlock Lulo's true diamond riches.

"We now have a confirmed kimberlite adjacent to the Mining Block 8 alluvial diamond field where we are recovering both large valuable diamonds and coarse kimberlite indicator minerals," said Wetherall. "This makes L259 a compelling target as we close in on our major goal at Lulo, which is to find the primary kimberlite source or sources of the exceptional alluvial diamonds we are recovering on a daily basis. The area we have recovered kimberlite material from in our ongoing pitting programme also suggests this to be a significantly sized kimberlite.

"We are also extremely excited that our alluvial grade control pitting programmes have been successful in significantly expanding the extent of the Mining Block 8 alluvial diamond field, which continues to produce large diamonds of exceptional quality.

"This area will remain the priority focus of our kimberlite exploration and alluvial diamond mining operations at Lulo." ■

Avnel Gold updates Kalana Main mineral resource

TSX-listed Avnel Gold Mining has announced an updated mineral resource estimate (MRE) for the Kalana Main project in south-western Mali. The company also reports that completion of the Definitive Feasibility Study (DFS) and approval of the Environmental and Social Impact Assessment (ESIA) are expected by the end of the first quarter of 2016.

According to the MRE, the Kalana Main deposit has a measured plus indicated (M+I) mineral resource of 2,81 Moz at a diluted grade of 2,85 g/t Au at a gold price of US\$1 100 per ounce. Some 46 % of the M+I resource is classified as measured.

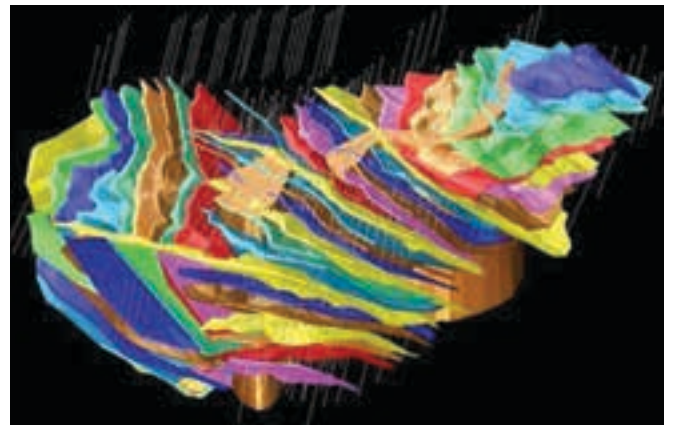
"With this new resource, the Kalana Main project stands out as one of West Africa's highest grade, multi-million-ounce, open-pit development projects with significant exploration upside," says Howard Miller, Avnel's Chairman and CEO.

"The increase to the mineral resource is a direct result of the drill programme that we completed last quarter. In addition

to demonstrating the continuity of mineralisation and improving confidence in the geological model, this drilling has upgraded a significant portion of the inferred mineral resource and added to the mineral resource by defining new zones of mineralisation and extensions to known vein packages. This drilling also defined thick corridors of lower grade mineralisation that are being reassessed as part of the DFS to determine if they are amenable to a lower cost bulk mining approach.

"The DFS remains on track for completion by the end of the first quarter of 2016 and we continue to expect for the updated mineral resource to positively impact several key performance indicators. For example, it is

worth noting that within the M+I mineral resource approximately 730 000 ounces are contained within the favourable saprolite and saprock horizons at an average diluted grade of 3,05 grams per tonne. This is expected to generate high gold production at lower mining and processing costs in the initial years of the DFS mine plan." ■



Kalana Main 3D rendering (major and second order mineralisation modelled and extended in all directions and at depth).

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Aveng Moolmans extends its contract at Tshipi Borwa

Aveng Mining subsidiary Aveng Moolmans has concluded a five-year extension of its contract with Tshipi Borwa open-pit manganese mine in the Northern Cape. This second cycle contract extension was won following a very competitive open tender process in a tough operating environment and – says Aveng Moolmans – is testament to the company’s leadership position in surface mining.

Aveng Moolmans has over 40 years’ experience in hard and soft rock environments and operating in remote and challenging locations. This together with its continuous focus on improvement initiatives has ensured the consistent delivery of a world-class mining service to the Tshipi Borwa site. Tshipi Borwa is offered full service mining including topsoil stripping, drilling and blasting, loading and hauling of ore, as well as waste mining and dewatering. The primary equipment used on this site comprises three excavators, eighteen 100-ton trucks and three drill rigs.

“Aveng Moolmans is delighted to



The Tshipi Borwa manganese mine in Northern Cape Province.

continue our working relationship at the Tshipi Borwa project, one of the largest exporters of manganese ore globally,” says MD of Aveng Mining, Stuart White. “Aveng Moolmans’ service ranges from short-term waste mining and bulk earth-moving to a complete and long-term mining solution.”

The mine is owned by Tshipi é Ntle Manganese Mining (Pty) Limited, an empowerment company. “Tshipi has over

the course of the last five years developed a partnership business model through which we strive to deliver value to all our diverse stakeholders. Aveng Moolmans has over the course of the last five years earned our respect and have taken their place as our trusted mining partner. We look forward to continue building this mutually beneficial relationship into the future” said Brendan Robinson, CEO of Tshipi é Ntle Manganese Mining. ■

ANNOUNCEMENT

This notification serves to inform you that the distribution agreement between Barloworld Handling and Metso will end in October 2015.

Due to the current market conditions in the Mining, Construction and Oil & Gas industries Barloworld Handling has decided to focus on the core business which is in line with the company’s business model.

This decision is supported by Metso and the current business will revert back to Metso in the next few weeks.

During this period Metso and Barloworld Handling will work together to ensure a smooth handover for all our customers whilst carrying on with business as usual.

Jarkko Leppanen will be the Metso contact throughout the process.

We thank you for your commitment to Metso and Barloworld Handling.



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Barloworld
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Assay results received from Northern Cape tailings project

AIM-listed Xtract Resources has announced the copper assay results received from the drilling campaign on its O’Kiep and Carolusberg copper sulphide tailings dams located in the Northern Cape close to the town of Springbok (within a 30 km radius). A Phase 1 drilling and sampling programme was recently completed at the site.

The Carolusberg tailings dam reported an average in-situ copper value of 0,21% Cu (lowest value of 0,02 % Cu and highest value of 0,53 % Cu) compared to an assumed in-situ value of 0,19 % Cu while the O’Kiep tailings dam reported an average in-situ copper value of 0,14 % Cu (lowest value of 0,05 % Cu and highest value of 0,28 % Cu) compared to an assumed in-situ value of 0,23% Cu.

At an assumed specific gravity of 1,5 (test work is still outstanding on the actual specific gravity), the Carolusberg tailings dam represents 29,35 Mt of material compared to an initial assumed volume of 28 Mt while the O’Kiep tailings dam represents 7,3 Mt compared to an initial assumed volume of 5,8 Mt. The Carolusberg dam contains approximately 122 million pounds of copper in situ while the equivalent figure for the O’Kiep dam is approximately 22 million pounds of copper in situ

Xtract’s initial in-house calculations, which have not been validated by any independent third party, still estimate that the project has an NPV of US\$110 million with an IRR of 68 %. These calculations are based on a number of assumptions including: recoveries of 85 %; a copper price of US\$4 500/t; operating costs of US\$2 500/t; a requirement for US\$40 million of new capital to finance the project; and a discount rate of 10 %. The projected annual throughput is 5,6 Mt over the first 10 years of the project which declines to an annual throughput of 1,4 Mt over the last four years. It is envisaged that the in-situ copper grade would be upgraded to a concentrate grade of 25 % Cu.

“We are still awaiting the recovery and mineralogical test work results which will enable the company to conclude if it will move ahead with the project and complete a bankable feasibility,” comments Jan Nelson, Chief Executive Officer of Xtract. “The assay results received are in line with our initial assumed estimates and expectations and we are very pleased with these results.” ■

SGS to acquire Bateman Projects

Tenova reported recently it had entered into final negotiations with SGS to sell its EPCM business operations based in South Africa, known as Bateman Projects. Tenova will remain active in the mining industry, focusing on its activities in the technology and equipment sector.

Bateman Projects specialises in providing process plant design and engineering, project management and commissioning and optimisations services for mineral processing plants over a variety of minerals including gold, iron ore, copper, uranium and coal. The Bateman modular process plant business and expertise will form part of this transaction. The transaction is subject to approval by the South African Competition Commission and is expected to close within the next few weeks.

Based in Johannesburg and active throughout sub-Saharan Africa, as well as providing specialised project services in many other parts of the world, the business employs 250 experts and staff and has generated revenues in excess of €30 million in the latest financial year (ended June 30, 2015). ■



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MCC awarded R3,6 billion

MCC Contract Mining & Plant Rental (MCC) has been appointed as the mining contractor for the new Nsele opencast coal mine in Mpumalanga and is expecting to move onto site shortly. According to Justin Colling, CEO of MCC, the first five years of the contract are likely to represent R3,6 billion worth of turnover for the company. As he says, "Nsele is a very welcome addition to our order book given the extremely tight conditions in the mining industry at present." **Modern Mining** recently spoke to Colling and Heine van Niekerk, a Director of Nsele's owner, Delta Mining Corporation (DMC), to learn more about the mine, its scale and the scope of MCC's involvement.



Justin Colling (Left), CEO of MCC, pictured with Heine van Niekerk (centre) and Pieter Wiese, both directors of Delta Mining Corporation, at MCC's Midrand premises.

Formed in 1972, MCC is a division of the plus R9-billion-a-year Eqstra group and accounted for approximately 42 % of Eqstra's revenues in FY 2015. While it ranks as one of the biggest opencast mining contractors in South Africa, over the past several years it has not performed to its full potential. Colling was appointed as CEO at the beginning of this year, his brief being to reinvigorate the operation. While he acknowledges that there is still much work to be done, he points out that MCC is now starting to operate very efficiently. "We don't have a single loss-making contract on our books and for FY2015 our operating profit was R308 million, which was nearly 29 % up on the previous year."

One of the biggest problems facing all mining contractors currently is standing machines. "We have about 6 % of our asset base unutilised



Nsele coal mine contract

at the moment,” says Colling. “While this is very low by world standards, it is still a figure that we need to reduce significantly. This is one of the reasons that Nsele is so important. It’s a bigish contract – monthly volumes will build up to about a million cubes – which will keep a significant portion of our fleet busy over the next several years.”

Nsele is located close to Kendal power station in Mpumalanga, just a few kilometres from the town of Delmas. The 2 600 ha property is surrounded by operating coal mines, with its immediate neighbours including Keaton Energy’s Vanggatfontein mine, Exxaro’s Leeuwpan mine and Stuart Coal. A Bankable Feasibility Study (BFS) on the project was completed several years ago. This is currently being updated but the main parameters of the project are known and Nsele will start as a 2,5 to 3 Mt/a (ROM) mine with a life of plus 20 years. The total capex to establish the operation is estimated at just R350 million (with the IDC willing to provide R240 million as debt funding). The life of mine strip ratio is estimated at 3:1 (tonnes). The project’s after-tax NPV (at a 10 % discount rate) is put at plus R600 million and the IRR in excess of 29 %.

