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ABOUT PUBLICATION

Mining Zimbabwe is the premier source of unfiltered Zimbabwe Mining News. Our core focus is the Zimbabwe 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's 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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CONTENT

Mining Zimbabwe Magazine | Issue 70

Warmest congratulations to the Association of Mine managers of Zimbabwe (AMMZ) on reaching a remarkable milestone - your 51st anniversary! This extraordinary achievement is a testament to your unwavering commitment and exceptional contribution to the mining industry in Zimbabwe.







Wishing a Happy 51st Anniversary to the AMMZ

06 Shine Mine Manager Shine

07 Eng Elton Gwatidzo AMMZ President's two-year review

08 AMMZ EXECUTIVE COUNCIL MEMBERS - 2-year reflection

12 Mineral Production sees year-on-year In-crease in Q1 2023

14 "Revolutionizing Mining: The Pivotal Role of Portable Toilets in Shaping a Sustainable, Inclusive, and Gender-Equal Future"

16 Yes Captain! Interview Fazilla Mukazi - Shift boss, (PROTO) brigade's person

20 Magna24 consultancy provides free mining software training at the School of Mines

22 ZSM defends the decision to incorporate Mandarin into the curriculum

24 Softening commodity prices, high cost of electricity, and taxes decrease profitability by 15%

26 The Chamber of Mines emphasises the need to promote local suppliers

28 The role of mine managers in fostering employee productivity and engagement

29 Implats cutting capital expenditure for some of its projects, including its Zimplats

30 Chasm Between Public Relations and Conflict Resolution in the Mining Sector

32 Challenges Faced by Ventilation Practitioners in Zimbabwe

34 Guano Mining: The Green Gold of Agriculture

36 Gambiza predicts lithium prices to surge in 2030

37 Muzarabani oil and gas: Preliminary wireline program completed

38 Student Creates Autonomous Locomotive to Improve Safety & Boost Productivity in Under-ground Mining

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Shine Mine Manager Shine!



Keith Sungiso

THE CLEAR PERSPECTIVE

In the world of Mining, efficiency, productivity, and safety are the topmost priorities. At the core of it all is an individual who plays a crucial role in ensuring that everything runs smoothly and efficiently - the Mine Manager.

This unsung hero, is responsible for supervising mining operations, coordinating with various departments, and leading a team of mine workers to extract and process valuable mineral resources from the Earth.

The importance of a mine manager and why they should shine in their role.

A Mine Manager is entrusted with the task of keeping workers safe and ensuring all operations comply with environmental and safety regulations. The mining sector is known for its potential hazards and risks, ranging from accidents due to cave-ins, explosions, harmful gases, and falls. Mine managers are trained to identify and mitigate risks, implement safety protocols, and provide proper training to workers.

Furthermore, a Mine Manager is crucial for achieving optimal productivity and efficiency. They are responsible for designing mining plans, setting goals, and allocating resources effectively. By strategically organizing tasks and implementing streamlined processes, Mine Managers can maximize the output of the mine while minimizing costs.

In addition to their technical and managerial skills, mine managers must also possess strong leadership qualities. They are responsible for motivating and inspiring their team, often working long hours in challenging conditions. In conclusion, mine managers are the backbone of successful mining operations.

To shine in their roles, Mine Managers must continually refine their technical skills, hone their leadership abilities, and adapt to ever-evolving industry standards. By doing so, they not only contribute to the growth and profitability of mining operations but also ensure the well-being of their team and the sustainability of the overall industry. ***Shine, mine manager, shine!*** Happy 51st Anniversary...

You can write to us or submit contributions on ***email: info@miningzimbabwe.com*** or *WhatsApp: +263 242 777728.*



Eng Elton Gwatidzo

AMMZ President's two year review



Engineer Elton Gwatidzo

Reflecting on your tenure as President of the Association of Mine Managers of Zimbabwe, what accomplishments are you most proud of?

We have managed to successfully unite mining professionals. This achievement has been accomplished through the implementation of regular quarterly visits and monthly meetings. This is evidenced by the remarkable attendance at the 2022 Conference. Additionally, we have re-branded the Association's website which has garnered international acclaim.

What were some of the main challenges you faced during your presidency, and how did you approach them?

Some of the challenges have been mainly in failing to achieve some goals of the Association such as getting finality to the Mining Regulations Review as well as getting affiliation to the Engineering Council of Zimbabwe. Continued engagement is the only way out.

How would you describe the state of the mining industry in Zimbabwe when you took on this role, and how has it evolved during your time as President?

The industry had been shrinking and shifting focus to small mining operations. Lithium mining and some investments in gold mining have been encouraging. More still needs to be done in exploration to increase potential.

Can you share any specific initiatives or policies you implemented to promote growth and sustainability in the mining sector?

Continual and regular quarterly technical visits which brought major stakeholders together partnering and sponsoring some activities in the academic areas of mining.

In your opinion, what are the biggest opportunities and potential areas for improvement in Zimbabwe's mining industry going forward?

Exploration, policy consistency, promotion of Chinese-local cooperation

How have you worked to strengthen relationships between the Association of Mine Managers of Zimbabwe and other key stakeholders such as government agencies, mining companies, and local communities?

Through Technical visits, we have continually invited and partnered with the Ministry of Mines and other key stake-holders. By fostering partnerships and creating a platform for dialogue, we were able to address some of the concerns facing the industry and implement strategies to navigate the economic down-turn. I have also encouraged and supported my team responsible for collaboration to continually engage partners

As the outgoing President, what advice would you give to your successor to effectively lead the association and drive positive change in the industry?



· positivity and continued networking

· deliberate engagement with key stake-holders

Can you discuss any significant partnerships or collaborations you facilitated during your tenure that have had a lasting impact on the mining sector?

I had the opportunity to forge several significant partnerships and collaborations that have had a lasting impact on the mining sector. These partnerships allowed us to gain firsthand access to the operations and strategies of these companies. This helped enhance our industry expertise and enabled us to advocate for the interests of the mining sector. There are far too many to mention but I would like to say working with Mining Zimbabwe immensely aided to the growth of the Association.

How have you prioritized the safety and well-being of mine workers throughout your presidency, and have you seen improvements in this area?

My administration has implemented several key measures aimed at prioritizing mine worker safety. Firstly, we have worked closely with relevant regulatory authorities to strengthen safety guidelines and regulations within the mining industry. This includes conducting comprehensive assessments of mining operations to identify potential hazards and implementing proactive measures to mitigate risks. As you know, I am also the Mine Rescue Association of Zimbabwe (MRAZ) President. Part of my duties is to organise and coordinate rescue activities furthermore ensure that the rescue teams are at all times in condition to undertake rescues in irrespirable foul atmospheres. Although progress has been made in enhancing the safety and well-being of mine workers during my presidency, there is still a pressing need for further improvement. Its still a delicate area so the need for improvement in safety is still key

Looking back, what will you miss most about serving as President of the Association of Mine Managers of Zimbabwe (AMMZ)?

As I reflect on my time serving as President of the AMMZ, there are several aspects that I will deeply miss. Firstly, the opportunity to collaborate with fellow industry experts and professionals who share the same passion for mining and its development in Zimbabwe. It was truly invigorating to engage in meaningful discussions, exchange knowledge, and collectively work towards innovative solutions for the Zimbabwe Mining industry. Secondly, the ability to advocate for the rights and interests of mine Managers and contribute to shaping policies that promote sustainable mining practices was an out of this world experience. The sense of responsibility I felt in representing our members and striving for their advancement will be greatly missed. Lastly, the chance to witness the growth and progress of mining in Zimbabwe, playing a role in fostering a thriving and responsible industry will always hold a special place in my heart. The memories of overcoming challenges, celebrating milestones and witnessing positive transformations will be cherished forever. As I step down from the role of President of one of the greatest Mining Associations in Zimbabwe, I am truly grateful for the incredible journey and the invaluable relationships formed along the way.

ENGINEER ABEL MAKURA



What innovations or technological advancements have been introduced or supported by the AMMZ to enhance mining practices in Zimbabwe during your tenure?

"During my tenure, the AMMZ has supported the introduction of battery electric equipment for underground mines in Zimbabwe to help reduce the environmental impact of mining by eliminating the use of diesel engines and associated emissions in the drive towards zero carbon emissions. Other associated benefits include improved safety through the reduction of the risk of fire and other hazards associated with traditional diesel equipment. Lastly not forgetting the improved cost savings due to the elimination of the need for fuel and reduced maintenance costs. We partnered with SMT Scharf Group, a global technology leader in the battery and diesel-powered versions of underground rubber-tired vehicles who came into the country and showcased their splendid product lines that include LHDs and personnel carriers during one of our technical visits. Most mines showed keen interest in the battery electric equipment and some have already started the procurement process," Engineer Makura said.

"We have also as the AMMZ encouraged the adoption of the Internet of Things as a tool to aid our mining processes as we move towards the 5IR. One such area, we encouraged our members is Fleet Data Management and telemetry," Makura opined.

"FDM systems allow for the collection and analysis of data from the machines, such as location, speed, fuel consumption, and other metrics. This data can then be used to improve the efficiency of the machines and the overall mining operation. Additionally, these systems can be used to improve safety by monitoring the condition of the machines and alerting operators to potential problems. We brought in GroundHog, experts in Mine Digitization and Automation for Mining whose solutions include Short Interval Control, Fleet Management, Telemetry, Asset Health, EHS and Safety during our technical visits to showcase this piece of innovation to our members and it was well received. Some mines are already using products such as Newtrax Optimine MDP from Sandvik," Makura concluded.

ENGINEER ALFRED MADOWE



What have been the key lessons or insights you have gained during your tenure on the outgoing AMMZ Executive Council over the past two years?

1. A successful council requires individuals who are dedicated to serving the industry. One needs to make time to advance council business and participate in the activities of the association. This commitment to the Council and the association requires a delicate balance with one's duties as an employee.

2. I have found immense value in participating in technical visits. There is so much to learn from other organisations and other professionals. No one knows everything. What one is struggling with is seldom unique, someone out there has faced similar challenges and can offer valuable solutions and insights.

3. The advancement and success of our mining industry is enabled by knowledge sharing and skills development both of which are key focus areas of the association.

