

Mining

Z I M B A B W E

ISSUE
06

MARCH 2018



SCAN TO MOBILE

TEN MINES

that Zimbabwe should
urgently revive

UNLIKELY HERO IN THE RACE FOR

LITHIUM

**"ZIMBABWE IS READY FOR
INVESTMENT!"**

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ABOUT PUBLICATION

Mining Zimbabwe is the premier source of Zimbabwe Mining news. Our core focus is on the ever evolving face of the mining industry, trends, new technologies being developed and used to improve this crucial sector, as well as new opportunities and investments arising from it. Mining Zimbabwe sole purpose is growing and empowering the mining industry and highlighting all its challenges as well as putting forth expert solutions.



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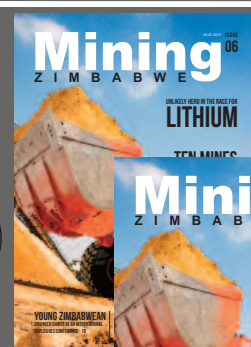
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2018

Editor's Note



"Zimbabwe is ready for investment!"

A New Year, brings new beginnings not only for the world but for Zimbabwe. The year 2018, started off well where our country hosted International investors who had an opportunity to consider the vast investment opportunities in Zimbabwe's growing mining sector at the Mining Indaba held from 27 to 28 February 2018 at The Meikles Hotel in Harare.

I am positive that many of our readers in the Mining sector were excited, as this conference brought new life and prospects for our country. This is where President Emmerson Mnangagwa officially opened the Indaba, which attracted top international mining executives from over 20 countries. This is also where President Mnangagwa declared Zimbabwe open for investment. It is for this reason that this issue featured articles on Lithium batteries (page 6) which have become an ideal power source for energy-hungry devices such as cell phones because they are more efficient and scalable than previous-generation nickel-metal hydride batteries therefore making them to be high demand in support of automobile and electronics manufacturing.

The question "Is Zimbabwe ready for investment?" may arise, however rest assured that this issue surely answers the question when you read on page 8 you learn that Zimbabwe is a home to

800 mines and they are all listed in the article for your convenience. These new beginnings see Zimbabwe's mineral revenue rising in 2018. If you are not smiling by now perhaps the article on page 12 will get you springing for joy as it ventures on "Expanding Underground Mining Simulation Services in Africa". This is a definite must read.

We hope you really enjoy reading this issue and most importantly you have an opportunity to brush up on the Zimbabwe Mining Laws on page 32 which soon should offer foreign miners a consistent legal framework. As Zimbabwe prepares to attract fresh capital for the mining sector we too also hope to attract fresh new readers, investors and who knows, perhaps there is an opportunity to increase more pages to our magazine.

As always our issue brings you jam packed machinery, artisanal mining and much more. We are always happy to hear from you, so do not hesitate to drop us an email or better yet connect with us on our social media handles provided.

Till next issue, stay awesome and stay blessed!

H. Makhhalima

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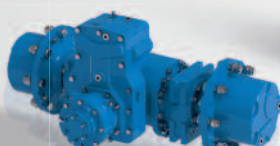


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Zimbabwe emerges as unlikely hero in the race for lithium



LITHIUM BATTERIES

By Justice Zhou

The scramble for the so-called “white petroleum” is heating up amid soaring demand, as the world shifts its focus towards cleaner fuels that do not necessarily hurt the environment, but the tussle for a piece of the lithium pie isn’t without surprises. Zimbabwe, the world’s fifth biggest supplier of lithium, is turning out to be the most unlikely champion in the quest to ramp up the production of the key element of modern technology.

As a wave of exploration projects continue to uncover the alkali metal beneath the southern African country’s soils, investors seek to take advantage of rising demand for hybrid cars and the new government’s investor-friendly policies. This, along with an upsurge in the global prices of commodities, offers miners good reasons to dig out a raw material which forms the basis for rechargeable lithium-ion batteries.

Zimbabwe’s mining minister, Winston Chitando, made it abundantly clear at a recent mining forum in South Africa that the soft and silver-white metal is poised to be the flagship in the resource-rich country’s wide spectrum of minerals, the new bait for foreign investors looking for higher returns in the mining sector.

Apparently, modern lifestyles would virtually be rendered impossible to get by without the lithium-ion battery, which powers everything from hybrid electric cars to pocket-sized and trendy smartphones to laptops, among many other tech gadgets, some of which could be customized to fit in the palm of one’s hand. The lightest metal also has extensive commercial use in renewable energy sectors for off-grid electricity back-up gadgets, as well as in mental healthcare.

Following the advent of what are known as “gigafactories”, the lithium-ion battery production facilities that were first mooted by electric car maker Tesla in the US, but are now spreading tentacles to Europe and elsewhere, prospects for bright lithium mining in the near future have in turn been boosted by chances of skyrocketing demand for the “clean fuel” worldwide as the appetite for next-generation hybrid cars spikes.

This will offer Zimbabwe a chance to slug it out for the share of the market to supply the coveted lithium compounds with Australia, Chile, Argentina and China, among other top producers, if not setting up “gigafactories” and making electric cars as well.

The hopes of increased production lie not only in existing sites,

Zimbabwe emerges as unlikely hero in the race for lithium

but from discoveries owing to further exploration and establishment of new mines, according to government officials. For example, the state mining company has been seeking out private partners to venture into both mining and exploration. A deal to partner with a South African junior miner whose project is expected to generate revenue of about \$1.4 billion over eight years was announced earlier in January, while two other projects are in the pipeline.

Zimbabwe, the world's fifth biggest supplier of lithium, is turning out to be the most unlikely champion in the quest to ramp up the production of the key element of modern technology.

On the other hand, Prospect Resources, a Southern Africa-focused Lithium and Gold mining and exploration company based in Perth with operations in Zimbabwe. Its flagship project, the Arcadia Lithium Project located on the outskirts of the capital Harare, revolves around a method whereby mining is based on extracting the ore from hard rocks. The company announced recently that plans were already afoot to start the near-term production of petalite and spodumene concentrates in the in the third quarter of 2018

Another miner, Premier African Minerals Limited, which is developing the Zulu Lithium Project near Fort Rixon in Zimbabwe, is on course to be launched as explorations have yielded positive results, based to the updates by the company. The ongoing drilling programme is expected to lead to the mining of high-grade spodumene.

Premier's CEO George Roach, has said: "These drilling results reaffirm the size potential of the Zulu deposit. The results also continue to return high ratios of spodumene to petalite and confirm a core of high-grade mineralisation that is strongly supportive of the high internal rates of return and very rapid payback predicted in our recently released scoping study.

"Meanwhile, activity at a corporate level has been extremely busy as we continue to engage with potential new stakeholders and partners to advance the Zulu Lithium Project and have recently seen a significant increase in interest from foreign investors in the Zimbabwean mining sector."

Last year, Zimbabwe maintained lithium production of roughly 1,000 metric tons for the fourth year in a row, according to by the U.S. Geological Survey which pales in comparison with top producer Australia's 13000 metric tons. However, the fact that the country's holds some of the world largest reserves of the metal, estimated at around 23 000 metric tons, has kept authorities punching above their weight when it comes to the future prospects of mining the metal.

Worldwide lithium production increased by an estimated 13 percent to 43000 tons in 2017, versus the world's total reserves of in response to increased lithium demand for battery applications, according to the January 2018 study. Identified lithium resources in Zimbabwe amounted to 500 000 metric tons.

"Owing to continuing exploration, lithium resources have increased substantially worldwide and total more than 53 million tons," according to commodity specialist Brian Jaskula, who compiled the report.