Outlining the background to Nsele, Heine van Niekerk, a Director of DMC (and also of its holding company, Anglo African Capital),



says the project has been a long time in gestation. “I founded DMC in 2004 and one of the assets we acquired was Nsele, which was then known as Rietkuil, after the farm on which it was located,” he explains. “We prepared a feasibility report on the project in 2009, which – given the market back then – looked at an export coal project. We were intending to list DMC on the JSE but around 2010 we received an approach from overseas which eventually led to DMC becoming part of Sable Mining, an AIM-listed company.

“I’m not going to go into all the ins and outs

Above: MCC prides itself on having one of the best trained workforces in the surface mining contracting industry.

Below centre: The Nsele (Rietkuil) property lies in an area which is already being intensively mined. One of the neighbouring operations is Leeuwpan.

Below: MCC machines in action – a Cat 992G loads a Cat 777D dump truck.





MCC's giant Liebherr 996 shovel, seen here at the Benga coal mine in Mozambique, is now operating as a rental unit at the neighbouring Moatize coal mine.

of this transaction but, suffice it to say, the acquisition of DMC by Sable was not really a success. The net result was that Rietkuil remained on the backburner for several years, although a full feasibility study was completed in 2011. Earlier this year I reacquired control of DMC and we're now moving at full speed on Nsele. We're currently updating the feasibility to reflect the fact that we're now planning to produce thermal coal for local use rather than export product. The project has had its mining licence in place for several years and all we're now waiting for in terms of permitting is our water use licence, which we're expecting imminently. We're also negotiating with Eskom on an offtake agreement and these talks are going very well. If, by any chance, we don't secure this agreement, we will still go-ahead with the mine, as there is a ready market for the products that Nsele can produce."

Nsele is currently a 'virgin' site, which raises the question of how the coal will be processed. "We estimate that it will take us about eight months to build a single wash modular plant and we're in advanced negotiations with two companies who specialise in the design and construction of plants of this nature and who both have an excellent track record," says Van Niekerk. "Since we'll start mining before the plant is operational, we're looking – in the interim – at either selling our product to one of our neighbours who would then undertake the processing or, alternatively, toll treating at a neighbouring operation. We've spoken to a couple of our neighbours and both these approaches are entirely feasible."

He adds that one of DMC's divisions, DMC Energy, is presently negotiating to acquire

Kelvin power station in Johannesburg (which is currently only producing about a third of its 600 MW design capacity). "If this comes off, ultimately we could see Nsele also supplying coal to Kelvin, which is only about 70 km from the mine," he says.

Van Niekerk notes that the contract with MCC was negotiated. "We could have gone out to tender but we've had a relationship with MCC which goes back to 2007, when we were talking to them about possible contract mining at an iron ore project we had in West Africa. We liked what we saw of the company then and we're absolutely confident that we've made the right choice in selecting MCC as what is, in effect, our mining arm."

Looking at the project from MCC's perspective, Colling says that while MCC wins much of its work on open tender, it prefers to negotiate. "The reason for this is that we believe we can add a great deal of value to any open-pit mining operation and that the best way to realise this value is via negotiation and, preferably, early involvement in the project," he observes. "Our goal is to become a partner of the client rather than simply a service provider and to totally align ourselves with the client's objectives. Certainly we're extremely proud of the fact that MCC will not only move the tonnage at Nsele but virtually act as DMC's mining department, handling every aspect of the mining operation."

While the final fleet to be utilised at Nsele has not yet been finalised, Colling says that it will probably include at least one Liebherr R9350 excavator, a 350-ton machine, as well as a fleet of 150-ton payload dump trucks, on the overburden and interburden with Liebherr R984s working in conjunction with 100-ton dump trucks being used to mine and haul the coal.

Nsele will join a portfolio of seven other contracts that MCC has, which are spread through South Africa, Botswana and Mozambique. The biggest of these is the Benga mine near Tete in Mozambique, where MCC has been working since 2011. Volumes on the contract have been cut in recent months from roughly 2 million cubes a month to 1,6 million cubes a month because of market conditions. Says Colling: "This resulted in us having over-capacity on site but fortunately we have been able to rent out some of our machines, including our big 650-ton Liebherr 996 excavator, the biggest unit in our fleet, to the neighbouring Moatize mine. We believe this is a relationship which could grow. We're in negotiation with our client ICVL on a possible extension to our contract at Benga. If that doesn't come off, then there is the

possibility that we could sell our fleet to the client. On the whole, we've changed our thinking on Mozambique. A few months ago, we saw it as a problem, now we're increasingly looking at it as an opportunity."

Giving a quick round-up of MCC's other contracts, Colling says that within South Africa the company is working at the Mogalakwena platinum mine near Mokopane, the Pilanesberg platinum mine in North-West Province, the Dorstfontein East colliery in Mpumalanga, the Tharisa chrome mine near Marikana and the Aganang limestone mine near Lichtenburg. In Botswana, it was appointed as the mining contractor at the Karowe diamond mine in the Orapa area at the end of last year.

"All the contracts are going well although at Mogalakwena the contract is nearing completion," says Colling. "We are obviously talking to Anglo American Platinum in respect of an extension at Mogalakwena, where we are responsible for about 10 to 12 % of the mine's volumes, and are naturally hopeful that the relationship will continue."

Colling also mentions that MCC has two significant leasing contracts with Rockwell Diamonds, which have seen MCC equipment being deployed to the Saxendrift and Remhoogte properties on the Middle Orange, while in Namibia it is renting machines to Vedanta's Skorpion zinc mine. "The leasing/rental business offers us opportunities to maximise the use of our assets and we're in the process of extending our leasing and rental services to both Zambia and the DRC," he says. "Rental and leasing contracts provide an excellent entry point to markets and we see this side of the business growing."

Looking ahead, Colling predicts the market could well get tougher before it gets better. "There are a handful of prospects on the horizon – the new Boikarabelo coal mine in the Waterberg is one example – but generally there is a dearth of new work. So a major part of our strategy is to work with existing clients to see whether there are opportunities for increasing volumes – after all, the best customers are the ones we are already working for.

"Geographically, we're open to working all over Africa but the African mining market is also not very buoyant at the moment," he continues. "Even further afield, we are increasingly interested in India, which is a huge economy. Certainly, there is scope for us to get involved there, initially perhaps just on the basis of selling our skill set rather than taking machines over. Geographical diversification, however, is probably still some way off. In the meantime,



we have to work with the Southern African market as we find it and we're doing this quite successfully. Our order book has grown over the past few months and I'm confident that we can continue to make progress despite the headwinds that we're undoubtedly facing due to the commodities slump." ■

One of MCC's Cat D10 dozers at a platinum mine in the Western Bushveld.

Shanta plans underground operation at New Luika



Shanta Gold, whose shares are quoted on London's AIM, has announced the completion of an underground feasibility study, a new base case mine plan and an updated reserves statement for its New Luika Gold Mine (NLGM) in Tanzania. The underground feasibility study (FS) envisages 1,57 Mt of ore at 6,5 g/t being extracted over six years for the production of 310 000 ounces of gold. Shanta is targeting the commencement of portal development in Q2 2016 with underground production scheduled from Q2 2017.

The completion of the FS follows on from a drilling programme at New Luika initiated at the beginning of this year to better define the resources on which an underground mining operation would rely. Following on from the drilling and the preparation of an updated resource statement, AMC was engaged to undertake the FS for the New Luika Underground Mine (NLUM) below the existing Bauhinia Creek (BC) and Luika open-pit operations.

The planned underground mining operation

is low tonnage, with access from a portal in the BC pit with minimal footwall ramp development. Mining methods will be long-hole open-stopping with backfill. A development drive across to Luika will provide access to a similar footwall ramp development for mining by cut-and-fill. Final depth of mining based on current reserves is planned to 330 m and 315 m for BC and Luika respectively.

Key milestones for the project are the commencement of portal development in Q2 2016 with underground production scheduled from Q2 2017. The design of the open pit has provided for the portal and ventilation rise locations and these are being incorporated into the current open-pit mining operations.

The US\$38,4 million in pre-production expenditure comprises US\$8,2 million for surface and underground fixed infrastructure, US\$14,5 million for mobile equipment, US\$8,2 million for lateral and vertical development and US\$7,5 million for the power plant upgrade. The underground mining equipment includes a 5 % contingency within an overall contingency for all capital purchased items of 8 %.

Cut-off grades were calculated to be 3,0 g/t



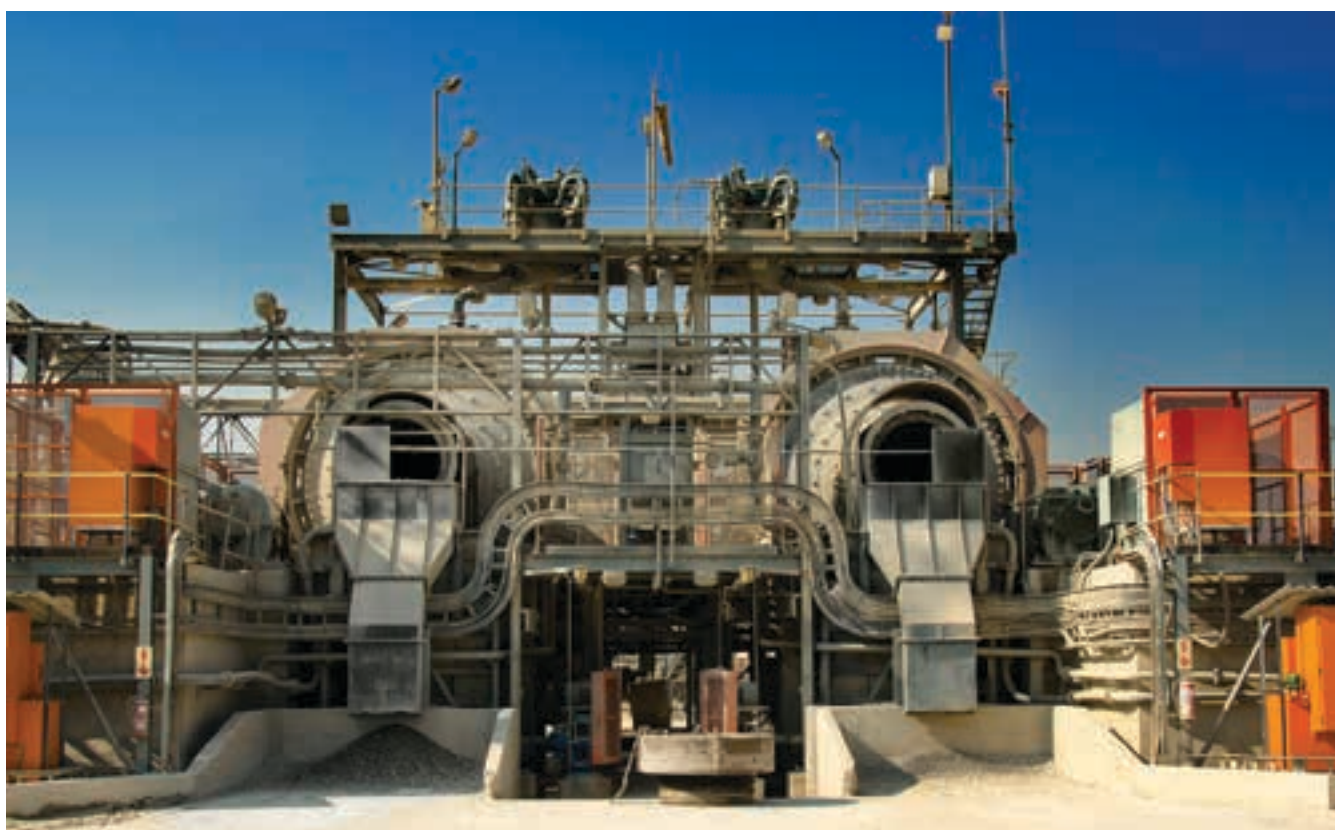
and 3,5 g/t for BC and Luika respectively. The higher cut-off grade applies to Luika because the selected mining method has a higher cost per ton. Mining method selection was based on achieving maximum recovery with minimum dilution with particular consideration given to orebody geometry and geotechnical constraints. At BC the method of long-hole open-stopping with cemented rock fill will ensure high productivity at relatively low cost. At Luika the method of cut and fill with flat-backing will ensure higher selectivity and smaller spans in what are expected to be more adverse ground conditions compared to BC.