4. It is very vital that the Association of Mine Managers of Zimbabwe grows and managers across most major or all mines are part of the association. This will grow the voice of the association to positively influence the direction of the industry.

ENGINEER COBURN KATANDA



What notable achievements or milestones have the AMMZ and its Executive Council Members reached in the last two years?

Key achievements include:

• The AMMZ turned 50 years in 2022 marking a key milestone in the history of the association under the watch of the Current Executive

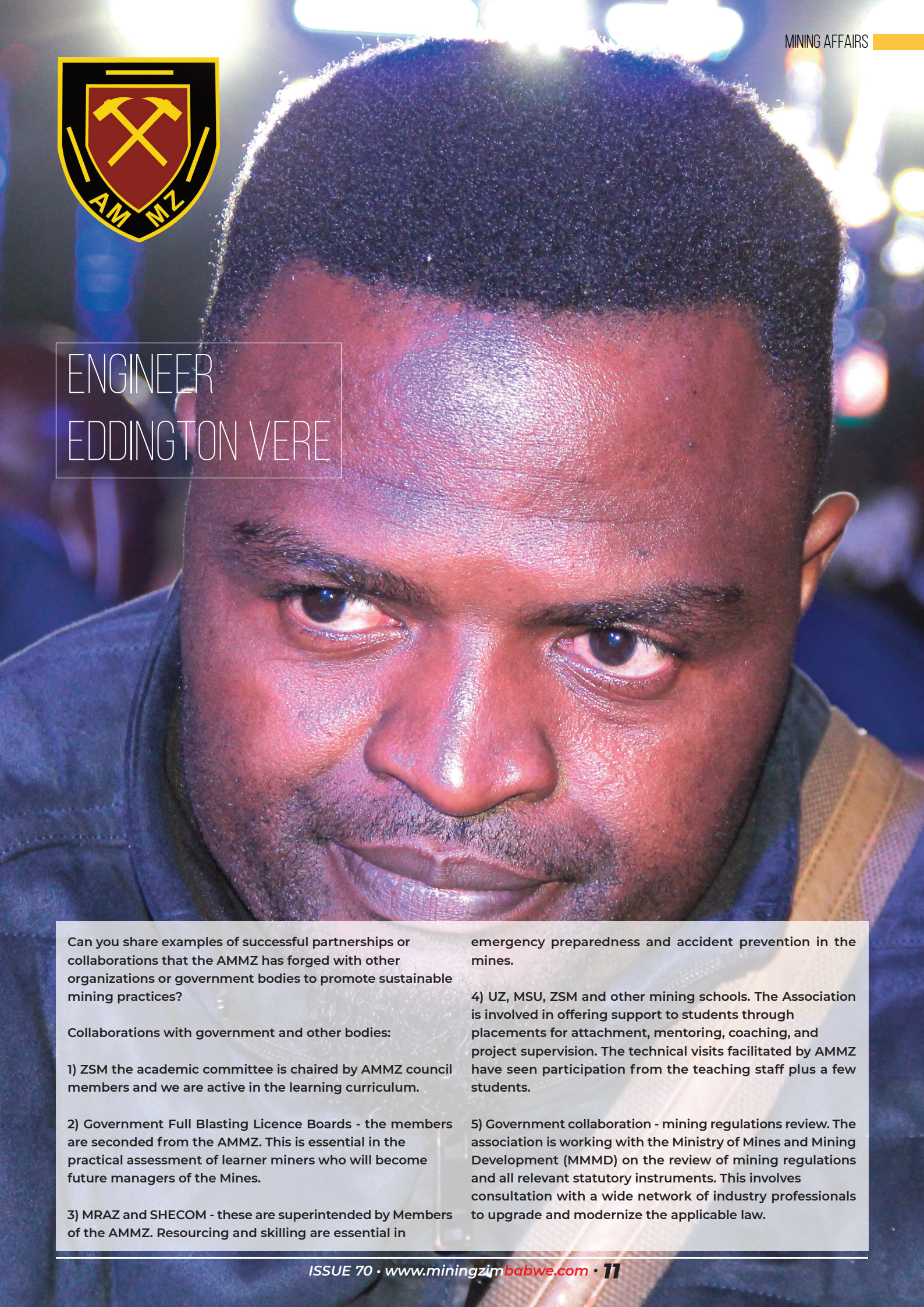
• Review of the Mining (Management & Safety) Regulations S.I. 109 of 1990 and the Explosives Regulations S.I. 72 of 1989 in response to industry needs and the need to align the old regulations with current global mining standards and trends. Draft amendments have been submitted to the Chief Government Mining Engineer's office for legal drafting and subsequent processes

• With guidance and support from the Chamber of Mines of Zimbabwe (CoMZ), the AMMZ successfully lobbied the Engineering Council of Zimbabwe (ECZ) to register and recognize CoMZ as a constituent body under which Mining professionals can be legally registered as mining practitioners in compliance with the ECZ Act. The application is awaiting the position of the Minister of Local Government for finalization.

• For the past two years, quarterly technical visits have become the norm. Such visits are meant to foster the sharing of proven practices and ideas to drive performances across the mines in support of the Ministry of Mines and Mining Development's vision to create a USD12bn Mining industry

• The AMMZ studied fall-of-ground accidents in Zimbabwe and developed standards for adoption and adaption by mines in the country.

• The Association was instrumental in founding the Jumbo Golf Tournament an event that has developed to be a prime event on the Zimbabwean mining calendar.



ENGINEER EDDINGTON VERE

Can you share examples of successful partnerships or collaborations that the AMMZ has forged with other organizations or government bodies to promote sustainable mining practices?

Collaborations with government and other bodies:

1) ZSM the academic committee is chaired by AMMZ council members and we are active in the learning curriculum.

2) Government Full Blasting Licence Boards - the members are seconded from the AMMZ. This is essential in the practical assessment of learner miners who will become future managers of the Mines.

3) MRAZ and SHECOM - these are superintended by Members of the AMMZ. Resourcing and skilling are essential in emergency preparedness and accident prevention in the mines.

4) UZ, MSU, ZSM and other mining schools. The Association is involved in offering support to students through placements for attachment, mentoring, coaching, and project supervision. The technical visits facilitated by AMMZ have seen participation from the teaching staff plus a few students.

5) Government collaboration - mining regulations review. The association is working with the Ministry of Mines and Mining Development (MMMD) on the review of mining regulations and all relevant statutory instruments. This involves consultation with a wide network of industry professionals to upgrade and modernize the applicable law.

Mineral Production sees year-on-year Increase in Q1 2023



The Index of Mineral Production for the first quarter of 2023 has shown a significant year-on-year increase of 16.8 percent compared to the same period in 2022. The index for Q1 2023 stood at 138.9, higher than the previous year's index of 118.9.

However, on a quarter-on-quarter basis, there was a decrease in the index from 149.3 in the fourth quarter of 2022 to 138.9 in the first quarter of 2023, representing a decline of 6.98 percent.

Looking at specific minerals, gold production exhibited a decline in Q1 2023. The output index for gold decreased by 23.9 percent, with a quarterly production index of 110.7 compared to 145.4 in the previous quarter. On a year-on-year basis, the index also decreased from 117.2 in Q1 2022 to 110.7 in Q1 2023.

Platinum production, on the other hand, saw an increase in the first quarter of 2023. The index for platinum production stood at 139.1, showing a year-on-year increase of 34.6 percent compared to Q1 2022. On a quarterly basis, the index increased by 2.1 percent from 136.3 in Q4 2022.

Diamond production recorded a significant year-on-year increase in the first quarter of 2023. The output index for diamonds rose by 54.8 percent from 229.3 in Q1 2022 to 355.0 in Q1 2023. On a quarterly basis, the percentage change was 7.2.

Nickel production also showed a positive year-on-year increase, with a 9.6 percent rise in the first quarter of 2023. However, on a quarterly basis, there was a decrease of 15.4 percent in the index from Q4 2022.

Copper production witnessed a substantial year-on-year increase in the first quarter of 2023. The output index for copper rose by 30.6 percent from 112.0 in Q1 2022 to 146.3 in Q1 2023. On a quarterly basis, the index increased by 2.3 percent.

Coal production showed remarkable growth in the first quarter of 2023. The output index for coal recorded a year-on-year increase of 94.9 percent, with an index of 410.9 compared to 210.9 in Q1 2022. Furthermore, on a quarterly basis, the index increased by 21.5 percent from 338.2 in Q4 2022.

Lithium production experienced a significant year-on-year increase of 169.5 percent in Q1 2023. The output index for lithium rose from 68.4 in Q1 2022 to 184.2 in Q1 2023. On a quarterly basis, there was an increase of 22.2 percent.

However, the production of granite faced a year-on-year decrease of 29.1 percent in the first quarter of 2023. The index for granite production stood at 213.4, lower than the index of 301.0 in Q1 2022. On a quarterly basis, the index decreased by 66.2 percent from 121.3 in Q3 2022.

Overall, the mineral production sector has shown mixed results in the first quarter of 2023, with some minerals experiencing growth while others faced declines. The year-on-year and quarter-on-quarter comparisons provide valuable insights into mineral production trends and the industry's performance over time.







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"Revolutionizing Mining: The Pivotal Role of Portable Toilets in Shaping a Sustainable, Inclusive, and Gender-Equal Future"



In the dynamic landscape of modern mining, sustainability is no longer a buzzword—it's a mandate. The era of environmental, social, and governance (ESG) principles has ushered in a new era of responsibility for mining operations. Surprisingly, portable toilets have emerged as unsung heroes, driving ESG objectives and addressing the critical challenge of providing equitable access to sanitation. Dive into this article to uncover how portable toilets are transforming the mining industry, not only as sanitation solutions but as catalysts for inclusivity, diversity, and safety.

EQUITABLE ACCESS TO SANITATION

1. Bridging the Gap: Portable toilets are the link between urban luxury and remote mining sites. They ensure miners have access to pristine sanitation facilities, regardless of their location, fostering a sense of dignity and well-being.

2. Shaping Gender Equity: Women in mining face unique challenges, and portable toilets are stepping up to the plate. Tailored designs cater to the specific needs of female workers, promoting gender equity and creating a more welcoming industry for all.