The lithium-ion batteries needed to power new-generation electric cars use lithium carbonate or lithium hydroxide. By comparison, they have the edge over conventional ones such as the lead-acid batteries, which are considered to be much heavier and some of the worst pollutants of the environment.

Goldman Sachs analysts have projected the lithium market would triple in size by 2025. At the same time, the spot prices of lithium hydroxide in China soared to an average of \$14 000 metric tons, while lithium carbonate climbed to \$11 719 metric tons in January 2018, from \$4 350 metric tons in 2010.



Ten mines that Zimbabwe should urgently revive

By Justice Zhou

Resource-rich Zimbabwe is home to a whopping 800 mines, some of which were shut down or placed under care and maintenance in the past two decades, for various reasons.

These include a fall in the global prices of minerals, unfavorable economic conditions, hostile indigenization laws, operational costs and steep tax rates among other problems. However, as the new government seeks to lure investors, it has relaxed indigenisation and local empowerment laws, exempting all minerals, except diamonds and platinum, from mandatory ceding of a 51 percent to locals.

Previously wary investors appear to have been charmed by the friendlier policy stance and are starting to show interest in grabbing mining and exploration opportunities. A sharp recovery in global commodity prices and the rising demand for minerals that are pivotal in the development of "clean fuels" technology, needed to reduce carbon footprints, has prompted the government to embark on a priority programme in which it seeks partners looking for higher returns to invest in the revival of a number of mines that are of strategic economic importance.

Below, Mining Zimbabwe takes you through some ten mines that could offer higher returns if revived.

10. Sabi Gold Mine

Although the mine is slowly getting back on track after it was placed under judicial management, following the suspension of operations in 2014, there's no doubt that it still faces debt problems and also needs a massive cash injection to ramp up operations. Located in Zvishavane in the Midlands, Sabi mine claims were first pegged in the 1890 with the first recorded production in 1909. It was acquired by ZMDC in 1984. ZMDC owns 100 percent of Kimberworth Investments (Pvt) Ltd trading as Sabi Gold Mine, a company currently running the mine. It operates one rectangular double compartment shaft reaching down to 15 metres below a 12 level elevation. The principal mining method is underhand stopping, while it has a capacity to treat 450 tons of ore per day. With bullion prices showing signs of robust recovery, this could be a good bet for investors.

9. Jena Gold Mines

Located in Silobela, 60 km outside Kwekwe, central Zimbabwe, Jena mines

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Ten mines that Zimbabwe should urgently revive

was first pegged in 1979, was later acquired by state mining company, the Zimbabwe Mining Development Corporation or ZMDC in 1984. It operates a multi shaft system. The mine has a capacity to treat 450 tons of ore per day. The mine employs underhand benching long-hole open-stopping and shrink stopping mining methods. With bullion prices showing signs of robust recovery, this could be a good bet for investors. The government is reportedly looking for funds to recapitalize the mine, which had remained operational yet under care and maintenance due to financial problems.

8. Elvington Gold Mine

Elvington Gold Mine, about 100 km west of the capital Harare, is also 100 percent owned by ZMDC. The mine suspended operations in 2003 due to the collapse of one of its main shafts. The mine is on care and maintenance. Currently the mine is involved in dump retreatment while preparing for resuscitation of underground operations. The aim of the sand treatment project is to see whether it is feasible to leach the sands. Elvington used to produce 45kg's of Gold per month before the shaft incident. According to reports, the collapse of the mine in 2004 saw ore reserves at the mine shrink from a high of 1,3 million to 340 000 tons, with recommendations there is need for extensive exploration to be carried out. According to ZMDC, further exploration to find out whether there are reserves left at the mine will justify the need for underground mining.

7. Shabanie Mine

Shabanie Mine, located in Zvishavane in the Midlands province, used to be one of the biggest employers with

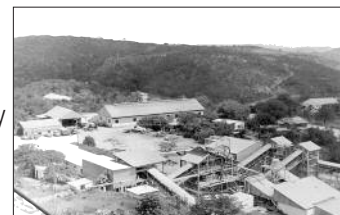


over 2 000 workers, but was shut down closed in 2004, due to low demand of white asbestos. Government has reportedly found an investor for the revival of one of the oldest mines in the country, although the details are sketchy, with planned electricity reconnection at the mine in preparation for its revival. Shabanie Mashaba Mine Holdings, the owner of the mine, has started renewing contracts for its employees, amid reports suggesting that the new government is keen to see to put the

asbestos giant back in operation.

6. Kamativi Tin Mines

Kamativi Tine Mines, a wholly owned subsidiary of Zimbabwe Mining



Development Corporation, closed operations in 1994 after 58 years of operation. The closure of the mine was prompted by the fall of the price of tin, the state miner has said. In its heyday, it produced tin and other by-products including tantalite niobium and lithium minerals. Kamativi mine is having renewed interest because of the firming tin prices and the large suite of minerals associated with tin. ZMDC intends to resuscitate Kamativi in the near future. Recent explorations at the site indicated that that there were, in fact, more deposits of lithium at the mine than tin itself, with plans now afoot to dig for the so-called "white petroleum", which is vital in new-general tech gadgets and electric cars.

5. Bikita Mine

The mine is located in southern Zimbabwe in province, about 80 km east of Masvingo town. Reports suggest the ZMDC will soon start mining its lithium deposits in Bikita, on the back of firming demand for the mineral on the global market. It is one of the largest lithium mines in Zimbabwe. It is home to reserves amounting to 10.8 million tons of lithium ore grading 1.4% lithium thus resulting in 0.15 million tons of lithium. The state is reportedly planning to start mining lithium deposits at Bikita, on the back of firming demand for the mineral on the global markets.

4. Sanyati Copper Mine

Located in Kadoma District, Mashonaland West, Zimbabwe located about 92 km NW of Kadoma on the



Sanyati River, and 200km W of Harare, Zimbabwe's three copper mines, namely Sanyati Mine and Alaska Copper mines, Mhangura Copper Mines and Lomagundi Mines are owned by the state miner. They were mothballed due to a slump in copper

Ten mines that Zimbabwe should urgently revive

prices and an unfavourable economic and policy environment. However, Sanyati Copper Mine is reported to be having better prospects than, for example, Mhangura mine, which previously had major operations but was later closed in 2000. Feasibility studies and further exploration indicated the former had larger deposits of the mineral, according to state media reports. Efforts are said to be at an advanced stage to revive the mine in the near future. The state miner is allegedly scouting for \$500 million required to revive its three copper mines together with a new smelter and refinery.

3. Sandawanda Mine

Sandawana Mine is located nearly 100 km south of Zvishavane town in the Mberengwa district in the southern part of Zimbabwe. Emeralds were first discovered in 1955 at Sandawana. The mine was controlled by Gemstone Resources Limited, a British owned company following a sale from Rio Tinto Zimbabwe in 1992, but it has since been acquired by ZMDC. Sandawana hosts part of the Mweza Greenstone Belt and has great potential for emeralds, gold, tantalite, beryl, iron ore, silver, niobium, lithium, chrome, tin and slate. It consists of a number of emerald deposits including Ceres, Athene, Eros, Marmaid, Junc, Zeus, Atom, Plato, and Vulcan among others. Emerald occurrences are situated in a contact zone of pegmatite and tremolite schist along the southern slope of Mweza. Sandawana has been a major producer of emeralds for 40 years, until operations were suspended in 2011, with loss of traditional markets being cited.



2. Lynx Mine

The Karoi-based graphite mine, a joint venture firm between (ZMDC) and Graphit Kropfmhul GmbH of Germany, is under care and maintenance. Production was discontinued in September 2017, with lack of capital being cited. It was recently reported by the state media that that Lynx Mine was negotiating with potential investors to secure long-term production.