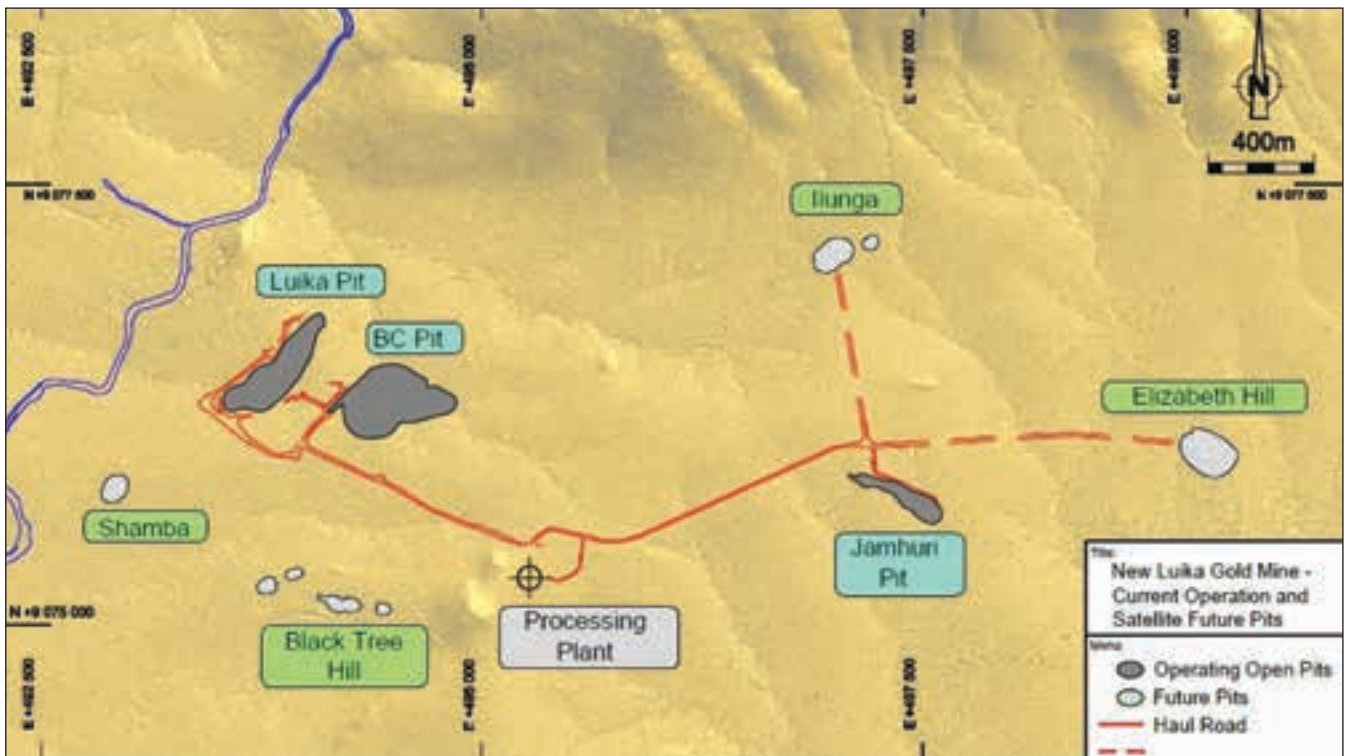
According to Shanta, the senior underground mining engineer to take this project through development and into production is already employed and has been working closely with the project team on the FS since April this year. Individuals for key roles in the underground team have also been identified.

The FS estimates the NPV of the underground project (at an 8 % discount rate and a gold price of US\$1 200/oz) at US\$72 million and the pre-tax IRR at 56 %. The underground life-of-mine average cash cost and the all in sustaining cost (AISC) are estimated at US\$499/oz and US\$540/oz respectively. Shanta says options are being reviewed to finance underground mobile equipment and the power plant upgrade with the balance of funding to come

Left: The processing plant at the New Luika Gold Mine in Tanzania.

Below: The mills at New Luika. Based on reserves at the time of completing the new base case mine plan, unutilised mill capacity exists in four of the next five years representing 362 000 tonnes of spare throughput.





Layout of the New Luika Gold Mine property.

The CIL circuit at New Luika. The New Luika processing plant was commissioned in August 2012 with a new elution and electrowinning facility being added in Q2 2014 and a new crusher plant in September 2014.



from internal cash flow and from the undrawn portion of Shanta's Investec standby facility (US\$10 million).

In parallel with the FS, Shanta has also prepared a new base case mine plan, designed to maximise value and mine life from the existing assets within the mining licence.

The future for BC and Luika is increasingly underground focused. From 2017, NLGM will be a blend of underground mining of high grade ores and smaller scale surface mining of lower grade resources. The plan provides for mining extraction of 2,79 Mt for the production of 443 000 oz from January 2016 to 2022 with 133 000 oz (30 %) from the open pits and 310 000 oz (70 %) from underground.

A separate tailings recovery project produces a further 19 000 oz with a project NPV of US\$5,1 m (at an 8 % discount rate) and a pre-tax IRR of 49 %.

Based on reserves at the time of completing the plan, unutilised mill capacity exists in four of the next five years representing 362 000 tonnes of spare throughput. According to Shanta, there remains substantial scope to improve the plan as new reserves are brought to account. It is anticipated that full mill capacity will be utilised and subsequent mine plan updates will progressively reflect this.

Production for the next five years averages 84 000 oz/a. Included in the production figures is the processing of mineralised material from underground development which is below the economic definition for underground reserves but is comparable to the lower grade ores from surface operations.

There are a number of key infrastructure projects that will be completed as part of the plan. These relate to water security and, as mentioned, power supply and tailings storage.

NLGM is in the final approval stages to construct a dam on the Luika River that will enable operations to withstand a year without rain. The quantity of water stored is an insignificant proportion of the water that

flows down the Luika River. At the end of the life of the NLGM, this dam will form part of Tanzania's infrastructure.

The plan includes a new power plant to replace and expand the existing power plant. NLGM will continue to use heavy fuel oil but the new plant will have low speed engines which provide a longer life and are more efficient. The cost benefits of the revised power costs have been incorporated into the plan. Options to use renewable energy sources, namely solar and hydro, are potentially part of the solution, as is the connection to grid power for non-essential services, where this will further improve cost. NLGM already has a 63 kW pilot solar plant operating on site.

The new tailings storage facility is to be commissioned in 2016 and will provide for an initial eight-year mine life at current mill capacity. This includes capacity for the retreatment of the contents of the existing tailings facility which contains gold and silver not recovered prior to the installation of the elution plant, which was commissioned in 2014.

In the updated reserves statement for NLGM, the total reserves are given (as at 1 September 2015) as 2,66 Mt at a grade of 5,93 g/t for 506 000 contained ounces and 455 000 recoverable ounces. The underground reserves account for 1,57 Mt (at 6,5 g/t) of this total and the open-pit reserves for 1,08 Mt (at 5,08 g/t). While there has been no change to the open-pit reserves since the last reserve statement of April 2015 (save for depletion since then), the underground reserves have increased by 31 000 oz (10 %) from the October 2014 reserve statement.

Total resources in addition to those in the mine plan amount to 6,64 Mt at 2,41 g/t for 514 000 oz (1,0 g/t cut-off for open pit; 3,0 g/t cut-off for underground). Within this, 2,77 Mt at 2,38 g/t for 212 000 oz are indicated resources and are predominantly (77 %) surface mineable. Shanta says work is underway to review the mining cost of these surface deposits to enhance their economics.

Of the inferred resources (3,87 Mt at 2,43 g/t for 302 000 oz), the majority are underground (87 %) and can benefit from increased drilling density. Of particular interest in the underground inferred resources are the potential extensions at BC and Luika deposits which are open at depth and will have the benefit of the planned mine infrastructure, which is anticipated to be capable of supporting mining down to 500 m. Inferred resources for BC and Luika underground are 0,68 Mt at 4,76 g/t for 105 000 oz. The deeper drilling of these deposits is planned from the underground mine.



With the anticipated upgrading of resources that sit outside the plan, there is an opportunity to bring forward production from satellite open pits. This will utilise spare mill throughput capacity and also potentially stretch the life of the high grade underground reserves, thus enabling further low grade resources to be profitably mined. This has benefits of improving overall project value and delaying capital expenditure.

Commenting on the new mine plan recently, Dr Toby Bradbury, Shanta's CEO, said it gave clarity on the production profile at New Luika from January 2016 to late 2022. "The mine plan clearly demonstrates a significant upward revision of the reserve figures and the positive economics of the underground feasibility study it includes. The economics of the updated mine plan remain robust despite the recent gold price environment and demonstrate the quality of the geological endowment at New Luika. We are confident that subsequent upgrades will be provided through an active review of costs and the substantial resources that remain outside this mine plan.

"We will continue to explore on-mine and surrounding mineralisation, and bring indicated and inferred resources into future mine plan reserves. I would like to thank the entire team that has worked so hard to deliver this result, our investors and our host communities for their continued support."

Photos courtesy of Shanta Gold

The NLGM property is located in south-west Tanzania in the historic Lupa goldfield. NLGM is the only current commercial-scale producer in the goldfield.

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New mine plan enhances and derisks the Liqhobong project

Firestone Diamonds, the AIM-quoted company which is developing the R2,1 billion Liqhobong diamond mine in Lesotho, reports that project construction was 49 % complete, as at the end of September 2015, versus the 50 % target under the revised timetable, announced in June 2015, and on track for initial production in Q4 2016. It has also announced that a new mine plan has been completed which further derisks the project and reconfirms the strong base case project economics.

According to Firestone, the critical path earthworks are complete and civil, structural, mechanical and electrical construction works have all begun. The major critical path items that include the Residue Storage Facility (RSF), civils, accommodation and office complex, bulk power, and the steel, mechanical, piping and platework erection and fabrication are all on, or close to, schedule and within budget. The first steelwork has been assembled and the scheduled delivery of steel to site has begun. The construction teams are also reportedly working hard to get ahead of schedule while there is a favourable weather window.

Overall engineering design is 90 % complete, with only the final control and instrumentation

interface designs outstanding and this work is progressing on schedule and within budget.

Accordingly, says Firestone, it is confident that, with the continued co-operation of the Government of Lesotho in granting the required specialist skills work permits necessary for the short term contractors, it currently remains on target to achieve initial production during Q4 2016.

