Review

20217102 Mining & Business News that Matters



Ore sorting testwork exceeds expectations at Kayelekera Uranium Project



Kayelekera Uranium Mine, insert Bowes

By Marcel Chimwala

SX-listed Lotus Resources, which is advancing preparations to reopen the Kayelekera Uranium Mine in Karonga, says it has achieved excellent results in the initial phase of ore sorting testwork for the mine as the grade of the ore sorting product has increased by up to 100% compared to the original feed sample.

MD for Lotus Keith Bowes says the ore sorting testwork results on ~500kg of ore from the Project have exceeded the company's expectations and validates the Company's view that ore sorting has the potential to both increase the feed grade (annual production) and extend the life-of-mine through utilisation of low-grade ores as plant feed. Bowes explains: "As previously stated, ore sorting is not essential for the Kayelekera mine to recommence production, but this technology has the potential to improve the economic returns of the Project, by reducing operating costs, increasing annual production and extending the mine life."

"These initial results have exceeded our initial expectations, as the ore has been upgraded by as much as 100%, compared to the feed grade. This means for example that a 400ppm U3O8 marginal ore could be upgraded to around 800 ppm U3O8 in feed for the main plant. Importantly, this initial phase of testwork tested each sensor individually."

"Our next phase of testwork will look at combining the sensors (i.e., testing the colour and **cont. on page 3**



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GEMMAP registers success despite Covid-19 hiccups

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ore sorting testwork exceeds expectations at Kayelekera Uranium Project

....trom front page density sensors in the same run) to determine if it is possible to improve on these results further."

He says testwork will continue during the third quarter of 2021 to further refine the results focused on testing a combination of sensors on the ore sorter to further optimise results and testing additional material types, including lower grade stockpiles.

Current indications are that a single ore sorter for the project would cost between US\$2M – US\$3M.

Bowes says the results of further ore sorting testwork and associated engineering studies will be incorporated into the Feasibility Study which is expected to commence in the third quarter of this year.

The Company tested two samples of run of mine ore (~500kg) at the STEINERT testing facility in Perth. The two samples were tested in a commercial scale ore sorting unit, with one sample using only the colour sensor and the other sample, using only the density sensor.

Sample	Mass Split	Upgrade Ratio	Distribution
Fines (-20mm)	16.1	1.0	16.2
Ore sorter (+20mm)	83.9	1.0	83.8
Concentrate	31.5	2.0	61.8
Middlings	5.0	1.6	8.0
Tails	47.4	0.3	14.1
Products			
Conc + Fines	47.6	1.6	77.9
Conc + Midds + Fines	52.6	1.6	85.9
Head Sample	100	1.0	100

Table: Colour Ore Sorting Results

The sample as received was initially crushed to 100% passing 60mm and then screened at 20mm. The +20 mm -60mm material was delivered to STEINERT for testing.

A total of three products were produced from each test – a concentrate sample that represented a high-grade product, a middlings sample that represented a high recovery option and a tailings sample. Each of these samples were collected, weighed and prepared at the laboratory, then submitted for chemical assay.

"The initial results indicate that colour sorting may be more effective on these specific ore types (86% recovery with an upgrade ratio of 1.6 versus recoveries of 71% at upgrade ratios of 1.5 using density) but there

Sample	Mass Split	Upgrade Ratio	Distribution
Fines (-20mm)	16.8	1.0	16.3
Ore sorter (+20mm)	83.2	1.0	83.7
Concentrate	8.9	2.1	18.8
Middlings	22.0	1.6	36.3
Tails	52.3	0.5	28.7
Products			
Conc + Fines	25.7	1.4	35.0
Conc + Midds + Fines	47.7	1.5	71.3
Head Sample	100	1.0	100

Table: Density Ore Sorting Resultscaption



Facility used during the testwork is the same size that would be used at the Project

are indications that the density separation may produce a higher grade product," says Bowes.

Bowes says the upgrading of the fines portion of the feed material is ongoing, with results expected to be received in the coming months.

A second phase of ore sorting testwork, whereby the various sensors are used together is being prepared with testwork planned to take place later. While this work is being undertaken, new samples from site will be delivered for further testing. These will include samples of the lower grade material, along with the other rock types treated at Kayelekera.

Bowes says the company expects results of this testwork to be available during third quarter of 2021.

Lotus Resources recently announced that it has commenced a 5,000 metre reverse circulation (RC) drilling program at the Kayelekera Uranium Project, which is the first uranium exploration drilling program at the project in more than 15 years.

The drilling will test airborne radiometric anomalies located within 3km of the existing processing facility. The exploration program aims to test these near mine targets with the ultimate objective of increasing the current 14-year mine life.