1. R.H.A. Tungsten Mine



The mine is located 270km south of Bulawayo, Zimbabwe's second biggest city, and is owned by AIM-listed Premier African Minerals. Operations at the mine were suspended in January as the company said it was negotiating with a state empowerment company on a new funding model after the indigenisation law was relaxed by the new government. Premier says it has completed 1,302 metres of drilling to date with assay results awaited. The group has also embarked on an independent conceptual study with a view to establishing a code compliant resource and an early assessment of the potential to bring the mine back into production. The company has a diverse portfolio of projects, which include tungsten, rare earth elements, lithium and tantalum in Zimbabwe, encompassing brownfield projects with near-term production potential to grass-roots exploration.



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underground simulator modules for Sandvik, Atlas Copco, Zephir and Caterpillar equipment, including some machines which are tele-remote" Anthony Bruce says.



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Australian law firm says Zimbabwe mining sector ripe for foreign investors

By Justice Zhou

Zimbabwe's mining sector is now looking positive for Australian and other foreign investors after the new president Emmerson Mnangagwa was appointed about three months ago, an Australian law firm said this month.

Hopgood Ganim Lawyers, a full-service commercial law firm and advisory which also houses one of Australia's largest family law practices, said the repeal of the controversial indigenisation and other restrictive mining laws was good for Australian and other foreign investors.

Moves to amend the Mines and Minerals Amendment Bill signified Zimbabwe was making strides in bringing about real changes to regulation to encourage investment, increasing transparency and accountability, the firm said.

"In the past, Zimbabwe has scared away investors with its challenging regulatory framework, high taxes, indigenisation policy and political turmoil, according to a report by Josh Hunt, Nino Odorisio and Michelle Muscillo, partners at Hopgood Ganim Lawyers.

"However, with the largest concentration of mineral deposits in the world, Zimbabwe hosts a range of opportunities for mining proponents." Zimbabwe's 51 percent indigenisation policy now only applies to diamond and platinum mines, while all other types of mining and sectors are open to investors regardless of nationality, overturning a long-

standing policy of former president Robert Mugabe.

In addition, the government has reduced royalties for platinum miners, from 10 percent to 2.5 percent and has deferred a 15 percent levy on raw platinum exports to January next year.

The company says the mining sector in Zimbabwe remains lucrative, despite the outdated regulatory framework. It cited Ontario-based Caledonia Mining, whose Blanket Gold Mine hit record production, rising to \$18.2 million in the third quarter of this year, from \$17.2 million generated in the same period last year, and now planning to further expand the mine.

It also noted a report 2017 report by the Chamber of Mines of Zimbabwe, which says 90 percent of mining executives and investors are optimistic that the new administration will resolve legislative and policy bottlenecks affecting the mining industry, forecasting a positive economic growth outlook for the country.

'All of the twelve measured indicators in the report recorded improvements for 2018, compared to those recorded for 2017. Only 2 variables, political risk and access to capital, remained in negative territory. However, they also recorded improvements for the comparable periods," it added.

According to the finance ministry figures, mining accounted for 60 percent of total exports in 2016, making it Zimbabwe's largest earner of foreign currency.

Some of the policy changes which the

firm alerted to investors include a "use it or lose it" policy, which will prevent miners from holding land without conducting operations on and incurring expenditure in relation to the land, strengthening environmental provisions including making riverbed mining an offence. In addition to that, there is establishment of a cadastre system which provides a public rights of access to information on mining licences, the declaration of strategic minerals whose exploration and extraction will follow special rules, and the creation of a mining rehabilitation fund.

Zimbabwe has also announced plans to build a \$200 million platinum refinery next year in a joint venture with Australia's Kelltech Ltd.

"The government's investment in domestic processing and beneficiation provides opportunities for Australian companies to share technology and capabilities," the law firm said.

"This year also saw the first battery grade lithium produced in South Africa by Prospect Resources from petalite rich ores mined from its Arcadia mine in Kwekwe, Zimbabwe. Prospect has produced battery grade lithium carbonate with purity of 99.5% and has reported that its pilot plant should be commission at the end of 2017. The plant is expected to produce 100kg of lithium carbonate."

MonaChrome resumes operations



Selous based chrome smelting company, MonaChrome Private Limited has resumed its operations and seeks to develop systematic underground mining after a longtime of shut down of the company.

Monachrome judicial manager of Fairvalue Management Consultancy Christopher Maswi said priority was to execute Research and Development studies with the target to develop feasible and sustainable operations.

The full scale revival has been anchored on the payment of \$4 million to its creditors by the new German investor, NK Trading after a scheme of arrangement had been approved.

"Priority was to execute R and D studies with the target to develop a feasible and sustainable underground chrome smelting system as a base for sustainable and systematic underground mining to create a long term foundation for profitable chrome smelting operation and export of chrome ore.

"An underground mining system has been designed, manufactured and put into test operation," said Mr Maswi.

He said the new mining underground system has successfully run through field tests with about 4 000 tonnes of chrome mined. The mining system and respective mining logistics are currently being improved and adopted in accordance with the gained field test results.

Mr Maswi said the maturity will be reached soon and the introduction will follow in due course. Monachrome has started to clean up and make operational its Selous based plant site.

He said refurbishment of the smelter unit is in progress and the plant is planned to be operational later this year. During field test phase approximately 60 miners and workers were employed temporarily. The chrome smelter intends to have a multiple of mining systems in operation later this year with respective employment created.

"An underground mining system has been designed, manufactured and put into test operation," said Mr Maswi.

After initial substantial investment in R and D, Monachrome is now gradually developing its resources. Creditors of the company in 2015 accepted a \$4,5 million bid from the German investor ,NK

Trading. Prior to the approval of NK Trading, two local investors had formally submitted bids worth about \$4,3 million each for the acquisition of the company and this saved the company from the jaws of liquidation.

The lifting of ban on the export of chrome is expected to go a long way in ensuring viability of MonaChrome. Mr Maswi said the lifting of the raw export ban by Government and the current rise in chrome prices presents a huge opportunity to mine chrome, export and build working capital to fund plant restart.

In light of the company's future, the judicial manager has managed to secure a five year lease which is expiring in 2019 and is renewable. MonaChrome was formed in 2008 when it was initially registered as a shelf company under the name Monawood Trading (Pvt) Ltd. In July 2009 it was registered by the Zimbabwe Investment Authority in accordance with the ZIA Act (Chapter 14:03), under investment license number 000521.

MonaChrome smelter produces an average of 36 tonnes of ferrochrome per day which converts to 12,600 tonnes of ferrochrome per annum.

There have not been significant changes in terms of chrome industry and three out of nine smelters are running Zimbabwe that is Afrochine, Xin Yu and Jin An. Zimasco, Olikan, MonaChrome, ZimAlloys, Maranatha and Wel Mine are not running and the reason for closure was mainly based on market price concerns.

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Efficient fencing that lasts: BONNOX supplies just what you need –quick as a flash

by Du Preez de Villiers



Whether you order lightly galvanised or fully galvanised wire fencing from Bonnox, the quality and workmanship is excellent .

With Bonnox , you score between the posts !

Bonnox is well renowned for their quality and fully galvanised fencing.

Already, many farmers are aware of Bonnox's range of fine products: The "Money Saver", "Close Mesh", "Kombi Fence", "Square Mesh", "Multi Fence" and "Flexi Fence" were all meticulously designed to provide for every possible need. But what sets a manufacturer apart from the rest, is the ability to promptly observe and react to new trends and needs in the market.

The prefabricated fencing market in Africa currently needs a product which is inexpensive, as farmers are currently required to be thrifty with their

money. Therefore, Bonnox decided to introduce their "Economy" range. The only difference between this fencing and their existing "Elite" range, is that it is lightly galvanised instead of fully galvanised. Now a farmer can compare "apples with apples" when comparing Bonnox with competitors' fencing products.