PORTABLE TOILETS AND ESG IN MINING

1. Environmental Guardians: Equipped with advanced waste containment systems, portable toilets actively reduce contamination risks, safeguarding local water sources and ecosystems. Witness how these unsung champions diminish the environmental footprint of mining operations.

2. Social Responsibility Champions: Beyond basic needs, portable toilets contribute to worker welfare, reducing absenteeism, and fostering positive community relations. Uncover the social responsibility angle that makes portable toilets integral to a healthier, happier mining workforce.

3. Governance in Action: Good governance in mining involves adherence to Occupational Health and Safety (OHS) regulations. Portable toilets emerge as silent enforcers, ensuring compliance and securing the health and safety of every worker on site.

ESG in Mining: A Gender Perspective

Within the broader ESG framework, gender equality takes center stage in mining. Portable toilets, surprisingly, play a pivotal role in reshaping the industry to be more gender-responsive. Discover how:

Equitable Access to Sanitation Bins: Portable toilets address the often-overlooked needs of female miners by providing discreet and hygienic solutions, promoting dignity and comfort.

Women's Safety: Enhanced security features in portable toilets create a safer environment for female workers in remote mining areas, mitigating the risks of harassment and assault.

Comfort and Privacy: Tailored designs of portable toilets offer increased space, ventilation, and user-friendly amenities, recognizing and addressing the unique needs of women in mining.

Developments in the Portable Toilet Space

Explore the cutting-edge innovations propelling portable toilets into the future:

1. Waste Management Revolution: Anticipate breakthroughs in recycling and sustainable disposal methods, redefining the environmental impact of portable toilets.

2. Smart Sanitation Solutions: IoT-enabled toilets are not just smart; they're the future. Witness how technology is optimizing sanitation services in the remotest corners of mining operations.

3. Green Energy Integration: Solar-powered toilets are redefining energy efficiency, reducing the carbon footprint associated with portable sanitation solutions.

The Future of Portable Toilets in Mining

As the mining industry evolves, portable toilets are set to play a more significant role in shaping a sustainable, inclusive, and gender-equal future:

1. Innovations in Waste Management: Expect pioneering approaches in waste management within portable toilets, focusing on recycling and sustainable disposal methods.

2. Health and Safety Integration: Portable toilets may become central to broader health and safety strategies, featuring on-site health monitoring and hygiene management.

3. Customized Designs: Portable toilets will be tailored to meet the diverse needs and cultural sensitivities of women in mining, recognizing that one size does not fit all.

Conclusion

From humble beginnings to indispensable components, portable toilets have become champions of ESG goals, gender equality, and equitable access to sanitation in mining. Applaud those leading the charge, setting an example for responsible mining practices worldwide. As the industry embraces ongoing advancements and customization, the future of portable toilets in mining promises even greater contributions to both ESG principles and the well-being of the mining workforce, irrespective of gender. It's time to celebrate those ensuring adequate sanitation for all at mining sites, making a lasting impact on the path to a sustainable future.



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Yes Captain! Interview Fazilla Mukazi - Shift boss, (PROTO) brigade's person


Eng Fazilla Kudzai Mukazi

Can you give us a brief introduction of yourself?

I am Fazilla Kudzai Mukazi, aged 28. Currently employed at Bulawayo Mining Company as Mining Shiftboss. I am a Mining Engineer by profession (UZ) currently serving as a Mine Rescue (PROTO) brigade's person.

What drove you to consider Mining as a career?

Insightful Career guidance sessions at High school. Professional individuals from various fields and experience conducted the sessions which really had an impact on our career choices. Despite facing discouragement, I persevered and pursued a career as a Mining Engineer. This decision turned out to be a good choice for me. Much gratitude is expressed towards my parents for unwaveringly supporting my chosen career path.

You are currently plying your trade as Shift Boss at BMC. What are your responsibilities and achievements in this role?

I was recently appointed this year as shift boss. I am responsible for Mine re-entries soon after Primary Blasting, manning production in all sections, enforcing safety regulations and optimum utilization of machinery and labour.

How do you ensure the enforcement of safety regulations in all sections as a Shift Boss?

Mining used to be regarded as one of the most dangerous jobs until safety regulations were formed for sustainable mining. Zimbabwean Mining is governed by statutory instruments such as SI 109 OF 1990, SI 72 of 1989 etc and the Mine tailor-made standard operating procedures. As a shift boss, the aim is to ensure all workmen are conversant with these regulations and working standards through refresher training and safety talks before the start of shifts.

Despite facing discouragement, I persevered and pursued a career as a Mining Engineer. This decision turned out to be a good choice for me - FKM

What were your responsibilities as an Overseer Miner at Bulawayo Mining Company?

My responsibilities were Enforcing safety regulations in the Main development section. Section planning leading and monitoring ensuring the optimum utilization of machinery and labor. Enforcing adherence to Mining standards and achievement of the benchmarked efficiencies targets. I gained vast experience from the Shaft sinking Project, availing a new Mining block to all the Sublevel Open Stoping production areas. As the Main Development Section miner, I was in charge of 60 people. I had to ensure the safety of workmen and optimize labour and machinery utilization as I was working on availing one of the main production areas which is one of my achievements at BMC.

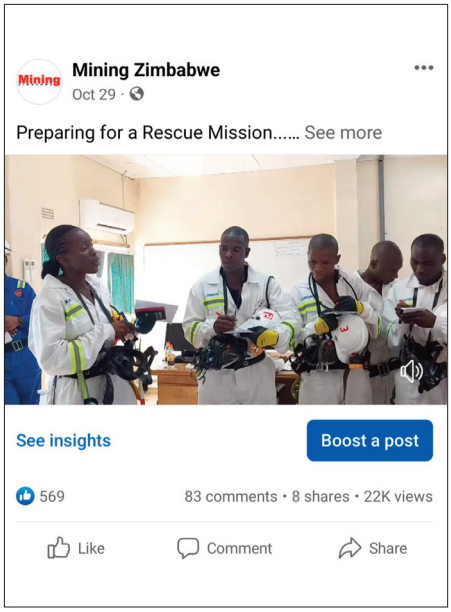
Can you tell us about your experience in shaft sinking and shaft equipping at BMC?

Shaft sinking is a critical stage in underground mining operations as it is a complex and challenging task. I would say it is one of the most intriguing experiences that every miner dreams of having. I have had the opportunity to be part of the entire mining cycle in both shaft sinking and shaft equipping. Depending on the technologies adopted, planning, precise execution and adherence to strict safety protocols are critical. I can confidently state that I have gained significant experience through my involvement in the ongoing shaft-sinking process at BMC.

Mining Zimbabwe shot a video (which has had over 22 000 views on Facebook and 16 000 impressions on LinkedIn) where you were giving instructions to your rescue team which comprised 100% men. It has earned you the reputation of being an "Iron Woman". As a woman do you face any challenges working with and leading men?

My experience in the mining industry has been primarily focused on two mines: Mimosa Mines and Bulawayo Mining Company. These organizations have placed a strong emphasis on women's

Continued on the next page>>



empowerment, creating an environment that is conducive to my growth as a Mining Engineer. I have been fortunate to receive equal opportunities and support from my male counterparts, ranging from management to subordinates, hence no hectic challenges faced.

Tarisai wishes to be like you. What is your advice for her to reach where you are at such a young age?

Dear Tarisai I have been fortunate enough to enter the industry through hard work, starting from my education and working towards securing a position within the field. Over time, the industry has embraced the agenda of women's empowerment, dispelling the myth of it being a "men-only" zone. Today, there are limitless opportunities available within the industry, and one can dream as big as they desire. However, it is crucial to have proper career guidance from experienced individuals who have already made their mark in the industry.



Fazilla Kudzai Mukazi,

Describe the project you undertook at Mimosa Mine, designing a new rock mass support system. What were the objectives and outcomes of the project?

Mimosa Mines had initiated undertaking a mining project in a highly fractured area. The main objective was to design and implement a robust rock mass support system to ensure the safe mining of the orebody. To achieve this, advanced mining software such as PHASE 2 and Rocklab were utilized to simulate the stresses on various excavation designs. This allowed for the development of an optimum design that would not only make the mining of the ores profitable but also ensure the safety of both workers and machinery involved in the mining process.

Some people are of the opinion that Mining is for men, your comments on that?

So far, I have managed and I know a number of females who are doing extremely well, some are my role models. I can confidently say that I am living proof that mining is a field open to anyone willing to put in the effort. Contrary to popular belief, mining is not selective based on gender orientation. Like any other field, it requires a certain level of commitment and dedication. With hard work, compliance, and genuine interest, anyone can succeed in this industry.

Can you elaborate on your role as a qualified brigade person for the BMC Mine Rescue Response Team (PROTO)?

BMC Mine Rescue Response Team (PROTO) is a specialized team that remains on standby to respond promptly to any potential disasters or emergencies within the west zone. As one of the captains, my role involves planning activities, leading the team, maintaining their welfare and ensuring their readiness. This includes maintaining their physical fitness through regular training and exercises. By conducting drills and simulations, we aim to enhance our skills and readiness to respond effectively in real-life scenarios and promote safety awareness throughout the mine.

What are your future career development goals within the mining industry? How do you plan to contribute positively to the growth of the Zim industry?

To remain acquainted with the latest technological advancements in mining as the industry is in transition to the fourth industrial revolution. It is essential to stay up-to-date on the latest developments in mineral exploration, extraction, and processing technologies. As minerals are a non-renewable resource, some mineral deposits will soon require advanced technology to extract and process, and I can be a valuable asset in the continuous growth of our mining industry.

If there are things you would change in the Zimbabwe Mining industry what will those be?

From a brigade person perspective, it is evident that there is a pressing need for increased community engagement in order to raise awareness about mining safety. The mining industry is currently facing numerous challenges, particularly with regard to artisanal mining disasters. As a mining engineer, I strongly believe that it is crucial for professionals in the field to be well-versed in advanced technologies and to implement them in their respective work areas. This not only leads to potential profit gains and world prestige but also ensures the safety of workers, especially considering the fact that many mineral deposits are now located at deeper underground levels.

Besides the Mining business, what is Fazi into?

I really try hard on the work-life balance. I recently joined a golf club, which I find quite interesting. In my spare time, I enjoy culinary and hair plaiting, which are hobbies that bring me joy and relaxation.



