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- Liqhobong to start up in Q4 2016
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Cover

The new 224-tonne Cat 6020B hydraulic shovel – which offers a 22-tonne payload – has been introduced to the Southern African market by Barloworld Equipment. See page 18 for further details.



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Robert Friedland receives mining's ultimate accolade

I've been surprised at how little publicity Robert Friedland's recent induction into the Canadian Mining Hall of Fame – arguably mining's ultimate accolade – has received locally. While he is a Canadian (in fact he was born in Chicago and has dual US and Canadian citizenship), all his current activities in the mining field are focused on Africa – specifically South Africa and the DRC – and his company Ivanhoe Mines is one of the few operating in our region that is actually implementing mining projects. Indeed, it's probably not an exaggeration to say that the mining scene would look a lot bleaker if it were not for Ivanhoe's activities.

In South Africa, Ivanhoe's incredible Platreef project near Mokopane is pretty much the only platinum project currently on the go, if one ignores Bakubung (which was planned and went into execution in happier times) and Maseve, which is now virtually commissioned. The Platreef project is still in its early phases but there is a major shaft actually being sunk – which is a rare event these days. Similarly, in Katanga in the DRC there's not a great deal going on at the moment in mining, with the exception of Ivanhoe's Kamoanga underground copper project, on which early works have started, and the company's ongoing refurbishment of the historic Kipushi copper-zinc mine.

For those not familiar with it, the Canadian Mining Hall of Fame recognises individuals who have demonstrated outstanding lifetime achievements to the benefit of the Canadian and/or global mining industry. It was the brainchild of the late Maurice (Mort) Brown, a former editor and publisher of Canada's premier mining publication, *The Northern Miner*, and was established in 1988. Friedland was one of five industry leaders inducted at a formal ceremony held in January this year in Toronto which was attended by roughly 800 guests.

The citation from the Canadian Mining Hall of Fame makes for interesting reading, with Friedland being described as “a dynamic, transformative force in the Canadian and international industries for more than 25 years” and as “one of the most recognised mining personalities and achievers on the world stage”. It also notes his many other awards including Canada's Developer of the Year (1996) and Mining Person of the Year (2006); Australia's Dealmaker of the Year (2011); and Hong Kong's Inaugural Mining Personality of the Year (2012).

Recounting his career, the citation notes that he graduated with a political science degree

from Reed College, Oregon in 1974 but was soon drawn into the mining scene. “Flashlight inspection of an abandoned drift at the inactive Warner gold mine, on Oregon timberland acquired in an investment partnership with college pal (and Apple co-founder) Steve Jobs, provided the first glint of Friedland's mining destiny in 1978. He found only fool's gold (pyrite), but it sparked innate curiosity, and lifelong intrigue, about understanding earth's mineral riches,” says the citation.

Mentored by Victor Hollister, a distinguished Canadian geologist and mine-finder, Friedland entered Vancouver's “frenetic, junior mining scene” in 1980 and his achievements since then are now the stuff of mining legend. Among other things, he played key roles in the discovery of the Fort Knox gold deposit in Alaska (which subsequently became a mine and today ranks as Alaska's largest gold producer), the Voisey's Bay nickel deposit in Canada, and the phenomenal Oyu Tolgoi copper-gold-silver deposit in Mongolia.

I should mention, by the way, that his induction into the Canadian Mining Hall of Fame is not the only recognition that Friedland has received recently. *Mining Journal* in London named him in December 2015 as the fourth most influential person in the world of mining (with the others in the top five being Chinese President Xi Jinping, US President Barack Obama, Randgold's Mark Bristow and Sprott's Rick Rule). “No other person packs out a room like Friedland and so it can be accurately said that mining professionals actually queue up to listen to his views,” says *Mining Journal*.

Certainly, anyone who has seen Friedland speaking at the Mining Indaba in Cape Town will know that he packs the auditorium and that his presentations are bravura performances which are eagerly awaited each year.

Friedland's achievements are obviously much appreciated by his colleagues within Ivanhoe, with the company's CEO, Lars-Eric Johannson, saying recently that Ivanhoe is privileged to have his guiding leadership and experience as it enters a new year that is already presenting formidable challenges for the global mining industry.

“Our ability to attract the necessary international investment in our key projects requires an experienced, respected leadership with a can-do spirit that consistently delivers on its commitments. It's part of what we know to be The Ivanhoe Way,” said Johannson.

Arthur Tassell



“Flashlight inspection of an abandoned drift at the inactive Warner gold mine, on Oregon timberland acquired in an investment partnership with college pal (and Apple co-founder) Steve Jobs, provided the first glint of Friedland's mining destiny in 1978.”



The camp serving the Bisie project in the DRC's North Kivu Province (photo: Alphamin).

Feasibility Study supports underground tin mine at Bisie

Alphamin Resources Corp, listed on the TSX-V, has reported on the results of the Feasibility Study for its 84,55 %-owned Bisie tin project in North Kivu Province in the east central DRC. The study supports a technically simple underground mining operation with recovery of tin via gravity separation methods that offers low unit capital and operating costs, rapid payback and strong financial performance at metal prices of US\$14 800/t tin (Sn).

“The Bisie project is an ideal foundation on which to build a mining company, and act as a catalyst for the economic development of North Kivu. It is straightforward, financeable, resilient, and has tremendous opportunity to grow. We are delighted to have reached such an important milestone, and feel strongly that our development approach is ideally suited to the attributes of the orebody,” comments Boris Kamstra, Alphamin’s CEO.

“The Bisie project stands out in the world of tin development projects. With very high tin grades, excellent metallurgical recoveries, very low levels of deleterious materials in concentrate, an approved mining licence, modest capital requirements and low operating costs, our projected margins are healthy,” he continues. “In addition, the project has been designed

to provide flexibility to scale up and take advantage of the potential to deliver additional tin metal from the known areas of mineralisation, as demonstrated by our exploration team’s efforts at Mpama North. The foundations for a profitable tin producer are in place today with a proven management team to lead us forward.”

The proposed Bisie project implementation plan is over a period of 18 months, with underground ore development and

stopping commencing 12 months before first production of tin in concentrate, which is anticipated in Q4 2018. The project requires an estimated initial capital expenditure of US\$119,3 million to support the construction of an access road, underground mine, process plant, tailings dam and associated facilities with a process capacity of 360 kt/a. The mine is estimated to produce on average 9 000 tonnes of tin contained in concentrate per



Alphamin is in the process of clearing a route from the mine site to the closest road which is about 35 km away. Seen here is a completed bridge on the route. To maximise the impact on the local economy, Alphamin is constructing the road by hand. Once the road is complete, it will allow light vehicle access to the site and facilitate construction of the final access road (photo: Alphamin).

year over a 10,5 year mine life, with all-in operating costs of US\$8 450/t Sn.

It is anticipated that the project would employ approximately 700 people during construction, and create approximately 450 permanent local jobs during operations along with significant economic benefits in an area of the DRC that has seen little foreign investment.

MDM Engineering led the Bisie Feasibility Study, which included input from leading consultants such as Bara Consulting, Epoch and The MSA Group.

The Mpama North orebody will be mined by contractors using proven underground mechanised mining methods to deliver ore to the process plant at a rate of 30 kt/month. Mineral reserves (converting only indicated mineral resources) of 3,04 Mt at a grade of 3,76 % Sn using a cut-off grade of 1,8 % Sn have been estimated by Bara.

A comprehensive programme of metallurgical testing was executed to support the Feasibility Study. Test work included

mineralogical work, heavy liquid and dense media separation, spiral and jigging test work, thickening and filtration test work, as well as pilot scale process plant test work. A total of 19 variability samples were tested to verify the results of the pilot testing campaign.

Overall metallurgical recovery of 79 % was achieved under laboratory conditions. Factoring in operating conditions and operator skill levels, an overall recovery of 72 % has been applied in the evaluation of the project economics.

The process plant design is based on recovery of tin into concentrate through conventional gravity separation methods. Mined ore will be crushed to 100 % passing 10 mm. The coarse material (-10 mm to +1 mm) accounts for 75 % of the mass flow and the tin contained in this size fraction will be recovered in conventional jigs. The fine material (-1 mm) makes up the balance of the material and the tin contained in this stream will be recovered using spirals. The concentrates from both the jigs and spirals

will be milled and subjected to flotation to remove sulphide material.

It is envisaged that after thickening and filtering, the tin-rich concentrate (>60 % Sn) will be trucked to Goma using rough terrain vehicles. In Goma the concentrate will be transferred to standard triaxle truck and transported to Dar es Salaam for shipping to Malaysia.

The Feasibility Study confirms that the project is scalable. Whilst the Feasibility Study is based on the Mpama North orebody, Alphamin says its exploration success in proving up this world class orebody demonstrates the potential to add additional tin-bearing material from Mpama South and potential extensions to the mineralisation at depth at Mpama North to extend the life of mine or provide incremental feed for the process plant.

Alphamin believes there are opportunities to further improve the economics of the project through continued engineering, capital cost reductions, and potential process plant engineering initiatives. ■

Avnel Gold Mining provides update on Kalana

TSX-listed Avnel Gold Mining has announced metallurgical test programme results completed as part of a Definitive Feasibility Study (DFS) for the Kalana Main open-pit project in south-western Mali. The company has also provided details of the processing plant design parameters for the DFS, which remains on track to be completed shortly.

During 2015, detailed mineral processing and metallurgical test work programmes were conducted at SGS Booyens in Johannesburg under the management of DRA Projects. The results of this programme confirmed a high gravity recovery component for all material types achieving bench scale gravity recoveries in the ranges of 19 to 88 % for saprolite, 62 to 92 % for saprock, and 57 to 96 % for fresh rock material.

The optimal leach feed grind size has been determined to be 80 % passing 75 microns. Average cyanide and lime consumption rates were between 0,7 to 0,8 kg/t of material and 0,4 to 1,2 kg/t, respectively.

The processing plant design is based upon annual throughput rates of 1,5 Mt/a for saprolite and 1,2 Mt/a for saprock and fresh rock material. The plant design is

simplistic and consists of a conventional two-stage crushing circuit and a single-stage milling circuit to achieve a target grind size of 80 % passing 75 microns. The milling circuit design consists of a single 5,33 m diameter by 8,08 m effective grinding length ball mill rated at 4,5 MW.

Gold is to be extracted by gravity concentration and a carbon-in-leach (CIL) plant to produce a gold doré via elution, electrowinning, and smelting. The CIL circuit is designed for a 24-hour residence time when treating fresh ore at 1,2 Mt/a and this reduces to 18 hours when treating saprolite at the higher throughput rate of 1,5 Mt/a.

The design philosophy incorporates a requirement that the processing plant be constructed in a manner that would expedite the construction of the leaching and adsorption circuit with the intention of processing historic tailings prior to the hot commissioning of the mill. These tailings consist of 0,04 million ounces of indicated mineral resource (0,7 Mt at a grade of 1,75 g/t Au) and are intended to be recovered by hydraulic mining and pumped to the plant for processing through the CIL circuit over a five-month period. This represents an opportunity to generate

pre-commercial production cash flow that could potentially partially offset development capital requirements.

"I am pleased to report that the results from DFS test work programmes conducted in 2015 continue to demonstrate excellent recovery rates for all material types and that the expected average recovery for saprolite material has increased to more than 95 %. The increase in recovery for saprolite is expected to contribute to higher gold production at lower mining and processing costs in the initial years of the DFS's mine plan as saprolite will be the dominant ore type," states Howard Miller, Avnel's Chairman and CEO.

"Mine engineering is nearing completion and it has been determined that a mining rate of 1,5 Mt/a in saprolite and 1,2 Mt/a in saprock and fresh rock is reasonable, which has allowed us to finalise the design criteria for a simple conventional gravity plus CIL processing plant. As a result, we remain confident that the DFS will be completed by the end of first quarter of 2016. The pit design and mineral reserves will be based upon a gold price of US\$1 000 per ounce to reflect the current gold price environment. The impact of a higher gold price of US\$1 300 per ounce pit design will also be evaluated and reported as part of the DFS." ■

Yaoure confirmed as a “compelling” gold project

AIM-listed Amara Mining reports that its NI 43-101 compliant optimised Pre-Feasibility Study (PFS) for its 100 %-owned Yaoure gold project in Côte d’Ivoire confirms that it is “a compelling gold development project in the current capital constrained market environment.”

Based on the updated mineral reserve estimate announced on 25 January 2016 and a smaller 4,5 Mt/a plant, the optimised Pre-Feasibility Study successfully delivers an increased head grade, reduced upfront capital cost and robust economics

at a conservative gold price.

The post-tax internal rate of return (IRR) is estimated at 38 % and the project has a post-tax net present value (NPV) of US\$555 million based on a discount rate of 8 % and a gold price of US\$1 200 per ounce. The project remains strong at a gold price of US\$1 000 per ounce with a post-tax IRR of 25 % and a post-tax NPV of US\$281 million.

Yaoure would have an average annual production of 248 000 ounces in years 1-5 and average annual production of 203 000

ounces over a 15-year life of mine (LOM) from a single open pit containing 3,2 million ounces. The average head grade processed would be 1,62 g/t based upon the mineral reserve estimate announced in January this year.

The upfront capital cost is estimated at US\$334 million, including a US\$44 million contingency and US\$60 million for an owner-operated mining fleet. The pay-back period is put at 2,1 years with mining throughout this period focused on the higher grade, continuous CMA zone where 72 % of Yaoure’s proven mineral reserves are located.

John McGloin, Chairman and Chief Executive Officer of Amara, commented: “I am delighted to be able to deliver materially improved economics for our Yaoure gold project, including a 100 % increase in the project’s IRR at a US\$1 200 per ounce gold price. The optimised PFS has achieved both of our key objectives for Yaoure: to significantly increase the average head grade going to the processing plant and to significantly decrease the upfront capital cost. As a result of the higher grade, Yaoure’s strong production profile is maintained despite using a smaller processing plant, with average production of 248 000 ounces in years 1-5 of the mine’s life. The reduced capital cost is also better tailored to the current capital constrained market environment.

“Yaoure’s other metrics have also improved substantially, cementing Yaoure’s position as one of the few gold development projects that achieves an IRR of 25 % at a US\$1 000 per ounce gold price. Due to the excellent existing infrastructure of Côte d’Ivoire, it benefits from exceptionally low operating costs and we expect Yaoure to be one of the lowest cost, largest new gold mines in Africa. We are completing work to confirm that 4,5 Mt/a is the optimal processing plant size in light of the significant reduction in the cost estimates we received during the optimisation work and I expect the results to further highlight the exceptional economics and versatility of the Yaoure gold project.”

Amara has recently announced plans to merge with ASX- and TSX-listed Perseus Mining, which owns the Edikan gold mine in Ghana and the Sissingué gold project in Cote d’Ivoire. ■



The Yaoure project site. Yaoure was mined by CMA (which established a heap leach operation) between 1999 and 2003 and by Amara between 2008 and 2011 (photo: Amara Mining).

Tschudi achieves nameplate production

In its interim results for the period from 1 July 2015 to 31 December 2015, AIM-listed Weatherly International reports that its Tschudi copper project near Tsumeb in northern Namibia achieved nameplate production rates of 17 000 tonnes per annum during December 2015, with production for that month of 1 420 tonnes of copper cathode.

Weatherly exceeded its increased Tschudi production guidance of 10 400 tonnes of copper cathode by 2 % to reach 10 659 tonnes produced in CY2015.

In December, the company announced a JORC (2012) reserve and processing update for Tschudi. Ore reserves are now 24,4 Mt at 0,85 % copper for 214 000 tonnes of contained copper metal after mining depletion of 8 000 tonnes. Pit optimisation work has decreased the strip ratio by 13 % from 7,5:1 (waste: ore) to 6,5:1

while life of mine C1 costs are expected to be reduced. In addition, Weatherly has identified an opportunity to increase processing capacity from 17 000 to 20 000 tonnes per annum.