A regional uranium exploration assessment is underway at Kayelekera, which includes a more detailed review of the historical data available on the four most prospective exploration licences together with mapping, radiometric prospecting and sampling.

The Kayelekera Project already has a 14-year mine life and exploration success is seen as beneficial in increasing the mine life.

Lotus purchased 85% controlling stake in Kayelekera Uranium Mine from ASX-listed Paladin Energy in March last year.

The mine is currently on care and maintenance as production was suspended by Paladin due to low prices of the yellow cake on the market.

Resumption of production at Kayelekera would require an initial capital of US\$50-million which is on the lower side due to the mine's existing infrastructure including 1.4-million tonne processing facility, on-site acid plant and accommodation camp.

Kayelekera, which has 31-million pounds U308 of remaining uranium resource, produced 10.9-million pounds of uranium from 2009 to 2014 when it was placed on care and maintenance.







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EDITORIAL



Malawi needs to build on GEMMAP successes

As reported in the article on Pages 8 and 9, the Geological Mapping and Mineral Assessment Project (GEMMAP) has handed over its deliverables to the Ministry of Mining, reflecting the successes of the 10.2million Euros project that has been implemented with debt relief financing from the French Government.

The project's deliverables include geohazard, geological, structural, mineral potential and mineral occurrence maps, a new documentation centre, and a refurbished laboratory with modern rock/mineral processing and analytical equipment.

As well as updating the geological map coverage of Malawi (40 maps at the scale of 1:100 000, 10 maps at 1:250 000 and one map at 1:1 000 000) and the inventory of its mining potential, the programme included a geochemical survey of stream sediments, an analysis of the small-scale and artisanal mining sector, a natural risk (geohazards) mapping component, the construction of a documentation centre, upgrade of the GSD laboratory and training of Ministry of Mining staff.

As GEMMAP Project Manager Thomas Fulgraf is quoted in the article, the geohazard maps depict areas prone to disasters such as floods, landslides and earthquakes while the geological, mineral occurrence and mineral potential maps will assist the country to identify potential areas for further mineral exploration.

GEMMAP also indexed and confirmed numerous occurrences of minerals in the country including sulphides, copper, graphite, titanium, vermiculite and rare earth elements, including high potential for the niobium used in new technologies.

In the laboratory that it has refurbished at the GSD headquarters, GEMMAP has installed new equipment including X-ray fluorescence (XRF) and X-ray diffraction (XRD) instruments.

GEMMAP has trained artisanal and small-scale miners (ASMs) mining gemstones (corundum, ruby, beryl, tourmaline and spinel) with a view to organising the sector more efficiently, in particular through training for those involved and the establishment of a certificate of origin and the setting up of co-operatives.

We agree with Director of Geological Survey Department Kondwani Dombola who described the project as a milestone in the development of Malawi's mineral sector.

It shows great commitment for the implementation team lead by Geological Survey of France (BRGM) to meet its targets despite that travel restrictions that countries put in place to curb the spread of the coronavirus (Covid-19) pandemic affected the project as they impacted mobilisation of foreign experts and equipment.

But progress in the mining sector should not end with this project. We call on the Malawi Government to utilise the **GEMMAP** deliverables in taking the sector to new heights.

Change of domain name for website We would like to notify our readers that due to circumstances beyond our control, we have changed the domain name of our website to www.miningtradenews.net. We regret any inconvenience the changes may have caused to our readers - Editor





Phiri: We are advertising the blocks

By Wahard Betha

he Malawi Government is scouting for investors to acquire licences for all six vacant oil and gas ex-

ploration blocks in the country's Great Rift System, which is a geological zone with potential for the discovery of hydrocarbons.

The development follows recent relinquishment of hydrocarbon search licenses by UAE firms Hamra Oil Holdings and Rakgas LLC.

"Currently, all petroleum blocks are vacant and the good news is that all these six blocks are now on advertisement looking for new applicants," PRO for the Ministry of Mining Sangwani Phiri told Mining and Trade Review.

However, there were concerns that the existing blocks are too big with experts calling for re-demarcation.

Responding to the suggestion, Phiri said Government is also taking into consideration the demarcation of the big blocks and will ensure that it is done before new investors acquire the tenements.

Malawi Govt. seeks investors for vacant oil exploration blocks

He said the demarcation process will be conducted in tandem with provisions of the new Upstream Petroleum Policy and revised Petroleum (Exploration and Production) Act 1983. Government is currently reviewing both instruments.

Malawi's Petroleum Law is considered outdated because it was enacted during the one party era hence gave absolute ownership of petroleum resources to the Life President on behalf of the People of Malawi.

Based on the existing Law, in 2009 Malawi developed Petroleum (Exploration and Production) regulations which provided legal basis for the demarcation of the six Oil and Gas Blocks in Malawi.