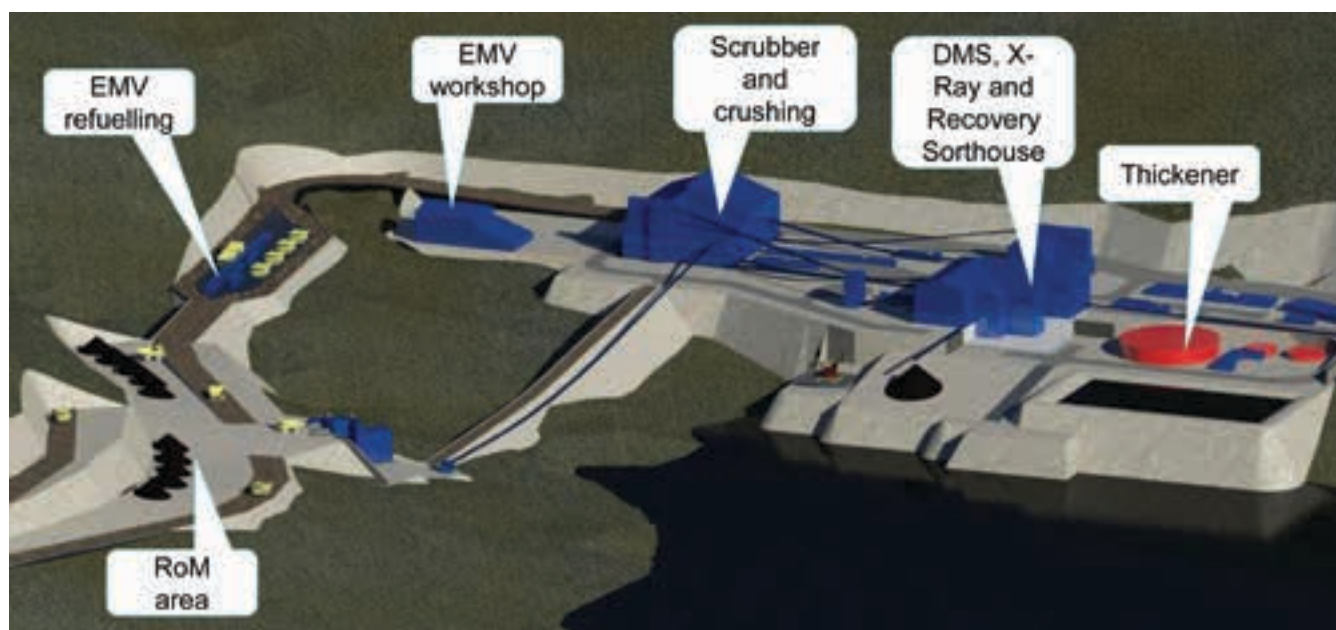
Firestone also reports that the grid power project has been completed on budget and ahead of schedule and is undergoing the final commissioning phases, having been connected to the national grid.

The mine will be an open-pit operation with mining taking place to a depth of 383 m over 15 years. The ore will be treated in a 3.6 Mt/a facility using only proven technologies. The flowsheet incorporates a combination of jaw and cone crushers; scrubbing and conventional screening; coarse and fines dense medium separation; and final concentration by X-ray fluorescence technology. The design allows for the recovery of stones of up to 400 carats.

Firestone, which is headed by ex-De Beers executive Stuart Brown, notes that it has been working hard over the past year to finalise a number of specific work streams to further de-risk and enhance the project. The project's new economics are based on detailed additional

The raw water dam at Liqhobong – 100 000 m³ of storage capacity complete.





work on the diamond resource, updated in 2014, an improved mine plan, updated diamond price assumptions, additional rand capital expenditure to enhance and de-risk the delivery and operations of the project, and updated foreign exchange rates to reflect the devaluation of the rand.

The Definitive Feasibility Study (DFS) announced in November 2013 indicated a base case post-tax, pre-financing NPV at an 8 % discount rate of US\$379 million and an IRR of 30 %, with an upside potential post-tax, pre-financing NPV at an 8 % discount rate of US\$728 million and an IRR of 45 %. The revised economics show a higher base case post-financing NPV at an 8 % discount rate of US\$389 million and an improved IRR of 42 %. The project has broadly similar economic returns when compared to the 2013 DFS, but

with a significantly de-risked operational start up and delivery. The upside pricing option previously run at US\$156 per carat has not been updated to 2015 estimates as the company remains conservative in its view on diamond pricing, when taking the current market conditions into account.

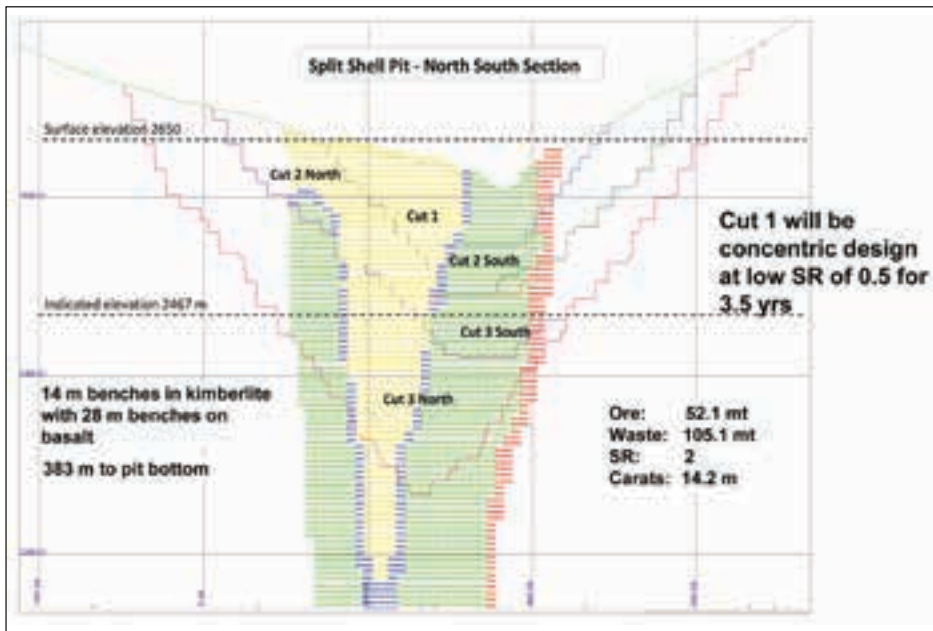
The new diamond resource reflects a number of changes, which include a new geological model with reduced volumes at depth due to the pipe tapering, the removal of the board carats, as Firestone is focusing on gem diamonds, an increase in the BCO (bottom cut off) to 1,25 mm from 1 mm to align to the new treatment plant's BCO (which was determined as being optimal during the 2013 DFS), and depletions as a result of production from the pilot plant, which was closed in 2013.

These changes have had the effect of

The Liqobong plant will have a 500 t/h capacity.

A 160 m³ concrete pour underway for the thickener outer ring.





Open pit design. Overall basalt slope angles range from 50 to 55 deg. Kimberlite angles range from 40 to 46 deg.

Main plant terraces: -6 m, 0 m and +8 m (September 2015).

reducing the overall diamond resource grade from 33 to 28 carats per hundred tonnes (cpht) and the total diamond resource carats from 29,7 to 23 million carats (Mct). As a result the undiluted mine plan grade has reduced from 32 cpht to 27 cpht, thereby resulting in a 17 % reduction in the overall carats recovered over the mine plan, which is partially offset by an increase in the diamond price as described below. When combined with the reduced waste stripping associated with the new split shell mine design, the favourable rand/US dollar exchange rate and the changes to the modelled cash flow, the overall rand revenue per tonne for the mine plan has improved.

As indicated above, a split shell design has been adopted for the open pit. Advantages of

this approach include a reduced risk of ramp failure (once two splits join then a concentric ramp results), lower capex for the initial mining fleet (due to lower waste) and less in-pit traffic congestion with multiple ore and waste faces available.

The stay in business capital and operating costs for the project have also been reviewed in detail and, taking into account inflation, better cost definition and risk mitigation, they have increased in rand terms by R323 million and R1,9 billion respectively. Following the devaluation of the rand against the US dollar (R10:US\$1 used in the 2013 DFS versus R13,27:US\$1 used in the

mine plan), this translates to an increase in stay in business capital of US\$20,6 million and a decrease in operating costs of US\$56,8 million. These changes have been included to reduce the overall risk of delivering the mine plan.

The 2013 DFS used a base case average diamond price of US\$107/ct with an upside average large stone potential of US\$156/ct both at a 1 mm BCO. In preparation for defining parameters for running the mine plan, independent consultants were appointed to re-price the Lihobong pilot plant production parcel and compile an updated August 2014 US\$/ct diamond revenue estimate. The 2014 US\$/ct revenue estimate was based on a combination of modelled size frequency distributions (SFD) per facies and modelled



assortment (US\$/carat/sieve size). The resultant revenue estimate was increased to align to the BCO of the new treatment plant of 1,25 mm. Furthermore, the large stone potential was investigated by extrapolation of assortment and SFD data beyond +10,8 ct/stone.

Applying the latest revenue estimates in the mine plan resulted in a weighted un-escalated average diamond price of US\$131/ct, which has equated to an average escalated diamond price over the life of mine of US\$165/ct, representing an increase of approximately 13 % from the 2013 DFS. Given the current market conditions, the 2014 revenue estimate has not been escalated until 2017 in the financial model.

The first stage in producing the new mine plan involved the appointment of an independent consultant to update the SAMREC compliant 2009 diamond resource estimate for Liqhobong.

This process started with a detailed re-logging of the main pipe borehole core, enabling the construction of a new 3D geological solid model for the project. As part of the re-logging exercise, new density measurements were also collected which allowed for a local block estimate of density for the first time. The previous grade estimate was also based on the wide diameter holes drilled during 2008 but has now been updated to exclude the boart component. The independent work, undertaken in accordance with SAMREC guidelines (2009), estimated that the Liqhobong main pipe contains: an indicated diamond resource to a depth of 2 467 m above sea level or masl (183 m below surface) estimated to comprise 9,5 Mct in 35 Mt



Toe of the new slimes dam wall (September 2015).

of kimberlite at an average grade of 27 cpht; and an inferred diamond resource below 2 467 masl, estimated to contain 13,5 Mct in 48 Mt at an average grade of 28 cpht.

The 22 % carat reduction in the total diamond resource from 2009, says Firestone, is mainly a result of the reduced volume due to the new geological model and the pipe tapering at depth, the removal of the boart carats, the increase in the BCO to 1,25 mm from 1,0 mm and depletions due to the pilot plant.

The Liqhobong project is being built under the direction an owner's team led by Glenn Black, Firestone's Chief Project Officer. The EPCM contractor is DRA with the other major contractors being Turnkey Civils Lesotho (Residue Storage Facility), Stefanutti Stocks (civils and earthworks) and SMEI (structural, mechanical, platework and piping). The total workforce currently numbers around 680 and the site had recorded zero lost time injuries (with over 1,3 million man hours worked) to the end of September.

Photos courtesy of Firestone Diamonds



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Drones, 3D photos and GPS take



BME's Tony Rorke.

It is well known that good blast design ensures an effective distribution of powder that improves blast results and reduces drilling and blasting costs. Now, through the use of unmanned aerial vehicles (UAVs or drones), global positioning systems (GPS) and three-dimensional (3D) photogrammetric software, the field of blast design has been taken another step forward, as Tony Rorke, Technical Director of BME, explains in this article.