Craig Thomas, CEO of Weatherly, commented: “Despite difficult market conditions, this period has been one of significant progress for Weatherly and I am pleased with the achievements the company has made since July 2015.

“Operations at the Tschudi mine have exceeded the company’s guidance and the first full quarter of commercial production, achieved at the end of last year, was a major milestone. In addition to this production success, Weatherly has also produced a resource, reserve and processing update that increases ore reserves, reduces life of mine C1 costs and identifies expansion opportunities.” ■

True Gold to combine with Endeavour Mining

True Gold Mining Inc, listed on the TSX-V, has entered into a definitive arrangement agreement with TSX-listed Endeavour Mining Corporation in terms of which Endeavour will acquire all of the issued and outstanding common shares of True Gold in an all-share transaction to be completed by way of a statutory plan of arrangement. True Gold's principal asset is the Karma mine in Burkina Faso, a low cost, heap leach gold mine nearing production.

True Gold says the transaction allows it to reach its strategic objective of becoming an intermediate gold producer. The Karma gold mine will become a cornerstone asset within Endeavour's existing portfolio of four operating mines along with its fully permitted and construction ready Houndé project. The combined company will also benefit from having one of the largest and most prospective exploration land packages in West Africa, along with Endeavour's operating and executive team's significant in-country and regional experience.

In a recent update on the Karma project, True Gold said construction was approximately 94 % complete with commissioning being the major activity on site. Over 500 000 tonnes of stockpiled ore will provide the initial feed to the fully commissioned soft rock crusher, agglomeration and stacking circuit.

"With construction nearing completion and commissioning underway, our team is now focusing on ramping up to commercial production," stated Christian Milau, President and CEO of True Gold. "Our mining team has been in full operation for the past four months, starting with pre-stripping waste and now stockpiling ore. Our processing team has successfully commissioned the ore crushing to stacking circuit, and we are in the final stretch of process plant completion in preparation for plant commissioning. It's incredibly exciting to be on the eve of a major company milestone."

Ore has been introduced into the crushing and agglomerating circuits, and

agglomerated ore is being stacked on the leach pad.

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

Phase I of the grade control drilling programme for the Goulagou II pit has been successfully completed and the results are consistent with the anticipated tonnage and grade for the volume drilled. ■



A Komatsu PC3000 loads a Komatsu 785 haul truck at Karma's Goulagou II pit (photo: True Gold).

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Acacia's gold production up for third year in a row



The Bulyanhulu gold mine. Acacia has fundamentally re-engineered the operation at Bulyanhulu over the past two years and delivered a 40% production increase in that time (photo: Acacia).

Reporting on its results for the 12 months ended 31 December 2015, LSE-listed Acacia – which operates the Bulyanhulu, North Mara and Buzwagi mines in Tanzania – says that gold production for the reporting period was 731 912 ounces, 2% higher than 2014, with gold sales of 721 203 ounces. The all-in sustaining cost (AISC) was US\$1 112 per ounce, in line with 2014, and the cash cost US\$772 per ounce. Revenue was US\$868 million, 7% lower than 2014, due to the 8% lower average gold price.

“I am pleased with the progress we have made across the business over the past 12 months as we continued to transform Acacia into a leading company in Africa, although the speed of the turnaround is slower than I had hoped to achieve,” says Brad Gordon, Acacia’s CEO. “While we did not realise our primary aim of generating free cash flow in 2015 as a result of the challenges we faced, primarily in the third quarter, we did see an increase in production over 2014. This production was, however, lower than planned, which had a knock-on effect on costs.”

Gordon says that gold production in 2015 was up for the third consecutive year but was marginally below the initial guidance range for the year. “Production increased by 5% at North Mara to

287 188 ounces driven by the contribution of the newly commissioned Gokona Underground and by 17% at Bulyanhulu to 273 552 ounces as we saw a full year of operations of the re-claimed tailings project,” Gordon states. “At Buzwagi, production fell by 19% as a result of operations being focused on low grade areas in the open pit.”

Looking ahead, Gordon notes that Acacia has fundamentally re-engineered the operation at Bulyanhulu over the past two years and delivered a 40% production increase in that time.

“We have made significant progress in the mechanisation of the mine, increasing workforce productivities and improving underground operating metrics,” he says. “Our focus is on free cash flow and accordingly we have reviewed reserves based on the lower gold price assumption and a more detailed mine design approach.”

“Following this review, and our experience in 2015, it was determined that within the Upper East Zone, which was expected to ramp up significantly in 2016, further definition drilling on the Reef 2 series is required in order to better define the geological complexity and as a result have deferred the planned increase in mining rates. As a result, we expect production in 2016 to be broadly in line with 2015 and

with our focus on cost reduction measures we expect AISC to fall by more than 15% year on year.

“We are still confident that Bulyanhulu will produce 350 000 ounces per annum over the medium term and are assessing the potential above this production rate through an ongoing three-year drilling programme, primarily on the Reef 2 series.”

“North Mara is expected to continue to perform strongly as the Gokona Underground is fully ramped up and a second access portal is developed to provide additional flexibility,” Gordon continues. “As a result of the increased proportion of mill feed being sourced from the underground, we expect to see a 5% increase in production, with a similar reduction in AISC in 2016 over 2015.”

“At Buzwagi, we expect the mine to generate solid cash flows over 2016, with production expected to be 10% higher than 2015 with AISC down by approximately 15%. As a result of delays in waste movement in 2015, there will be a focus on waste stripping in Q1 2016 to reduce the backlog. This will result in the deferral of some of the high grade material previously planned to be mined in the year into Q1 2017 and will mean that approximately 35% of the mill feed in the first quarter will come from lower grade stockpiles.” ■

People on the move at SRK

SRK Consulting (SA) has announced a number of new appointments within the firm, including a new Chairman, board member and heads of business units.

Taking on the chairmanship from January 2016 is partner and principal engineer Graham Howell, filling the role formerly played by Roger Dixon – who retired at the end of last year but remains at SRK as corporate consultant.

With 40 years of experience in his field, Howell is a structural and geotechnical engineer focused mainly on soil-rock-structure interaction. He first joined SRK in 1985 and has worked in the Johannesburg and Cape Town offices, while working closely with colleagues all over Africa, Australia, the UK and North America. He also has the honour of having been elected a Fellow of the South African Academy of Engineering.

Taking over Dixon's roles on the board and as head of SRK's mining business unit are William Joughin and Marcin Wertz, respectively.

A partner and principal mining geotechnical engineer at SRK, Joughin joined SRK in 1998 from a career in South Africa's largest gold mining companies, and specialises in underground rock engineering investigation and design.

Wertz, principal mining engineer at SRK, has over 25 years of experience in his field and has been with the company since 1996. His focus areas have included reviewing mining methods, underground layouts and production scheduling for underground hard rock mines, and conducting reserve audits. He has also coordinated and managed mining engineering studies from scoping through to full feasibility study level to bankable standards involving multi-disciplinary teams.

The environmental geotechnical (Engeo) unit also has a new head in Adriaan Meintjes, a principal geotechnical engineer at SRK, who assumes this role from Graham Howell. Meintjes joined the company in 1992 as an expert in soil and rock engineering, and also specialises in tailings and slimes projects in various parts of the world. ■



Graham Howell, Chairman, SRK Consulting SA.

BBE Consulting opens Canadian office

BBE Consulting, the internationally recognised world leader in mine ventilation and bulk air conditioning founded in 1989, is now expanding its global footprint to Canada.

BBE works alongside mining clients in all sectors to find project-specific solutions by offering an integrated approach to ventilation, bulk air conditioning, refrigeration and chilled water reticulation from conceptual ventilation and heat load analysis through to detail engineering and procurement management.

The Canadian office, located in Sudbury Ontario, will be supported by over 100 engineers from established BBE offices in South Africa and Australia. BBE Canada will be headed by Dr Stephen Hardcastle, previously senior scientist with Natural Resources Canada and head of CanmetMINING's Mine Ventilation Research.

Hardcastle has over 30 years of mining experience and has worked with the majority of Canadian mining companies over the last three decades focusing on making mines more energy efficient while maintaining or improving health and safety for mine workers. ■

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Northam's Booyensdal North mine on the Eastern Limb of the Bushveld Complex. The mine has completed its production ramp up and the capital footprint is fully developed (photo: Northam Platinum).

Shallow, mechanised operations are the future for Northam

In a foreword to Northam Platinum's results for the six months ended 31 December 2015, Chief Executive Paul Dunne provides a review of the period and Northam's progress against its strategic objectives.

"The first half of the 2016 financial year has been challenging for the entire platinum sector," says Dunne. "Prices of PGMs have, along with other commodity prices, moved lower, placing enormous stress on the industry and its stakeholders. Northam has not been immune from these effects. However, by sticking to our conservative overall strategy, we believe the company is well positioned to face the future, to develop further and, in the shorter term, to work through the present trough in metals prices.

"Our strategy is based on sound operating performances focused on safety and on containing the costs of producing each PGM ounce. Our future focus is

and will remain on developing shallow, mechanised operations. We will continue to exploit the Zondereinde mine, helped by a change in the mix of Merensky and UG2 ore, and our growth ounces will be shallow and mechanised. This was the fundamental consideration in our acquisition of the Everest property and, crucially, of its processing plant located adjacent to our developing Booyensdal South project. The plant will process Booyensdal South's ore and its acquisition contributes to the efficiency of the total capital spend on the mine. The fact is that we have a resource of 100 Moz at Booyensdal that offers superior risk-to-reward ratio."

Dunne notes in his foreword that as the half year under review progressed, Northam steadily ramped up production at the Booyensdal North property, reaching the planned full production run rate at the end of the period.

"The next stage will be the start of the development of Booyensdal South, utilising the established infrastructure as a base," he says. "This approach will result in a capital efficient project while positioning the company to benefit from an upturn in the PGM market. Booyensdal South is at the feasibility study stage, which is expected to be completed by the end of our financial year in June. This project will contribute to the group's advancement down the cost curve, an essential element in our strategy for the long-term sustainability of the business."

According to Dunne, operational performance during the period under review was good. "Zondereinde has adjusted well to a higher UG2 mining ratio which has resulted in a reduction in unit cash costs. Booyensdal North mine has completed its production ramp up and the capital footprint is fully developed." ■

RHA transitions to underground mining

Premier African Minerals Limited (Premier), whose shares are traded on AIM and which holds a 49% interest in the RHA tungsten mine (RHA) in north-west Zimbabwe, says that an internal study prepared by RHA with input provided by Whaleside Shaft Sinkers Zimbabwe supports its board's decision to investigate and accelerate underground development at RHA.

RHA and Whaleside, the appointed mining contractor at RHA, are in the process of implementing the necessary works to allow underground mining operations, at present limited to the 926 'adit' access level, to be extended to the 870 and 856 lower levels.

RHA's implementation plan is based on targeting the processing of approximately 32 000 tonnes of run of mine ore at an average grade of 6,20 kg/t (based on the historic non-compliant resource) to produce 249 tonnes of concentrate at 63% WO₃ (tungsten trioxide) over a six-month period from February 2016.

In addition, Premier says that during this period it will consider test work on open-pit ore and possible implementation of XRT-based ore

upgrading. Underground development will continue to allow extraction from the compliant resource situated below the open-pit operations in the future.

The capital cost for the underground operations is estimated at US\$406 000.

Mining on the 926 level began in November 2015 and will continue until the installation and commissioning of production infrastructure on the 870 level is completed.

George Roach, Premier's CEO, commented: "RHA was always planned, in the longer term, to be an underground mine. Unforeseen developments during the initial open-pit operations led the company to accelerate the move to underground mining. This change in strategy has resulted in the need to finance company overheads for an extended period without recourse to cash flow generated from the open pit and finance substantial additional debt generated by RHA." ■

Tanzanian miner appoints Chief Operating Officer

LSE-listed Acacia, which owns and operates three gold mines in Tanzania, has announced the appointment of Mark Morcombe as Chief Operating Officer (COO). He is a professional Mining Engineer with more than 20 years of gold industry experience, primarily in the underground mining environment, and has operated across the African continent for a number of years.

Before joining Acacia, Morcombe was Senior Vice President for AngloGold Ashanti at the Obuasi gold mine in Ghana, a position he held from September 2012. Prior to this he was Senior Vice President, Planning and Business Development for AngloGold Ashanti's Continental Africa Region, supporting mines in Mali, Namibia, Tanzania, the DRC, Guinea and Ghana. He has previously held various roles in Africa with Gold Fields, having started his career in Australia. ■

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A blast at the New Liberty Gold Mine in Liberia. The mine has recently achieved Commercial Production (photo: Aureus Mining).

Commercial Production declared at New Liberty

Aureus Mining Inc, listed on AIM and the TSX, has announced that Commercial Production has been declared at the New Liberty Gold Mine (NLGM) in Liberia, effective 1 March 2016.

Aureus says the process plant is now (early March) operating in line with both design specifications and management expectations. Over the past 60 days of operations, the process plant has achieved an average of 88 % of design throughput capacity. During February 2016, plant throughput totalled 90 099 tonnes of ore milled, resulting in the recovery of over 9 000 ounces of gold, with operating recovery levels of 90 %

achieved by the end of February.

The value of the gold produced prior to Commercial Production being declared will be deducted from the capitalised construction costs of New Liberty, rather than recorded as revenue.

The New Liberty process plant has now processed 503 286 tonnes of ROM fresh ore and lower grade oxide material. Gold production achieved for the calendar year is currently over 14 000 ounces.

To date, there have been 25 shipments of gold doré from New Liberty for smelting and refining at the MKS PAMP refinery in Switzerland, resulting in sales of approximately 31 500 ounces of gold.

Mining operations at New Liberty continue to progress, with run of mine (ROM) stockpiles currently standing at 70 844 tonnes of fresh ore at a grade of 2,59 g/t and oxide and transitional stockpiles standing at 81 881 tonnes at a grade of 1,32 g/t.

Aureus is continuing to work towards finalising an updated mine plan for the project, and MonuRent, the New Liberty mining fleet provider, has purchased and shipped to Liberia five new 100-tonne capacity Komatsu HD785 rigid haul trucks and one PC1250 excavator. The new fleet of equipment is scheduled to be delivered to New Liberty and mobilised ready for operations during April 2016. ■

Lerala diamond mine valued at A\$105 million

ASX-listed Kimberley Diamonds reports that it has received the first independent valuation of its 100 %-owned Lerala diamond mine in Botswana. The valuation was prepared by global mineral resource consultancy Venmyn Deloitte, which has valued the asset at A\$105 million. This valuation is an increase of 24 % over KDL's previously announced in-house valuation of A\$85 million.

Venmyn Deloitte made the following key findings:

- The diamond resources and ore reserves for Lerala (announced on 11 January 2016) were assessed as reasonable,

based on the information available and assumptions used, and provide a suitable basis for a mineral asset valuation.

- The preferred mineral asset valuation for Lerala is A\$105,0 million, within a valuation range of A\$55,86 million to A\$128,73 million.
- The planned Life of Mine (LOM) was extended from seven years to nine years.

Venmyn noted that the process plant is one of the greatest areas of risk in relation to the success of the project but stated that theoretical performance of the modifications being undertaken appear to address previous production and recovery issues.

The increased valuation is driven largely by the upgrade to the Lerala mineral resource and ore reserve that was announced by KDL on 11 January 2016, along with decreased costs negotiated within the mining contract signed with Basil Read Botswana, a weaker Australian dollar assumed over the life of the project and Venmyn Deloitte's decision to place a value on inferred resources that currently fall outside the LOM plan.

Subject to finalisation of funding, Lerala – which is being upgraded and expanded after having been on care and maintenance – is scheduled to commence production in April 2016, with the first diamond sale planned for June 2016 (see also page 39). ■

Mawson West to stop operations at Kapulo

Mawson West, listed on the TSX (but based in Perth, Australia), has decided to place its small Kapulo copper mine in northern Katanga in the DRC on care and maintenance. The company is planning to cease mining at the end of March, with milling operations continuing into April. Kapulo is a relatively new mine, with commissioning having only started in late 2014.