"There are lightly galvanised wire fences on the market, but many of our clients ask for it under the Bonnox brand name," says Anita Gent, Director of Bonnox. "We therefore decided to also manufacture an economical version of the nine most popular products in our range of seventy products. This includes the "Money Saver", "Close



With their new 'Economy' range, Bonnox found a balance between costs and quality.

Mesh" and "Multi Fence" ranges of 1,2m, 1,8m and 2,4 m. This offers the farmer an inexpensive solution of fencing for his stock, small and large game.

In areas where the effects of the elements are not very harsh on wire fencing, this inexpensive Bonnox will still last for many years, but fully galvanised Bonnox is still recommended for areas where the elements affect fences more severely.

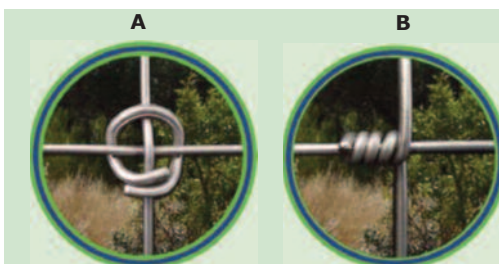
As the "Elite" and "Economy" ranges look exactly the same, the labels on the existing "Elite" range are green while those on the economical range are royal blue. The price of the economical range is only 75% of the price for the existing range, but it is still being manufactured with the same Bonnox meticulousness and care. The wire still being from the same supplier.

Skip the middleman

"Any farmer can order our products directly from our factory in Sunderland Ridge, south of Pretoria, to simplify logistics and cut costs. This also means that the farmer can gain the best advice and support directly from the manufacturer," Anita says.

Bonnox makes sure that there is minimal or no lead time at the factory. Bonnox keeps stock of approximately 70 different fencing varieties to suit every customer's requirements. Bonnox is continuously looking for ways to accommodate the farmer.

"For every ten rolls of fencing a farmer buys, he gets one free," she says. "On top of that, we offer a 25% discount. Bonnox also provides erecting equipment at competitive prices which makes fence erection a simple matter.



Two of Bonnox's innovative prefabricated fencing designs are the (A) Ringlok® for sloping or uneven gradients and (B) Hingejoint® for the remainder of the fencing range.

Contact Bonnox's friendly sales team to discuss your fencing needs. Their numbers are 076-169-9068 or + 27 012-666-8717. You may also send them an e-mail to gerda@bonnox.co.za or linda@bonnox.co.za or zane@bonnox.co.za, or visit their website at www.bonnox.co.za.

Young Zimbabwean Engineer Shines at an International Explosives Conference



Moshen Exchanging notes with one of the attendees

A Zimbabwean Explosives Engineer, made history in San Antonio by becoming the only African and first Zimbabwean Engineer to present at this year's prestigious International Society of Explosives Engineer (ISEE) conference. Moshen Jena, was one of the keynote presenters at the recently held International Society of Explosives Engineers 44th Annual conference on Explosives and Blasting held in San Antonio, Texas, USA. The conference was held from the 28th to the 31st of January, 2018. More than 1700 experts in the field of explosives engineering attended the conference which is the largest of its kind in the field of explosives engineering in the world.

The conference brings together blasters, engineers, manufactures, researchers, academia, government officials and industry leaders. A total of 90 papers were presented during the Technical sessions showcasing the latest technological advances in the field of explosives engineering. The conference provides a forum for the discussion of practical and technical information as

well as presentation of the latest discoveries in the commercial explosives industry worldwide.

Moshen presented a paper entitled 'The application of underground bulk explosives in polyethylene pipes for perimeter control'. The paper was basically a case study of the system for a period of four years at a platinum mine in Zimbabwe where the system has been



successfully implemented. The paper was presented on the 30th of January in session 7-Underground blasting.

In his paper, Moshen focussed on a system of perimeter control which originated in Zimbabwe and now becoming a standard as more and more mines are adopting the technique as a cost effective way of controlling the perimeter walls. This system of perimeter control uses Underground Bulk System technology (emulsion explosives) placed in specially formulated Polyethylene pipe

to decouple the bulk explosives.

The effectiveness of this method was evaluated using information obtained during routine blast audits and data supplied by the mines on half cast factors, over break and under break as well as analysis of data from Ground Penetrating Radar (GPR) Scans over a period of four years.

This method of perimeter control, has given the platinum miners in Zimbabwe a competitive edge in cost effective perimeter charging and blasting by simplifying the previously costly deployment of traditional barrels and other decoupled cartridges. The method has been adopted by all the platinum mines in Zimbabwe as it has proven to be a cost effective alternative of controlling the perimeter walls, along with other key benefits that relate to safety, productivity and effectiveness.

It was battle royal, as the young Engineer who turned 34 in January, shared the stage with other veteran international presenters from all over the world. When his time came, Moshen dazzled the attendees with his eloquence, expressiveness and knowledge of blasting science.

Moshen Jena went to St Faith High School in Rusape for his secondary education and studied Mining Engineering at the university of Zimbabwe. Currently he works for AEL Mining Services, a leading explosives manufacturing company as an Explosives Engineer.

Other notable presentations were from

Young Zimbabwean Engineer Shines at an International Explosives Conference



Explosives Engineer, Moshen Jena Presenting at the ISEE 44th Annual Conference

from the opening Speaker and astronaut Mike Mullane who delivered a powerful message on an employee's role in keeping themselves and their teams safe in hazardous environments during his talk entitled, "Countdown to Safety." He used the space shuttle Challenger disaster to define this term, its safety consequences and how individuals and teams can defend themselves from the phenomenon. Ryan Brogden, a Principal Inspector of Explosives for the Department of Natural Resources and Mines in Queensland, Australia who also presented learnings from the Ammonium Nitrate Vehicle explosion that occurred at Angellara Creek. He was the lead investigator into the Angellara Creek Ammonium Nitrate vehicle explosion and now leads the National Working Party implementing the recommendations from the incident.

Besides the Technical papers that were presented, the attendees were taken through training on different technological advances in explosives and blasting industry and also had an opportunity to see exhibitions from the leading manufacturers and service providers in the explosives industry. In summary, the conference was indeed an opportunity to learn, connect and exchange experiences from the different parts of the world.

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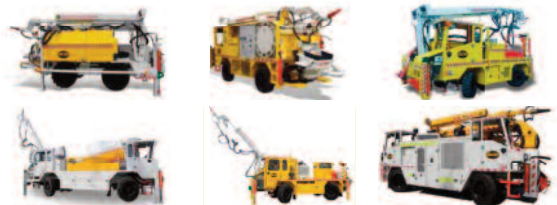
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Open Letter to the President for the Recognition of Diamond Cutting and Polishing Students.



A diamond cutting student at work

On behalf of the 25 Diamond Cutting and Polishing students from the Zimbabwe School of Mines Students we are writing this letter to raise our concerns about our Diamond Cutting and Polishing Program which was started by a company in Partnership with Zimbabwe School of Mines.

The program was set out under the ZIMASSET aim of value addition and beneficiation and 25 students were sent to China to study Diamond Cutting and Polishing process in order to help our country in processing its own Diamonds.

It is with great concern and discomfort that we have discovered Zimbabwe is going to send Diamond rough to Botswana for processing even though we are equipped with these skillsets and are currently unemployed. Due to our lack of experience it is difficult to get employment elsewhere thus we look to you the facilitators (the Government) for the opportunity to prove our worth and be integrated into the industry.