In a previous interview, Minister of Mining Rashid Gaffer also admitted that the Blocks are too big.

Gaffer said Malawi demarcated such large Blocks to help prospecting companies to study geology of the country at large while trying to identify potential areas for Oil and Gas discovery.

He said: "Now that there has been exploration work going on with acquisition of some geological information and data, Government is considering re-demarcating the Blocks."

"You might also wish to know that during consultation meetings for review of Petroleum (Exploration and Production) Act of 1983, such issues were being raised and best international practices were being proposed by key stakeholders to be adopted in order to have sizable Blocks rather than what we currently have.

Pacific Oil Limited was the first oil search firm to leave Malawi vacating Block 6 covering the lower Shire Valley area before EFORA Energy (formerly SacOil) relinquished its licence for Block 1 covering Chitipa and parts of Karonga followed by Hamra Oil Holdings Block 2 and 3 covering the Lake Malawi area of Karonga, Nkhatabay, and Nkhotakota and then Rakgas Block 5 and 6 covering lakeshore and Shire River sides of Dedza, Machinga, Mangochi, Blantyre, Zomba, Mulanje, Thyolo and Phalombe.

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Preparations for establishment of state-owned mining company on course

By Tawonga Mayuni

The Ministry of Mining says it is making progress in its plans to establish the stateowned mining company the Malawi Mining Investment Company (MMIC) and the Malawi Mining Regulatory Authority.

State President President Lazarus Chakwera said in his press briefing of October 2020 that he will expedite the establishment of the two government bodies

PRO for the Ministry Sangwani Phiri told *Mining* & *Trade Review* that the issue is with parliament to allocate funds for the formation of the two institutions.

"Be assured that we are on track, we were a bit quiet as parliament was in progress from where subventions are gotten from all Ministries, including the Ministry of Mining," he said

But Phiri said the bills on the formation of the two government bodies are yet to be tabled before parliament, as the issue is on "deskwork" stage.

Asked if the functions of the two government bodies will not overlap with those of the Department of Mines and Geological Survey, Phiri said that functions of each entity will not in any way interfere with the overall vision and mission of the parent Ministry.

"The Mining Regulatory Authority will among other things be looking after regulation, rules and other related stipulations that will govern the general operations anywhere in Malawi, while the Mining Corporation will be mandated with the role of business," Phiri said.

He said that the two establishments are expected to relieve the Ministry of Mining of the backlog of work that it is currently handling.

Meanwhile, the Ministry has announced that the formation of the two institutions will not be financed by the Reserve Bank of Malawi (RBM) through its subsidiary Export Development Fund as previously announced.

"The money will not come from the RBM, these are government sponsored establishments as such there is no need to have the RBM bridging financially," he said.



Chakwera pledged to expedite formation of MMIC bodies are yet to be constituted.

The formation of the MMIC and plans to form the Malawi Mining Regulatory Authority were initially announced by the former President of the Republic of Malawi, Arthur Peter Mutharika in June 2020.

The Board of Directors for the two government

Licence hitches delay coal mining



Mwenifumbo: We are waiting for mining licence

By Tawonga Mayuni

anya Mining Company, which is a joint venture between local and Indian investors, has revealed that there are delays in their plans to start mining due to the dilly-dallying by the Department of Mines (DOM) to approve its mining license and the Environmental Affairs Department to approve its environmental and social impact assessment.

Director for Aanya Mining Company Frank Mwenifumbo told Mining and Trade Review in an interview that the Company, which holds an Exclusive Prospecting License for the coal deposit located in Livingstonia Coalfiled, completed exploration work for the project.

"Full scale mining activities have not commenced yet due to delays in granting the mining license and approval of the environmental and social impact assessment. It has taken over a year, waiting for the documents," he said

Mwenifumbo also said Aanya mine already purchased mining equipment to kickstart mining works as soon as the license is granted.

He explained that exploration at the mining site, which is located in Jalawe, Rumphi, involved some

drilling, and a few tones of coal were extracted as samples.

"We have also extracted few tones of samples to ascertain the availability of coal and the Department of Mines has so far given us permission to sell the samples," he said

He said the trenching, clearing and sampling phase employed about 52 people, mostly locals.

"We hope to employ more people from the surrounding area when we get into mining stage," said Mwenefumbo.

He also said that Aanya Mine intends to make a difference from the rest of mining companies through adherence to minimum wage as set by government.

Mwenifumbo said "We have put programs in place like improvement of learning and health facilities around the area."

"We also intend to build a shopping complex for the communities once business becomes viable."

Mwenifumbo is the Director of a local company Trident Group of Companies, which holds the EPL for the Aanya tenement.