The company says it has made this decision due to continued weakness in the price of copper, which has resulted in unprofitable and unsustainable mining operations at the mine.

"At current prices, the company is producing at levels insufficient to cover its operational and financial obligations, and is also depleting Kapulo's short mine life (four years) to generate little to no free cash flow," comments Anthony Lloyd, Acting CEO of Mawson West. "The company has determined that the best course of action is to place the mine on care and maintenance in order to preserve the asset until such time

as the price of copper recovers sufficiently to permit profitable mining. Our majority shareholder and secured creditors are in agreement with this course of action and have agreed to arrangements which will permit this to occur.

"While the financing is quite dilutive and will, if approved by minority shareholders, likely result in the com-

pulsory acquisition of their interests, the company requires financing in any event and the alternative would more than likely be insolvency proceedings which would be of uncertain outcome for minority shareholders." ■



The processing plant at Kapulo in the DRC. Mawson West has decided to place the mine on care and maintenance as a result of the low copper price (photo: Mawson West).

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The Tantalite Valley mine in southern Namibia, which has seen some limited production in the past (photo: Kennedy Ventures).

Tantalite Valley mine enters production

AIM-listed Kennedy Ventures, which is presently focused on tantalite production through its 75 % holding in African Tantalum (Aftan), reported recently that first delivery of high-grade concentrate to the offtake partner from Aftan's Tantalite Valley mine in Southern Namibia was expected by the end of February. The mine is located near Warmbad in the Karas district.

Blasting faces have been fully prepared and blasting is now taking place at all four main adits of the Homestead

deposit, generating substantial volumes of underground high grade ore. Blasting commenced later than anticipated due to an unexpected delay in receiving the necessary explosives licences.

Plant tonnages continue to ramp up to the planned 10 500 tonnes per month, with increasingly improved performance and delivery of high grade concentrate. Throughput will be stabilised at 46 tonnes per hour at an average expected ore feed grade of 400 ppm.

Demand from the offtake partner remains high with further negotiations taking place to establish a structure to assist utilising near-term cash flow to finance new investments in the sector.

Comments Peter Hibberd, CEO of Kennedy Ventures: "The company's investment in Aftan continues to represent the launch pad for Kennedy Ventures to take advantage of further investment opportunities in the sector. After a slight delay, Aftan is now positioned to deliver substantially improved performance from both mine and plant." ■

Infill drilling extends Syama's mineralised 'footprint'

ASX-listed Rolute Mining has reported results for the recently completed infill diamond drilling programme undertaken at the Syama gold mine in Mali.

The programme commenced in October 2015 and comprised 18 holes designed to confirm and enhance the confidence of the mineral reserve in the upper levels of the proposed Syama underground development. Assay results have been returned for the first 15 holes with the remaining results expected during the current quarter.

The drilling results extend the mineralised footprint and provide confidence that the Syama underground reserve estimate can be enhanced. The programme was designed to provide drilling data in

gaps between previous holes and to target a shadow area directly beneath the completed open pit.

This area was historically sparsely drilled due to the difficulty of targeting shallow angled holes beneath the open pit with surface drilling. An electric powered underground diamond drill rig was used to improve the targeting and orientation of drilling within the limited space along the open pit haulage ramp. Drilling focused on a 250 m section of the broader, high grade, northern area within the extensive mineralised strike of the Syama orebody.

Commenting on the assay results, Rolute's MD and CEO, John Welborn, said the recent and current drilling pro-

grammes confirmed that Syama was a world class orebody that would continue to grow.

"The Syama Underground PFS published in June 2015 demonstrated Rolute has the opportunity to develop a long life robust underground operation at Syama. Our current ore reserve is a wide rich orebody with limits that are yet to be defined. We know that the ore we mined at the bottom of the open pit graded in excess of 3,2 g/t. Today's results confirm that we can expect the early years of the underground operation to produce ore of a similar grade profile. The infill drilling programme and the deep resource extension drilling programme are part of a commitment to enhance the economics of the Syama Underground Project." ■

Harmony Gold strengthens its executive management team

Harmony Gold Mining has announced the appointment of Beyers Nel as Chief Operating Officer of the South African operations and Phillip Tobias in the new position of Chief Operating Officer of Special Projects and Development (which includes safety, mining projects and company strategy) with effect from 1 March 2016.

Both Nel and Tobias have been Regional General Managers at Harmony – responsible for certain mining operations – since 1 July 2014.

Nel holds a BEng (Mining Engineering), has an MBA and is a registered professional engineer (Pr Eng). He has 15 years' experience in gold mining – 13 years at Harmony – gained on a variety of opencast, deep and ultra-deep gold mines in both supervisory and management positions. He is also currently the Vice President of the Association of Mine Managers of South Africa.

Tobias holds a BSc (Mining Engineering), has completed the Wits International Executive Development Programme and GIBS Advanced Management Programme, is a registered professional engineer (Pr Eng) and holds a Mine Manager's Certificate of Competence. He has more than 20 years' experience in the mining industry, acquired at a number of gold and platinum mines. He was appointed the first black President of the Association of Mine Managers of South Africa in 2008.

"Both Beyers and Phillip have a wealth of mining experience, are tenacious, energetic and have proven themselves as successful mining engineers. They will join the executive team and report to me directly. I have no doubt that we will see excellent results from them both," said Peter Steenkamp, Harmony's CEO. ■

DRA to acquire Canadian consulting company

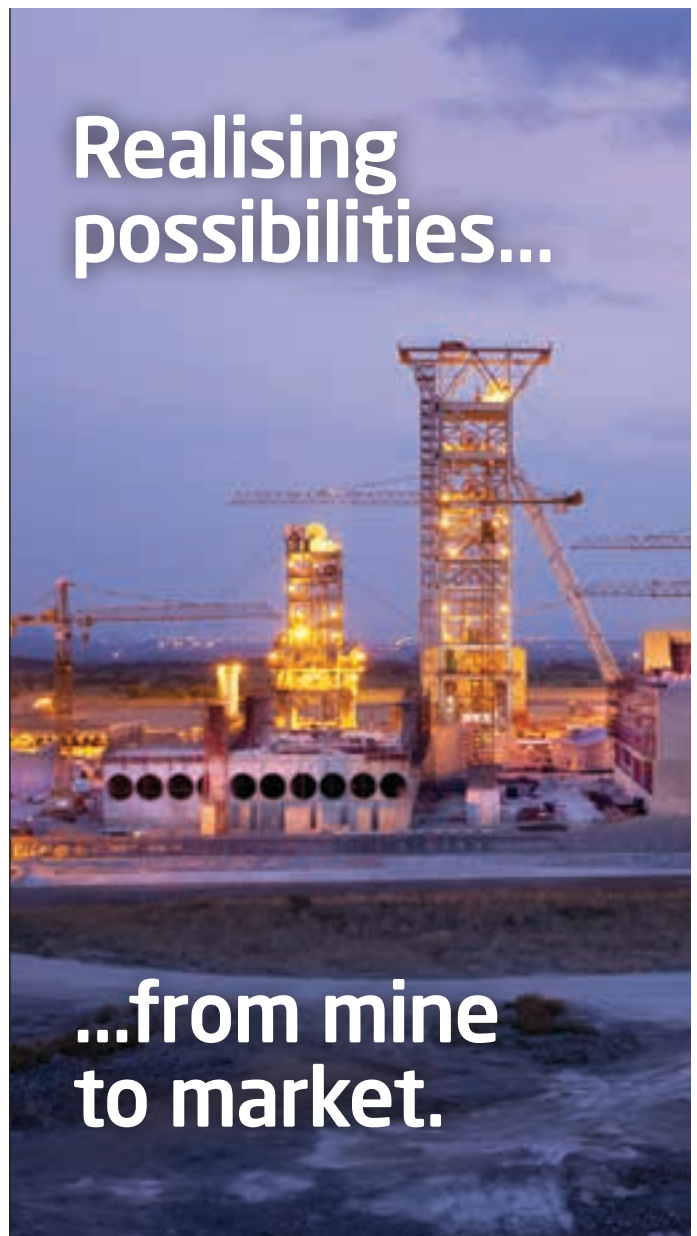
Engineering Group DRA International (DRA) is to acquire Met-Chem Canada Inc (Met-Chem) from UEC Technologies LLC, which is part of United States Steel Corporation.

Met-Chem is a consulting engineering company, headquartered in Montreal, Quebec, which provides services including resource estimation, mine design and planning, and mineral processing to the metals and minerals industry worldwide.

Established over 40 years ago, Met-Chem is well-respected with mining clients in Europe, Africa, China, India, and North and South America. In addition to its mining expertise, it has developed a good track record in industrial minerals in recent years.

DRA will retain Met-Chem's office in French-speaking Montreal, Canada, from which it will continue to service clients in Quebec, Eastern Canada, North and West Africa, as well as globally.

DRA, which originated in South Africa, established an office in Canada in 2005 and acquired Taggart Global in 2014. "DRA continues to expand its business in the Americas, and the acquisition of Met-Chem is a logical next step for our growth in this region," said Wray Carvelas, Chief Executive Officer of DRA Americas. "This acquisition allows us to offer enhanced services to our existing mining and mineral clients and we look forward to servicing new clients, in the Americas and other regions such as French-speaking Africa, with our expanded capabilities." ■



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Yaramoko heads for second quarter commissioning

Reporting on its Yaramoko gold project in Burkina Faso, Canada's Roxgold Inc says that approximately US\$64 million of the US\$110,8 million capital estimate has been spent to date and the project remains on budget. The overall construction programme is approximately 75 % complete and on schedule and project commissioning remains on target for Q2 2016.

"We are very pleased with the progress on the project in recent months," comments Roxgold's President and CEO, John Dorward. "With a number of important infrastructure works now complete, the team is focusing on underground development and the start of commissioning activities."

During the month of December 2015, the underground mine access infrastructure was completed with the Armtec tunnel installed and the boxcut backfilled.

Underground development has

advanced well, with the underground contractor, African Underground Mining Services (AUMS), delivering several months of above plan development rates. Total development meterage stood at 1 237 m as at the end of January against a planned level of 972 m. The ramp had advanced 610 m from the portal and level development was advancing on four levels, namely the 5270, 5253, 5236 and 5219 levels.

Since the last update, the deposit has been cross-cut at the above mentioned four levels, exposing the 55 Zone vein. Roxgold says it is encouraged by what has been observed here with the orebody and thickness consistent with that of the block model. Initial chip sampling of the crosscuts indicates that ore grades are also consistent with expectations.

The vent raise contractor, Bauer Drilling, is on site and has completed the pilings for the first vent raise. Initial site works

for the raise boring contractor, Murray & Roberts, are well advanced. All equipment associated with the final installation of the ventilation fans is on site.

Construction of the surface mine infrastructure, including workshops, offices and back-up power station, remain on schedule. The surface settling ponds are complete and the recycling of underground water has commenced.

Construction of the processing plant by the lump sum EPC contractor, the DRA/Group Five Joint Venture, is approximately 80 % complete.

Since the last update, key mechanical packages such as the thickener, kiln, screens, cyclone pack, agitators, carbon transfer pumps, reagent mixing and crusher plant have been received on site and installed.

The Carbon-in-Leach (CIL) tanks had been erected to their full height by the end of January with top of tank steel also in place. ■

First gold poured at Buckreef project in Tanzania

Tanzanian Royalty Exploration Corporation, listed on the TSX and NYSE, reports that its 55 %-owned Buckreef redevelopment gold project has successfully completed its first gold pour.

The company notes that the timing and amount of the pour of gold was not a decision of management but was done in response to a request made by the Deputy Minister of Energy and Minerals of Tanzania. "As a show of reasonable willingness to cooperate on this non-contract item, we did what we preferred not to do – pour prematurely to proper market price," says

Tanzanian Royalty. "It is the opinion of management that in time the gold price will rise to at least US\$800 higher than it was at the time of the pour."

The pilot CIC process plant is in the process of being de-commissioned and assimilated into a more flexible CIL process plant designed with an initial throughput of 45 000 tonnes of mineralised material per month.

The company is in the process of completing a Feasibility Study (FS) with a view to targeting full-scale commercial gold production in the second half of this year. ■



Celebrating the first gold pour at the Buckreef redevelopment gold project (photo: Tanzanian Royalty).

Pangolin updates on Malatswae

Pangolin Diamonds Corp, listed on the TSX-V, has provided an update on its Malatswae diamond project, located 105 km south-east of the Karowe diamond mine of Lucara in Botswana.

The most recent results are from the MTS grid where pyrope garnets with near-source features were previously reported. Following on these initial results, an additional 78 soil samples from the MTS grid have been confirmed to contain kimberlite indicator minerals.

Pyrope garnet has been visually-confirmed in 62 of the 78 grid samples and ranges from 0,4-1,0 mm in maximum dimension. Pyrope garnets with near-source surface features are present in 55 of the 62 samples, with 12 of those samples having four or more garnets with near-source features.

"These latest results continue to build upon previous data for the MTS grid that suggest that undiscovered kimberlites are present within the MTS grid area," comments Pangolin's President and Chief Executive Officer, Dr Leon Daniels. ■

Kombat Copper signs agreement with EBM Mining

Kombat Copper Inc, which is listed on the TSX-V and owns the Kombat copper mine in northern Namibia, has signed a definitive agreement with EBM Mining Namibia to carry out development and mining of lead/copper mineralisation at Kombat while also commencing the refurbishment of the mine infrastructure and production facilities. Production is expected to commence within the year.

EBM will begin operations in the Kombat East and Kombat Central areas of the Kombat mine for a three-year term. Kombat Copper's core areas of Kombat West, Asis West and Asis Far West are excluded. EBM will also focus on the lead-enriched Gross Otavi deposit located 12 km to the west of Kombat.

EBM has committed to making an investment to refurbish certain necessary components and infrastructure, which will benefit Kombat Copper in the future. Kombat Copper will have the right to acquire all the installed components and infrastructure at the end of the three-year contract for a nominal N\$1 and does not have to invest any capital up front.

Profits will be split equally between Kombat Copper and EBM. Kombat Copper has agreed to reimburse up to 50 % of EBM's capital investment from 50 % of its profit share. EBM will pay

operating costs directly. To maintain control, Kombat Copper will collect the proceeds from the sale of materials and then pay EBM its contracting fee.

EBM will source local skilled and non-skilled labour and will utilise local suppliers and contractors, whenever possible, from the Kombat region. In its role as contractor, EBM will be managing the hiring process to support operations.

Paul Bozoki, President and CEO of Kombat Copper, commented: "We are

extremely pleased to have finalised this landmark agreement with EBM Mining Namibia. Kombat will now be able to realise its goal of restarting operations at the Kombat mine with an experienced and respected contractor. This relationship is expected to not only support the company with a steady stream of cash, but it is also a great win for the local economy as we anticipate an increase in trade with our local merchants in the town and surrounding areas." ■

Positive PEA on Tulu Kapi gold project

AIM-listed KEFI Minerals, which is developing the Tulu Kapi gold project in western Ethiopia, reports positive results from its Preliminary Economic Assessment (PEA) of the underground mining potential underneath the planned open pit.

KEFI anticipates starting development of the underground mine after Tulu Kapi has begun generating positive cash flows from the open-pit mine and repaying its development finance, with a view to introducing underground production around the third year of the open-pit operation.

The PEA indicates that the total production of Tulu Kapi (combining the open-pit mine and underground mine) could approximate 150 000 oz/a. This production capacity would result in aggregate net operating cash flow of around US\$100 million per annum with KEFI's share of the estimated project NPV being US\$150 million, assuming a gold price of US\$1 250/oz and an 8 % discount rate. ■

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New Cat 6020B hydraulic shovel offers simplicity, safety and reliability

Four global pilot studies, combined with around five years of engineering design, have yielded an exceptional Cat hydraulic shovel in the 22-tonne payload class: a clean sheet design that delivers. Landing in Africa for the first time in January 2016 following its worldwide release in late 2015, the new Cat 6020B hydraulic mining shovel is positioned to become the next class leader in a very competitive market niche.