At the heart of this technical advance is the ability to conduct high-quality 3D face profiling using stereographic image pairs, providing accurate and detailed information for better drilling and charging designs that optimise powder distribution and reduce the risk of fly-rock.

The high-quality images also provide good visual assessments and measurements of block conditions and blast results – often not achievable from the blast elevation or from fixed elevated viewpoints. This information is particularly useful to pit-managers, mine surveyors, planning engineers and blasting consultants.

Working in a number of South African mining operations – in collaboration with US expert Robert McClure of RAM Inc and Terracam (Pty) Ltd – BME has been combining these technologies to more effectively quantify blast parameters including drilling quality, block geometry, back damage, heave profile and fragmentation evaluation.

The approach involves the use of small fixed-wing drones (or multi-copters to deliver oblique views) that are pre-programmed to fly a grid across a particular area of interest on the mine site. This is done before and after a blast, to create accurate and measurable 3D images for analysis.

Due to the evolution of modern, high

energy-density lithium polymer batteries, UAVs have become smaller and more affordable; and with reliable satellite navigation, they can safely fly aerial photographic surveys for up to an hour.

Equipped with small, high-resolution (10-20 megapixel) digital cameras, a fixed-wing drone can fly at low altitudes and deliver high-precision, geo-referenced orthophotos of the blast area. Still images are taken at intervals so that there is sufficient overlap to generate a 3D topographic surface, with accuracy relying on the placement of surveyed ground control points with sufficient elevation variance. The projects in South Africa consistently achieve vertical and horizontal accuracies less than 100 mm with a minimum of four ground control points.

Once this field information has been collected, analysis is quick and effective; by incorporating the options into a single package, a mine can manage their site with more confidence – making decisions with the most up-to-date information. Two software applications are required: one to generate a 3D surface orthophoto from the UAV images, by creating dense and filtered 3D data in any format from ASCII point clouds to raster GeoTIFFs or ECWs; and survey software to analyse volumes, cut-lines and surfaces.

The type of blast-specific information obtained from the photographs are: pre-blast

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block condition and volumes; blast-hole positions; and post-blast analysis of muckpile shape, back damage and fragmentation.

The information is valuable not only for reporting purposes but for assessing blast performance by examining the distribution of fragmentation and fly rock around a blast. As these are orthophotos with geo-referenced points, measurements can be made directly off the images. The view from directly above a blast is unique as it is possible to see and measure features that are not necessarily obvious from any other angle.

Muckpile profiles can also be created, allowing a geo-referenced, 3D digital surface to be analysed easily for volumes and cross-sections. Accurate vertical cross-sections are generated quickly from cut-lines drawn on the surface in the survey software.

For blast planning purposes, block-shape, hole locations and areas of damage are variables that can be accessed from the data. The

position of holes can be detected from an orthophoto and saved as text-delimited files for use in blast planning software.

Rock variation in a bench often has a significant impact on blastability and explosives performance, and it is sometimes necessary to place waste or air decks in a hole traversing a sequence of strata in specific locations to concentrate or dilute the explosives energy. To address these issues, the new drone-based techniques also allow a closer inspection of the blast area's geology. A scaled image of a face taken from a multi-copter provides a good source of information on the positioning and variation in width of strata in a single bench for charge planning purposes.

BME's experience from mining projects in South Africa has shown the usefulness of using drones to leverage existing photographic, software and GPS technologies to improve blasts; there is no doubt that this science has plenty of potential yet to be uncovered. ■

Muckpile profiles can also be created, allowing a geo-referenced, 3D digital surface to be analysed easily for volumes and cross-sections.

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Impumelelo commended for engineering excellence

Night view of Impumelelo, a new 8,5 Mt/a replacement tonnage coal mine complex in the Secunda area.

The Impumelelo shaft project at Sasol Mining's Brandspruit mine received a commendation at the CESA Aon Engineering Excellence Awards 2015 for the RSV ENCO Hatch Goba Coal Joint Venture. Sasol Mining appointed the Joint Venture as the Engineering, Procurement and Construction Management (EPCM) consultant in August 2009.

The 62-month, R4,6 billion multi-disciplinary greenfield project in the Secunda area had an integrated management team at its helm. The Joint Venture's multi-disciplinary team had to interface with the Sasol project team, the Sasol Mining team and the Sasol Coal Supply team, which would ultimately run the entire operation and therefore had to be brought up to speed with the project's technical scope.

"The constructed project demonstrates our commitment to sustainable engineering solutions," comments Kevin Seyfried, Director Mining AEM, Associate at Hatch Goba. "Specialised package managers were responsible for the total delivery within their areas of responsibility."

The basic engineering design packages ensured suitability, functionality, constructability, operability and maintainability of the new mining infrastructure and associated materials handling system. All the systems were designed

to be energy efficient and optimised within strict coal degradation and spillage tolerances.

A techno-economic review of the project's feasibility was completed by the Joint Venture in June 2009, followed by a detailed engineering design phase from July 2009 to December 2010. Construction began in earnest in June 2011. Phase 1 construction was completed in June 2015, with Phase 2 scheduled for completion in June 2019. Upon completion, Impumelelo will have 13 production seams, with a total shaft depth of 235 m.

Impumelelo is a new 8,5 Mt/a replacement tonnage coal mine complex for Brandspruit in the Secunda area of Mpumalanga. The project scope entailed the design and development of the complete greenfield mine complex. Therefore special consideration had to be paid to the build-up of the new operation, in conjunction with the phasing out of the existing coal-mining operation.

It included the entire shaft system of two vertical shafts, a decline shaft and associated

The 15 000-tonne coal bunker at Impumelelo under construction.

feature



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underground development. In addition, the scope of works comprised all supporting infrastructure, from offices to a change-house and workshops, as well as fibre-optics, roads, power and water supply and sewage treatment.

The materials handling system comprises underground conveyors, surface bunkers and a 2 400 t/h, 27-km-long single-flight surface overland conveying system, reportedly the longest of its kind in the Southern Hemisphere to date.

The geographical area of the project extended over 27 km. A 4 000 tonne coal bunker was constructed at one end (km 27), with the overland conveyor infrastructure at mid-station (km 18). A 15 000 tonne coal bunker was constructed at the other end (km 0), together with the various ancillary buildings, dams and the shafts.

The current reserves at Brandspruit mine are nearing depletion, and hence the new Impumelelo mine, which is ultimately expandable to 10,5 Mt/a, is essential to guarantee coal supply to the Sasol Synfuels Complex.

The project created significant opportunities for local community involvement in that local contractors and labour were used wherever possible. There were about 1 300 workers on-site during the construction period up to April 2015, with a peak of 2 122 in November 2013. The project clocked over 13 million man hours.

The Impumelelo shaft project at Brandspruit was one of two commendations received by Hatch Goba in the category of 'Projects with a value in excess of R250 million' at the CESA Aon Awards at the Vodafone Arena on the evening of 12 August. Present at the awards banquet were Kobus Louw, Johan Duvenhage and Willem van den Heever, all from Sasol Mining, Conrad Stark from Hatch Goba, and Alan Wingrove from RSV ENCO.

"There were nine vastly different

contenders in this prestigious category, and to have received not one, but two, of the three commendations awarded over and above the winning project is an indication of the difficulty in selecting a clean-cut winner," Hatch Goba Chairman Trueman Goba comments. Hatch Goba's second commendation in the category of 'Projects with a value in excess of R250 million' was the Umgeni Road Interchange upgrade for SANRAL.

Impumelelo forms part of a larger replacement project that will transform the Secunda area in Mpumalanga into one of the largest underground coal complexes in the world, with total extractable run-of-mine reserves estimated at 1,3 billion tons. In terms of the overall project, Thubelisha will replace Twistdraai and Impumelelo will replace Brandspruit, while Middelbult will be expanded by Shondoni.

Hatch Goba's mining capability ranges from dewatering to infrastructure, shaft sinking, materials handling systems, hoisting headgear design and dynamic simulation or operational modelling across all of these areas. ■

The Impumelelo overland conveyor and power line. The 2 400 t/h, 27-km-long single-flight conveying system is reportedly the longest of its kind in the Southern Hemisphere.

Overall view of the Impumelelo mine site.



Optimisation study strengthens case for Tanzanian coal project

Kibo Mining, the Tanzania focused mineral exploration and development company listed on London's AIM and Johannesburg's AltX, has announced what it describes as "significantly improved financials" for the coal mine component of its Mbeya Coal to Power Project (MCP). The company and its advisers, South Africa's Minxcon Projects, have now completed a financial optimisation study for the MCP coal mine, based on feasibility results received to date.

The Mbeya (previously Rukwa) coal project comprises 16 tenements located in south-western Tanzania. What is known as the Central Block contains the 109 Mt Mbeya thermal coal mineral resource and will host the MCP. The Central Block covers 1 873 km² and is situated approximately 70 km north-west of the regional town of Mbeya and just south of Lake Rukwa.

Kibo, which also has gold projects in Tanzania as well as the Haneti project, prospective for nickel, PGMs and gold, launched a Definitive Mine Feasibility Study (DFMS) on Mbeya in the second half of last year. The company is planning an open-pit mine at Mbeya allied to a 'mine mouth' power station of 250 to

300 MW capacity (probably using Circulating Fluidised Bed technology). It believes there would be a ready market for the electricity generated by the project, given that Tanzania's national installed generation capacity is 1 500 MW (with only 780 MW operational) while demand is currently in the range of 1 500 to 1 800 MW and expected to grow by at least 10 % per annum over the next several years.

The project received a boost earlier this year with the signing of a 'Joint Development Agreement' which will see Kibo collaborating with SEPCOIII, a China-based EPC contractor specialising in the construction of power plants. SEPCOIII has an impressive track record, having installed 37 000 MW of generating capacity since being founded in the mid-1980s. It is estimated that the power station component of the MCP could cost between US\$640 and US\$760 million to develop, depending on the plant configuration adopted.

The findings of a Pre-feasibility Study (PFS) – part of the overall DFMS – on the mine were released in August this year. The project was assessed for a 28-year mine life, with an annual average coal production of 1,48 Mt over the life of mine. The PFS identifies the preferred mining method as modified terrace mining, with over-burden removal by means of a free dig (truck and shove) method and coal seam and inter-burden mining by means of the mechanised continuous surface mining method.

According to the PFS, only limited processing in the form of destoning of the product would be required, as the surface miners would ensure the delivery of coal on specification to the power station, with no need for crushing and washing. In addition, a river diversion which was identified in the Concept Study as being needed has proven unnecessary in the PFS pit optimisation.

The PFS estimates the capital cost at between US\$38 million and US\$73 million depending on the development options chosen. The mine would generate annual estimated coal sales of between US\$48,4 million and US\$48,6 million.

In the latest financial optimisation study for the MCP coal mine, the impact

Drilling at the Mbeya Coal to Power Project site in Tanzania (photo: Kibo Mining).



of optimal gearing was tested on the surface miner contractor option, one of four alternative options for project development examined in the PFS. One of the key conclusions resulting is that the all-in cost margin ranges from 47,9 % to 48,1 %. Applying this margin, Kibo interprets that annual earnings before interest and tax (EBIT) of between US\$23,5 million and US\$23,6 million will be generated.

The high all-in cost margin reflects low operating costs as a result of the proposed mining method and shallow orebody, small sustaining capital expenditure and a fixed coal price as received from the power plant and is – says Kibo – a key indicator of the robustness of the project.