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GEMMAP registers succes

GSD now has refurbished laboratory with modern equipment

By Marcel Chimwala

he Geological Mapping and Mineral Assessment Project (GEMMAP) has handed over its deliverables to the Ministry of Mining, reflecting the successes of the 10.2-million Euros project that has been implemented with debt relief financing from the French Government.

GEMMAP Project Manager Thomas Fullgraf handed over the deliverables at an official function that was held at Geological Survey Department (GSD) headquarters in Zomba and was organised by Carol Zammit, director of BRGM Malawi.

The acting Director of GSD in the Ministry of Mining, Kondwani Dombola, received the deliverables on behalf of the Malawi Government.

At the same function, GEMMAP also officially presented to the Malawi Government all the property it has been using, including mineral exploration equipment and nine 4X4 vehicles that were used during the project.

The project's deliverables that Dombola officially received from GEMMAP (which closed offices on June 30, 2021 and officially ends its implementation period on December 31, 2021) include geohazard, geological, structural, mineral potential and mineral occurrence maps, a new documentation centre, and a refurbished laboratory with modern rock/mineral processing and analytical equipment.

Fullgraf said: "Travel restrictions that countries put in place to curb the spread of the Covid-19 pandemic affected the project as they impacted mobilisation of foreign experts and equipment".

"However, I am pleased to report that we have managed to successfully produce all the deliverables contained in the concept of the project, and the Covid-19 hurdles have not affected the results which are excellent."





New geological map for kirk Range



New geological map for Mzimba

GEMMAP was launched in June 2016 and implemented over 5.5 years by a consortium led by the BRGM partnered by GTK and the CGS (the geological survey organisations of Finland and South Africa).

The project aimed to assist Malawi in undertaking geological mapping and mining inventory programmes across the entire country.

As well as updating the geological map coverage of Malawi (40 maps at the scale of 1:100 000, 10 maps at 1:250 000 and one map at 1:1 000 000) and the inventory of its mining potential, the programme included a geochemical survey of stream sediments, an analysis of the small-scale and artisinal mining sector, a natural risk (geohazards) mapping component, the construction of a





Old geological map for kirk Range



Old geological map for Mzimba

documentation centre, upgrade of the GSD laboratory and training of Ministry of Mining staff.

"One important aspect of the project is that for the first time in the history of Malawi, we have managed to produce geohazards maps which will be used by the Department of Disaster Management and District Councils for planning purposes," said Fullgraf.

He explained that the geohazard maps depict areas prone to disasters such as floods, landslides and earthquakes.

Fullgraf said the geological, mineral occurrence and mineral potential maps will assist the country to identify potential areas for further mineral exploration.

"The project has identified potential for a number of minerals including graphite and ru-



GEMMAP's Fulgraf (left) handing over different maps produced by the project to Ministry of Mining's Dombola

Fulgraf (right) presenting exploration equipment to Dombola

s despite Covid-19 hiccups

Project produces new geological and mineral potential maps of Malawi

tile, he said.

Fullgraf, however, said the project only confirmed the existence of alluvial gold in stream sediments; hence, there is need for follow-up surveys to identify the sources of the gold.

GEMMAP also indexed and confirmed numerous occurrences of minerals in the country including sulphides, copper, graphite, titanium, vermiculite and rare earth elements, including high potential for the niobium used in new technologies.

In the laboratory that it has refurbished at the GSD headquarters, GEMMAP has installed new equipment including X-ray fluorescence (XRF) and X-ray diffraction (XRD) instruments.

"The XRD can be used to identify all minerals. Nearly all the elements in a sample can be analysed by the XRF machine including the REE," said Charles Missi; head of the GSD laboratory.

GEMMAP has trained GSD personnel to operate the laboratory equipment in its training component for professionals working for the Ministry of Mining.

The training programme also involved mentoring of Ministry of Mining professionals by consortium geologists, through work and diploma courses (Master of Science degrees and continuing training). Potential development plans for the coming years include establishing long-term cooperation between local academics (Chancellor College), the Ministry of Mining and foreign universities (France, Germany and South Africa).

Particular attention was given to smallscale mining for gemstones (corundum, ruby, beryl, tourmaline and spinel) with a view to organising the sector more efficiently, in particular through training for those involved and the establishment of a certificate of origin and the setting up of co-operatives.

In his remarks when he officially received





Group picture of officials who attended the hand over ceremony

the GEMMAP deliverables on behalf of the Malawi Government, Dombola described the project as a milestone in the development of Malawi's mineral sector.

"This is a step ahead for Malawi coming at an opportune time when the government has earmarked mining as a priority area in economic development as stipulated in Malawi 2063," he said.