Replacing the Cat 6018, the Cat 6020B slots into what Caterpillar refers to as its Versatility class, joining the Cat 6015B/6015 FS units. For clarity, there are three Caterpillar shovel classes. The other two comprise the Ultra Class (the Cat 6090 FS); and the Productivity Class (Cat 6030/6030 FS – 6060/6060 FS models). The last two digits equate approximately to the shovel's payload

capability, e.g. 30 tonnes for the Cat 6030. (FS, where configured, stands for 'Face Shovel'.)

The 'B' designation on the machine's nomenclature is significant and marks a new wave of Caterpillar research and development (R&D). All future new hydraulic models designed and built by Caterpillar will have a 'B' in their model number. This has a historical significance and traces back to Caterpillar's acquisition of Bucyrus, a leading US original equipment manufacturer, in July 2011.

"With the Bucyrus deal, Caterpillar acquired a host of additional product lines, including hydraulic shovels. At the time, these shovels were either branded as Bucyrus or Terex (forming part of Terex Mining). Since then, new machines leaving the factory have subsequently been rebranded as Cat. And ongoing R&D has converted each model to a 100 % Cat product," explains Wouter Kraan,



Above: The Cat 6020B in a typical application. The swing system includes a triple-race swing roller bearing with internal gearing connected to an automatic lubrication system.

Top right: The Cat 6020B's large windshield and side windows optimise safe machine positioning and truck loading.

Centre right: The compact power module houses the engine, the engine radiator, the hydraulic oil cooling unit and the pumps.

Right: The Cat 6020B's automatic track tensioning system is a simplified design that requires no manual adjustment.

senior product manager: Cat mining shovels at Barloworld Equipment. Research on the Cat 6020B started before the Bucyrus acquisition, with Caterpillar then taking over the programme. (Barloworld Equipment is the Cat dealer for Southern Africa.)

Prior to every new Cat model introduction, a specified number of validation hours – recorded through rigorous in-field testing – is required before a machine can be signed-off as ready for manufacture. The past few years have been spent refining the Cat 6020B. Four pilot units were deployed as part of Caterpillar's R&D initiative: three at global mine sites in Suriname (gold), Finland (phosphate), and Canada (iron ore, Arctic Circle) respectively, and the fourth at Caterpillar's proving grounds at Tinaja Hills



in Tucson, Arizona. The end result is a machine that is geared towards achieving lowest cost per tonne production in its class in direct response to global customer requirements.

"The simplicity of the Cat 6020B's design is what makes it so remarkable," adds Kraan. "It's not complicated. It's not over-engineered, and it's not difficult to assemble, operate or maintain."

Key features that set the Cat 6020B apart

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In the first phase of production, the Cat 6020B, with its 224-tonne operating weight, will be supplied only in backhoe configuration, with power delivered via a Tier II Cat C32 ACERT™ diesel engine performing at a full rated power (SAE J1349) of 778 kW at 1 800 rpm.

From a maintenance perspective, the Cat 6020B's exchangeable power module brings a new level of flexibility to the industry, with easy headroom walk through access to all engine and hydraulic components. (The machine also has a centralised service area that is accessible from ground level.)

This container-type module, which has multiple entry and exit doors, can be quickly removed and replaced with a spare unit to increase machine uptime. This option will prove attractive to large fleet owners, particularly in remote areas, during periods of intensive production, where scheduled maintenance can continue without impeding availability.

The standard 12 m³ bucket has a 22-tonne payload, making the Cat 6020B an optimal four to five pass match for haulers that include the Cat 777 off-highway truck. The latter has an approximately 96,9-tonne payload and is one of the industry's most popular mining trucks. This shovel is also capable of being paired with 136-tonne payload Cat 785 trucks, where it is a five to six pass match.

Fast cycle times are achieved thanks to the 6020B's hydraulic system, which includes six main pumps with an open-loop swing circuit. This system interacts well with the machine's newly designed advanced hydraulics. Utilising Caterpillar's patent-pending dedicated pump-flow allocation technology, hydraulic pumps are allocated to individual circuits on demand, allowing all produced oil flow to be translated into cylinder motion. This optimises hydraulic efficiencies and reduces heat generation. Machines come standard with high pressure and return oil filtration. (A separate kidney loop provides continuous filtration and optimum oil cleanliness at all times, supporting the hydraulic system.)



In operation, the Cat 6020B also leads from operator comfort and safety standpoints. During training, the Cat 6020B's proprietary three-seat design ensures unobstructed visibility of the digging environment for the instructor, observer and trainee. A distinctive feature is a mezzanine grated floor window below the operator's feet that enables a clear view below. As a backhoe unit, this minimises the chance of the bucket colliding with the tracks during excavation operations.

The machine's ease of operation is due in part to the Cat 6020B's advanced electronic control system. The system enhances control response and optimises hydraulic engine load management to help operators be as productive as possible.

Exclusive to Cat hydraulic mining shovels, the CAMP (Control and Monitoring Platform) provides a streamlined system that only requires two controllers for all functions on the 6020B, namely drive train and servo. The result is reduced control system inventory. The CAMP system also improves fuel efficiency as it ensures that both engine and hydraulic pumps work in the optimal range of performance during the entire digging cycle.

"Over the past three years, we've experienced strong growth in demand for Cat hydraulic mining shovels across our Southern African dealer territory, which includes models such as the Cat 6090 FS, Cat 6060 FS and Cat 6030," adds Kraan.

"The introduction of the Cat 6020B now fills an important niche in our comprehensive market offering for quarrying and mining customers. The machine meets the most stringent safety standards in a robust design package that will deliver decades of service in Africa's demanding operating conditions." ■

More efficient hydraulic pump utilisation, reduced energy losses and increased fuel savings are achieved with Caterpillar's dedicated pump-flow allocation technology.

Fast cycle times are achieved thanks to the 6020B's hydraulic system, which includes six main pumps with an open-loop swing circuit.

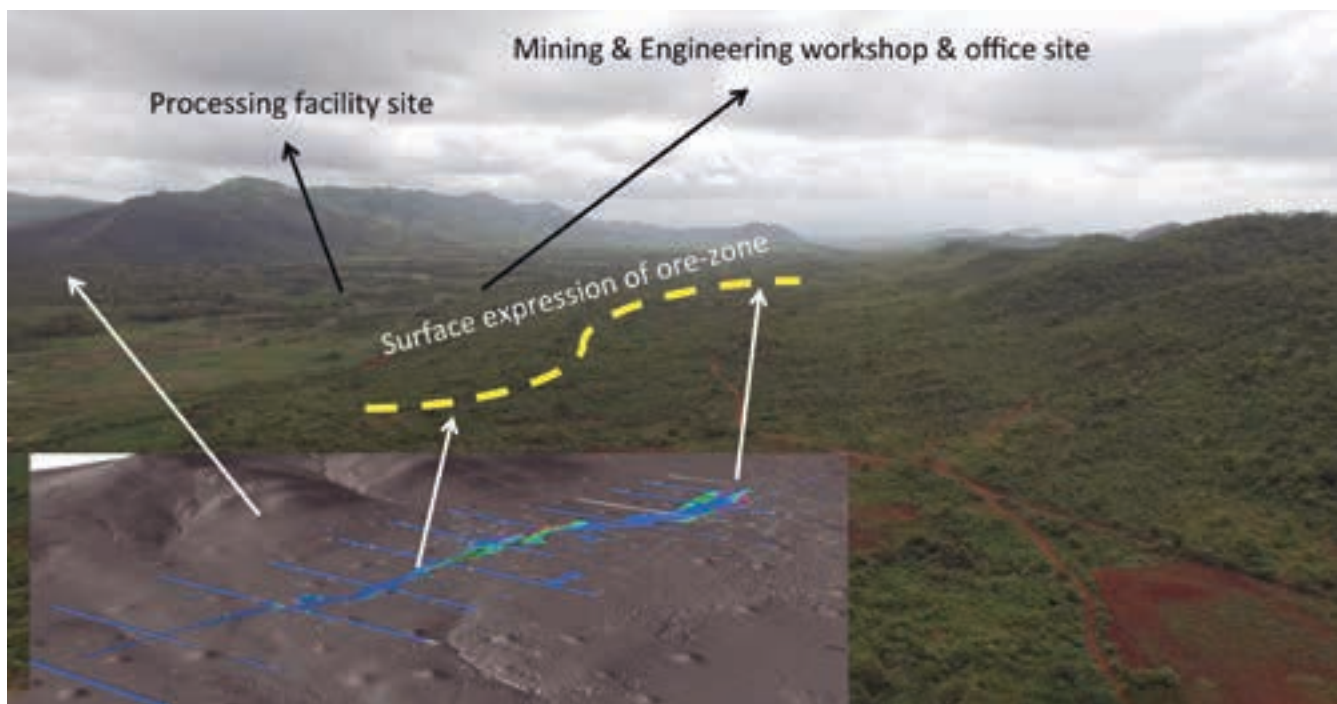
Xtract improves the metrics of the Manica gold project

Xtract Resources, whose shares are quoted on London's AIM, has completed an in-house update on the economic metrics of the Manica gold project in Mozambique, as part of the Definitive Feasibility study (DFS) that is currently being undertaken by independent consultants. The update generally improves on the previous metrics, with total gold production increasing significantly and the project NPV (discounted at 10 %) increasing from US\$50 million to US\$70 million.

The project is located just several kilometres north of the town of Manica, approximately 270 km west-northwest of the city of Beira and close to the border with Zimbabwe. Geologically, it is situated on the eastern limb of the Zimbabwe Craton and lies on the OMM (Odzi-Mutare-Manica) greenstone belt.

Xtract announced last year that it was acquiring the project from ASX-listed Auroch Minerals and the transaction has now been concluded following the approval of the deal by the Mozambican mining authorities earlier this year. This was the last of the regulatory approvals required to complete the transaction.

Aerial view of Manica open pit area.



Explaining the background to the update, Xtract says that in June 2015 it reported on certain economic metrics for the Manica project, which had been completed by Auroch Minerals as part of the Preliminary Economic Assessment report (PEA). Following the development work it has undertaken since this time and based on its own in-house estimates, Xtract has now revised its expectations of the project (although it stresses that its figures have not been verified by independent consultants and have a high probability of changing as the DFS is completed).

The project's NPV has now increased from the US\$50 million projected in the PEA to US\$70 million while the IRR decreases to 50 % from the PEA figure of 58 % assuming a gold price of US\$1 250. The Life of Mine (LOM) increases to 12 years from eight years. Annual LOM production is estimated at 6,3 Mt at a head grade of 2,93 g/t recovering 477 koz, compared to the PEA figures of 3,4 Mt at a head grade of 3,49 g/t recovering 316 koz. Expected recoveries are 96 % for oxide ore, 82 % for transitional ore and 80 % for sulphide ore.

The start-up capital cost is estimated at US\$35 million compared to the PEA capital

estimate of US\$28,4 million for open pit and plant. Additional capital of US\$14 million, from cash flow, will be expended in years three and four of the Manica project as part of underground access development compared to US\$8,7 million capital for underground development planned in the PEA. This allows for eight years of underground mining versus the three years contemplated by the PEA.

The estimated cash cost is US\$549/oz compared to a cash cost in the PEA of US\$650/oz while the project delivers EBITDA of US\$245 million (assuming a LOM of 12 years) compared to the PEA EBITDA of US\$130 million (assuming a LOM of eight years).

“The economic metrics of the Manica gold project remain robust and the company’s in house estimates of EBITDA have significantly increased relative to the increased capital requirement compared to the PEA,” comments Jan Nelson, Xtract’s CEO. “The Manica project remains at the low end of the cost scale and we are now focusing on completing the DFS and starting mine construction.

“We are completing a new resource calculation for the Manica project and expect to provide an update to the market as soon as possible. We will also report on the alluvial mining plan for the project within Q2 2016.”

The alluvial project referred to by Nelson was announced by Xtract in October last year. It said then it had entered into a joint venture agreement with Mineral Technologies International (MTI) which would see MTI mining alluvial gold on the Manica property, with the anticipated level of production being 32 000 oz/a of gold a year over a possible mine life of 10 years.

Although Xtract has only recently acquired the Manica project, it is well known to Nelson. A geologist by profession, he is a former CEO of

Pan African Resources which held the project for a number of years before selling it to Auroch in 2013.

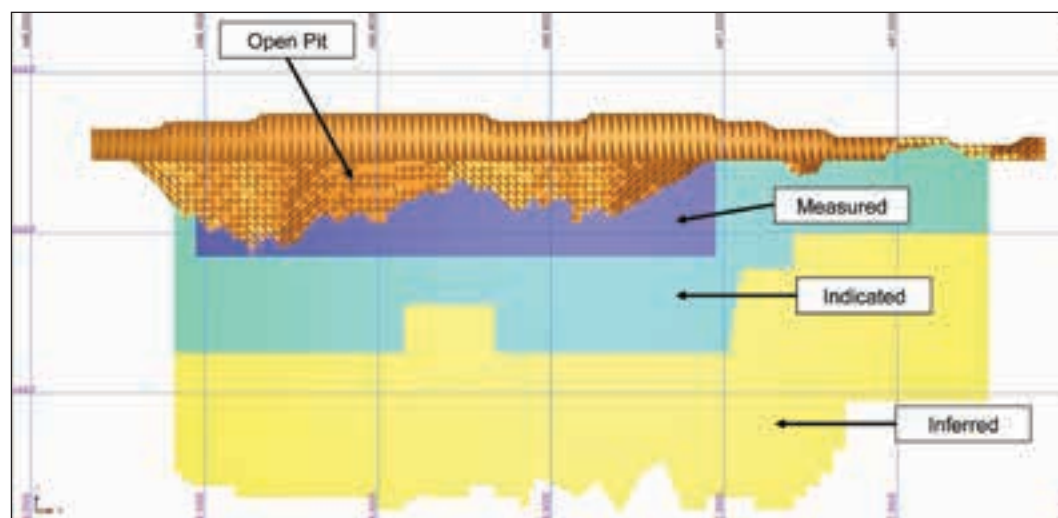
The Manica project can be divided into two stages. The first stage involves surface mining operations and is scheduled to commence in Q4 of 2017 with target production of 477 kt at a head grade of 2,62 g/t. This would recover approximately 32 koz of gold over a LOM of four years.

Underground Mining Operations (UMO) will be the second stage of mining and with target production of 555 kt at a head grade of 3,06 g/t would recover approximately 43 koz of gold per annum. The LOM of UMO is eight years but the orebody is still open to depth and it is anticipated that with further drilling from underground once mining starts the LOM could potentially be increased.

The DFS is still on schedule to be completed by the end of Q2 2016. Most of the technical studies will be complete by the end of Q1 2016 and the environmental studies are expected to be finished in the first half of Q2 of 2016. Completion of the re-settlement study is expected to occur by the end of Q2 2016; however, this process has been influenced by a recent change in legislation and will be subject to certain approvals being granted by a government committee, which may require additional time and, in a worst case scenario, could prolong completion of the DFS by three months.

Apart from the Manica project, Xtract owns the small Chépica gold and copper mine in Chile. In recent months it has also been evaluating the economic potential of the O’Kiep and Carolusberg copper tailings dams in the Northern Cape but said in February this year that recoveries were too low to produce a viable copper concentrate and that it would not be pursuing the project. ■

“The Manica project remains at the low end of the cost scale and we are now focusing on completing the DFS and starting mine construction.”



Mine plan. The open pit operation will extend over the first four years of the project with underground mining following for a further eight years.



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Joint venture to target DRC's underground mining market

Underground mining and shaft-sinking specialist Murray & Roberts Cementation and EGMF, part the Forrest Group, have teamed up to form a new company – Cementation Mining Company – which will target underground mining projects in the DRC. **Modern Mining** spoke to Allan Widlake, Business Development Executive of Murray & Roberts Cementation, at this year's Mining Indaba to learn more about the new joint venture.



Allan Widlake, Business Development Executive, Murray & Roberts Cementation.