According to the plan and contracts given to us after completing this program, both the company and the government had promised to give us jobs after the study, helping us start our careers in the industry and utilize our skills. But however since the return of these students in June 2017 nothing has been done to assure us of these jobs and no communication has been made between the school, company or government and the students. This has more than raised

concerns and panic among us students who are left with uncertainty about their future. All of us having our own stories to tell, one thing was unanimous that we all were given the assurance that this was a step in the right direction Career wise and that we were going to be pioneers of this promising industry.

As a group we are kindly asking for recognition from the government in regards to the skills that we acquired from the Major Diamond Cutting and Polishing player that is China and we believe that our talent, determination and hunger to do what we know best are key in helping with the development of our Country if given a chance to show our skills. We are quality-oriented recent college graduates and managed to accrue nearly a year of work experience with on the job training at Chow Tai Fook (Pvt) Ltd Diamond Factory, one of the largest diamond Companies in China.

So we we'd like to claim this opportunity that has come in front of us and offer our services to the new initiative, whether the diamonds get polished locally or outside but we want to be a part of this. Therefore, make us part of the system we want to work with you on a tangible way forward.

We look forward to a favourable response from you.

Diamond Cutting and Polishing Graduates

Zimbabwe Mining Law

The below are some of the important pieces of legislation that govern Zimbabwe mining operations.

As Zimbabwe turns a new leaf and new investors make their way into the country below are some of the important pieces of legislation that govern mining operations. Anyone involved in mining in Zimbabwe should be familiar with the provisions of these pieces of legislation as they detail the obligations of holders of mining locations.

- Mines and Minerals Act Chapter 21:05
- Explosives Regulations
- Mining (General) Regulations
- Mining (Managements and Safety) Regulations
- Mining (Health and Sanitation) Regulations
- Mines and Minerals (Custom Milling Plants) Regulations
- Gold Trade Act
- Precious Stones Trade Act
- Environmental Management Act
- Environmental Regulations
- Forestry Act
- Water Act
- Zimbabwe National Water Authority Act

There are other pieces of legislation that impinge on the operation of commercial ventures such as the Companies Act, the Sales Tax Act, Exchange Control Act and others that mining companies as commercial activities need to comply with. (Hard copies of all pieces of legislation may be purchased from the Printflow).

PROSPECTING, EXPLORATION AND MINING TITLES

The Mines and Minerals Act Chapter 21:05 is the law for the mining industry in Zimbabwe. There are other Acts and



Regulations that draw their existence from this Mines and Minerals Act. The Act has been acknowledged as a good piece of legislation by both local and international investors. Given recent developments in the SADC region there is a growing need to refine the Act so that it continues to provide a competitive operating framework for investors. The government is in the process of amending the Mines and Minerals Act to provide stronger environmental provision in line with the Environmental Management Act that came into force in 2007. The amendments are also intended to:

- Simplify the Mines and Minerals Act
- Provide for a computerised cadastre unit to manage mining titles

Mineral resources are vested in the President of the Republic of Zimbabwe. This provision conforms to the international norm where resources are held by the state on behalf of the people of the country. One acquires the right to search for and work the resources by obtaining licences. These licences are applied for through the Mining Commissioner from the mining district in which the resource is located.

PROVISIONS IN CURRENT MINES AND MINERALS ACT

Rights to minerals

The dominion in the right of searching and mining for and disposing of all minerals, mineral oils and natural gases is vested in the President. Any person of 18 years of age or older who is a permanent resident of Zimbabwe or his agent may acquire one or more prospecting licences on payment of the appropriate fee. The licence to acquired is valid for 24 months. Any person may make written application to the Mining Affairs Board for authority to prospect on reserved ground

Exploration and Prospecting:

Three types of titles are available for searching for minerals. These are Exclusive Prospecting Licence, Special Grant and Prospecting Licence.

Land open to prospecting

All State Land and Communal Land. All private land to which there has been reserved, either to the British South African Company or to the Government of Zimbabwe, the right to all minerals or power to make grants of the right to prospecting of minerals. All land held by any person under enactment or agreement whereby such person is entitled to obtain from the State title thereto on the fulfilment by him the conditions prescribed by such enactment.

Prospecting Licence:

Any person above the age of 18 years may apply for a prospecting licence. The licence provides the right to search for minerals and peg claims. There two types of prospecting licences the Ordinary Prospecting Licence and the Special Prospecting Licence.

Exclusive Prospecting Orders (EPO):

Any person may make written application to the Board for an EPO in his/her favour over any defined area in Zimbabwe, including any area reserved from prospecting. On application the applicant shall pay a deposit, as gazetted from time to time (Contact to Geological Survey of Zimbabwe). If the Board is satisfied that the applicant is a fit and proper person to obtain the order and is of adequate financial standing to undertake the operations under the order; and that it would not be against the national interest to make such an order, then the Board may recommend to the Minister to make the EPO in favour of the applicant.

Zimbabwe Mining Law

exceeding three years but an order may be extended by the Minister on recommendation by the Board for a further period not exceeding three years in all.

The rights granted under an order shall be personal to the authorised holder who may not cede or assign any such rights to another person. The Minister may, on the recommendation of the Mining Affairs Board and with the consent of the concession holder, which consent shall not be unreasonably withheld, authorise any person to peg and register for a mineral other than a mineral for which the concession holder is authorised to prospect.

Every concession holder shall submit for the approval of the Board, a programme of work containing particulars of the intended prospecting operations and their costs.

The concession holder shall carry out the approved programme and submit to the Board a report of the work carried out during the period covered by the programme including expenditure incurred. If the concession holder fails to submit the report, he/she is notified in writing by the Board that his/her order is liable to be revoked. If no report is received within 21 days of such notification then the Minister shall revoke the order.

Special Grant (under Part XIX of the Mines and Minerals Act):

This title provides the holder with the right to prospect for minerals in an area reserved against prospecting and

pegging of claims. The title provides the duration of validity of the right to prospect and peg and the terms and conditions under which title will operate. The Secretary for Mines issues the Special Grant.

Titles for mine development and mining:

The titles available for mine development and mining include Mining claim (normally registered as a block of claims), mining lease, Special Grant and Special Mining Lease.

Mining leases:

The holder of a mining location or contiguous registered mining locations may make written application to the mining commissioner for the issue to him of a mining lease in respect of a defined area within which such locations are situated. The holder of a mining lease has the exclusive right of mining any deposit or mineral that occurs within the vertical limits of his lease.

Special mining leases:

The holder of one or more contiguous mining locations who intends to establish or develop a mine thereon and investment in the mine will be wholly or mainly in foreign currency and will exceed US\$100 million in value, and the mine's output is mainly intended primarily for export, may apply in writing to the mining commissioner for a special mining lease of a defined area within which his mining locations are situated.

The board may permit a person to make

an application notwithstanding that either or both the criteria mentioned above will not be met, if the Board considers that it is desirable in the interest of the development of Zimbabwe's mineral resources.

Having received the application the Board shall forward it to the Minister together with their recommendations. The Minister shall submit them to the President together with his own recommendation for the President's approval.

Special grant:

The Secretary may issue to any person a special grant to carry out mining of coal, minerals oils or natural gas.

Mining Claims:

A holder of a prospecting licence may peg claims and register the claims for the purpose of mining. The maximum size of the each precious metal block of claims is 500m X 200m. This constitutes a block of 10 claims. Base metal claims pegged by a holder of an ordinary prospecting licence may not be more than 25 claims and each claim shall not exceed one hectare in extent. The length of any straight line between any two points may not exceed 250m. Base metals pegged by a holder of a special prospecting licence may not exceed 150 claims and each claim may not exceed one hectare in extent. The length of any straight line between any two points may not exceed 2000m.