Dombola explained that with the laboratory, most of the samples, which would have been exported to be tested in foreign laboratories, will now be analysed locally.

He also said the new data obtained through GEMMAP will help in attracting investors to identify potential exploration and mining



GEMMAP also donated vehicles used by the project to Ministry of Mining

areas.

Dombola said: "Countries are competing for investors to bring Foreign Direct Investment and mining investors prefer those countries where more data is readily available.

"This data collected through GEMMAP puts Malawi at an advantage."

The Ministry of Mining has planned to unveil the data collected through GEMMAP to the nation at a public function to be held in October.

BRGM previously worked on Malawi's geology and mineral resources in cooperation with its counterparts in Malawi, producing a brochure in 2015 summarising current knowledge to promote the mining sector.







Dombola (right) receiving laboratory equipment from Fulgraf

Group picture of officials who attended hand over ceremony of documentation centre

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FISCAL REGIME AND THE MINING SECTOR RAW DEAL

ABSTRACT

Fiscal regimes need to be designed in such a way as to create smart partnership between government and the resource companies. While governments try to maximise revenue from the minerals industry, they also need to let companies realise return on their investments. Building trust between the two partners increases investor confidence.

The paper explores how fiscal components and tax justice can affect government revenue.

INTRODUCTION

It is universally accepted that natural resources are a nation's inheritance and belong to its people. Mining companies come into the country to exploit these resources with full understanding that there will be benefit sharing between government and the company. This benefit sharing is guided by the fiscal regime of the host nation. Governments try to use fiscal regime tools to maximise their revenue while mining companies look for loop holes to maximise revenue for its shareholders. An effective fiscal regime maximises government revenue while maintaining a good return on investment for resource companies.

The paper tries to enlighten policy makers and "watch dogs" on how the fiscal regime of natural resources projects can be designed to realise a fair share of the profits for government and resource companies.

FISCAL COMPONENTS

Governments collect the following from resource companies:

1. Annual ground rent per hectare – Other countries allow payments to local administrative authorities. In Malawi, Exploration Licences pay MK10,000 per square kilometre up to year 3, there after its MK15,000. Mining Licences pay large scale mining is MK50,000 per square kilometre and MK20,000 for small scale mining licences.

2. Royalties – These are a percentage of the value of minerals produced without taking into account production costs. Royalties vary normally between 5 and 10 %.

3. Corporate Income Tax – This is a percentage of net profit (after deducting operation costs). Corporate Tax may range from 30 to 35%.

4. Withholding Tax – This is a percentage of payments made to third parties. This can be in form of payment for services and dividends. In Malawi it is 20%

5. State equity participation – This offers a share of profits to government as long as no operational risks are attached.

6. Production sharing - This is mainly practiced in oil and gas projects. Companies collect an agreed share

of produced oil to offset exploration and development costs. The rest is shared between government and the resource company. The initial oil produced is subject to a royalty charge. Figure 1 shows a standard agreement between a resource company and government.



The design of a fiscal regime depends on how government wants to balance between attracting Foreign Direct Investment and maximising Effective Tax Rate (or its fair share of proceeds). Average Effective Tax rate for oil and gas varies between 50% and 80% while that of solid minerals varies from 40% to 70%.

RAW DEAL

Raw deals emerge when government designs regressive tools that offer lesser shares of the proceeds as profits increase. Some investment incentives are self-defeating in areas where companies take advantage of governments' investment incentives. For example, Double Taxation Agreements encourage Transfer Pricing and Treaty Shopping. Lack of project ring fencing erodes government revenue collection as taxes are assessed together as one project in two projects with one that is highly profitable and the other loss making. Thin capitalisation reduces project revenue thereby prolonging non-payment of profit based taxes due to high and long loan servicing. Taxes that are affected in this situation include Corporate Tax and Resource Rent.

Policy makers need to monitor effectiveness of their fiscal regime. Fiscal regimes should maximise government revenue within shortest time possible.

Most governments rush to take state equity without proper mechanisms for monitoring their investment and putting up mechanisms for effective participation in the operations of the resource company. Lack of participation in working with the resource company leads to unethical activities such as transfer pricing on managing of procurement of goods and services

Raw deals emanate from tax avoidance and tax evasion. Tax avoidance is the ability to reduce one's tax burden while complying with tax law. Tax evasion corresponds with not reporting all of one's income. Treaty shopping leads to tax avoidance and this is not il-

of produced oil to offset exploration and development legal. Tax evasion is illegal as it is tantamount to cheatcosts. The rest is shared between government and the reing.