Murray & Roberts Cementation, of course, is one of the iconic names of the mining industry with a global reputation for its underground mining skills. It is based in Johannesburg but has sister companies in North and South America and Australia. The Forrest Group, for its part, is extremely well known in Central Africa. It is active in many sectors of the DRC's economy, from mining, infrastructure build and electrical contracting through to banking and agriculture.

Says Widlake: "This is an exciting development for Murray & Roberts Cementation. We are certainly not strangers to the DRC but generally in the past we've entered the country to work on specific projects and then exited on the conclusion of each contract. The new partnership with EGMF – which is essentially the civils, road-building and open-pit mining contracting arm of the Forrest Group – will give us a permanent presence in a country which we regard as one of the most important in Africa in terms of the potential it has for underground mining."

He adds that EGMF's deep knowledge of operating in the DRC – in terms of clients, the legal system, logistics and similar issues

– will be a major benefit to the joint venture. EGMF will also be responsible for most of the administration that the company will need, meaning that Murray & Roberts Cementation will generally only need to commit permanent personnel to the DRC on a project by project basis.

The history of EGMF (Enterprise Générale Malta Forrest) dates back to the early 1920s when company founder Malta Forrest arrived in Africa from New Zealand. He established a transport company in Kolwezi, and this was the beginning of the present Group which reportedly ranks as the DRC's leading private employer. It has offices not only in the DRC but also Belgium, Kenya and South Africa.

EGMF is based in Lubumbashi, the capital of Katanga Province, in the heart of the DRC Copperbelt and this will serve as the base for the new joint venture company. A big plus is that EGMF's Chief Operating Officer (COO) is Nick James, a South African mining engineer (he graduated from Wits) with a long and distinguished record in the Southern African mining industry. His previous positions have



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included being Mine Manager at Konkola copper mine on the Zambian Copperbelt and Business Leader at Modikwa platinum mine on the Eastern Limb of the Bushveld Complex in South Africa. He served as COO of Rand Uranium for three years and immediately prior to joining EGMF was COO of Metorex.

According to Widlake, James approached Murray & Roberts Cementation around 18 months ago with a proposal for a partnership. “We then carried out a due diligence – in which we were assisted by one of the big four auditing and accounting groups – to ensure that we would be teaming up with a group with similar values to our own,” he says. “Of course, the fact that Nick was known to many of us in Murray & Roberts Cementation – our company was a contractor at Konkola when he was Manager – gave us additional assurance that our values would be aligned.”

Detailing Murray & Roberts Cementation’s recent experience in the DRC, Widlake says the company has executed work at the Kamoto underground mine, part of the Kolwezi mining complex (where EGMF is responsible for the opencast mining of waste), and has also dewatered Ivanhoe’s Kipushi underground zinc/copper mine, located 30 km south-west of Lubumbashi. He adds that Murray & Roberts Cementation has a strong presence across the border in Kitwe on the Zambian Copperbelt, where one of its main clients is Mopani Copper Mining, part of the Glencore Group. Glencore is also active in the DRC through its subsidiary Katanga Mining, whose assets include many of the mines and treatment plants in Kolwezi.

The copper and cobalt mining industry in Katanga will obviously be an important market for Cementation Mining Company, with several mining companies having plans to develop underground operations. Ivanhoe, for example, is continuing with its rehabilitation of Kipushi and is also planning a large underground copper mine at Kamoia, west of Kolwezi. Beyond the Copperbelt there is also potential further north in the DRC – particularly in North Kivu and Orientale provinces – for underground gold and base metals operations.

Widlake says Cementation Mining Company will be able to offer clients a total turnkey package including underground mining contracting, underground capital development and all associated civil and

structural work. He also says that the new company could potentially provide a platform into other parts of Africa, particularly the Francophone countries.

The joint venture is already bidding on projects in the DRC. “Clearly the mining market globally is in a downturn but there are projects around and we believe that our efforts will soon meet with success. Looking further ahead, we are positioning ourselves for the eventual turnaround in resources, which should lead to a very buoyant mining sector in the DRC, which is – without question – one of Africa’s leading mining countries,” Widlake concludes. ■



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Liqhobong project on course

Firestone Diamonds (Firestone) is making excellent progress on the construction of its new Liqhobong kimberlite mine in the Maluti Mountains of Lesotho, with the project 65 % complete (as at the end of January) and on course to commission and start production in the last quarter of this year. The site has also enjoyed an unblemished safety record thus far with more than 2 million man hours having been worked by a labour force that numbers nearly 1 000 people without a single LTI having been recorded. **Modern Mining's** Arthur Tassell recently discussed the project with Firestone's CEO, Stuart Brown.



Stuart Brown, CEO of Firestone Diamonds.

Liqhobong is probably the only full-scale diamond mine under construction in Southern Africa, with most other diamond projects currently underway – for example, the Venetia Underground Project, the Lace underground mine in the Free State, the C-Cut at Cullinan or the small Lerala project in

Botswana – being more accurately categorised as ‘brownfield’ developments. Some might argue that Liqhobong has also seen some previous commercial mining but it is nevertheless probably fair to describe it as a ‘greenfield’ project as the previous small plant on site and virtually all re-

Primary crusher steelwork at the Liqhobong site in January this year.



feature

for fourth quarter 2016 start-up



lated infrastructure was removed prior to the current project entering construction.

“Everything at Liqhobong is new,” says Brown. “The plant we are building is a large custom-built facility with a 3,6 Mt/a capacity and incorporates brand new equipment – nothing has been refurbished. The orebody we will mine is also largely untouched. Previous mining at Liqhobong mainly targeted the 1,6 ha satellite pipe whereas we will be mining the much bigger main pipe, which is 8,6 ha at surface, and which has only been subjected to limited trial mining. The plan is to mine this by open-pit methods to a depth of 383 m over 15 years, in the process producing approximately 1 million carats a year.”

An interesting point is whether Liqhobong

will take over as the ‘flagship’ of Lesotho’s diamond mining industry, a title currently held by the Letšeng mine of Gem Diamonds. Says Brown: “Our carat production at 1 million a year will be around nine times that of Letšeng, in part reflecting our orebody’s much higher grade of 33 cpht compared to the less than 2 cpht of Letšeng. On the other hand, Letšeng has a record of producing – on a consistent basis – very large stones of extremely high value, resulting in the average price it gets per carat being over US\$2 000, which is phenomenal for a kimberlite mine. By contrast, the base case price in our revised feasibility is US\$107 per carat.”

He adds that this figure could well be an under-estimate. “The Liqhobong main pipe

The lined raw water dam provides 100 000 m³ of storage capacity. This photo is from September last year.

A very recent (February 2016) view of the site showing the scrubber and first screen in position.



feature



A recent view of the Residue Storage Facility (RSF). This has involved 103 000 m³ of cut and 1,5 million m³ of fill.

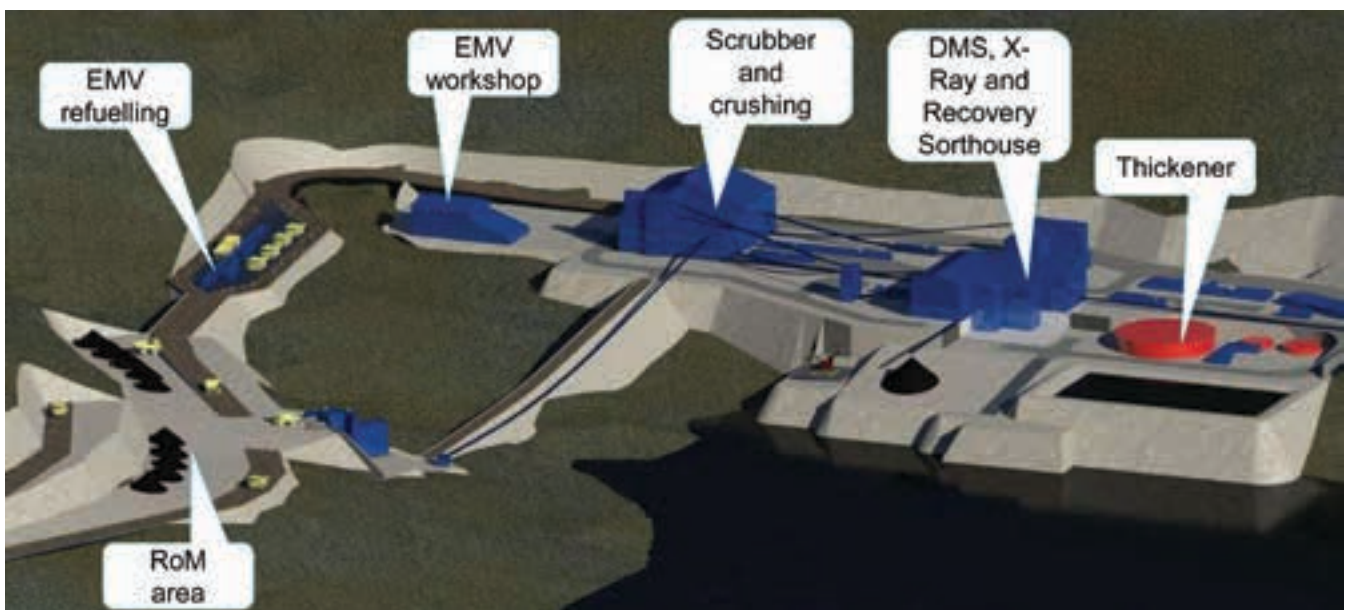
definitely has the ability to produce large stones. We believe that during previous processing campaigns at the site at least three large stones of plus 200 carats – one a plus 400-carat yellow diamond – were broken in the pilot plant, a conclusion based on the analysis of fragments,” he explains. “If the large stone potential is realised during operation of the mine, we calculate that the average carat price could be US\$156/carat.”

Describing the Main Treatment Plant or MTP, Brown says that it uses a conventional flowsheet comprising scrubbing, screening, crushing, concentration via DMS and final recovery using Flowsort X-ray machines. It will have 2 x 250 t/h processing streams. “We are deliberately not pioneering any new

technology,” he notes. “Everything is proven and we know it will work.”

To implement Liqhobong, Brown – who is ex-De Beers (he served as Group CFO for five years before being appointed Joint Acting CEO) – has assembled a highly experienced project team. It is headed by Glenn Black, who also has a background with De Beers (one of the projects he managed was Voorspoed in the Free State) and who has been involved in the project since February 2014. Firestone has also appointed contractors with good track records. The vastly experienced DRA is the EPCM contractor, Turnkey Civils Lesotho is responsible for the Residue Storage Facility (RSF), Stefanutti Stocks is undertaking the earthworks and civils, SMEI is the structural, mechanical,

The Liqhobong plant features a conventional flowsheet and will have a capacity of 500 t/h.





pipework and platework (SMPP) contractor and CUSA the electrical, control and instrumentation (EC&I) contractor.

“People sometimes ask me what are the keys to a successful project,” says Brown. “The answer is that you need to do your homework in terms of all your studies and planning, you need to put a good team together and then you – and all your contractors – need to work extremely hard. There are simply no short cuts – although I can’t deny that it does help to have a bit of luck! Certainly, at Liqhobong we’ve ticked off all the boxes. What most impresses me is the work ethic on site – our own people are highly committed and their enthusiasm has been matched by our contractors, who have all performed very well.”

While Liqhobong is currently on schedule, this is on the basis of a revised timeline which was announced in mid-2015. “Originally, we were planning to be producing by the end of the second quarter of this year,” notes Brown. “We were, however, delayed by the amount of overburden removal on the primary crusher and plant terraces being far greater than anticipated. The weather was also not kind to us during the early months of construction and in November 2014 Liqhobong received double the normal annual rainfall in just a few days. We’ve now recovered from these setbacks and currently are very satisfied with progress, with almost all our work packages either on or ahead of schedule or, at the worst, just marginally behind and catching up fast.”

As of January this year, design and engineering of the project was 99,8 % complete and procurement 99 % complete. Fabrication was

96,1 % complete versus the target of 91,9 %. The civils package was at 68 %, the RSF at 94,6 % and the earthworks at 99,5 %. As one would expect, the SMPP and the EC&I packages are at earlier stages, at 13,5 % and 3,5 % complete respectively. As regards accommodation, 18 out of 24 prefabricated units – all with underfloor heating – were on site and occupied. These have been supplied by National & Overseas Modular Construction of Bloemfontein and apart from housing construction workers will also provide the mine’s permanent accommodation. A new, fully staffed and equipped clinic has also been commissioned.

Some of the quantities involved at Liqhobong are quite formidable, with the RSF, for example, involving the placing of 1,5 million cubic metres of rock and earth for the starter wall and the main plant terrace about 1,2 million cubic metres of earthworks. The project has also involved some road construction. It was determined as long ago as 2012 that the existing road

Looking west towards the main plant terrace. In the foreground is the scrubber feed conveyor.

Prefabricated accommodation. When this photo was taken in January, 18 out of 24 units had been completed.



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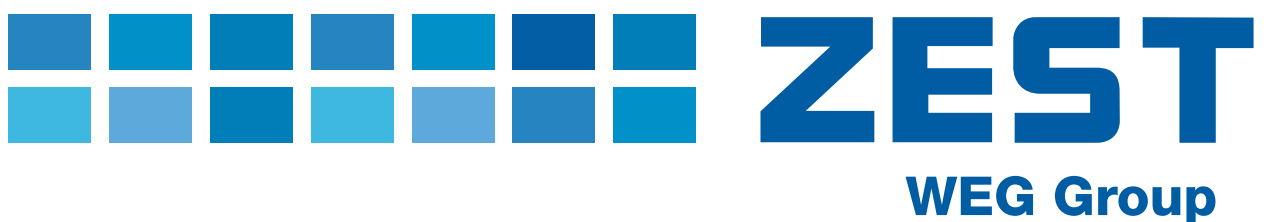
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This is how the Liqobong site looked several years ago. The old plant seen here was dismantled and removed prior to the start of construction of the current project.

to Liqobong was inadequate and an improved two-way, 8 km shorter, 5,8 km long layered access road was completed in August last year. It has an average width of 8 m and allows trucks with a 20-m trailer and 35-t loads comfortable access to the mine.

Unlike previous operations at the site, the new mine – which will require roughly 5 MW of electrical power – has grid power. It has been connected to the Lesotho grid via a 132 kV overhead powerline running over a distance of 28 km, a project which was completed in October last year. Comments Brown: “The cost of the project was R189 million as opposed to the original budget of R165 million. In fact, though, we’ve achieved a very significant saving. When we were planning the powerline project, it was intended that the supply would just be for Liqobong. We managed, however, to involve Storm Mountain Diamonds, the owners of the neighbouring Kao mine, and they agreed to contribute half of the costs of the revised total project. This involved extra expense as the powerline had to be taken over the mountain to Kao but the overall saving to Firestone is R70,5 million.”

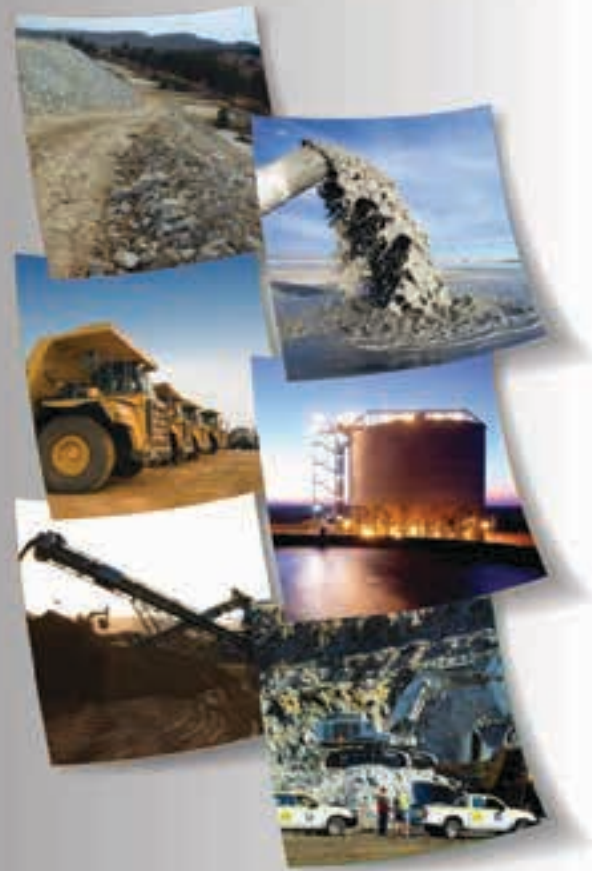
Once in operation, Liqobong will employ around 500 people. Current thinking is that Firestone will operate the plant itself but use a contractor for mining. In fact, the documentation for the mining contract has now gone out and Brown notes that – reflecting conditions in mining at the moment – a large number of mining contractors (from as far afield as Zambia) have expressed an interest in tendering.