Fazilla & team prepare for a rescue mission





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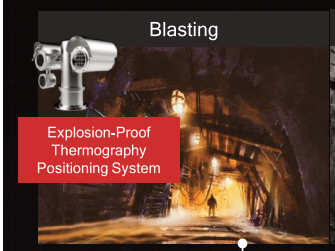
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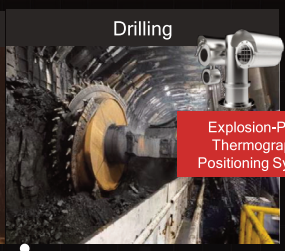
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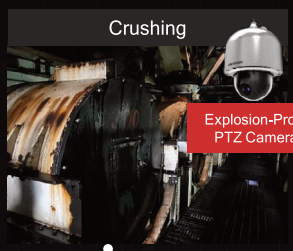
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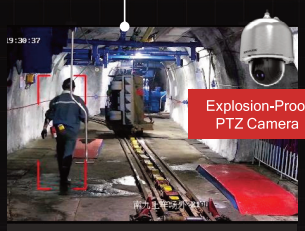
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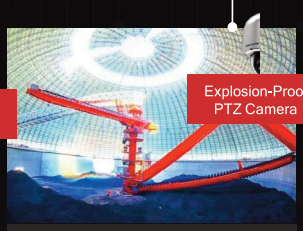
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Magna24 consultancy provides free mining software training at the School of Mines





To enhance its Corporate Social Responsibility (CSR) initiative, Magna24 Consultancy is expanding its support to the Zimbabwe School of Mines (ZSM) by offering free software training. This training aims to equip students with the necessary skills to effectively utilize mining software in a practical industry setting.

Mining software is a digital tool used to streamline the various processes in mining operations, including quarry exploration, mineral extraction from open pits or underground sites, processing of raw mineral ores or other mined materials, and even mine closure. There are various mining software which include Deswik, Vulcan, SafetyCulture, RPM MinePlanner, DataMine, MicroMine, and SHEQSY among others.

Magna24 consultancy has taken the Students through pit optimization, mine scheduling, mine planning and designing to ensure that students are well versed with mining software for them to be relevant in this technological determinism social where critical skills in new technologies are greatly appreciated in workplaces.

Mining software is critical because it addresses structure, behavior as well and the data processed by the software system. Mining software systems may happen at various levels: program level (individual statements and variables) and design pattern level. call graph level (individual procedures and their relationships)

Why is mining software critical?

Mining is one of the most challenging undertakings because of the complexity of the processes, safety risks, and its sheer environmental impact. Upholding industry best practices and adhering to regulatory mandates are attainable with the help of mining software solutions.

The following are the benefits in detail

Optimizes resource allocation
Mining companies have an extensive list of raw materials, machinery, and employees to track. The software manages these assets and resources, optimizing their use and reducing wastage in the process.

Enhances safety

While the industry has improved its operations, significantly decreasing disasters, deaths, and injuries over the years, there is still much to do to safeguard lives. Software features like hazard identification and automated reporting can help organizations achieve the goal of zero fatality.

Guarantees sustainability

Mining plays a vital role in providing essential resources for various industries. But there is no doubt that it has negative consequences for the environment. With the software, companies can better implement responsible mining practices to minimize their impact.

Improves analytics

Miners do not just dig soil and rocks. They also do office and laboratory work that requires appraising ores, visualizing benchings, calculating reserves, and collating certifications for regulatory agencies. All these can be analyzed using the platform.

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ZSM defends the decision to incorporate Mandarin in curriculum



The Zimbabwe School of Mines (ZSM) has defended its position to teach Mandarin to mining graduates stating that it will enable Zimbabweans to understand the Chinese language and be able to sit at par with them in any company's board.

Rudairo Mapuranga



Eng Martin January

Speaking to Mining Zimbabwe ZSM Training and Operations Manager Eng Martin January said the Chinese account for 90 per cent of new investment in Zimbabwe and it was important from a business point of view for citizens to understand Mandarin as this will enable the country to guard against possible corruption or conspiracy.

He said the role of educators is to ensure that the curriculum is evolving to suit current needs and give graduates an edge.

"The Chinese are here and are accounting for more than 90% of new investments in the mining industry. It's easier to criticize the teaching of the Chinese language when you have limited interaction with the Chinese themselves. You have instruments in Chinese, how do our students learn if they can't communicate? I had a tour of the foundry and iron and steel industry in Zimbabwe. I can say 75% of new companies are Chinese and processes are documented in Chinese. The best is to have graduates who understand Mandarin and can sit in the boardroom and discuss at par with their Chinese counterparts. It's wishful thinking to assume that we will wake up one day with the Chinese gone, we can only prepare our future generations to be able to cope with them. The Confucius Institute that is teaching ZSM is based at UZ and am just wondering why the department is also not utilizing them. Or teaching some languages such as French, Portuguese and Spanish. To be truthful the world has become a global village and China is leading the pack," January said.

Mineral and Resource Governance Expert Obriel Nhachi said since the Chinese have been criticized for poor environmental and human rights management, the incorporation of Mandarin leads to increased collaboration.

"Chinese mining companies have been criticized for their poor record on environmental and human rights abuses in Africa If the introduction of the Chinese language leads to increased collaboration with these companies, it could potentially exacerbate these issues in the Zimbabwean mining sector.

"Secondly the introduction of the Chinese language at the Zimbabwe School of Mines (ZSM) is a response to the growing presence of Chinese companies and their personnel in the country's mining sector. And this will facilitate the smooth movement of our natural resources to the Asian country," Nhachi said.

Zimbabwe Diamond and Allied Mine Workers Union (ZDAMWU) General Secretary Justice Chinhema said it was important for mining professionals to learn Chinese but it was also of great importance for Chinese to be taught Shona when they come to invest.

"This is something we can not run away from but we would have wanted our government to also put a policy compelling all Chinese people coming to Zimbabwe to be taken through Shona Language and partly English," Chinhema said.



Justice Chinhema



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Softening commodity prices, the high cost of electricity and taxes decrease profitability by 15%



Profitability for mining companies declined by an average of 15% in 2023 due to softening commodity prices, and high-cost structure and is expected to further decline in 2024 due to high electricity and high royalty costs, the State of Mining Industry Survey Report has revealed.

Rudairo Mapuranga

According to the report by lead researcher Professor Albert Makochekanwa presented at the sidelines of the 26th edition of the Mining, Engineering and Transport Expo (Mine Entra) 2023 held in Bulawayo recently, most mining companies are expecting their profits to slump in 2024 compared to 2023. However, those in the gold industry are expecting their profitability to remain the same.

According to Professor Makochekanwa, most mining executives expect the overall cost of production to increase in 2024 due to the high cost of electricity, high royalties and taxes, high labour costs and high financial costs.

High electricity charges according to Professor Makochekanwa are going to be the major cost driver leading to a decrease in profitability.

According to the report, all Mining Executives expressed concern about the newly approved tariff of US$14.21 KWh indicating that the tariff is too high and unaffordable.

Impact of tariff increase

Analysis of survey responses shows that the upward tariff review from US$c1221/kWh to US$c 14.21 KWh will result in the proportion of electricity costs to 24%, from 21% at US$12.21 KWh. The overall cost of production is set to increase by between 7 to 10%.

"Survey findings show that profitability for mining companies declined by an average of 15% in 2023 due to softening commodity prices and the high-cost structure. Approximately 50% of respondents reported that they were now struggling to break even. When interrogated on profitability prospects for their businesses in 2024, most respondents (70%) indicated that they are expecting their profitability to worsen compared to 2023. Those that are expecting profitability to remain the same are mostly in the gold sector.

"Survey findings show that in general, most mining executives expect the overall cost of production to increase in 2024 citing the following:

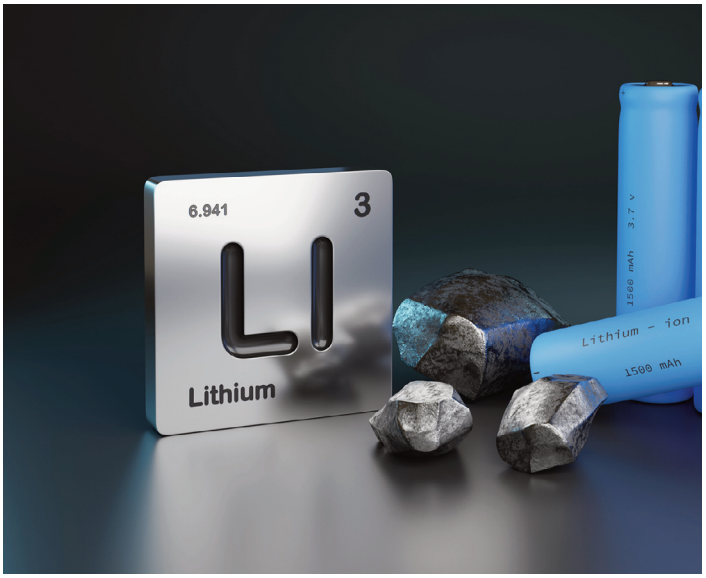
1. High cost of electricity - respondents noted with concern ZESA's proposal to increase electricity tariff by 2 cents
2. High royalty and taxes
3. High labour costs
4. High financing costs.

"Analysis of survey responses shows that most key minerals subsectors including PGMs, ferrochrome, gold and diamond sectors are expected to experience increases in their cost of production in 2024 citing high electricity charges as the major cost driver,

"Further analysis of survey responses shows that the major cost drivers are procurement (39%), labour (32%), electricity and diesel (21%). Other costs including administration expenses," the report reads in part.



Prof Albert Makochekanwa





Analysis of tariff tolerance levels by mining executives shows that on average the mining companies can tolerate a tariff level of around US$c9/kwh cents per kWh. 90% of mining executives indicated that they would accommodate a tariff of between US$c7/kWh to US$c10/kwh, while 10% indicated that they would accommodate a tariff of between US$c6/kWh to US$c7kWhh.

In terms of electricity bill payment modalities, the majority of mining executives (90%), indicated that payment of electricity bills must be done in line with the prevailing foreign currency retention framework while those in the coal sector recommended payment wholly in ZWL as they receive most of their payments for coal deliveries in local currency.