Mining rights

Priority of acquisition of title to any location, reef or deposit, if such title has been fully maintained, shall in every case determine the rights as between the various peggers of mining locations as the aforesaid and in cases of dispute the rule shall be followed that, in the event of any rights of any subsequent pegger conflicting with the rights of a prior pegger, then, to the extent to which such rights conflict, the rights of any subsequent pegger shall be subordinate to those of the prior pegger.

Preservation of mining rights

The holder of any block of base mineral, reef or placer deposit claims registered as precious metal or of any mining lease shall, within six weeks of registration, apply to the mining commissioner for and obtain a certificate of inspection in respect of work executed on the mining location. The Secretary may authorise a mining commissioner to grant a protection certificate in respect of any block of reef or placer deposit claims.

Alluvial, eluvial, rubble deposit, dumps and precious metal blocks: The holder of such blocks shall continuously work his claims from the date of registration of such blocks and shall pay to the mining commissioner annually in advance the prescribed fee in respect of such blocks.

Working other designated mineral deposits:

The minister may, by statutory instrument, declare any mineral to be a designated mineral for the purpose of the control of working such a mineral and may revoke in like manner any such mineral.

Other entry points into mining:

There are various entry points into mining. One may elect to start the process from prospecting stage until mining, while others may elect to enter into agreements to acquire mining locations owned by others. The later entry points are detailed below.

Transfers:

When any registered mining location or any interest therein is sold or otherwise alienated, the seller or person who so alienates shall notify the commissioner of the transaction within 60 days of the date of transaction. The seller shall provide the following information to the Mining Commissioner:

- The name of the person to whom such location or interest is sold or otherwise alienated
- The amount of the valuable consideration, if any, agreed upon, the date of the transaction.
- The agreement should be registered with the mining commissioner.

A transfer duty is payable by the purchaser on the sell at a fee prescribed by parliament. This duty should be paid within six months. If payment is partly in cash and partly in shares of a company, the nominal value of the shares shall be used. In the case where payment is contingent upon some future event the purchaser shall give security to the satisfaction of the Mining Commissioner that he will pay the transfer duty at a fixed rate when the consideration becomes due.

No transfer is possible if:

The mining location is liable for

forfeiture or under attachment

Duties, fees, royalties, rentals and other payments in respect of the mining location are outstanding with the Mining Commissioner's office.

There are outstanding payments due to the Rural District Council Transfers can only be made to permanent residents of Zimbabwe. In the case where transfer is to be made to non-residents the Mining Commissioner has to receive assurance from Reserve Bank of Zimbabwe that all exchange Control requirements have been fully complied with.

On receipt of the fee the Mining Commissioner will then issue the new owner with a new certificate of registration.

Tributes:

If any holder of a registered mining location has agreed in writing to grant a tribute to any other person, the tributor may apply to the mining commissioner for the registration of a notarial deed embodying the terms of such agreement.

The holder of the mining location is to provide the following to the mining Commissioner:

- Names of parties to the agreement
- Name and registration number of the mining location
- Date upon which the rights conferred by the agreement will commence and expires.

If the agreement confers the tributor the option to exercise the right to purchase the location at a future date then the agreement will be registered as an option agreement.

Caledonia Mining Corporation Plc record quarterly and annual gold production at Blanket Mine



Steve Curtis - CEO Caledonia Mining

Caledonia Mining Corporation Plc announces record quarterly gold production from the Blanket Mine ("Blanket") in Zimbabwe for the quarter ended December 31, 2017 ("Q4 2017" or the "Quarter"). All production numbers are expressed on a 100 per cent basis and are based on mine production data and are therefore subject to adjustment following final assay at the refiners.

Approximately 16,425 ounces of gold were produced during the Quarter, a new quarterly production record for the mine. Production in the Quarter was 14 per cent higher than the previous quarter (Q3 2017) which was itself a record production quarter, and 21 per cent higher than the corresponding quarter of 2016 (Q4 2016).

Total 2017 gold production was approximately 56,135 ounces marginally ahead of 2017 production guidance of 54,000 – 56,000 ounces

Total 2017 gold production was approximately 56,135 ounces, marginally ahead of 2017 production guidance of 54,000 – 56,000 ounces. 2017 production represents a new annual

production record for the Blanket Mine, an increase of 11.4 per cent over the annual gold production in 2016.

Steve Curtis, Chief Executive Officer, said:

"We are very pleased to have achieved our full year production guidance for 2017 and to have delivered a second consecutive quarterly production record at Blanket for the fourth quarter of 2017, surpassing the previous production record set in the third quarter. Full year production of 56,135 ounces for 2017 is a significant achievement especially when considering the relatively slow production we experienced in the first half of the year. To finish the second half of the year with two quarterly production records and the production of almost 31,000

ounces of gold in the six month period is an achievement of which all of our technical and production staff should be justifiably proud and bodes well for the delivery of our expansion plans at Blanket as we continue to invest for the production of 80,000 ounces by 2021."

"As a business we remain steadfast in our commitment to the production of

safe profitable gold and I am pleased that the initiatives introduced during 2017 to focus on the safe production of gold have been adopted and fully supported by the Blanket work force."

"2017 was a pivotal year for Caledonia as we announced our plans to extend the current central shaft project deeper with the resulting extension in mine life at Blanket following the encouraging exploration results that were achieved during the year. This production achievement will set the business up well for 2018 as we target production of between 55,000 and 59,000 ounces of gold. I look forward to updating the market in due course."



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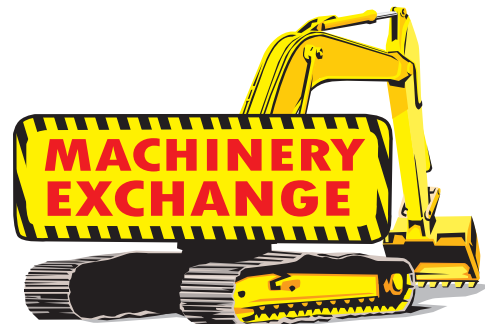
Model Code	ZW310-6
Engine Rated Power (kW) Power (kW)	232 kW (ISO14386 net)
Operating weight (kg)	24 140 – 24 590 kg
Bucket capacity (m ³) ISO Heaped	3.2 – 4.5 m ³
Breakout force (kN)*	183 – 223 kN
Tipping load, standard bucket, straight (ISO 14397)	19 000 – 19 510 kg
Tipping load, standard bucket, articulated (ISO 14397)	16 570 - 17 010 kg



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Machinery Exchange Hitachi Relaunch in Zimbabwe

Machinery Exchange successfully secured the dealership for the Hitachi equipment product range and is relaunching this full product range in Zimbabwe.

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Hitachi has been providing a multitude of industry customers, including mining, construction, quarry and forestry with reliable and high quality machinery and aftersales support solutions for decades.

Machinery Exchange is the premier company in Zimbabwe for the provision of general & component repairs, machine reconditioning & rebuilds, engineering repairs & fabrication, spare parts supply, servicing & maintenance and new machine

& truck sales to service the Earthmoving, Transport, Mining and Construction Industries.

Our Customer Support division is responsible for the after sales support of the full Hitachi equipment sold into the field. With an experienced and highly qualified team of Customer Support Technicians – their job is to ensure that all repairs, servicing and maintenance is carried out on time and to the right quality.

These technicians travel with fully equipped light vehicles and carry all their tooling with them so that they can carry out all necessary work on the client's site. The customer support division is also supported by larger field service vehicles which are able to provide mobile field support with built-in compressors, welding machines, generators etc.

Through the Customer Support Division, Machinery Exchange offers an on-site, or on-callout Maintenance Agreement for select customers, whereby we carry out all the servicing, repairs and maintenance of a fleet of equipment. The equipment does not necessarily have to be supplied by

Machinery Exchange. In addition to this service, we offer a trouble-shooting or diagnostics service for the full Hitachi Equipment range, as and when customers require. Our targets in the provision of the full service maintenance agreement are an 85% equipment availability, through disciplined service intervals, proactive inspections, timeous intervention and repairs. This allows the customer to focus on his business whilst we focus on keeping the equipment in good working order.