Finally, Brown points with pride to the fact that the Liqobong project is running within budget. “The capex in rand terms has increased from R1,85 billion to R2,08 billion – mainly because of the additional earthworks required – but the US dollar cost of the project remains unchanged at US\$185,4 million,” he says. “This is a considerable achievement given the fact that so many mining projects these days experience quite significant cost over-runs. We are fully funded, incidentally, to completion and are confident that we will remain within budget through to commissioning.

“When we were planning the project and in the process of raising money in 2014, the market was very sceptical that a junior like Firestone – with a market cap of just US\$35 million at that point – could achieve all that it was claiming it could achieve. I doubt that it is sceptical any more. We’ve proven that we have the ability to deliver on all our promises and I believe Liqobong – once commissioned – will be seen as a model of efficient project delivery.”

Photos courtesy of Firestone Diamonds

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Stellar makes solid progress on West African diamond projects



Karl Smithson, CEO of Stellar Diamonds.

*With a positive Preliminary Economic Assessment (PEA) in place and the process of obtaining a mining licence well advanced, Stellar Diamonds plc is hoping to start development of its Tongo Dyke-1 project in Sierra Leone later this year (subject to the availability of funding). The company will also be making a decision in the second half of this year on whether to advance its Baoulé kimberlite open-pit project in Guinea, which is currently the subject of a trial mining programme, to the feasibility phase. Stellar's CEO, Karl Smithson, updated **Modern Mining's** Arthur Tassell on both projects at this year's Mining Indaba in Cape Town.*

The Tongo Dyke-1 project – located in Sierra Leone's Eastern Province in the Kenema District – has the great advantage that it can be fast-tracked into production, with surface mining in the first four years providing cash flow while a shallow underground mine is developed. Given that it is a fissure-type deposit, Tongo Dyke-1 is unlikely to ever support a huge mining operation and, in fact, the total

carat production over an 18-year mine life is estimated in the PEA at just 955 000 carats, with a peak yearly production of 85 000 carats. The economics of the project are nevertheless very robust. Adding to its appeal, the required capex to establish the infrastructure for both surface and underground mining is a modest – and manageable – US\$24,8 million.

Smithson is highly enthusiastic about the potential of the project. “Dyke-1 has a grade of 165 cpht, which is well above average, and the



Above: The small processing plant at the Tongo kimberlite dyke project in Sierra Leone.

Left: Panoramic view of the Baoulé site in Guinea showing the processing plant, stockpile and workshop.

Below: Mining kimberlite in the east lobe at Baoulé.



diamonds are expected to sell for an average of US\$270 per carat – which makes it one of the highest value kimberlites in the world in terms of the in-situ dollar per tonne value,” he says. “In preparing our PEA on the project, we’ve erred on the side of caution and used the more conservative of two size distribution models we have for the resource – which estimates the grade at 120 cpht. On this basis, the project has a pre-tax NPV at a 10 % discount rate of US\$53.2 million and an IRR of 31 % with the gross revenues over the life of mine amounting to US\$387 million.

“The present mine plan is based on a JORC-compliant resource of 1,45 million carats for Dyke-1 to a depth of between 300 and 400 m, so there is plenty of scope for us to drill deeper and prove up additional resources,” he continues. “Certainly, similar fissure mines in South Africa – Helam, for example – have operated to plus 700 m depth.”

Smithson notes that there are a further three dykes on the Tongo licence which could add to the overall resource. “These three dykes – based on our exploration to date, which is ongoing – have indicated grades that are similar to – or even higher than – Dyke-1. So the bottom line is that the current mine life of 18 years could be extended significantly.”

Interestingly, Tongo represents a virgin discovery by Stellar. “The informal diggers had

given the area some attention but Stellar – and its predecessor, Mano River Resources – can take the credit for identifying the fissures,” he says. Smithson, incidentally, is well known to the diamond mining community in Southern Africa, having worked earlier in his career for De Beers in South Africa, Botswana and Zimbabwe in a variety of roles including exploration manager in Zimbabwe.

It was originally envisaged that Tongo Dyke-1 would be an entirely underground operation, with the shaft and associated infrastructure required taking up to two years to develop before first production and cash flow. This presented problems for Stellar, a junior with limited resources. “We decided to look at options to accelerate the start of production and asked our consultants, Paradigm Project Management (PPM) of Johannesburg, to assist with this exercise. They analysed a number of mining methods and concluded that surface mining to supplement the underground mine was both technically feasible and economically viable.”

The method for surface mining recommended by PPM and accepted by Stellar is the unusual technique of manual slot or open bench stopping. Comments Smithson: “The method is extremely safe. It also allows us to mine from surface to a depth of 40 m and deliver ore simultaneously from a number of mine faces and depths along strike. Moreover, it involves no additional capex as compared to underground mining only.”

In terms of the surface mining plan, a total of three mining pits each of 500 m length along the 2 km strike of the orebody will deliver 100 000 tonnes of ore and 120 000 carats over the first four years of mine operation, primarily

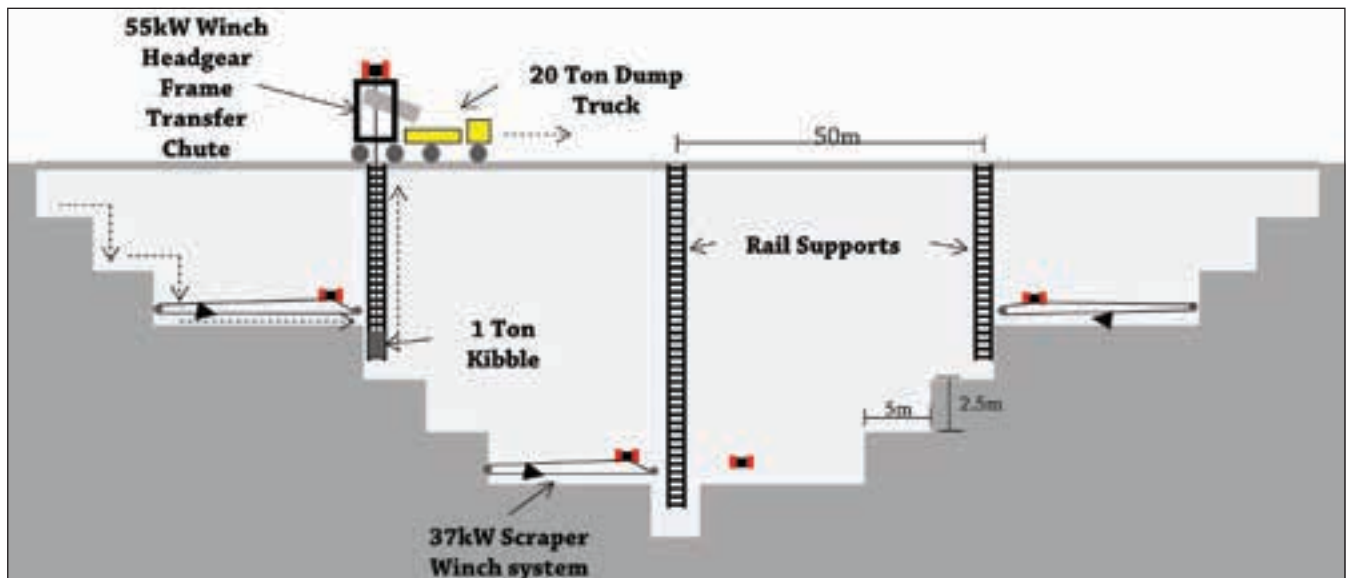
between years two to four. Two stopes with multiple mining faces of 2,5 m vertical height are envisaged per mining pit. The ore will be drilled and blasted from the mine faces, then hoisted to surface via rail-mounted 1-tonne kipples and transported to the processing plant. Each pit will be adequately de-watered and ventilated as mining progresses to depth.

The start-up of the underground mine will overlap with the surface mining with production extending from year 3 to year 18. In all, 838 000 carats will be produced by the underground mine. Access to the orebody will be provided by a 300 m vertical shaft with mining levels at 40 m intervals.

According to Smithson, the Tongo Dyke-1 project is now ready to roll. “We’ve done all the technical work needed and we’re now focusing on securing our mining licence. Once that’s in place, then it becomes a funding issue – we’re definitely going to need an element of debt,” he explains. “Our licence application is currently being processed by the National Minerals Agency and we’re optimistic that it will be granted shortly. The government is very supportive of the project which will ultimately employ around 300 people in an area where formal sector employment opportunities are extremely limited.”

Stellar is as much a mining company as an explorer and is proposing to own mine at Tongo. Its past experience as a mine operator includes the mining of the Mandala alluvial deposit in south-east Guinea from 2009 to 2011, an exercise which produced 128 000 carats. In addition, its trial mining operation at Baoulé in Guinea is a relatively substantial undertaking, with the plant complement on site including four excavators and a number of 25-t and 30-t

Bench stope mining from surface to 40 m depth will be used to get Tongo into early production.





articulated dump trucks (which were all transferred over from the Mandala site, along with a 100 t/h DMS plant able to treat both fresh and weathered kimberlite ore).

Discussing the prospects for Baoulé, which is located in the famous Aredor diamond district, Smithson says it potentially has a bigger resource than Tongo. “Baoulé is a 5 ha pipe which was discovered in the late 1990s by a Canadian company,” he states. “We acquired the project with a local partner roughly three years ago and the work we’ve done since then – combined with the results of exploration results from previous operators – points to a 22 Mt resource to a depth of 300 m containing 3,3 million carats. This is only an internal estimate and we’re now well advanced with our trial mining evaluation process which will allow us to determine with confidence the grade and diamond value of the pipe.”

The trial mining programme – which is essentially self-funding – was launched in November 2014 and has been on-going since then (with a break for four months in the second half of 2015, mainly as a result of the rainy season). The objective is to process and extract up to 100 000 tonnes of kimberlite. As of late February this year, the programme was about 70 % complete with just over 8 000 carats having been recovered at a 1,25 mm cut-off, giving an average grade of 12,7 cpht.

“One of the things we’re trying to establish with the trial mining is whether Baoulé has the capacity to deliver large stones on a consistent basis,” comments Smithson. “Certainly the Aredor district has a reputation for producing big stones from alluvial deposits with the biggest – according to the available records – being a 284,96-carat diamond recovered in 1993. Thus far we’ve recovered 610 stones at Baoulé greater than 1 carat including numerous gem diamonds up to 12 carats. Our biggest stone to date is a 55-carat diamond which we’ve just

recently recovered and which we’re still assessing. It appears to have a ‘boart’ exterior which potentially encapsulates a better diamond internally. Overall, we’ve been encouraged by what we’ve seen and believe Baoulé could well be the source of the large diamonds that have been recovered from alluvial operations.”

Smithson says the trial mining will continue till about mid-year. “At that point we will assess the results and decide whether to proceed with the project. Our target carat value for the project is US\$200. The latest – May 2015 – average sale price is US\$156/carat but we think that we could reach the target figure if there are enough high quality larger stones. If we do decide to advance the project, then we’ll need to look at doing a full BFS as the estimated capital requirement to establish a commercial mine is probably going to be in the region of US\$50 million and we’re not going to get this type of funding without a bankable study.”

Looking ahead, Smithson believes that Stellar, which is listed on London’s AIM, is well on its way to making the transition from being primarily an exploration company to a commercial mid-tier producer. “It is almost certain that Tongo will be developed at some point given its excellent potential and its very low capex and our hope is that we will start on development sooner rather than later – and, in a best case scenario, sometime this year,” he says. “The outlook for Baoulé is slightly less clear cut. Our current thinking is that it is a very viable project but clearly we need to get the full results of the trial mining exercise before we can say much more than this. Overall, we’re extremely happy with the progress made on both projects over the past couple of years and believe that Stellar is well placed with its assets to take advantage of a rough diamond market that has very sound fundamentals and a healthy longer term outlook.”

Photos courtesy of Stellar Diamonds

The Baoulé 100 t/h DMS plant is able to treat both fresh and weathered kimberlite ore.

“One of the things we’re trying to establish with the trial mining is whether Baoulé has the capacity to deliver large stones on a consistent basis.”



Jaco du Toit - 12 years



Christina Ramotsabi - 9 years



Ricardo Montoya - 25 years



Rejean Foisy - 25 years



Godwin Dzweiro - 26 years



Noel Mills - 33 years



Fregelina Mabotja - 9 years

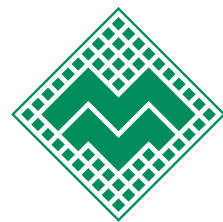


Roy Roche - 34 years

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Lerala on the brink of production

Botswana's Lerala diamond mine near the border post of Martin's Drift – which was originally commissioned in 2008 but placed on care and maintenance early in 2009 – is on the brink of recommissioning, with first diamond production expected in April. The owner, ASX-listed, Kimberley Diamonds Limited (KDL), has all but completed an extensive refurbishment and upgrade of the process plant designed to allow it to achieve a reliable throughput of 200 t/h and enhanced diamond recovery.

The deposit at Lerala comprises a cluster of five diamond-bearing kimberlites – designated K2 to K6 – which were originally discovered by De Beers in the early 1990s. KDL will be the fourth company to mine at the site. De Beers undertook a trial mining programme starting in 1997 but decided that the Tswapong project – as it was then known – did not meet its economic criteria. ASX-listed DiamonEx later picked up the project and built the present mine infrastructure but had the misfortune to bring the mine on line when the global resources market was in disarray following the global financial crash of 2008.

A third company, Mantle Diamonds, operated the mine for a few months in 2012 producing approximately 73 000 carats. A range of technical issues in the processing plant, however, resulted in poor recovery and led to the mine once again being put on care and maintenance.

KDL acquired the project in early 2014 and is confident that it can succeed where its predecessors have failed. It announced in September 2014 that South African engineering company Consulmet had been appointed to design modifications to the plant intended to facilitate dramatically improved diamond recovery and throughput reliability. Consulmet was subsequently engaged to execute the plant upgrade and refurbishment on an LSTK basis.

The upgrade and reopening of Lerala is costing A\$14 million (with the plant modifications accounting for A\$9,4 million). The mine – which has a 20,1 Mt resource with an average grade of 24,2 cpht – will have a life of nine years and is expected to generate a net cash flow of A\$165 million over this period. Average annual production is estimated at 336 000 carats.

Approximately 1,4 Mt of ore will be

produced annually with the mining being handled by a mining contractor, Basil Read Botswana. The contract covers the initial five years of mining and its value is around A\$47 million at current exchange rates. Basil Read Botswana was due to start mining this month (March), starting in the dewatered K3 pit.

The upgraded plant is a conventional diamond processing facility incorporating primary, secondary and tertiary crushing and associated screening; primary and secondary scrubbing and screening; and gravity concentration via a DMS module with dual cyclones which are fed fines (+1 mm/-6 mm) and coarse (+6 mm/-18 mm) product streams. Sink screen concentrate is pumped to a new recovery module which will classify and dry the concentrate prior to X-ray sorting and final recovery by hand sorting, all within a new secure recovery facility.