This happens due to some of the following reasons:1. Low ability of tax administration and fiscal

courts to enforce tax liabilities

2. Unwilling to pay due to attitude of tax collectors

3. High costs to prepare revenue accounts in

order to comply with tax laws

4. Bartering of goods

Any business ventures need to be properly monitored in terms of how they manage procurement of goods and services. Government needs to have a highly trained and sophisticated unit to maximise revenue from business entities without creating enmity with companies. Figure 2 summarises some of the reasons GIZ attributed to tax



avoidance and tax evasion in developing countries. CONCLUSION

Fiscal regime design and management should bring investor confidence while maximising government revenue. Tax avoidance and evasion can be minimised in an environment of trust and respect for business operations. Insufficiencies in tax collection can be reduced through building capacity for tax collectors, motivating them and reducing compliance costs for resource companies.

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GeoConsult conducts drilling works at Sovereign's Kasiya rutile project

By Marcel Chimwala

SX-listed Sovereign Metals has contracted Lilongwe based consulting firm Geoconsult to conduct exploration drilling works for its Kasiya Rutile Exploration Project in Lilongwe.

MD for Geoconsult Michele Sabelli says in an interview that this is the second time that his Company is carrying out drilling works for Sovereign Metals at the Kasiya project, having conducted basic exploration during the very early stages for the project.

He says: "We are excited to be involved in this project from the beginning as it has uncovered one of the largest high quality rutile deposits globally."

"It is also exciting for Malawi to have this deposit, and to have a Company like Sovereign Metals, who is proven to be very professional and following the due diligence with the people of Malawi at heart."

Sabelli explains that his Company has mobilised two drilling rigs which are being used to carry out the exploration drilling works at Kasiya, the samples are being dispatched to Sovereign Metals' site for analysis.

He says holes are being drilling across the whole area hosting the Kasiya deposit with a total of 2500m targeted to be drilled.

Sabelli says his Company is glad that it has managed to mobilise machinery for the project from overseas despite some challenges posed by the coronavirus disease (Covid-19) pandemic.

"Covid-19 made it difficult to import the equipment due to border restrictions and increased freight costs, however we luckily managed to import the equipment and spares in time." he said.

Sabelli says the purchase of the equipment, which includes an extra drill rig and the X-ray Fluorescence Spectroscopy (XRF) machine has scaled up the capacity of the Company to execute exploration work for mineral exploration companies as currently they are focused on geotechnical engineering.

"With the XRF, we have the capacity to analyse most of the minerals found in Malawi," he said.

Geoconsult are specialists in a number of disciplines including Geotechnical design which includes foundation design, work on soil and rock strength characteristics, borehole investigations, and technical work on slope stability.

Geoconsult are also experts in geotechnical testing and design which alongside the drill rig can give bearing capacity values and soil properties up to 20m below ground level. They have a full inhouse soils and concrete laboratory where they service the construction industry with quality control testing and design as well as concrete mix designs and cement/concrete testing.

The company was established in 2017 and has since successfully completed several high profile jobs, some including:

US funded Millennium Challenge Account (MCA) **Energy Compact Project**



Geoconsult conducted geotechnical design and testing for over 40 overhead lines and five substations for Fichtner, the Contract Engineer for the project.

The Contractor also conducted borehole drilling for overhead line and substation, bearing capacity design and recommendations for each case to determine the ultimate safe load and if stabilisation was required.

The Contractor also conducted quality control of works for the substations during construction through soil testing of foundations and appropriate materials giving the go-ahead if acceptable and recommendations of where to improve if not meeting requirements.

GeoConsult was also tasked with all the quality control of the concrete from the early stages of aggregate testing, mix designs as well as having a concrete technician batching on site for all concrete pours at every substation to ensure that the concrete was to Fichtner's specifications. The assignment also included concrete cube casting and crushing.

Nkhotakota Solar PV 24MW Project

Geoconsult carried out geotechnical investigations for 60Ha site, including ground water mapping and foundation recommendations based on bearing capacities.

Salima and Golomoti Solar PV Project

Geoconsult carried out geotechnical, hydrological, and topographical/drone surveys for both sites, totaling 300Ha, to compile a comprehensive report for OPIC investors. Report included seismic activity, 15m boreholes across the sites with compressive tests carried out on bedrock, triaxial testing allowable bearing capacity for various foundations. Pile pullout testing was conducted across the Golomoti site to determine pile failure loads.

Expansion and Rehabilitation of Lilongwe Water Mains

Over 200km of new and existing pipeline was to be replaced or installed across the capital city of Lilongwe. Geoconsult conducted testing every 1km to establish subsoil conditions. Drilling was conducted for all reservoirs and pumping stations to establish the potential site's ultimate bearing capacity and any recommendations for improvements.