Machinery Exchange is based within a 9,400 square metre industrial property at no. 5 Martin Drive, Msasa Harare. This provides us with a solid base of support from which we can operate our 4 x business divisions and allows us to provide world class service to our customers.

"Our customer's success is our success"

Contact **MACHINERY EXCHANGE**
5A Martin Drive, Msasa
Harare, Zimbabwe
Tel: +263 (4) 486942

Closer Look: Doosan DA30-5 and DA40-5 articulated trucks



Doosan DA30-5 in action

Doosan's 28-metric-ton, 365-hp DA30-5 and 40-metric-ton, 490-hp DA40-5 are powered by fuel-efficient Scania DC9 and DC13 diesel engines, respectively. The trucks have been configured with a high-pressure common-rail (HPCR) fuel delivery system as well as cooled exhaust gas recirculation (CEGR). Selective catalytic reduction (SCR) using diesel exhaust fluid (DEF), and a diesel oxidation catalyst (DOC) reduce engine emission levels.

New to these models is a mass airflow sensor and exhaust brake, working in tandem to reduce emissions. The mass airflow sensor allows the electronic control unit to improve the management of airflow provided by the variable geometry turbocharger, and to optimize fuel delivery to the combustion chamber based on air intake volume and rpm. The exhaust brake helps to maintain consistent engine temperatures at lower engine speeds to improve operating efficiency. Consistent engine temperatures reduce harmful emission

levels in the exhaust when the engine is running at lower rpm. Under normal operation, with high rpm, the exhaust brake is inactive.

The new Doosan ADTs continue to feature a front-mounted turning ring, a sloping rear frame, tandem rear bogie and independent front suspension. The front-mounted turning ring helps keep all six wheels in permanent contact with the ground, even at a maximum turning angle. These ADTs are able to operate on very rough and soft terrain and are ideal for the mining and aggregate industry, commercial and residential site developments, and infrastructure projects.

A sloping rear frame lowers the centre of gravity for more equal weight distribution, and improved stability and safety when fully loaded. The sloping frame improves tractive effort, helps to minimize tire wear and lowers ground-bearing pressure. The independent front suspension improves operator comfort in

rough terrain and assists in maintaining ground contact.

The tandem rear bogie provides maximum ground contact in uneven terrain. Due to the tandem design, fewer points of power transfer mean less power loss and a more efficient driveline. Maintaining maximum ground contact and the best transfer of power to all wheels can result in reduced maintenance costs.

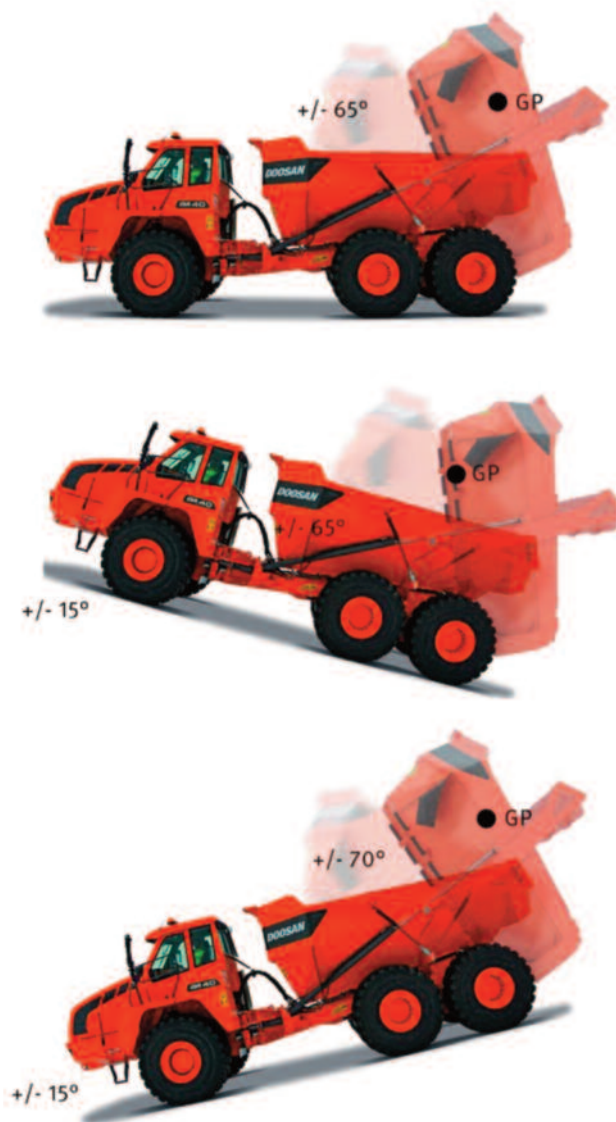
The DA30-5 and DA40-5 now come standard with a gradient meter. Two meter readings are visible on the LCD screen. Uphill/downhill is shown as a percentage, and sideways tilt is shown as a degree value.

DA30-5 and DA40-5 trucks have only three wear parts on the entire rear frame, and they are greased by the automatic lubrication system. It is managed by the vehicle control unit and greases the various sections of the truck only when required. If the grease reservoir is empty,

the transmission is limited to first or second gear only to prevent damage to the major components such as the turning ring and the tandem bogies.

Centre of Gravity Adjustment

This feature reacts to sticky material in the body during dumping. If the material starts pulling the hoist cylinders backward, the dumping speed is automatically slowed to allow uniform dumping flow and to minimize unstable conditions.



GP shows position of the gravity point when hydraulic flow will be reduced.



Free-Swinging Rear Tandem Bogie Suspension

The Doosan ADT's free-swinging gear-driven rear tandem bogie and special articulation system offer excellent performance and the best possible ground contact in soft and uneven terrain for maximum productivity. It also allows easy loading of the truck in almost all positions and applications.

Economic Minerals of Zimbabwe

GOLD



Gold mining and exploration in Zimbabwe has been going on from ancient times and it is estimated that a third (about 700 tonnes) of all historical gold production was mined locally from the seventh century until the introduction of mechanized mining methods with the arrival of Europeans about a century ago. There are over 4000 recorded gold deposits, nearly all of them located on ancient workings.

The occurrence of gold in Zimbabwe is mainly confined to hydrothermal vein and shear zone deposits found exclusively in rocks of the Basement Complex age formed 2400 million years or more ago. The only noteworthy production from outside the Zimbabwe craton has been Renco Mine, which is in ancient deformed, high-grade metamorphic rocks of the Archean age North Marginal Zone of the Limpopo Mobile Belt and a number of mines in the Proterozoic Piriwiri Group of metamorphosed argillaceous sedimentary rocks with minor volcanics. Some gold is also recovered as a by-product from copper deposits in the Deweras Group Sediments. The production of alluvial gold, present along all the major rivers draining the greenstone belts, has largely been the domain of illegal gold panners.

SILVER



It occurs as native silver in association with other minerals such as gold, copper and lead. With exception of the Osage Mine in Zimbabwe it is declared as a by products from the mining of platinum, gold and copper. Gold mines in the Odzi greenstone belt have the highest silver and gold ratios.

PLATINUM GROUP ELEMENTS



Platinum Group Metals (PGMs) consist of platinum, palladium, rhodium, ruthenium, iridium and osmium and have a high demand worldwide because of their wide variety of uses in industry. Zimbabwe's Great Dyke, a linear early Proterozoic layered mafic-ultramafic intrusion trending over 550km at a maximum width of about 11kilometres, has the second largest platinum reserves in the world after the Bushveld Complex in South Africa. An estimate of 2.8 billion tonnes PGM ore at 4g/t are estimated to lounge on the Dyke. Notably, PGMs are mined as primary metals only in the Bushveld in South Africa and along the Great Dyke in Zimbabwe.