The completely new recovery section is designed to enhance first pass diamond recovery and minimise diamond loss while the new secondary crusher is expected to improve diamond liberation and processing reliability. A scrubber and trommel have been added to the plant to handle wet ore and maintain throughput while additional surge capacity will decouple sections of the plant, reduce downtime and maintain head feed rates. Automated thickener control will ensure a consistent and optimised tailings treatment philosophy.

The mine and processing plant are powered by diesel gensets and source excess water via a pipeline from the Seleka wellfield. Labour and services will be sourced from the local villages including the Lerala village, located 10 km south-west of the 21,86 km² mining licence. ■



The new platform for the primary scrubber (left foreground) ready to accept the scrubber shell, the primary crusher (rear) and the refurbished conveyor (photo: Kimberley Diamonds)

KDL acquired the project in early 2014 and is confident that it can succeed where its predecessors have failed.

Understanding AC motor control models

Since the late 1970s, many control models with different names have been developed for AC motors. Examples at SEW-EURODRIVE include V/f control, VFC, CFC and SERVO control.

To achieve clarity among the many designations and abbreviations, SEW-EURODRIVE Mechatronics Engineer Norman Maleka explains the basic characteristics of control models based on the example of SEW-EURODRIVE frequency inverters, which cover the entire power and application range – from basic standard to the toughest technical requirements.

“Up until the 1970s, DC motors were just about the only option for step-less

adjustment of speed and torque in industrial applications. Traditional DC motors are prone to wear, which generates both mechanical loads and servicing costs. AC motors, on the other hand, are far more robust and virtually maintenance-free,” states Maleka.

They were, however, far less easy to control, especially when AC control engineering and power electronics were still in their infancy – at a time when there were no digital signal processors and both power MOSFETs and IGBTs were at best theoretical concepts.

Maleka notes that open and closed loop control of AC drives has now become indispensable and is still enjoying highly impressive growth rates in electrical drive engineering. “Inverters with voltage/frequency control are ideal for simple applications such as pumps, fans or basic materials handling technology.”

They are used to drive moderately dynamic AC motors and are essentially based on the proportional adjustment of voltage and frequency. This keeps the

flux in the machine constant and maintains the maximum torque. Since the rated flux generates the highest torque per kg of machine, the raw materials used – steel, copper and insulating materials – are at their most effective.

“From the motor perspective, the controlled inverter takes the form of an adjustable socket for mains voltage and mains frequency. This means it is also possible in principle to operate several smaller motors simultaneously with one inverter. Thanks to their straightforward principle and easy handling, frequency inverters with V/f control are ready to use in a short time. This has therefore become the standard control mode, without speed feedback,” says Maleka.

SEW-EURODRIVE uses a mode based on V/f control in its MOVITRAC LTE-B, MOVITRAC B and MOVIDRIVE B frequency inverters for installation in control cabinets, and also in MOVIMOT, MOVIFIT FC and MOVIPRO SDC decentralised drive controls.

During project planning for an electric drive system, Maleka stresses that it is vital to identify the application’s control accuracy requirements. If these requirements are transparent and specified, the tailored drive system can be assembled from the necessary components – the gear unit, motor, encoder, inverter and controller.

SEW-EURODRIVE, tel (+27 11) 248-7000



MOVIDRIVE B frequency inverters for installation in control cabinets.

Tenova Pyromet develops smelting solution for Northam

Local high capacity furnace and smelting plant specialist Tenova Pyromet reports that it has developed a landmark technology solution for platinum miner Northam Platinum.

Northam is expanding its smelter facilities in Thabazimbi to support its planned growth in platinum group metals (PGM) production. The expansion called for an innovative approach to increasing the group’s processing and refining capability using a technical solution that offers the flexibility to process both high and low base metal concentrates.

Northam is looking to increase its output by increasing the throughput of UG2 ore, rich in chromite and difficult to smelt, from the Eastern Limb of South Africa’s Bushveld Complex.

The basic engineering for the 20 MW PGM smelting furnace and ancillary sys-

tems has been completed, and the detail engineering is currently in progress.

Close collaboration between client and technology provider throughout the development of the technical solution has been the key to successfully meeting the challenge of designing a furnace with a sufficiently broad operating range to accommodate feedstock with such widely varying mineralogy.

“Tenova Pyromet had the experience of designing a relatively similar solution for another platinum miner, but the project for Northam took the challenge to a much higher level and we are confident that our solution is a milestone in the industry,” says Andre Esterhuizen, General Manager, Sales and Marketing, Tenova Pyromet.

“Not only does this project prove yet again that South Africa remains at the forefront of technology development in the

global industry, but it is also notable for the fact that it is a proudly all-South African initiative – drawing on the expertise of a local technology provider, local contractors and suppliers and with the vast majority of the components manufactured locally – for a South African PGM producer.”

“The cyclical nature of the mining industry requires that miners such as Northam adopt a long term perspective in terms of strategic capital expenditure. Tenova Pyromet’s solution, which provides us with the flexibility to accommodate a range of smelter feedstock, positions us well to meet our growth aspirations,” says Rene Rautenbach, Manager – Projects and Strategy, Northam Platinum Limited.

Tenova Pyromet’s scope on the project covers the PGM smelting furnace, feed system and off gas handling plant, as well as the furnace building and all associated civil works, infrastructure and services.

Tenova Pyromet, website: www.tenovagroup.com

Roytec secures major belt filter contracts

A leading European mining company operating in the DRC has awarded Roytec a contract for the supply of 4 x 145 m² Roytec TXSY vacuum belt filters. This contract follows an earlier success where Roytec was awarded a contract for the supply of 2 x 145 m² vacuum belt filters for a new phosphate mine in the Western Cape.

The DRC contract is for copper recovery after tank leaching and employs a 3-stage counter-current cake washing system for optimum efficiency. The filters are being constructed in a combination of 316 stainless steel and mild steel sections and were ready for shop trial assembly eight weeks after contract signature.

Roytec carried out site testwork and completed the process specification in conjunction with the client's engineers, and a unique dual feed system allowing for a pre-coat of coarse material before the addition of flocculated fines has been specified.

The filters will be manufactured by Roytec's partner, Nuclear Industries Yantai

Tongxing (TXSY), in the Shandong province of China. They are fitted with standard European and South African brand mechanical components and are fully serviced and guaranteed by Roytec.

The 2 x 145 m² filters for the South African phosphate mine will be employed on concentrate and tailings dewatering duties allowing for a closed water circuit. They are the largest belt filters of their kind in Southern Africa.

Roytec, website: www.roytec.co.za



Shop assembly of 4 x 145 m² Roytec TXSY belt filters eight weeks after contract signature.



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Mill motor rehabilitated for New Zealand gold project

Marthinusen & Coutts recently performed an extensive rehabilitation of an old 2 985 kW salient pole synchronous mill motor that had not been in use for over 10 years.

The project was commissioned by international mining company Newmont for the Waihi opencast gold mine in New

Zealand. Marthinusen & Coutts took on the project after initially agreeing to retrieve the motor from where it had been left lying in the veld at the site of the old Crocodile River gold mine at Hartebeespoort Dam near Skeerpoort, Gauteng.

"We were first awarded a contract to assess the condition of the motor to establish what sort of state it was in and to then quote for repairing it," says Craig Megannon, GM at Marthinusen & Coutts. "Not surprisingly we found it to be in a poor state. Apart from the fact that it had been left abandoned for so many years, it is a very old motor. It was manufactured in Japan in 1970 and had since been deployed at mining operations in Australia, Argentina and South Africa.

"Repairing it has involved an extensive amount of work and included complete remanufacture of parts that we found to be beyond repair," Megannon says. The rehabilitation contract was awarded in October 2014 and was completed at the

end of October 2015. The repairs that were done included rewinding of the rotor and replacement of the stator core with laminations manufactured by Electrical Machines' Laminations & Tooling business unit. Parts that were replaced with re-manufactured parts included the journals, slip-rings, brush gear and coupling.

"We also modified the stator design to increase the stator copper thickness and reduce the overall temperature rise, which we found to be the main limiting factor in the stator in its original form. We did the design using advanced software we recently acquired for this type of specialised work," he explains.

Machine Monitor, an Australia-based third party engineering company, observed and monitored the entire rehabilitation process and testing at Marthinusen & Coutts' Cleveland plant throughout the duration of the contract on Newmont's behalf.

Marthinusen & Coutts, tel (+27 11) 607-1700



Marthinusen & Coutts's test technician, Suresh Gunpat, with the 40-pole synchronous mill motor during the series of tests conducted on it on completion of the rehabilitation process.

New generation excavators from Doosan introduced

Doosan's newest generation hydraulic excavators – the heavy duty DX225LCA series – have been designed for greater operator comfort, improved fuel efficiency, enhanced productivity and minimal maintenance requirements.

"There are currently 360 20-t Doosan DX excavators in operation in the local market and we expect the improved DX225LCA series to further consolidate Doosan's position as a leading supplier in this size class of equipment," says Chris Whitehead, National Sales Manager, DISA Equipment (Pty) Limited, trading as Doosan, part of the

Capital Equipment Group (CEG) of Invicta Holdings Limited. "These robust excavators, which are now available in Southern Africa, are fitted with special features to ensure optimum efficiency and extended service life in harsh local operating conditions.

"Design features for the African market include a Tier II mechanical engine for reduced operating costs, a heavy duty boom and arm, as well as standard hydraulic piping for hammer applications. These machines also have an improved H Class bucket and are supported by Doosan with a 2-year/ 4 000-hour warranty.

"This series features a range of new technologies that deliver effective control over the machine's power and also simplify maintenance procedures. As a result, efficiency and machine durability are increased, productivity is improved and operational costs are lowered."

The 21,5-t operating weight of these excavators is enhanced by new specifications that include a 0,92 m³ bucket capacity, a digging depth of 5 755 mm, a digging reach of 8 950 mm and a digging height of 9 750 mm. The engine rated power is 110 kW at 1 900 rpm. Maximum engine torque is 61,5 kg.m/1 400 rpm.

Doosan, tel (+27 11) 974-2095

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XRT sorters commissioned at leading diamond mine

A leading Southern African diamond mine famous for its large, top quality diamonds reports success with the two IMS Engineering (IMS) Steinert X-ray transmission (XRT) sorters that are being used in the final recovery plant of the mine. These are among the first XRT sorters to be used for final recovery in the diamond mining industry.

IMS, which has a JV with Steinert for the supply and development of sensor sorting technology into the mining, industrial minerals and recycling industries, says that Steinert XRT technology has developed rapidly over the past year or so. "The development of unique sorting algorithms that allow for extremely high accuracy in the detection and ejection of diamonds has created significant opportunities for new and cost-effective ways to separate minerals from waste," says Paul Bracher, Managing Director.

In this Southern African project, extensive test work was carried out to show the client that the XRT system could detect diamonds as predicted by IMS. "It was as a result of this test work that we could provide our process guarantees. We tested both simulants and diamonds provided by the client. The goal was to achieve 100% recovery during test work and we are proud to report that this was in fact achieved," says Bracher.

He adds that during the test work, separation algorithms were further developed for detecting and ejecting diamonds and hardware optimisations were carried out at the same time.

For this particular application, the equipment had to be re-designed to fit the client's footprint requirements. During this process, IMS and Steinert integrated the latest developments in the detection equipment as well as improvements in the algorithms developed during the test work. "The result was that we were able to customise the sorter to fit the required footprint, while retaining the maintainability through using standard components," says Bracher. "We have improved all areas of performance including detection and ejection into a secure area, all while obtaining the lowest possible yield to increase the diamond by weight ejected."

After being awarded the contract, IMS project managed the building of the sorters. The machines were then delivered to site where IMS supervised installation and commissioning.

During the commissioning phase, a 52-carat GNT type II, 75% unbroken diamond was recovered by the coarse sorter. "While the finding of large diamonds is always newsworthy, the detection of large stones is easy for the technology. Of more technological significance was the detection of a 2-carat diamond that was recovered in tailings material during pre-commissioning tests," says Bracher.

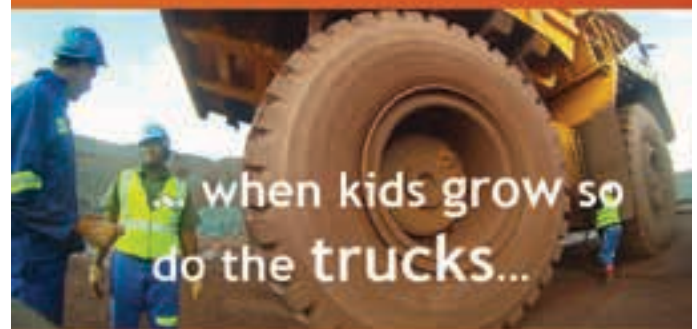
IMS Engineering, tel (+27 10) 001-8200



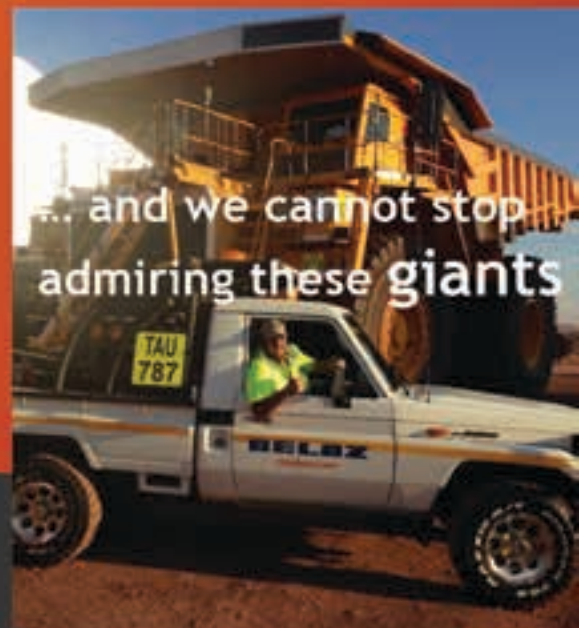
A leading Southern African diamond mine reports success with two IMS Engineering Steinert X-ray transmission (XRT) sorters.



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Plant hire company celebrates machine 'Number 8'



Machine No 8 has proved to be a durable workhorse for GaNala Plant Hire.

To fleet managers the big Kawasaki ZV90 wheel loader working for GaNala Plant Hire is just a number, one of a fleet of 19 similar loaders on hire to power stations and mines in the Mpumalanga region.

But to Christo Venter, GaNala Plant Hire founder, the loader means so much more as it is the machine that started his business and whose powerful frame has carried so much of the workload of his growing operation. Even despite clocking more than 72 000 hours of back-breaking production work, No 8 is still working as hard as ever fulfilling round-the-clock production duties at Black Wattle Colliery and to Venter's delight

is showing no signs of slowing down.

He says that No 8 has been a stalwart that has worked on numerous different sites loading everything from chrome, to rock, coal and anything else required. Thanks to its work rate, reliability, fuel consumption and high levels of support received from equipment supplier, ELB Equipment, it has spurred him on to standardise his entire loader fleet on Kawasaki machines.

"In my years of experience, Kawasaki loaders have proven to be the best machines for production loading and our fleet of 19 machines including No 8 have seldom let us down," says Venter.

"Apart from work rate and reliability, I have also found that the machines use up to 10 litres of diesel less per hour than comparable machines from other premium brand manufacturers. What's more, we receive complete support from ELB Equipment with the Middelburg and Johannesburg branch staff always available to us when we need them or, if we need head office expertise, it is just a call away."

Perhaps the company's proudest moment came in a time of crisis last year,

with the collapse of the main coal silo at Majuba Power Station. GaNala Plant Hire was called upon to supply nine loaders equipped with 6 m³ buckets to load the massive coal feeders that supply the station's six giant turbines.

"We worked hard and to the credit of all of us we managed to keep the lights on," says Venter. "Once again No 8 was at the forefront of our efforts and leading from the front as has been the case for all these years. But, at least, No 8's time with us is not done!"