According to the survey report, most survey respondents indicated that they were expecting an unstable fiscal regime in 2024 citing recent royalty increases for PGMs and platinum as precedence for fiscal policy inconsistencies. Executives in the PGMs and lithium sectors reported that the new royalty was high and unaffordable and worsened their viability challenges. The executives in the PGMs sector indicated that they experienced a 5% average increase in overall production cost as a result of the 180% royalty increase from 2.5% to 7% royalty while those in the lithium sector reported a 4% increase in the overall cost of production on the back of the 150% royalty increase from 2% to 5%.

Mining executives in the PGMs sector expressed their concern on the anticipated implementation of the export tax effective 1 January 2024 arguing that it will impact negatively on the viability of their projects.

They reported that as agreed with the Government, they signed commitment letters with Zimpats to utilize their facilities once they finalize the construction of additional meters and refurbishment of their Base Metal Refinery.

On Rural District Council (RDC) levies, Mining executives indicated that RDC levies were high compared to regional averages and varied with rural district councils.

Mining executives also reported that the environmental impact assessment levy was high and undermined the implementation of capital projects. They also raised concerns about the unaffordable 2% Environmental Rehabilitation levy. Respondent mining executives reported that some mining fees were high and unaffordable, impacting negatively the viability of mining projects.

Measures to minimize decline in profitability

When interrogated on measures being undertaken to minimize the decline in profitability, most mining executives reported that they are taking the following cost-cutting measures:

- Rationalize and optimize procurement,
- Freezing hiring and multitask where necessary,
- Defer some capital spending.





The Chamber of Mines emphasises the need to promote local suppliers



Chamber of Mines President Mr Thomas Gono

Despite local equipment and consumable suppliers facing several challenges which have hindered them from meeting the demand of the mining sector in Zimbabwe, there is a need to encourage local procurement in the mining industry to enable the growth and development of the country's economy, Chamber of Mines President Mr Thomas Gono has said.

Rudairo Mapuranga

Speaking at the Chamber of Mines 2023 Mining Industry Suppliers Forum which was held at ZITF Centre in Bulawayo and running under the theme "Addressing Challenges Affecting Suppliers of the Mining Industry", Gono said the Chamber of Mines recognises the importance of suppliers in the mining value chain and continues to take the lead in the use of local factors of production.

"The need to encourage local procurement will remain our industry's long-term goal. This is specifically one of the key tenets of our local mining industry where we know if we buy locally, we also enhance the economic activities of other sectors. The Chamber of Mines recognizes the importance of suppliers in the mining value chain and continues to take the lead in the use of local factors of production. Demonstrating this, our JSP committee which spearheads the strengthening of linkages between the supplier sector and the mining sector has achieved key milestones and its recommendations are being implemented by the mining houses through local enterprise development, and supply development programs.

"The key products covered under this theme include the manufacture of bolts, steel forges, manufacture of steel, engineering maintenance protective clothing, and work wear, welding and civil works, mining of silica, and brick manufacturing industries. The mining sector interventions include offtake agreements and procurement chain support, capitalization support, training support, safety and compliance audits improvements in lines of business. Such success stories have already been recorded with a growing number of manufacturing companies having benefitted from these initiatives.

"However, our suppliers are facing several challenges, chief among them foreign currency constraints, high-cost structure and competition from imports. This situation has limited the capacity of local suppliers to meet mining companies' demands to enhance the local content in the mining industry, suppliers should continue to strive to improve on quality of products as well as cost to tap into this opportunity. We need to be competitive, especially on pricing, quality and delivery time," Gono said.

Speaking at the same event Chamber of Mines CEO Isaac Kwesu said equipment and consumable suppliers are important for the growth and development of the mining industry with their challenges able to affect the performance of the sector.

"Our suppliers remain our lifeline and their challenges negatively affect the performance of the mining industry," Kwesu said.



Chamber of Mines CEO Mr Isaac Kwesu

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The role of mine managers in fostering employee productivity and engagement



The role of Mine Managers in fostering employee productivity and engagement is crucial in maintaining a successful mining operation. Managers are responsible for overseeing all aspects of the mine, from ensuring the safety of the employees to maximizing the productivity of the workforce. Their role goes beyond simply managing operations and production. They are instrumental in creating a positive work environment, fostering employee engagement, and boosting productivity.

Effective Mine managers understand that their success is closely tied to the satisfaction, motivation, and engagement of their workforce. By fostering a positive workplace culture, Mine Managers can create an environment where employees can feel valued and motivated to give their best. Here are some key ways Mine Managers can play a role in fostering employee productivity and engagement:

Communication

Open and transparent communication is fundamental in promoting productivity and engagement. Mine managers need to ensure that employees receive clear instructions, know what is expected of them, and have the necessary information to perform their tasks. By promoting two-way communication, mine managers can encourage employee feedback, suggestions, and ideas, which can enhance productivity and engagement.

Skill development and training

Mine managers should invest in employee training and skill development programs. Providing employees with opportunities for continuous learning not only improves their abilities but also increases their job satisfaction and engagement. Managers should identify areas of improvement, provide proper training, and encourage employees to enhance their skills and knowledge.

Recognition and rewards

Recognizing and rewarding employee efforts and achievements is key to fostering a positive work environment. Mine managers should acknowledge the hard work and dedication of individuals or teams to boost motivation and engagement. Regular recognition and rewards can significantly improve employee productivity and loyalty.

Empowerment

Empowering employees by delegating responsibilities and giving them autonomy fosters a sense of ownership and accountability. Mine managers should encourage employees to take ownership of their tasks and provide them with the necessary tools and resources to succeed. Empowered employees are more likely to be productive and engaged.

Teamwork and collaboration

Collaboration and teamwork are essential for a successful mining operation. Mine managers should encourage a collaborative work environment, where employees feel comfortable working together, sharing ideas, and supporting one another. By fostering a sense of camaraderie and teamwork, mine managers can increase employee engagement and productivity.

Safety and well-being

Ensuring the safety and well-being of the workforce is paramount. Mine managers should prioritize safety measures and provide a work environment that prioritizes employee health and well-being. When employees feel safe and cared for, they are more likely to be engaged and productive.

Performance feedback and development
Regular performance feedback and development discussions are valuable for fostering productivity and engagement. Mine managers should provide constructive feedback, offer guidance, and set clear development goals. This allows employees to understand their strengths and areas for improvement, promoting growth and engagement.

In conclusion, mine managers play a crucial role in fostering employee productivity and engagement. Kuvimba Mine workers have gone viral for their jovial mood and their behaviour depicts a highly motivated workforce. Highly motivated employees are often more productive and better performers than their unmotivated colleagues. They tend to work harder and focus on completing their tasks to the best of their abilities, which results in better output for their organizations. By prioritizing effective communication, providing training and development opportunities, recognizing employee efforts, empowering and encouraging teamwork, ensuring safety, and offering performance feedback, mine managers can create a work environment where employees thrive.

These efforts not only enhance productivity but also contribute to the overall success and sustainability of the mining operation.

Implats cutting capital expenditure for some of its projects, including its Zimplats



Zimplats' parent company, Implats, a leading mining company in South Africa, has announced a reduction in capital expenditure for several projects due to the ongoing downward trend in commodity prices. The company's decision particularly affects its Zimplats operation located in Ngezi, Zimbabwe, where profitability has been significantly impacted.

The global commodity downturn has hit precious metal miners hard, forcing them to reassess their financial strategies. Implats, as a major player in the platinum industry, is not exempt from this challenging environment. Consequently, the cut in capital expenditure is seen as a necessary measure to mitigate the adverse effects of the market conditions.

This move by Implats reflects the mining sector's broader struggle to combat diminishing margins. Falling prices for precious metals like platinum have drastically reduced profitability, prompting companies to seek cost-cutting measures and re-evaluate their project portfolios.

While the reduction in capital expenditure may generate concerns about the company's future growth and expansion plans, it is an essential step towards safeguarding Implats' financial stability. By aligning their operations with the current market realities, the company hopes to weather the storm and emerge stronger when the commodity cycle eventually rebounds.

Local suppliers to be hit hard

As miners cut back on projects, this will affect local suppliers and contribute to economic slowdown.

Zimplats accounts show that the company spent US$742 million on procurement in the financial year to June, a 26% increase from last year's US$553 million. Of this amount, US$350 million went to local suppliers. This was 47% of the overall spend, down from 58% last year.

Implats' decision to cut investment in its Zimplats operation in Zimbabwe is indicative of the challenges faced by mining companies operating in economically volatile regions. Despite these challenges, however, Implats remains committed to its operations in Zim and said it will continue to work closely with local stakeholders to navigate the obstacles.

As the commodity downturn continues to impact profitability, strategic cost management and prudent financial decisions are crucial to ensure the long-term viability of mining companies worldwide.

ZIMPLATS
Member of the Implats Group

Chasm Between Public Relations and Conflict Resolution in the Mining Sector



It is compelling to tackle this difficult subject.

by Albert Maipisi

Public relations roles are very important in modern organizations and this is equally true in the mining sector. The establishment of the role of public relations in the League of professions is more recent. That role does not usually expand to conflict resolution but in many cases, deflates tensions and defends company policies, approaches, and positions. In a nutshell, it plays the pseudo-propagandist role in the served organizations. In many cases, the communities are made to hear what they want to hear, which can be the actual truth or the choreographed truths. Investment in tackling conflict at its heart is, however, more desirable, since a business's social license is derived from the local community.

I am not against a profession. Nevertheless, the script of diverting people's minds through sweet-talking them in the name of public relations can continue until it is known to be generic rhetoric whose repetition may no longer achieve organisational objectives to the level previously expected. Thus, are public relations roles inclusive of defending known organizational wrongs? Or, are they related to repackaging narratives for the sake of the outside world which gets news from mainstream media, without engaging those locals reeling in realities so defended, for the sake of protecting the investor's image?

Organizations should endeavour to invest more in addressing the core causes of a conflict than defence, defiance, and pretence alone. There should, therefore, be levels of dealing with these issues, with the first step being the public relations level and then the higher level being the conflict resolution domain.