Applying a real discount rate of 5,51 %, the best estimated NPV of free cash flow to equity ranges between US\$214 million and US\$219 million while the equity IRR (leveraged) ranges between 131 % and 146 %, with a project IRR of 54 %. The cash return on capital invested ranges between 726 % and 732 % while the project payback period before loan repayment is estimated at 2,6 years.

“We are delighted to provide this update

showing the outcome of the latest, more detailed work undertaken by our advisers for the MCPP,” comments Louis Coetzee, CEO of Kibo Mining. “In particular, we are delighted with the confirmation of the NPV range of US\$214 million to US\$219 million which is solely in respect of the coal mining component and does not include the significantly larger power generation portion of the project.

“This is a large-scale project which is now demonstrably lower risk. With the relatively low capital investment required, the Mbeya coal mine delivers a high project IRR and short payback period.

“The IRR being substantially above the cost of debt makes it an attractive option to consider project level loan financing. The project’s robust financials will play in Kibo’s favour in respect of the competitiveness and conditions attached to any such loans.

“As each stage of our work on the MCPP is completed, Kibo emerges with a stronger, more valuable project. We will update shareholders with further progress in the near-term in what is a busy operational period for the Kibo team and the MCPP.” ■

“This is a large-scale project which is now demonstrably lower risk.”

*Louis Coetzee,
Kibo Mining*

feature

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Wescoal in strategic transition

Wescoal Holdings produced satisfactory results for its 2015 financial year with the key focus on the strategic transition of the business and delivery to all stakeholders in a tough environment. This is the view of Chairman Robinson Ramaite, who was commenting on the Group's 2015 Integrated Annual Report.

Ramaite said the Group's revenue has increased 0,19 % to R557,3 million and the margin from 13,5 % to 17,5 %.

"The board took a decision not to declare a final dividend, opting to use the available cash to develop its mining assets such as the Elandspruit project which, at the time of writing, has the mine feeding the new Wescoal Processing Plant with the expectations of reaching the target of 170 000 ROM tons per month before the end of the calendar year," he noted.

During the year, revenues from the mining division were R557,3 million (2014: R556,2 million) with an operational EBITDA of R94,7 million (2014: R101,2 million).

Wescoal's trading division's performance was highlighted by excellent cash generation. Its revenues were significantly higher at R1,16 billion (2014: R591,2 million) with operational EBITDA improving considerably to R34,3 million (2014: R1,6 million).

"However, direct comparisons to the previous year's figures are difficult because only four months of MacPhail's results were reported and there was a R75 million sale of the Vlaklaagte asset. There were also exceptional and non-recurring costs including the resignation of CEO Andre Boje, a year earlier than expected," said Ramaite.

The final results for the 2015 financial year reflected a solid performance for most of the period under consideration in a challenging business environment and delays in securing long-term coal supply contracts. On the positive side, there had been an asset base increase and the company has secured extension of existing life of mines and made a significant investment in Elandspruit.

"The main business of the Group is the mining, processing and the sale and supply of coal. We mine, source and supply to end users including the power generation,



Curtis Mnisi shows off product from Wescoal's new Elandspruit mine. Located 10 km west of Middelburg, Elandspruit started delivering coal earlier this year. The mine boasts reserves of over 34 million tons and a Life of Mine of 12 to 15 years (photo: Wescoal/Peter Morey Photographic).

manufacturing and petro-chemicals sectors. The key strategic thrust of Wescoal is to be a leading coal miner with a sustainable resource base and a coal trading operation," stated Ramaite.

"To achieve this, among other objectives, during the calendar year we will have in place a revitalised executive team including appointments in the HR, legal and financial departments while continuing with our strategy to position the company as an employer of choice.

"Looking ahead, management envisages that the coming 12 months will be challenging as competition increases, load shedding impacts the business and the state of the steel sector in South Africa comes under pressure with already reduced orders for coal being experienced.

"Wescoal Mining is evolving the long-term strategy around the Eskom requirements of 50 %+ HDSA ownership to ensure finalisation of long-term coal supply contracts. Management remains cognisant of the fact that currently 80 % of Wescoal reserves are of the Eskom-type of resource and therefore holds the view that most of Wescoal's business will continue to be built around Eskom.

"Additional avenues of coal supply are being explored as part of an assessment of the business's long-term strategy and risk management," Ramaite concluded. ■

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Sable enters agreement on Lubu power plant

Sable Mining, the AIM-listed exploration and development company, has entered into a Memorandum of Understanding (MoU) with a view to developing a 600 MW coal-fired power plant at the company's 19 236 ha Lubu coal project in Zimbabwe with CITIC Construction Co, Ltd, a subsidiary of CITIC Group, a Chinese-based construction and services provider.

Under the terms of the MoU, Sable and CITIC will explore the opportunities of using their respective expertise to work together to develop a commercial coal-fired power station at Lubu. It is the intention that coal mined at Lubu (which is located in the Mid Karoo Zambezi coal basin in the established Hwange mining district of north-western Zimbabwe) will supply the power station.

The MoU is supported by the Republic of Zimbabwe and the Ministry of Energy and Power Development, which is the authority in charge of power development.

"Considering the energy and power dynamic in Southern Africa, there is a major demand for a secure and reliable power supply, which will continue to grow unless new power

sources are established," comments Sable Mining CEO Andrew Groves. "Our proposition is to develop a 600 MW coal power station in conjunction with CITIC and with the support of the Zimbabwean government. This will represent a significant step forward in solving the ongoing energy deficit which is currently presenting significant obstacles to development within Southern Africa.

"The combination of our quality coal together with CITIC's access to power plant infrastructure, financing and construction expertise has the potential to create a long term power supply which, due to Lubu's strategic location in north-west Zimbabwe, could supply both domestic and regional demand once connected to the established power grid. Our team now look forward to exploring the commercial potential of this MoU further with the CITIC team and moving forwards with this project at speed." ■



The Lubu coal project exploration camp in Zimbabwe (photo: Sable Mining).

feature

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FLSmidth develops world's largest operating flotation cell



The new 600 Series SuperCell™ flotation machine is the world's largest operating flotation cell.

With the need to address declining grades and the pressure to reduce capital costs as well as operational costs, original equipment manufacturers (OEMs) must continue to leverage technology to provide solutions for the mining industry.

This is the view of Frank Traczyk, Director of Flotation at FLSmidth, who says that the depth of expertise and experience that resides within the company has allowed it to develop the new 600 Series SuperCell™ flotation machine. With an active volume of 660 m³, this massive cell is the world's largest operating flotation cell and allows customers to take advantage of economies of scale.

The first 600 Series cell is installed at KGHM's Robinson copper-molybdenum mine in Ely, Nevada. Initially water trials were conducted and – when operators

were confident with the results – slurry was introduced and the cell was successfully commissioned in April 2015. Due to successful functioning of the cell following start-up, the plant's operators were able to take over full operations after only 10 days. They subsequently reported that the 600 Series cell "runs like it's on autopilot."

One of the primary advantages of the 600 Series SuperCell™ technology is the reduced flotation circuit area footprint. Comparing this unit, which offers a significantly higher flotation capacity, to the 300 m³ machine, Traczyk says that it requires between 20 % and 30 % less area and can reduce capex by up to 25 % and opex by 15 %.

"Needing a smaller installation area makes it much easier and cost effective to retrofit these flotation machines into existing plants and also allows the footprint of new flotation circuits to be reduced, resulting in infrastructure and construction savings of up to 25 % for the customer," Harley Schreiber, Flotation Product Manager at FLSmidth, explains.

Schreiber says that process control in a flotation plant can be onerous with controlling slurry level and froth proving inherently difficult in a row of flotation cells. "The slurry level in any cell affects the driving head in adjacent cells and this can easily create unstable control conditions.

This situation is exacerbated as larger concentrators with increased flotation cells are forced to use more cells per row," he says.

The FLSmidth 600 Series SuperCell™, with half the number of flotation cells of smaller machines, offers a major advantage in terms of process control which facilitates more manageable control conditions in the plant.

In addition to improved process control, maintenance requirements and the associated labour and time costs are reduced. "The maintenance crew can be mobilised to focus on only the single larger cell in some cases and economies of scale can also be applied to parts inventories, again resulting in decreasing operational costs for the plant," Schreiber says.

With the growing need to optimise plants, this technology will allow additional rougher or cleaning capacity to be added to an existing circuit using a single 660 m³ cell. In this way the customer could easily increase the capacity or retention time of that particular row.

The large flotation machine, which is about 8,5 m high and nearly 11 m in diameter, offers significantly reduced specific power consumption. By providing the necessary power in the critical contact region near the rotor, excellent metallurgical performance is ensured with less energy used overall.

Terence Osborn, FLSmidth, tel (+27 10) 210-4820

MechCaL establishes repair services division

With current tight economic conditions, companies are often choosing to have equipment repaired instead of replaced. Responding to this trend, MechCaL is expanding its service offering to include repairs.

This service will help support mines and businesses by ensuring that the equipment that they rely on every day is always operational. MechCaL simplifies the process of managing needed repairs by properly diagnosing, repairing and promptly returning fans to working order to reduce downtime. MechCaL's repair services division is currently under development and will soon be fully operational.

Although MechCaL has become best known for the design and manufacture of innovative power-saving fans, the repairs

division adds yet another to a long list of additional services offered by MechCaL.

The company's MD, Professor Jan du Plessis, says the new division was conceptualised as a means of ensuring that its clients get the best out of MechCaL's products.

"The motivation behind this new service offering is to make sure that our products, old or new, perform optimally. This furthers our aim of providing the various industries that we supply to with the most efficient fans possible," says Prof du Plessis. "In the past we have supported the traditional fan repairers and we continue to do that but it is becoming more common practice for OEMs to remain responsible for repairs on their own products. By doing that, the mines then receive a virtually new unit once it is repaired."

To date, MechCaL has secured an agreement with Lonmin to be its sole repairs provider. According to Du Plessis, MechCaL will be carrying out ad hoc repairs but will be aiming to sign dual contracts for supply and repair.

"This will assist us in managing the long term quality control of products supplied to the market. In the very difficult current mining market, this will allow us to expand our service offering as well as create an additional revenue stream."

The types of repairs required by MechCaL's clients differ widely and range from standard motor service and complete stripping to repair of damaged parts and repainting. Du Plessis says that MechCaL has the technical capabilities to extend the repair services to fans supplied by other manufacturers as well.

MechCaL, tel (+27 12) 755-8307

Bell Equipment range showcased at Bauma Conexpo

Bell Equipment used the recent Bauma Conexpo Africa 2015 exhibition to showcase its extensive product offering available on the continent and reaffirm its commitment to the African market in the face of tough trading conditions.

In the weeks leading up to the show Bell Equipment released its mid-year results, which showed a modest improvement relative to 2014 with favourable exchange rates, efficiency improvements and a focus on the Northern Hemisphere construction equipment markets dulling the impact of the major difficulties in some of the company's major markets and industries.

While revenue was R2,9 billion, down 16% from R3,4 billion in the same period last year, the company's profit after tax increased 67% to R101 million and earnings per share increased 71% to 106 cents. "There has been no significant recovery in the mining activity so we are competing for a slice of a much smaller global pie but, as a company, we are in much better

shape," said Bell Group Chief Executive Gary Bell.