Tank foundation designs were based off all geotechnical bearing vales produced through the geotechnical drilling

Chipata Thermal Power Plant

The Company conducted full geotechnical testing and design for a proposed power plant in Chipata. This included 16 boreholes to analyze subsoil conditions, settlement analysis and bearing capacity across the site, 30+ trial pits to test percolation, water seepage and in-situ soil strength.

KRC – Dam and Irrigation Projects

KRC commissioned Geoconsult to drill and conduct soil feasibility for five earth dams in the northern region within the mountains to provide irrigation systems further downstream and allow farmers to grow year-round.

Within the same project Geoconsult conducted approximately 200km worth of souls investigations in Chikwawa in the southern region for a new irrigation scheme





Drilling in progress at Kasiya



Sabelli : We are excited to be involved in this huge project

set to be launched in 2023.

New American Embassy Compound

Geoconsult drilled in excess of 40 boreholes to determine bearing capacities across the area to identify potential weak layers and provide suggestions for cut levels. 30m of rock coring was conducted to identify rock type and strengths.

Consultancy - Kamuzu Central Hospital Neurosurgery Building

Full range of geotechnical testing was required due to poor soil conditions at the site. Investigations into the decomposed rock were required to find competent bearing strata for the multi-story buildings.

Consultancy & QC Control Testing for Linthipe -Lobi Road

Installed an onsite laboratory to identify suitable borrow pits for all layers of road construction. Supervised and tested all compaction and material requirements throughout the earthworks. Testing for all surfacing, chippings, and slurry layer, including the slurry mix design.



GeoConsult's XRF machine

Cube crushing machine

Triaxial testing

AUGUST 2021



The Author is a Consulting Geoscientist with experience in Mineral Exploration, Mining Geology, ESIA, Ground Water Resources and Occupational Safety, Health and Environment.

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Empowering Sustainable Mining

Q ustainable mining is the minimization mining operations, they leave a lot of waste be-of negative environmental, social- eco- hind when mining operations stop or, in the case nomic impacts associated with mining and processing activities while limiting extraction to rates that do not exceed capabilities to establish new sources, substitutes, or recycle any particular material so as to not compromise potential. Efficiency is a key differentiator towards the sustainability and success of a mine. In addition to using up non-renewable resources like minerals, mining operations use large amounts of other resources as well, including water, soil and energy. There are so many ways to empower sustainable mining and some of them are as follows:

1. Reclamation/Rehabilitation of Mine Sites

Many modern mining techniques cause destruction of the environment. They can cause massive soil erosion due to removal of overburden and vegetation cover and if this is left unchecked, it can lead to contamination for so many years even during post mine closure period.As a result mines are left unproductive, unusable by landowners and, in some cases, plant and animal life is disturbed. However, this damage may no longer be permanent. Mining companies can use many land reclamation/rehabilitation techniques to make mined land productive again or speed up the land's natural recovery process.

For example waste rocks can be used to fill excavated areas by backfilling, large scale re afforestation, some vegetation like vertiva can be promoted to reduce the impact of erosion. These have the impact of reducing possible disruption caused by mining activities and restoration of some species.

2. Recycling of Mine Waste

Mining naturally produces significant amounts of waste such as liquid/solid tailings, clean waste rocks, and wastewater. In many

of tailings, they are stored in Tailings Storage Facilities (TSF) or dams which may lead to dam failures and, as a result, may cause severe environmental damage or displacement of fauna, and people. Companies can use waste rocks in simple on-site construction, like backfilling and reconstructing mined terrain in a way that prevents soil erosion.

When adequately treated, mine water can be reused in some way like agriculture, as coolant, dust suppression in mine haul roads, process plant recycling and for drinking water.Depending on the mineral and chemical composition of the tailings, mines can use them in the production of bricks, as paint extenders or in agroforestry. However, not all of the applications are economic .The mining industry will likely need to invest in further research and development in the areas of mine waste reuse to make some of the methods workable at scale.

3. Stopping Illegal Mining

Illegal mining remains a significant issue for the industry. For example, there is a lot of illegal mining in Africa. Illegal mining often takes place on properties not suited for large-scale mining and without regard to regulations that reduce the environmental impact. Illegal mining brings about wasteful land in terms of cutting down trees on a large piece of land, leaving hollows due to unregulated digging, use of chemicals that are left uncontrolled and illegally dumped unnecessarily. Prevention of illegal mining operations can help to ensure that all mining is bound by the same environmental standards and ensure accountability.

4. Improving Mining Sustainability

Despite new technologies, the mining industry remains unsustainable in many areas. Luckily enough, there are a variety of technologies and techniques both in-use and in development that the mining sector can use to reduce its environmental impact. Advanced land rehabilitation techniques, coupled with low-impact mining methods and reuse of mine waste, can cut back on the impact that mining operations have on their immediate environment. Companies can also use new equipment, articulate trucks powered by electric engines to reduce their carbon footprint and become more ecofriendly.