Independent Zimbabwe expects approaches that symbolize the dignity that independence has brought to them. Law as a social phenomenon should lead to more peaceful co-existence than to favour one side. Minerals are being discovered where people already exist. EPOs, for example, encroach into human residences



and livelihood strategies. Naturally, this disruptive tendency of development requires common understanding among involved parties – the investor and the communities endowed with minerals. This is not easily achieved without the service of a facilitator. The internal public relations section often puts forward the company policy, in some instances without walking the cautious approach of a genuine mediator, but a biased intermediary.

"Dragon slayers" for example, find the opportunity to justify the rhetoric that the "Open for Business" mantra should not include the East. The 'hatred' already being planted in the local minds by those paid to slay the dragon, is becoming more and more justified, if maturity, deep thought, and extra effort towards resolving the seemingly small problem, continues to be always ignored. Those "hugging the panda" may see no problem in some of these investors' behaviours, as long as they are perceivably operating legally, but the community social license remains the most important component of mining in the modern world without exception to Zimbabwe. Much effort towards reducing conflict is visible. Nonetheless, tackling societal challenges using the 'one size fits all' mentality can impact organizational sustainability in the future, yet flexible and adaptive approaches to organizational management and development should guarantee mining houses goodwill and a long lease of life.

Adapting to the environment in which an organization exists is critical. Some organizations have already adopted the Corporate Social Responsibility and Community Engagement Office or any other similar position that can be differently named. The purpose of splitting this role from that of the Public Relations Office is the realization of the differences in the focus of these roles. Most local communities in which mining is taking place continue in disgruntlement and many have not yet been given the expected due attention. Elite-centric legislation may disempower these local communities while empowering community position-holders, and the investors who traditionally benefit directly from the mining proceeds. Yet, the ordinary members of the community remain the majority and part of the key stakeholders in mining business sustainability.

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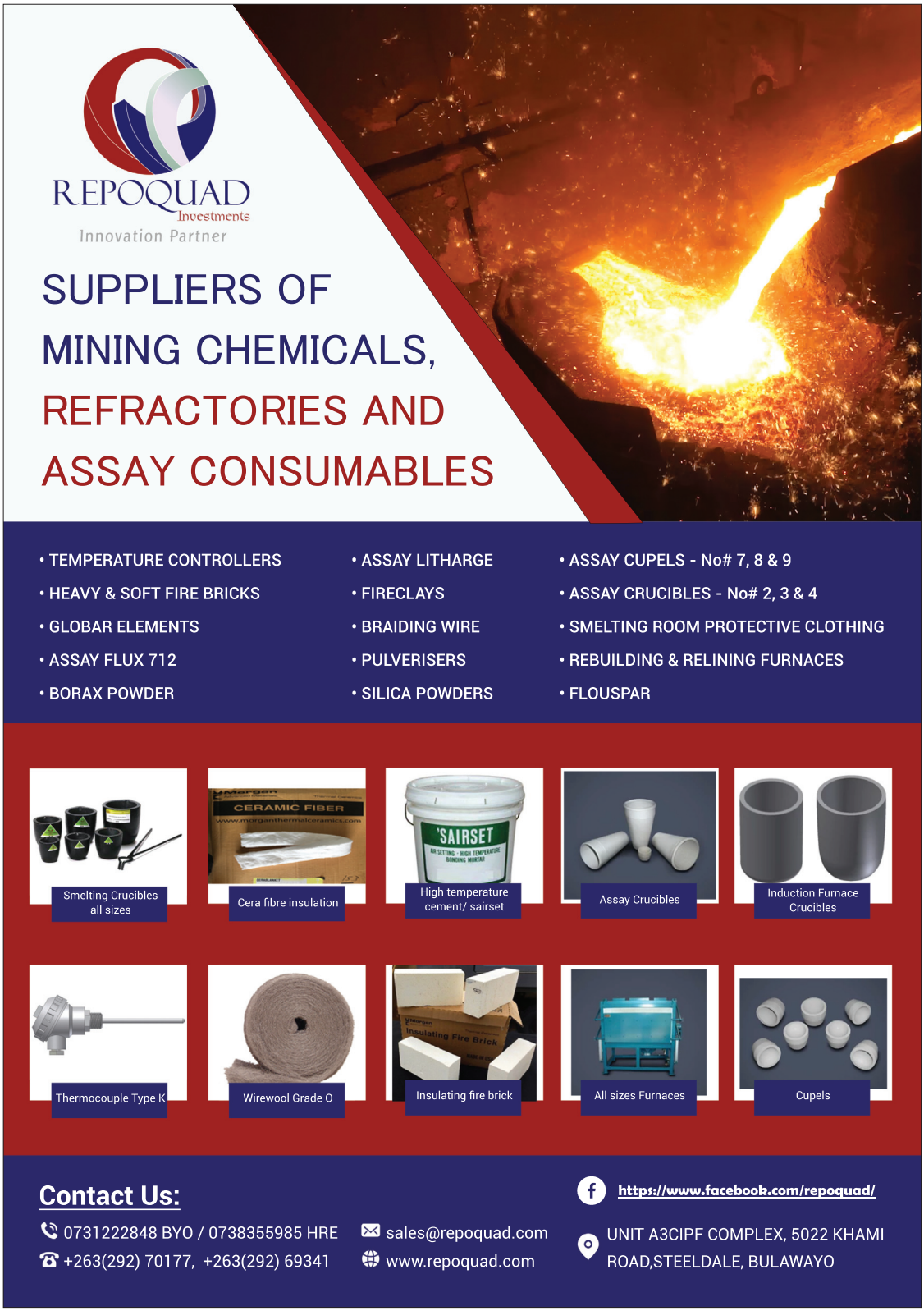
Mining houses entangled in defence, defiance, and pseudo-propagandist mazes need to invest more in strategies for genuine conflict resolution until such challenges are fully resolved, after which they can revert to ordinarily normal ways of doing business or the adoption of newer business structures. It is pertinent for corporates to adjust their technologies to the prevailing environment if they want to remain relevant and acceptable in their operating contexts. Social capital is as key as economic capital and strategic responsiveness to local demands needs to be seriously prioritized.

The world is not static. That equally speaks to methods and approaches that mining houses should employ from time to time. Drawn-up stakeholder engagement frameworks should be part of the mining houses' assets just as is common with human resources, gender inclusion, environmental management, and risk management policies. The scale of experienced threats and challenges should determine the practical approaches to business. Such consciousness should lead to investments worth the returns. Dealing with local perceptions requires a closer engagement with those holding the perceptions. Dialogue and co-creation of

"Public relations roles are very important in modern organizations and this is equally true in the mining sector"

solutions to challenges require the employment of more cooperative approaches. It is not wise for one to put new wine in old wineskins. In many instances, business can be forced to stand on its own, with limited or no support from mainstream politics. Particularly, that happens when the interests of the two collide. Thus, appropriate social investments should be taken seriously in order to minimize mining risks.

1 Albert Maipisi is a Disaster Risk Reduction Specialist and holds a Ph.D. in Disaster Management [UFS, SA]and Public Administration [NUPS, Hungary], a Master of Science in Disaster Management [NUST, Zimbabwe], and a Bachelor of Science Degree in Administration [UZ]. Published ideas entirely belong to the author.



Challenges faced by Ventilation Practitioners in Zimbabwe



The mining industry continues to evolve due to many factors including, to name a few, new mining techniques and equipment, new approaches to risk management, more stringent safety and health standards, and new employment practices as orebodies become deeper and often produce lower grades. In addition, the same technological revolution and plummeting cost of technology that has brought GPS, smart-phones, and digital cameras to the general population is also working its way through the mining industry, impacting communications, automation, and process control, as well as introducing major efficiency and productivity dividends. However, not all factors are positive, including, in particular, the issues of carbon costs and electrical power.

This piece explores some of the trends affecting ventilation practitioners in Zimbabwe.

By Tawanda Talent Muchena

Exclusion from Initial Mine Designs/Mine Planning

Mine ventilation is often not given the necessary consideration in the initial mine design and planning stages. As a result, ventilation systems may be retrofitted, which can be less efficient and more costly than if they were integrated into the mine design from the beginning. Proper planning is essential to ensure that adequate airflow is available to dilute and remove harmful gases and maintain safe working conditions.

Challenges in Implementation of Ventilation Engineering Standards

The implementation of ventilation engineering standards can be challenging due to varying regulations and standards across different regions and a lack of standardized global practices. This can lead to inconsistencies in ventilation system design and operation, making it difficult to achieve uniform safety and efficiency.

Limited Financial Resources to Acquire New Technology (Instrumentation and Equipment)

Many mining operations face budget constraints that hinder their ability to invest in state-of-the-art ventilation technology, instrumentation, and equipment. Without these tools, it becomes difficult to monitor and manage ventilation systems effectively, potentially compromising safety and efficiency.

Lack of Exposure to Different Mining Methods Making Ventilation Personnel Less Effective

Ventilation personnel may lack exposure to different mining methods and technologies. This can limit their ability to adapt ventilation systems to the specific challenges of different mining operations, reducing their effectiveness in maintaining safe and efficient ventilation.

Ineffective Organizational Structures

Poorly defined or outdated organizational structures within mining companies can lead to confusion and inefficiencies in ventilation management. Roles and responsibilities related to ventilation should be clearly defined, and communication channels should be optimized to ensure smooth operation.

Increased Gassing Incidents Among Artisanal Miners

Artisanal mining operations, which often lack the resources and expertise of larger mining companies, can face increased gassing incidents due to inadequate ventilation systems. This poses a significant safety concern, and efforts should be made to improve ventilation in these settings.

Training and Developmental Challenges (Course Administration, Instrumentation, Human Resources)

Challenges in providing adequate training and development for ventilation personnel can hinder their ability to optimize ventilation systems. This includes issues with course administration, a lack of access to appropriate instrumentation, and the need for skilled human resources in ventilation management.

Conclusion

Addressing these challenges in mine ventilation requires a multi-faceted approach involving collaboration between mining companies, industry experts, regulators, and educational institutions. By acknowledging these issues and working together, the mining industry can improve safety, efficiency, and sustainability in ventilation practices.

Tawanda Muchena is a third-year Mining Engineering Student at Midlands State University (MSU). He writes in his capacity. Muchena can be reached at talenttawa@gmail.com.