Commenting on the African region, Bell said: "The mining industry in Africa, like elsewhere in the world, is experiencing an unprecedented downturn but our broader range of products that we are able to offer today through our strategic alliances with John Deere, Liebherr, Bomag and Finlay means that we are not totally dependent on mining activity. We're continuing to introduce new partner products to provide customers with innovative solutions, like the Finlay Dual Power units, which are aimed at giving significant savings on energy costs."

In spite of the subdued demand for mining machinery globally, progress continues on completing the line of Bell E-series trucks with the larger B35E

to B50E range planned for release into Europe in mid-2016. A B50E pre-production machine generated a large amount of interest at Bauma Conexpo Africa and Bell said the company would continue to invest in its ADT research and development programme to drive down operating costs and improve ADT efficiencies while, at the same time, meeting more stringent global environmental requirements.

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The Bell stand at Bauma Conexpo Africa 2015.

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Strand jacking used to lift conveyor gantry sections

The application of strand jacking technology by international heavy-lift specialist Vanguard is reportedly proving to be an economical solution for clients, while enhancing worker safety and performance quality.

The strand jacks form part of Vanguard's extensive range of specialised heavy-lift equipment, which also includes hydraulic lift systems, jack and slide systems, rigging and installation equipment and a variety of specialised cranes.

Recently, Vanguard was requested to assist with lifting and placing pre-assembled sections of a stockpile conveyor gantry into position 30 m above ground level. The initial request was to execute these works using large cranes.

Vanguard conceptualised and engineered an alternative project solution

using strand jacks, according to Vanguard's Roger Rousseau.

"While strand jacks have been in use globally for some time, their versatility and benefits are not well known in the field of steel construction in Southern Africa and therefore are often unobserved," said Rousseau.

"Using this technology, our engineered project solution allowed the client to complete the assembly of each gantry section on the ground, improving the level of safety and the speed of the work, while facilitating closer quality control. It was also more economical, as the cost of deploying large cranes for an extended period is very high and uncompromising in the face of any unforeseen delays in schedule."

The sections that were lifted com-

prised three weighing 115 tonnes each, and a fourth weighing 150 tonnes including a tripper car; each gantry section was 50,4 m in length. The strand jacks have a lifting capacity of 70 tonnes each, and the contract employed four jacks at different points to lift the load. The conveyor gantries were connected to, and lifted by, the strand jacks using high-tensile steel cables, known as strands.

The lifting itself was computer-controlled through intelligent software that operated the four jacks in unison, so they could grip and pull the strands over a 'stroke' distance of about half a metre at a time.

To construct the framework in which the jacks could operate, four lattice towers were erected and connected horizontally by two pairs of header beams, one pair on either end of the load. Two platforms – each carrying two strand jacks – were individually placed on a pair of header beams. This arrangement also allowed for the lateral movement of the load to the required position.

"We hold most of the equipment needed for this kind of job. For this application, we engineered additional height on the towers to reach the 43 m required, and joined the header beams to achieve the 22 m horizontal distance required between the towers," said Rousseau.

The equipment was translocated from Vanguard's Johannesburg yard to site in Namibia, where it was assembled, ready for the first lift.

Vanguard, tel (+27 11) 616-1800

Strand jacking was recently used to lift preassembled sections of a stockpile conveyor gantry into position 30 m above ground level.



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Fire suppression system gains traction

Fogmaker fire suppression systems from Sweden have a solid reputation for protecting both human life and assets within the global bus transportation market. Fogmaker has an installed base of more than 100 000 systems in over 50 countries in Europe, the Middle East, Australia and the USA. The product for closed engine compartments is distributed in Southern Africa by Fogmaker South Africa.



The Fogmaker fire suppression system is gaining traction on mobile machinery.

This high pressure water mist fire suppression system is reportedly rapidly gaining popularity within a number of sectors where its value in terms of decreased downtime and reduced insurance risk is apparent. John Russell, General Manager for Fogmaker South Africa, says that uptake has been high in the bus industry, with the system also now gaining traction in industries using underground vehicles, forestry machines, marine vessels and other specialised mobile machinery.

"Due to the use of hydro-pneumatic fire detection, which is totally independent of any electric circuit, both the detection and suppression systems work even when the electricity supply is disconnected. Resetting a released suppression system is simpler, easier, faster and more effective than with powder or foam suppression systems. The total life span cost of Fogmaker suppression systems is low compared with competing systems," Russell says.

The patented discharge piston allows for a complete discharge, regardless of the orientation of the bottle. This, together with its high-pressure (100 bar) operation, results in a smaller installation footprint.

John Russell, Fogmaker South Africa, tel (+27 82) 614-9157

New pump rental hub launched

Xylem South Africa recently opened its new pump rental hub – said to be the largest of its kind on the African continent – in Kempton Park, Johannesburg.

The team at Xylem South Africa, a part of the global water solutions company Xylem Inc, has been hard at work over the past few months in preparation for the opening of the new hub, which offers customers ease of access to world-class pump rental solutions.

Over the past few years, Xylem South Africa has greatly expanded its regional footprint with branches currently servicing clients in Gauteng, North-West, Western Cape, Limpopo, Eastern Cape and Mpumalanga provinces.

The hub operates nationally through Xylem's regional depots and delivery and transport options to other areas can be discussed upon request.

"This will ultimately result in less downtime and higher productivity for clients. Coupled with the costs saved on initial capital layout on pumps or related systems, the sky is the limit for our customers. We place great value on providing the best solutions for businesses that place their trust in us," says Dirk Bekker, Rental Manager at Xylem South Africa.

Xylem South Africa, website: www.xylem.com/za

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Blast emulsions now fine-tuned to suit every purpose

Bulk emulsion explosives have come a long way since BME introduced double-salt – ammonium nitrate and calcium nitrate (AN/CN) – cold emulsion products into South Africa over 30 years ago.

“Factors like safety, stability and performance are still vital for the mining sectors that rely on emulsions for their blasting activities, but the technology is constantly

being developed to meet and exceed customers’ expectations,” said BME General Manager (South Africa and Namibia) Albie Visser. “Ongoing research and development has put us in a position where we are now able to customise the emulsion to suit the needs of each quarry or mine.”

Emulsions have made blasting safer because they are not classified as an explosive until sensitised in the drill-hole; up to that point, their status as a 5.1 oxidiser makes them safe to transport and handle – and simplifies logistics by not needing the special licensing, permissions and facilities required by traditional explosives.

The long shelf-life of the BME emulsions makes them easier to store, allowing quarries and mines to reduce supply chain risk where distances and accessibility make transportation difficult; and they do not require dedicated magazine facilities, saving on cost and administration.

With BME’s double-salt formulation, the emulsion has a lower ‘fudge’ point than single-salt emulsions, which means that the temperature required in the manufacturing process can be lower without crystals forming. Fudging results from the formation of unwanted nitrate crystals in the solution phase; this thickens and hardens the emulsion, making gassing and pumping impossible and the explosives non-detonable.

Many customers have applications in which the emulsion needs to be pumped a number of times before it is fed into blast-holes. “This doesn’t pose a challenge for us, as the double-salt formulation allows us to successfully re-pump our emulsion multiple times, with no degrading impact on the product,” said Visser.

Emulsions also have a higher velocity of detonation than Ammonium Nitrate Fuel Oil (ANFO), which improves fragmentation for quarries and hard rock mines. In underground applications – where pumpable emulsions have begun offering exciting opportunities – it reduces damage to side walls and hanging walls as there is less gas energy and more shock energy in the product.

The range of BME emulsions allows customers in quarrying, opencast and underground mining to take advantage of its benefits. In the opencast environment – BME’s traditional market – HEF emulsion is used for small-diameter surface drilling. Heavy ANFOs, which are emulsions blended with ammonium nitrates, are supplied by BME for larger-sized drill-holes.

BME has also made progress in helping customers address the challenges created by reactive ground, by developing a specialised emulsion for use in these conditions.

BME, tel (+27 11) 709-8765



With BME’s experience of developing, manufacturing and testing emulsions in the field, the company can now engineer a site-specific emulsion for a customer’s particular conditions and blast outcomes.

Miniature circuit breakers available from Zest WEG

A full range of approved miniature circuit breakers, offering protection against overload and short circuit in electric conductors, is available from Zest WEG Group. The WEG MDW and WEG MDWH miniature circuit-breaker line complies with the tripping characteristic curves B and C, according to standards IEC 60898 and IEC 60947-2.



These miniature circuit breakers have been developed to be used in low voltage circuits with direct or alternating current from 2 to 125 A and short circuit breaking capacity up to 10 kA. The full range includes all accessories in both 5 kA and 10 kA, making it possible for the Zest WEG Group to supply customers with complete solutions for specific projects.

All the WEG MDW and WEG MDWH miniature circuit breakers can be used in both commercial and domestic applications.

Kirsten Larkan, Zest WEG Group, tel (+27 11) 723-6000

Partnership on safety gloves

Personal protective equipment (PPE) manufacturer Midas reports it has expanded the reach of its protective gloves in Africa thanks to a successful long-term partnership with regional PPE expert North Safety.

Midas’ relationship with North started more than 15 years ago when North became its first supplier in Africa. Midas’ Regional Sales Manager for Africa and Middle East, Manu Vikraman, notes that Midas and North worked together from the beginning to develop the Ninja brand of safety gloves. “North has an intimate knowledge and understanding of how the gloves are made, and the company has done exceptionally well in promoting the Ninja brand across Africa,” he states.

Canada-based Midas was one of the first manufacturers to develop safety

gloves that feature different coatings, without compromising on comfort. “We have invested heavily in research and development and are regarded as a leader in new product development. Midas works diligently with customers and end users to meet the ever-changing and demanding needs of the PPE industry,” adds Vikraman.

Midas exclusively supplies the Ninja brand through North in sub-Saharan Africa. Vikraman points out that the gloves are laboratory-tested and come with a technical backing. “Rather than reducing the quality in order to bring down the costs, we sell quality products to the end users to ensure that workers feel safe and happy, which results in an increase in efficiency.”

North Safety, tel (+27 31) 705-6085

Vibro Optimax™ extends screen life

Wire screens are generally considered to be the most effective form of screen because of the stable screening surface and higher open area. By developing a wire with improved mechanical properties, FLSmidth has enabled customers to lower the total cost of ownership on screening plants.



The Vibro Optimax™ wire allows optimum throughput while offering superior wear resistance.

The company's Vibro Optimax™ wire allows optimum throughput while reportedly offering superior wear resistance, resulting in an improvement in the overall working life of the physical screen.

"This increase in screen life coupled with a significant decrease in maintenance translates into significant bottom line savings for our customers," explains Alistair Calver, GM of Screen Media at FLSmidth.

"Our continued focus on developing screen media products and ancillary equipment that will improve current screen performance allows FLSmidth to offer quality screen media solutions to meet specific application requirements," he adds.

Vibro™ wire was originally developed in the 1980s and over time this screening product has further evolved in conjunction with customer input to ensure optimum performance.

Vibro Optimax™ wire was developed in conjunction with Scaw Metals over an 18-month period and has a higher tensile strength than standard screen wires with better wear characteristics. It is suited to screening in hard rock applications such as aggregates, iron ore and manganese, and allows for a reduction in wire thickness which translates into an increase in the open area of the screen. This improves the screen's efficiency while maintaining the original life of the screen.