"We have just completed its third life rebuild and judging by the soundness of the frame and main components we are expecting to get at least another 20 000 hours of production work out of this old guy. I estimated that it has already loaded more than 20 million tons of materials in its time and by the time it gets retired I imagine this figure will be closer to 30 million. Our younger machines are also clocking up the hours with many of them already clocking over 30 000 hours and remaining reliable – just like No 8," says Venter.

ELB Equipment, tel (+27 11) 306-0700, website: www.elbequipment.com

Innovative truck body can cut opencast mining costs

An unconventional, innovative and cost-effective truck body, designed by international truck body manufacturer Desarrollos Tecnológicos S.A. (DT HiLoad), is now reportedly allowing opencast mining companies in Southern Africa to offset sliding commodity prices by reducing operational costs significantly. In the Southern African region, the bodies are manufactured by Johannesburg-based Efficient Engineering and are already in operation on Anglo American, De Beers and Swakop Uranium mine sites.

These lightweight and highly durable truck bodies have achieved success in coal, copper, iron ore, platinum, uranium and diamond mining applications, with almost 2 000 bodies supplied globally to fit Komatsu, Caterpillar and Hitachi trucks.

"Historically, not much emphasis has been placed on the rigid mining truck body," says Craig Davidovics, Efficient Engineering's Engineering Manager. "In fact, the design of these bodies has seen very little change over the past 25 years, with the focus primarily being on extracting maximum lifespan, which, in many cases, does not make allow-

ance for mine-specific ore densities."

In contrast, the DT body is a product of the evolution in smart engineering, taking into consideration the material density of the application as well as the particular truck model in order to ensure optimal fleet performance. Its innovative curved design fully exploits the allowable elasticity of the high performance, quench and tempered steel used in manufacture, allowing it to achieve structural integrity whilst utilising significantly less steel.

A recent case study within the South African coal mining industry illustrates the benefits of the DT body. In the study, a fleet of six rigid haul trucks fitted with the standard 93 m³ (3:1) conventional bodies, capable of hauling 155 tonnes each, achieved an average payload of 102 tonnes – a 34 % loss per load cycle – due to the low density of the coal. In comparison, when the new DT bodies were utilised in the same application, they offered a significantly higher load capacity of 150 m³ (3:1), and achieved an average payload of 155 tonnes.

"Despite the DT body's lightweight

design, lifespan has not been compromised – in fact, it has been significantly extended. Once the bodies reach the typical replacement age of 40 000 hours, they show only minor fatigue cracking and mechanical damage, and floor wear is limited to a maximum of 3 mm (9 %). Unlike traditional bodies, the modular design of the DT bodies allows for easy replacement of damaged parts, and can be repaired for continued operation at a third of the cost of full replacement," continues Davidovics.

Efficient Engineering is the only company authorised to build DT bodies outside of DT's own operation in Santiago, Chile.

The DT Hi-Load product was acquired by Komatsu Holding South America in October 2011, and is the only alternative body approved for first fit to Komatsu trucks. To date, 60 % of the bodies produced have been for Komatsu-based machines with the remaining 40 % being shared almost equally between Caterpillar- and Hitachi-based units.

Supply of DT bodies into Southern Africa is done through Komatsu South Africa, based in Isando Johannesburg.

Gerhard Kloppers, Komatsu South Africa, tel (+27 11) 923-1000



Multotec provides sampling solutions to coal industry

Accurate sampling of product is providing coal mining operations with a distinct advantage. By creating a clear understanding of what raw material quality is being supplied, process managers will achieve an early indication of the final product grade and yields that can be anticipated.

Willem Slabbert, Applications and Process Manager at Multotec, says that with accurate and unbiased information, better optimisation decisions can be made regarding how the ore is best beneficiated, and whether a high yield intermediate middling or high quality final product with lower yield will be produced. "A composite sample will provide a result that is fully representative of the quality of the whole, whether done on a two-hourly daily plant production or batch sample.

"It is also an important facet of a coal operation to allay concerns that out-of-specification coal is being supplied. Correct sampling designs facilitate this process by providing the opportunity of achieving the capture of accurate and precise data of the relevant product," he continues.

Rolf Steinhaus, Sampling Specialist at Multotec, says that Multotec has always participated actively in applying sampling best practice and ISO standards in the coal industry, and among other commodities including iron ore, base metals, gold, platinum, heavy mineral sands and manganese.

"Our primary focus is on providing reliable and accurate sampling solutions that can be validated by a third party. There is



Fully assembled Multotec sampler equipment with spares ready for despatch.

a solid footprint of operational sampling plants and individual sampling machines Multotec can refer to throughout the South African coal mining industry," says Steinhaus.

This in-depth expertise and experience enables Multotec to engineer fit-for-purpose sampling plants capable of achieving successful results. Multotec's ongoing investment into research and development, in conjunction with its licensor Siebtechnik GmbH in Germany, has played a major role in positioning Multotec coal sampling technology as one of the most credible in the industry today.

Typical coal sampling applications include plant feed (raw coal), product low ash or middling coal, discard streams and contractual sampling stations. A sampling plant in the coal sector would generally include a primary cross belt or cross stream sampler, sub-divisions of the primary increment after crushing, and increment splitting to ergonomic composite sizes to provide separate physical and chemical samples, the latter often in triplicate.

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

Pipe coupling offers fast installation

Victaulic, a leading producer of mechanical pipe joining systems, has announced the launch of the Style 905 Refuse-to-Fuse™ HDPE coupling in South Africa. This new installation-ready coupling reportedly installs up to 10 times faster than traditional fusing and can be properly installed using an impact gun or standard socket wrench with no special training or regular certification needed.

Ideal for mining applications including slurry transport, tailings and underground paste fill, water and air, as well as municipal

water transport and other industrial applications, the new coupling is designed for HDPE pipe (50-150 mm) and joins in just seconds. It is specifically designed to eliminate the need for butt fusing while offering visual confirmation of correct installation.

Additionally, weather is not a factor and no tents are needed. No heating or cooling time is required and the product can be installed on new, used or dirty pipe. The coupling also meets or exceeds the rating of the pipe.

Victaulic, website: www.victaulic.com

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The DoppiaTrac is a track mounted, self-driven, feeding, crushing and stockpiling machine for medium to hard bituminous coal crushing applications.

Coal supply for a variety of end users remains a hot topic in the South African mining industry and process operators are continually looking for cost-effective solutions to provide in-spec product against a background of deflated commodity prices.

One such solution is the DoppiaTrac DR400 double roll crusher designed and built by Jet Park crushing and screening specialist Pilot Crushtec International. The product is establishing itself as the coal crusher of choice with coalfield contrac-

tors not only for the efficiencies it offers in a highly competitive business but also for its unique status in the local market as a track-mounted double roll crusher.

The first DoppiaTrac DR400 to be delivered in 2016 was supplied to Witbank plant rental business Spy Imports and Hire in January. The year began with an urgent contract to process run of mine (ROM) thermal coal from >80 mm spec to <40 mm spec. Pilot Crushtec International was able to respond to the customer's needs by supplying a brand new product ex-stock and, within a matter of days, the machine had been delivered, commissioned and was producing product in line with, if not better, than customer expectations.

Pilot Crushtec International CEO Sandro Scherf explains that the DoppiaTrac's acceptance in the marketplace is very much related to the economies and efficiencies it delivers to owners and contractors.

"In thermal coal applications, the DoppiaTrac DR400 can crush >80 mm ROM coal down to <40 mm specification in a sin-

gle pass. This means that there is no need for additional screening and a return conveyor to pass oversize material back to the crusher. Apart from removing the capital or hire costs for these pieces of equipment, there are also considerable savings in running costs, especially diesel."

Another benefit is that the DoppiaTrac is noted for delivering product with a low fines content, a major bonus when processing coal and similar materials.

Spy Imports and Hire owner Martin Brown is well pleased with his company's new acquisition. "The tonnages are as good as we expected, averaging between 300 and 350 tonnes per hour (tph) and occasionally approaching a rate of 400 tph," he says.

Brown first made contact with Pilot Crushtec International in 2015 via the company's website which indicated that it is currently the sole local supplier of a tracked double roll crusher – a product that he identified as being most suited to his needs.

Pilot Crushtec International, tel (+27 11) 842-5600

MBE Minerals makes inroads into Australian market

The recent supply of a complete resonance screen with an additional screen box to an Australian iron ore mine underpins MBE Minerals SA's drive to participate in global markets.

The supply of these screens by MBE is

the continuation of the screen replacement programme of 20 such machines for this major Australian iron ore producer.

"Significantly, the original screens were manufactured in South Africa by MBE Minerals in 1997 and have been operating

successfully in a fashion that is typical of their reputation for extended life cycles in arduous hard rock applications. We can reference a number of enduring heavy duty vibrating screen installations in the iron ore sector, including ones in the South African Northern Cape, that have been in operation for more than 40 years," says Johannes Kottmann, Managing Director of MBE Minerals SA.

The 2,4 by 4,5 m screen employs the principle of resonance and dynamic vibration absorption for its screening action. "A number of design elements have been incorporated to enhance performance, including the operation of the screen box at near resonance frequency. This allows the actuating device to replace only energy lost to the oscillating system by mechanical resistance and material transport," Kottmann explains.

A counter-oscillating frame of pre-determined mass ratio to the screen provides vibration absorption, thus minimising the transfer of dynamic loads into the supporting plant structure.

MBE Minerals, tel (+27 11) 397-4660

Reelcare sets up shop in South Africa

Major UK hose and cable reel supplier Reelcare Ltd has established an operation based in South Africa. It has set up its hose and cable reel business in a fully stocked warehouse facility located in Wadeville, Johannesburg. Reelcare, which currently distributes hose and cable reeling equipment in the UK through its own network of distributors and OEMs, holds many agencies from globally respected hose reel manufacturers and plans to replicate its UK business model in South Africa.

"This venture was not a difficult decision to make," says Terry Crabtree, Sales Director of Reelcare. "We already enjoy doing business in South Africa within the mining and lubrication industries and have done so for many years. Over that time we have

developed some extremely good business relationships within these market sectors. However, we also recognise that even though the mining industry in South Africa is a major consumers of hose reels, there are many other industries in South Africa with whom we have experience from our UK operation. Since our product ranges overlap in most industrial sectors, our South African operation will be the focus of our targeted approach to the South African market giving us the opportunity to grow."

Whilst there are companies in South Africa which sell small ranges of hose reels, Reelcare has a comprehensive range of hose and cable reels and describes itself as a "one-stop shop" for all reeling requirements.

Louis D'Aubrey, Reelcare SA, tel (+27 11) 027-6471

Weba Chute Systems eliminate material degradation

Conventional chute design is often associated with the uncontrolled discharge of bulk materials, which is linked to increased material degradation. Custom engineered for individual application requirements, Weba Chute Systems are successfully moving materials in all commodity sectors globally.

Mark Baller, MD of Weba Chute Systems, explains that a systems approach to bulk solids handling design is essential to ensure operational characteristics are matched throughout the plant. By custom designing each transfer point, individual Weba Chute Systems can be configured to suit each particular application.

"Our system uses a 'supertube', with a cascade scenario, where 95 % of the material runs on material at the same time in a tumbling motion, rather than gliding down the chute. We have found that gliding particles cause extensive wear, while the tumbling or rolling motion causes far less wear. We have taken this a step fur-

ther by designing the internal angle of the transfer chute to match the product with the belt speed and in so doing product degradation is greatly reduced or completely eliminated," he adds.

The Weba Chute System uses a streamlined scientific approach to the dynamics of bulk materials handling taking all aspects such as belt speed, belt width, material size, shape and throughput into account. The custom design allows control of the direction, flow and velocity of a calculated volume and type of material in each individual application and, at the same time, drastically reduces dust.

"In essence, it is the absolute control of material while being transferred that will eliminate degradation. This requires an in-depth understanding of how material needs to be transferred and factors in changes of direction, the impact during these changes of direction and height of transfer," says Baller.

The geometry of the system should



Controlling the transfer of material onto the conveyor belt guarantees increased cost savings for clients in addition to an improved health and safety performance.

be such that material is moved through the chute system with gradual directional changes and controlled velocity in order to minimise impacts that lead to material degradation and dust generation. In addition, discharge onto the conveyor system must be correctly controlled and be as close to the belt speed as possible.

Weba Chute Systems, tel (+27 11) 827-9372

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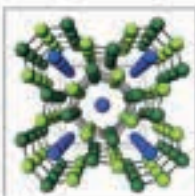
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Engen partners with world-leading uranium mine

China General Nuclear Power Holding Corp (CGNPC), China's biggest producer of nuclear energy, has commenced mining at the Husab mine in Namibia. Once in full production, Husab will be one of the largest uranium mines in the world.

In 2014, CGNPC's Namibian unit, Swakop Uranium, invited major players to tender for the supply of essential goods and services to its Husab project. Following a considered evaluation process, the contract for the provision of facilities, fuel, lubricants and services was awarded to Engen Petroleum.



The fuel storage and dispensing facility at Husab.

The General Manager of Engen's International Business Division, Drikus Kotze, says the company is proud to have been appointed the fuel and lubricant service provider on a project of this magnitude and importance to Namibia.

"Engen has been involved in the design, procurement and construction of the fuel storage and dispensing facility, and will assume full responsibility for the day-to-day management and reporting," says Kotze. "Husab is also an important HSEQ project for Engen, as it is both a flagship operation – with strict criteria on Health, Safety, Environment and Quality – and an opportunity for us to benchmark our capabilities and offering to the mining sector as a whole."

Naturally, to establish an operational fuel facility for a mine the size of Husab – which is located approximately 60 km from Swakopmund – is no easy task. "We are currently operational from a temporary facility with the permanent facility nearing com-

pletion," explains Kotze. "Construction of the permanent facility commenced in May 2015 and should be completed and commissioned in late March 2016," he adds.

Engen's Commercial Services Manager, Paidane Henrique, says the contingent requirements upon each tendering supplier were typically complex. "The mine will move 150 million tonnes of rock and 15 million tonnes of processed ore per year and consume 80 million litres of diesel in doing so."

Beyond the heavy-duty mining equipment, there were many challenges Engen needed to meet.

"For example, a broad range of heavy vehicles each carried stringent specifications, based on the original engine manufacturer's 50 ppm diesel and lubricants requirements. These included low sulphur fuels with low water content and superior cleanliness to ensure operations and fuel system longevity. Engen products fitted this perfectly," adds Henrique.

Engen Petroleum, website: www.engen.co.za

Transkei Quarries orders Osborn equipment

To meet the growing demand for aggregate in the Eastern Cape, Transkei Quarries has placed a R12-million order with Osborn for robust new machines to add to its equipment arsenal.

The company has ordered a new Osborn 50 x 60 primary jaw crusher, a new Osborn vibrating grizzly feeder and a new BTI rock breaker, also supplied by Osborn as the agent for its USA-based Astec Industries sister company BTI, reports Osborn's Product Sales Manager, Shane Beattie.

A predicted boom in demand for aggregate has prompted Transkei Quarries to increase the capacity of its plants, and this

long-standing customer chose Osborn machines for its expansion based on the quality of the manufacturer's machines and the company's industry experience, Beattie says. He states that year on year growth of some 20 % has been predicted for the construction industry in the Eastern Cape.

A significant feature of this order is that the Osborn 50 x 60 jaw crusher will be the biggest primary crusher installed by the company in the Eastern Cape. "Transkei Quarries will establish an impressive new jaw plant to feed three smaller plants downstream – in order to supply the region's growing demand and save on blasting

costs," Beattie explains. "The company's Mthatha plant is also looking to crush the current overburden built up over the past 20 years plus."

Expanding on the features and benefits of Osborn's massive 50 x 60 jaw crusher, Beattie says that it takes a maximum of 1 000 mm rock at approximately 850 t/h run of mine feed. "This unit's vast size means that it will need to be split into four pieces and reassembled on site, and will still be an abnormal load for transport from Osborn's Elandsfontein manufacturing facility to the Eastern Cape. It weighs 112 tons, and is 4,75 m high, 3,42 m wide and has a depth of 4,49 m."

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

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