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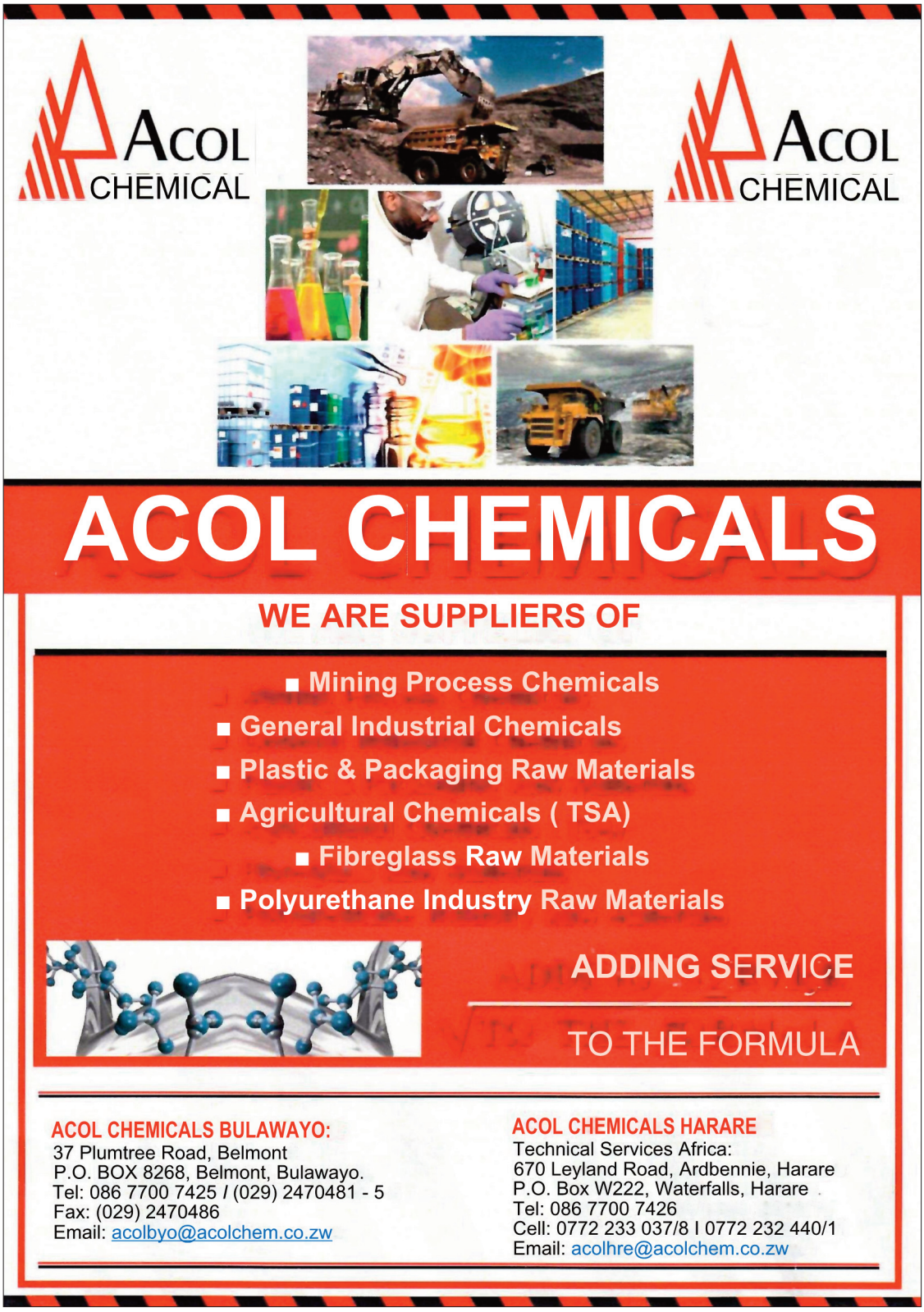
Acol Chemicals is a major supplier of chemical raw materials in Zimbabwe in both the Industrial and Mining Industry and acts as both a distributor and agent with sales offices located in Harare and Bulawayo.

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Guano Mining: The Green Gold of Agriculture



By Nomsa Ngono

There seems to be limited research on geological exploration and mining of Guano islands or caverns within the cratons of Africa. The reasons remain unknown, probably it is due to the fact that they are not of economic interest, or it might be the fear of contracting cave disease and inaccessibility.

This article seeks to dive deeper into both geological exploration and mining of bat guano.

Geological exploration was conveyed on various Guano mining caverns surrounding Zimbabwe. Some of these were Mabura Caverns which stretch for more than 60 km from Zhombe East to the Copper Queen area in Gokwe passing underneath Ngondoma River. Another deposit was Bashungwi in Hurungwe located in Magweto Village which has massive deposits with 15-20 years of life span. More listings on discovery were Chingwena deposits in Kadoma, Mburangwe deposits in Makonde and Odzi Deposits in Mutare.

Bat Guano

Bat Guano produces phosphorus which is used to manufacture fertilizer. The major source of phosphate used for fertilizer production is mined from Mesozoic deposits at Dorowa Minerals. There is a lack of competition and alternatives to the production of phosphates, which compromises fertilizer production prices which are always prone to abuse. The article will further explore the genesis of the Anthropocene, a revolution between soil phosphorus and human productivity. This will be done through assessing the enormous impact of hydrocarbons from rock phosphates on climate change which might necessitate geoscientists to consider Guano Mining either as an alternative or a competitor in minerals mined for agriculture.

The geological exploration of phosphate resources was carried out by the Geological Survey of Zimbabwe in 1991. Geological exploration conducted was for both rock carbonatite deposits and bat guano deposits from various caverns. Rocks associated with carbonites and cave accumulation of bat guano are the only two potential commercial occurrences of phosphates in Zimbabwe. However major attention and highlights shall be on bat guano phosphates. Mineral deposits of bat guano formed over million years ago by accumulation of excreta and bat remains. This occurred within caverns in Precambrian Proterozoic dolo marbles of the greenstone assigned to the Mucheka formation of the Lomagundi group. In almost every instance the caverns occur in limestone formations dissolved by acidic rain. Bat phosphate then composes in dump caves where bacteria action would have taken place and possibly the deposit would have been subjected to leaching leading to the formation of phosphorus.



At Organics Matter in South Africa Bat Guano is priced from R180

Though studies were carried out on the geology of bat caverns, the Ministry of Mines and Mining Development has not reached a point of converging bat guano as a mineral under the Mines and Minerals Act. Therefore, Guano Mines cannot be pegged under a prospecting license as the title of ownership is restored with the landowner. Almost all guano mines in Zimbabwe are under the jurisdiction of respective Rural District Councils. The question remains how do we then classify guano? As mineral deposits or agricultural chemicals? Nevertheless, since 1800 to date other countries across the globe considered guano as mineral deposits. Guano mining and guano trade contributed to industrialization and urbanization in parts of Europe and Latin America. Zimbabwe's lack of participation in guano mining hinders the global mineral resource supply chain. A considerable review of the Mines and Minerals Act to declare guano as an Agricultural mineral resource is worth a milestone in revitalizing both agriculture and mining which are the spring box of the Zimbabwean economy. Beneficiation of the project is for the poverty-stricken communities lying within the vicinity of guano caverns. Guano mining projects usher in elements of employment creation, industrialization and urbanization within the respective Rural District Councils. Like any other mining activity, mining guano is labour-intensive. Historically companies relied on slavery, indentured servants, prisoners and migrant labour.

Continued on the next page>>



Mining was highly manual using picks, brooms and shovels to loosen guano. The use of excavators was and is still prohibited because it is not only impractical due to the terrain, but it could frighten and disturb birdlife in the caverns. Caverns are often altered by explosives and drilling to facilitate guano extraction. The unabridged extraction process alters the micro-climate within the caverns. Of great importance when mining guano is considering bats' sensitivity to microclimate which may pilot bats abandoning the caves as roosts. Like any other mining shaft, caverns are dark hence mining procedures may introduce artificial light into the caves. Considering methods used in the process of extracting bat guano mainly explosives and drilling machines, guano is indeed an agricultural mineral deposit of great value worth classified under the Mines and Minerals Act. The Ministry of Mines and Mining Development is compelled to assess the viability, feasibility and sustainability of Guano Mining projects in different parts of Zimbabwe and whether they are able to sustain the fertilizer industry in the long run.

However, Guano as a raw material is a poorly balanced manure which needs the support of other chemicals or substances to manufacture suitable fertilizer. For example, an addition of sulphate potash to guano phosphates could make a great fertilizer. Nitrogenous guano with wood ashes proves a suitable fertilizer for maize and tobacco. Bat Guano in many caverns around Zimbabwe is of considerable value when made up of an approved formula with approved ingredients. More so into the bargain, if guano phosphate fertilizer is sold at a cheaper price than imported or other fertilizers it could be in great demand. Henceforth, the revival of guano mining in Zimbabwe under the wings of the Ministry of Mines and Mining Development could yield great economic prospects by introducing a new variant which will go a long way in expanding fertilizer-producing companies which heavily depend on phosphorus resources composed from the rocks.

As much as two-thirds of the world's known phosphate resources are composed from carbonate-rich phosphate rock, exploitation of phosphate deposits provides a potential contamination of the ozone layer, areas surrounding the mines and areas where phosphates are used by increasing heavy metal levels. Rock phosphates contain heavy and radioactive elements considered to be toxic to both humans and animals. The carbonates and phosphates have been identified as potential pollutant host minerals. High-grade quality rock phosphate deposits are being depleted worldwide due to increased agricultural activities, so more and more mining companies are turning to lower-quality sources of phosphates. These lower-quality phosphates could be attained from bat guano phosphates. Considering the life span of Dorowa Mine which is 60 years of marginal exploitation since its establishment in 1965, the phosphate resource is on the verge of depleting therefore there is a need for supplementary sources of phosphates from bat guano to sustain the fertilizer industry and boost international agricultural trade and domestic consumption.