The occurrence of PGE mineralization in

the Great Dyke was recorded in the early 1920s. Following these documentations and the discovery of PGMs in the Merensky Reef of the Bushveld Complex of South Africa, there was a boom in PGM prospecting between 1925 and 1926 that resulted in the discovery of Wedza Mine. Since the 1950s, several companies have undertaken exploration. Currently platinum exploration on the Great Dyke has been carried out by CAMEC (Todal Mining) in the Bougai section in Shurugwi, and Global Platinum Resources in Chegutu.

Mining is currently being carried out at Mimosa, Ngezi and Unki Platinum Mines. Mining operations ceased at Hartley Platinum Mine in 2000, because of bad ground conditions. Demand for PGMs has seen an increase in exploration and evaluation of Zimbabwe's platinum deposits.

Off the Great Dyke, the potential for PGM mineralization exists in the following areas

- Mashava Igneous Suite
- Bubi Greenstone Belt

DIAMONDS



Zimbabwe is located within an exceptionally rich diamondiferous metallogenic province. Large areas of the country are covered by the Archaean

Craton and the Archaean Limpopo Belt which are likely to have the best developed mantle root and diamond potential along with discoveries of the mineralized kimberlites on the Craton (Murowa, Sese, Colossus) and on the Limpopo Belt (River Ranch) which make Zimbabwe an excellent exploration target with potential for economic kimberlites. The diamond exploration success in the neighbouring Botswana and South Africa, the greatest producers of gem quality diamonds has made a positive impact on the diamond prospectivity of the country. More than 120 kimberlites have been discovered but economic grades occur in two deposits the River Ranch and the Murowa Diamond Mines. Currently evaluation is being carried out on several kimberlites in the southern area of the country while some were found to be non-commercial. Of late, the discovery of diamondiferous Proterozoic conglomerates in the Umkondo basin has led to the opening of several diamond mines within the Chiadzwa area, e.g. Mbada, Marange Resources, and Anjin etc.

CHROME



Zimbabwe has the 2nd largest high grade chromium ores in the world after South Africa with reserves of approximately 10 billion tonnes.

Chrome is mainly mined along the Great dyke of Zimbabwe and occurs as seam/stratiform deposits. In greenstone belts off the dyke it occurs as podiform structures in serpentinites, e.g. in Zimasco mine on Shurugwi Mashava. In Mashava chrome is found in greenstone

remnants in the Limpopo mobile belt south of Mberengwa. Chrome also occurs as alluvial deposits in the greenstone areas,

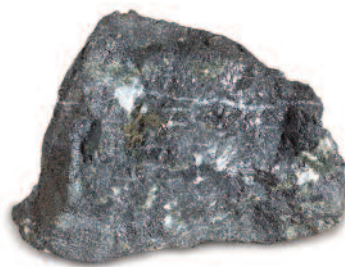
Giant crystals of up to 1.5m have been found on the dyke. Chrome is mainly used in stainless steel production, as a metal coat, in the chemical industry and in metallurgical processes.

COAL



Zimbabwe has vast high grade coal deposits occurring as fossilized carbon. It occurs in lower Karoo sediments. These are the middle Zambezi basin to the north and Save Limpopo basin in the south of the country hosts about 12 billion tonnes of good quality coal. About 29 coal localities are known but major producers are Hwange colliery and Makomo resources. The country's full potential is however yet to be exploited.

NICKEL



In Zimbabwe nickel occurs within the Archaean craton in rocks of komatiitic composition e.g. at Trojan mine. It also appears layered/unlayered mafic-ultramafic intrusive bodies e.g. Empress, Madziwa Great dyke. It's also found in nickel laterite e.g. northern part Great Dyke hydrothermal shear zone deposits. There are nickel deposits in several

serpentinite areas in greenstone belts with igneous complexes around the country. The country has got huge potential in komatiite and laterite and more than 30 nickel deposits are known. Currently production is at Trojan mine in Bindura.

ASBESTOS



Asbestos occurs as chrysotile. It's found in ultramafic complexes e.g. Mashava Igneous Complex, in massive serpentinites and slip fibre zones in which shears are filled with matted fibres in the Great dyke e.g. Ethel mine. There are 60 deposits scattered in the Masvingo, Insiza, Gwanda, Mberengwa, and Shurugwi, which have been worked on for chrysotile.

Zimbabwe was once the world's 3rd largest producer of asbestos before the demand declined. After gold asbestos was once largest income producer in the mining sector. Production ceased with the closure of Gaths Mine and Shabani Mine.

COAL BED METHANE

Coal bed methane is a gas intrinsically associated with coal. Coal is both a source and reservoir for methane gas occurrence in Zimbabwe. It mainly occurs in the middle Zambezi Basin e.g. in lupine concession. It's also found in the Save Limpopo basin e.g. Save Runde district.

Reserve is still a resources studies to ascertain if the gas could be exploited

Economic Minerals of Zimbabwe

commercially have not been concluded. Coal bed Methane is used for Electricity generation, Ammonia production for fertilizer and in Iron production.

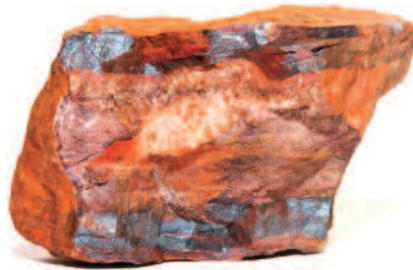
COPPER



There are over 70 known deposits in Zimbabwe that have produced copper either as a primary or secondary product. The main producing area has been the Magondi Basin in an area stretching for over 150km. Similar copper deposits are found in the south eastern part of the country in the Umkondo Basin. Several copper prospects also occur in hydrothermal deposits in Archaean Greenstone Belts and in granite e.g. Inyathi, Copper duke. Primary copper production virtually ceased following closure of Mhangura, now being produced as a by-product of other minerals e.g. PGM, Gold, Nickel.

IRON

Zimbabwe has huge iron deposits



associated with banded ironstone formations in greenstone belts. Major deposits are estimated to be over 30 billion tonnes of reserves. Magnetite deposit associated with Carbonatites e.g. Gungwa and Dorowa, Banded Iron Formation in Archaean Greenstone Belts, magnetite schists e.g. Chiredzi deposits (Mongula and Manyoka), layered Igneous complexes source of titanium and vanadium also e.g. Chuatsa Banded Iron Formation, Archaean Greenstone belts e.g. Kwekwe, Buhwa and oxidation of other minerals e.g. Ripple Creek Deposits with high grade ore are found in Buchwa and Ripple Creek. Significant ironstone deposits include the huge Mwanesi deposit west of Chivhu and Nyuni near Masvingo. Manyoka and Mongula and several similar deposits in the Limpopo Mobile belt are also important deposits.

PEGMATITE MINERALS

Pegmatites which are ubiquitous in several geological environments especially on the edges of greenstones and in metamorphic belts, are a source of a variety of minerals including tantalite,



tin and wolframite, beryl, mica, feldspar, and gemstones such as emerald, aquamarine, chrysoberyl, alexandrite and euclase.

DIMENSION STONES

Granites, gneisses, migmatites,



gabbro-norites, dolerite, marbles and quartzites, suitable for use as dimension stones are typical rocks belonging to Zimbabwe's geological environments. The most well-known dimension stone in Zimbabwe is black granite ubiquitous in the north-eastern part of the country which has attracted considerable foreign investors.

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