"Significantly, when selecting Vibro Optimax™ there is the option to reduce the wire diameter resulting in a reduction in mass on the screen and therefore the cost whilst increasing open area," Calver says. "Choosing this route does not impinge on the efficacy of the process and, in fact, actually increases throughput while still increasing the lifespan because of the mechanical property of the wire. Going for a lighter screen means less installed mass as well as increased ease of handling and correct installation with a direct positive impact on operator safety during the process," he says.

Wire screens facilitate optimum versatility as they can be manufactured with different aperture sizes and with different wire sizes at a relatively low cost. Calver does caution, however, that the accurate manufacture of wire screens is a challenge for the industry as, while many companies can manufacture screens, not all can manufacture the apertures correctly and according to required specifications.

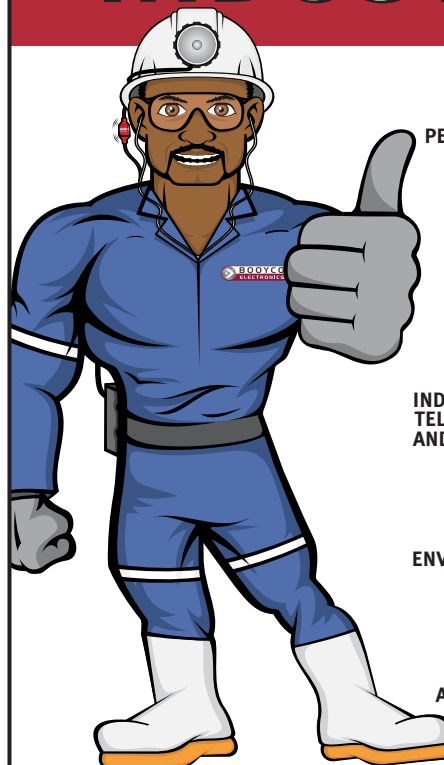
"It is essential that the correct aperture wire ratio is selected as it is this that will assist with the pegging and blinding issues commonly experienced," he adds.

"It is important that end users obtain input from a reputable supplier who is able to assess the requisite screening duties and apply the technology appropriately to ensure an optimum end result. We have references where the correct installation of Vibro Optimax™ has seen the life span of screens double," says Calver.

Terence Osborn, FLSmidth, tel (+27 10) 210-4820



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Modular, low maintenance chairlift systems from Becker



Becker Mining South Africa's chairlift systems are designed to transport up to 900 personnel per hour.

Becker Mining South Africa says its chairlift systems are designed to transport up to 900 personnel per hour, quickly, efficiently and safely in all underground applications, including difficult mining conditions.

"Becker's modular, low maintenance chairlift systems, which encompass the latest technology and manufacturing trends, meet stringent quality and safety regulations in the mining sector," says Anthony

Labuschagne, Product Manager, Becker Mining South Africa. "These chairlifts, with a simple, yet robust structure, are installed in underground sites with steep inclines up to 45 deg and long haulages up to 2 000 m, at drive speeds between 1,5 m/s and 3 m/s."

Safety features include a rope slip sensor and a fail-safe brake system, which is spring activated and hydraulically released on the drive wheel brake path. Secondary and primary brakes are capable of holding the entire out of balance load. Other critical safety devices are the passenger override sensor and an intelligent pull key system.

Streamlined drive units, with geometric precision for maximum use of balance and design strength, are available in three sizes: 22 kW-37 kW; 45 kW-75 kW; and 90 kW-132 kW. Drive units are equipped with a variable speed drive (VSD) or a soft start.

The return wheel unit is supplied with polyamide inserts for quick release of the rope spin. The tensioning arrangement of this system is via gravity or hydraulics. Friction rope grips are recommended for

gradients less than 13 deg and fixed rope grips are suitable for installations where gradients are greater than 13 deg.

These chairlift underground transport systems can be supplied with dependable diesel driven generator sets to ensure the absolute safety of miners in the event of a power outage.

Becker Mining South Africa has received orders recently for the design and installation of three chairlift systems for local mines.

The company completed the installation of Leg two of the Aquarius Bambanani mine in May this year and is currently busy with the installation of the third chairlift system for Aquarius' K6 Decline project. This project is due for completion by November 2015. Leg four will commence early in 2016.

Becker Mining South Africa is responsible for erecting the chairlift drive house, mechanical and electrical installations and all civils work.

Anthony Labuschagne, Becker Mining South Africa, tel (+27 11) 617-6320

Tracking device introduced for 'yellow' plant

GPS Tracking Solutions, a company in the Eqstra Holdings Group, has introduced a new tracking device specifically designed for 'yellow' plant in the mining and construction industries.

The unit tracks operational hours on the equipment which allows managers to accurately depreciate the asset over time. In addition, the unit regulates usage for correct billing and assists users to manage a contract by a load-counter and geo-fencing, supplying an accurate report on tonnage of rock shifted per day.

The unit features a breakdown management programme to reduce downtime on unexpected breakdowns. In the event of a breakdown, an alert button sends a message to the control centre allowing for rapid response time. A specially designed mobile app also enables the control centre to log all breakdowns and send repair schedules to a technician's mobile phone for increased efficiency and improved downtime management. In addition, accurate reporting of usage enables managers to schedule maintenance timeously.

The GPS units have been installed in more than 1 000 machines across both the Contract Mining and Plant Leasing & Rental divisions.

"The GPS device plays a vital function in driver management with respect to speed, braking and work zone identification. Safety is the number one priority throughout all our operations and being able to monitor operators ensures that all road and safety regulations are complied with," explains Justin Colling, CEO, MCC Contract Mining and Eqstra Plant Leasing & Rental.

Dwayne Porter, Eqstra, tel (+27 11) 458-7555, e-mail: dporter@eqstrafleet.co.za



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Angled support pedestal unveiled at Beltcon

A new angled support pedestal for Cooper split bearings was unveiled at the recent Beltcon 18 conference by Bearings International, a leading Southern African distributor of bearings and power transmission products.

The launch of this new product at Beltcon 18 marks the latest collaboration between Cooper and Bearings International.

Cooper's Vice President of Sales, Tom Black, explains that the new product represents the latest refinement of the initial development of the pedestal in the 1960s. "The new version saves a considerable amount of time and manpower due to the fact that it slides directly under the shaft at an angle, which does not need to be raised with a hoist or a jack."

Available previously as a bespoke solution, Cooper is now rolling out the angled pedestal across its standard range of SN and SD equivalent pedestal housings. Coupled with Cooper split bearings, customers and end users now have a total solution to reduce their maintenance

requirements and subsequent downtime.

"With a split bearing, all of the components are essentially split, including the pedestal. The angled pedestal from Cooper facilitates quick insertion of the pedestal underneath the shaft. What Cooper has developed is a pedestal that, instead of being horizontal with the base, is angled to allow it to slide easily in under the shaft," says Matthew Tyler, Cooper Product Manager, Bearings International.

Tyler adds that the new product was well received at Beltcon 18, attracting attention from major consultancies involved in designing materials handling systems for the mining industry. "All the major project houses who design conveyor systems took the time to come and see us," he says.

With the mining industry under pressure to cut costs due to falling commodity prices, the focus is now on sweating existing assets and increasing the productivity of current operations. Reducing maintenance requirements is therefore a key focus

for major component suppliers such as Bearings International.

"Some of the conveyor systems deployed to transport ore in the mining industry, both overland and underground, can be up to 20 km long. If these systems come to a standstill due to bearing failure, for example, it has tremendous implications on the bottom line," Tyler stresses.

Cooper split bearings are split to the shaft, which means that all necessary components can be changed-out in as short a period as possible. Combined with the new angled pedestal, proactive maintenance is now simpler than ever, requiring only minimal equipment such as Allen keys and a few basic tools.

Matthew Tyler, Bearings International, tel (+27 11) 899-0000

Cooper is rolling out an angled pedestal across its standard range of SN and SD equivalent pedestal housings.



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Belt cleaners designed for punishing conditions

According to Martin Engineering, its SHD (Super Heavy Duty) family of primary conveyor belt cleaners has been engineered for the world's fastest, most heavily loaded belts, with industrial-strength construction that delivers effective cleaning, minimal maintenance and long service life, even under punishing conditions.

Martin® SHD cleaners have been proven



The SHD Series was developed for super heavy-duty applications, with structural steel components to prevent bending of the main frame.

on belts up to 305 cm wide – with speeds as high as 10 m/s – carrying loads up to 300 000 tons per day. Designed with patented 'CARP' technology to achieve constant angle geometry to match pulley diameter accurately across all stages of service life, the massive urethane blades deliver up to 271 cm² of wear surface – more than seven times the wearable surface of standard cleaner designs.

The SHD Series was developed for super heavy-duty applications, with structural steel components to prevent bending of the main frame. The extremely durable construction helps eliminate carryback, reduces emergency outages and minimises unscheduled downtime. In some applications, it has been shown to be the only design that can withstand the severe operating conditions.

The SHD 1200 Series cleaner is built for high-speed conveyors with a head pulley larger than 122 cm in diameter and belt

widths from 107-305 cm. With blades up to 30,5 cm tall, a heavy structural steel frame prevents bending, even with high tonnages and large lumps.

Like its larger cousin, the SHD 600 Series cleaner is installed in the primary position, but is designed for pulleys smaller than 120 cm.

"The SHD Series was originally designed for a severe-duty mining application, built to handle the overburden at one of the largest pit mines in the world," says Martin Product Engineer Daniel Marshall. "Every cleaner they tried was getting destroyed by the harsh conditions. There just wasn't anything on the market that could withstand the speed and abrasive forces, so we completely re-engineered the conventional belt cleaner design, from the I-beam frame to the huge blade segments. In fact, these cleaners are so large that we had to invent a way to properly tension them," he says.

Martin Engineering, tel (+27 13) 656-5135

Quick Fit panels simplify wear lining installation

Experience and knowledge accumulated on a large number of diverse applications has positioned Multotec Wear Linings as a reputable provider in the wear solutions sector. Leveraging its extensive knowledge base and drawing on the individual skills and expertise of its technical team, the company has developed a range of products that decrease the operational costs for its customers.

The Multotec Quick Fit panel is one of Multotec Wear Linings' flagship products and comprises ceramic tiles embedded in polyurethane. Aimed at simplifying wear lining installation, the panels are attached by means of threaded studs that are simply stud welded to the chute. This method of attachment allows for rapid change out

when future liner replacement is required, a critical element when productivity is at stake.

"There is little surface preparation necessary as the panel requires no epoxy and therefore no curing time. This means the panels are equally quick and easy to remove, which also assists in reducing downtime," says Mike Dexter, MD of Multotec Wear Linings.

"We have standardised on three panel sizes – 300 mm x 150 mm, 300 mm x 300 mm and 600 mm x 300 mm. This standardisation of components translates into reduced stockholding and faster turnaround times," says Dexter.

Although the first installation of the panel requires the same time normally allocated to other panels, once a replacement is needed the installation time is dramatically

shortened because of the innovative quick fit process.

"This new approach to ceramic wear lining installation not only significantly shortens the maintenance time required, thereby increasing productivity and releasing maintenance staff for other tasks, but it still offers the well-known properties of high alumina ceramics," Dexter explains.

Multotec Quick Fit panels can be installed in existing chutes and in new chutes. A major benefit of these panels is that they can be supplied with the company's Green Dot tiles which include an integrated wear indicator. This allows for precise determination of the current wear level of the tiles which expedites timeous replacement and the associated reduction in both downtime and safety risk levels.

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

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