Whilst deliberating on climate change, Agricultural scientists are mulling a shift to green farming by reducing the impact of hydrocarbons on planet Earth. Geologists on the other hand are pestering on a green revolution between soil phosphorus and human productivity termed as Anthropocene. Their main objective is to replace the nutrients extracted from soil by crops. Humans have added all sorts of nutrients to the soil with hopes of enriching it, somehow to no avail. Although the list of traditional fertilizers is exhausting and bizarre, none has a strong history as guano which was once the agricultural equivalent of gold best described as the "white gold of agriculture." Historically, the marketing of Guano in Zimbabwe was controlled by the Fertilizer Act of 1932 and the Farm Feeds and Remedies Amendment Act of 1976. Which states that no fertilizer shall be sold under the name or description of Bat Guano. Under such, fertilizer shall contain 2.5% of nitrogen or 8% nitrogen and phosphorus taken together, and much of guano does not meet this criterion On the contrary, the stated criterion can be met when bat guano is mixed with other organic compounds or ingredients to come up with a proper formula for fertilizers.

Finally, until the danger of cave disease is fully assessed, geological exploration of the caverns should be carried out by men who either have a positive Histoplasma skin test or have previously explored the caverns with impunity because one attack of cave disease gives immunity to further attacks. Other than that, explorers, geologists and miners are required to wear fully geared PPE along with respirators and oxygen supply to be able to contain chemicals that affect the chest. Thereafter, the Ministry of Mines and Mining Development will be in a position to consider declaring bat guano as mineral deposits under the Mines and Minerals Act. Back in 1800 Guano mining industry proved lucrative, it was a catalyst for industrialization and urbanization in parts of Europe and Latin America. With the 21st-century geoscientists advocating for green revolutions in the agricultural sector, a boom and bust of Guano Mining is optimistic. Shifting to organic energy is the only way to save planet Earth. A reduced use of carbonate phosphates from rocks reduces land degradation and mitigates the destruction of biodiversity, and water, land and air pollution. Organic energy therefore reduces the cost of climate change mitigation in line with the Paris Agreement. However, a lack of research and compliance by some key mining fraternities and responsible ministries hinder Zimbabwe's participation in the global mineral resources-based supply chains. It only takes enough investment in guano mining to sustain meaningful levels of economic growth.

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Gambiza predicts lithium prices to surge in 2030



Godwin Gambiza on stage at the ZSM 2023 Lithium and Battery Minerals Conference

Mr. Godwin Gambiza, the General Manager of Sandawana Lithium Mine, has made a prediction stating that lithium prices are expected to experience a significant increase in approximately 2030 due to an anticipated shortage in supply.

Rudairo Mapuranga

Gambiza made this prediction at the Zimbabwe School of Mines (ZSM) 2023 lithium and battery minerals conference which was held on the sidelines of the mining, engineering and transport expo (MineEntra) at the Zimbabwe International Exhibition Centre (ZIEC) in Bulawayo following a question by Magna24 Consultancy Director Engineer Innocent Guvakuva who said that the overall lithium market will see a supply surplus in the coming few years thereby leading to a decrease in prices.

Gambiza, however, said while it is true that in a few years from now, there is going to be a supply surplus, in the long run, lithium uptake is going to increase to the extent of leaving a supply deficit leading to sky rocketing prices.

He said the prices might surpass the 2022 all-time high of around US$ 82,000 per tonne of lithium carbonate.

"Demand for lithium will outstrip supply by over 46 per cent around 2030. I can safely say that the prices which have started falling from the highs of around US$80,000 for lithium carbonate to the current US$22,000 per tonne, I can see those prices surging again because demand is going to outstrip supply," Gambiza said.

According to experts, the world could face a shortage of lithium as demand for the metal ramps up, with some analysts forecasting that it could come as soon as 2028 while others see a longer time frame before that shortfall hits.

According to forecasts by S&P Global Commodity Insights, Electric Vehicle (EV) sales are set to reach 13.8 million in 2023, but will subsequently proceed to skyrocket to over 30 million by 2030.

"We do fundamentally believe in a shortage for the lithium industry. We forecast supply growth of course, but demand is set to grow at a much faster pace," said Corinne Blanchard, Deutsche Bank's director of lithium and clean tech equity research.

Definitive data has shown that there are currently only 101 lithium mines in the world with hundreds of lithium project duration, but the complexity of geology and time-consuming permitting process still pose challenges.

According to Rystad Energy's estimates, while more lithium mines and mining exploration projects coming online could support burgeoning demand, that would only extend the runway for a few more years but would not meet the demand of around 2030.

Rystad Energy Vice President Susan Zou estimates that total lithium mine supply will increase by 30 per cent and 40 per cent year on year in 2023 and 2024 and that miners will continue to develop both existing and greenfield projects amid a "global push to electrify transportation."

While that could point to a global lithium surplus next year, shortages could start to plague supply chains in 2028.

"In the next couple of years, though the lithium supply may stay adequate at a world level, regional supply imbalance is still inevitable," Zou added, noting regional mining and processing capacities in the U.S. and Europe might not be able to keep up with demand for EV batteries.

"The global battery supply chain may find lithium in shortfall again approaching the end of this decade when the supply growth might not keep pace with that of the demand," she said.

In that scenario, Zou said lithium prices could spike to their historic 2022 highs, which in turn would increase battery production costs.

Lithium carbonate prices surged to a record high of almost US$82 000 per ton in November 2022, more than 12 times January 2021 prices.

Muzarabani oil and gas: Preliminary wireline program completed

Australia stock exchange listed oil and gas exploration junior Invictus Energy has completed a preliminary wireline program at its Mukuyu-2 well in Muzarabani with wireline log interpretation identifying multiple hydrocarbon bearing intervals in Upper and Lower Angwa reservoir sands, the company Managing Director Scott MacMillan announced.

A wireline is an electrical cable used to lower tools into and transmit data about the conditions of the well-bore. Usually consisting of braided cables, wirelines are used to perform wireline logging, as well. Wireline logging is the measurement of down-hole formation attributes using special tools or equipment lowered into the borehole. In wireline logging, the sonde is gradually pulled out of the hole and records the properties of the formation rocks and their fluids along the way.

According to MacMillan wiper trip is being conducted to prepare the borehole for downhole fluid sampling from Upper and Lower Angwa targets with results anticipated in 2-3 days following the completion of a fluid sampling program.

"Evaluation of the preliminary wireline logs has identified multiple hydrocarbon bearing zones in the Upper and Lower Angwa coincident with intervals that displayed elevated gas shows during drilling.

"Logging operations have taken slightly longer than anticipated due to a minor tool failure and required troubleshooting. An additional wiper trip was also undertaken to clear a slight restriction across a shale interval in the Lower Angwa which was preventing the wire-line tools from reaching Total Depth (TD) to acquire data over the entire hole section, and to circulate a buildup of trip gas out of the hole. The restriction was subsequently cleared, and primary logs have been acquired down to TD.

"Once the current wiper trip to circulate out the trip gas and condition the borehole for the fluid sampling run has been completed in the next 24 hours we will commence downhole fluid sampling for the Upper and Lower Angwa zones.

"The log analysis is subject to further calibration using core and fluid samples obtained from the well.

"We anticipate completing the fluid sampling program in the next 2 – 3 days depending on logging conditions and number of fluid sampling stations," MacMillan concluded.



Student Creates Autonomous Locomotive to Improve Safety & Boost Productivity in Underground Mining



In an effort to reduce accidents in underground mining operations and help meet production (tramming) targets, Clyton Tinotenda Jakata who is a third-year student at the Zimbabwe School of Mines (ZSM) came up with a prototype of an autonomous locomotive.

Rudairo Mapuranga

According to Jakata, the use of autonomous locomotives in underground mining operations offers several advantages. First, it eliminates the need for human operators to work in hazardous and challenging underground environments, improving safety and reducing the risk of accidents. Second, autonomous locomotives can operate continuously, increasing overall productivity and efficiency.

He said the locomotive uses Artificial Intelligence (AI) to avoid collision, predict maintenance, drive and monitor.

"It is fitted with a collision avoidance system, predictive maintenance system, driverless system and proximity sensors. That's the new technology whereas the traditional locomotives are man-operated and do not have the above-mentioned technologies," Jakata said.

Autonomous locomotives, also known as autonomous haulage systems (AHS), are unmanned locomotives equipped with cutting-edge technology that allows them to navigate and operate without human intervention. These locomotives utilize a combination of sophisticated sensors, artificial intelligence (AI), and advanced control systems to perform a range of tasks. These autonomous systems are designed to detect and respond to potential hazards, such as obstacles on the tracks or changes in operating conditions thus ensuring a higher level of safety for both the locomotives and the workforce. They can operate continuously, around the clock, without the limitations of human fatigue or shift changes thus improving efficiency and productivity in mining operations.



Jakata demonstrating the use of the autonomous locomotive at Mine Entra 2023

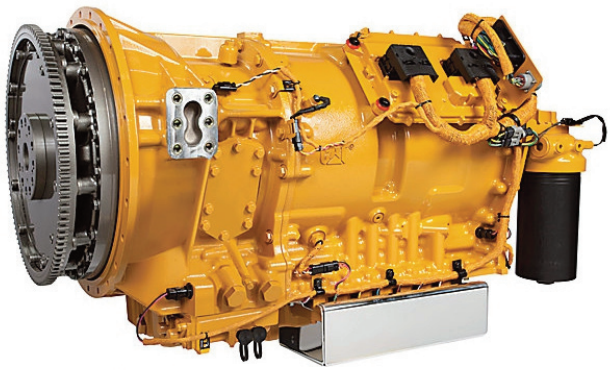


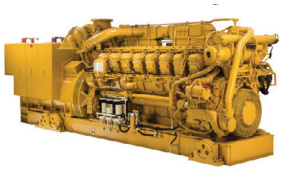


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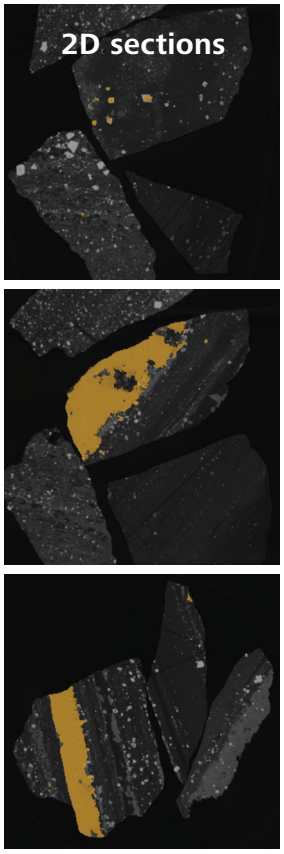
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