Not all of these technologies are economical. However, the mining industry as a whole does seem to be moving in the direction of sustainability. Over the next few years, these technologies should become more practical and it may be easier for mining companies to make themselves more eco-friendly.

5. Way Forward

Both the government and the mining industry need to take a comprehensive view of sustainable development that should cover dimensions other than environment alone, such as socio-economic development, stakeholder involvement, transparency and accountability. Preparation of a socio-economic assessment report for a mining project should be made a part of the permitting process for the grant and administration of mineral concession to a mining enterprise. Local socio-economic development works should preferably be executed by mining companies rather than governments to avoid the problems of inadequate capacity, political interference and corruption.

In order to alleviate the limitations of small mines in carrying out sustainable development activities, it is advisable to promote small mining companies. Technical advisory services should be made available to them in the relevant areas. Mineral development should be carried out within its available social and environmental capability and infrastructural facilities at a given point of time.









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MALAWI CSOS CALL FOR REVISED SADC MINING PROTOCOL



Rashid: The protocol has not fully been adhered to By Bester Kayaye

s the country is preparing to host the 41st Southern African Development Community (SADC) Heads of States summit in August, a local civil society grouping, Natural Resource Justice Network (NR JN) is asking summit participants to consider revising the SADC region protocol on mining.

The protocol, to which Malawi is a signatory, was signed in 1997 and became operational in 2000. It seeks to improve lives of the SADC citizenry through development and harmonization of legislation in the mineral sector.

Among other principles, the protocol recognizes that a thriving mining sector can contribute to economic develop-

ment, poverty alleviation and improvement of the standard and quality of life throughout the region by promoting private sector participation in the exploitation of mineral resources; developing sustainable environmental protection framework and ensuring relevant information exchange among member states.

NR JN coordinator, Kennedy Rashid, told Mining and Trade Review that since its ratification, the protocol has not fully been adhered to by most of countries to ensure that SADC develops from mining.

According to Rashid, lack of regional coordination and regulation of Artisanal and Small Scale Mining, and non-adherence to the promotion of environmental protection in the sector are among the loop-holes identified in the protocol.

Information sharing, technological advancement, environmental protection, Occupational Health and Safety, institutional strengthening, and networking within and among member states are some thematic areas emphasized by the protocol.

"But there have been weak coordination and regulation of the informal mining sector in the region, cases can be pointed out from Malawi, Zambia, Zimbabwe and Mozambique," said Rashid.

He also disclosed that illicit financial flows from the sector were left unattended to as information disclosure in the region is still a challenge.

Former Botswana President Festus Mogae once acknowledged that corruption and poor management of Africa's mineral resources affect the development of the country.

"Some of the internal factors that have led to the debt crisis in Africa, including Malawi and Zambia, relate to having low tax revenue and illicit financial flows," he said pointing out that reports reflect a hemorrhaging of potential mining royalties through underreporting.

"We do not have a standardized fiscal framework for the region in terms of Mining as we have various countries with different governance and political situations."

He, therefore, hinted that as CSOs they are expecting SADC Head of States to consider revising the protocol to align to the current trends in global mining industry.

Rashid explained: "There is a need for the protocol to consider the current trends in global mining governance standards as per recommendations and framework that were presented in the Mineral Resource Governance in the 21st Century Report by UN Environmental Programme."

Chairman of Nyasa Mining Cooperative Percy Maleta said as part of ASMs, they are delighted the country is to host the summit where their cooperative will exhibit what Malawi has on offer.

He said his organization anticipates the SADC Heads of States to come up with a harmonised policy for the subsector where borders will be opened up for players to trade freely thereby having a bigger friendly market.

Maleta said: "If not on the agenda we will ask the Heads of State to open the borders for us to network as a block, create more jobs as a region, enhancing skills. We also would like SADC to prioritize value addition of all minerals produced by ASMs as this is the only way we will benefit from our natural resources as prices dramatically increase with value added products."

PRO for the Ministry of Mining Sangwani Phiri acknowledged that the summit will come with a wide range of opportunities and as such, Malawi was scouting for funds to set pavilions to exhibit what it has to offer on mining to participants.

Canadian firm manages Malawi's mineral licensing system

By Wahard Betha

The Ministry of Mining has hired a Canadian firm Trimble Land Administration to manage Malawi's Mineral Cadastral Licensing System.

Cadastral system provides an online mining tenement management system to its users, primarily would be and actual license owners and to regulators and policy makers, whose State colleagues provide the input data that the system interactively presents.

The portal currently displays large-scale mining licenses but additional datasets will be included as and when the data are validated and made available.

PRO for the Ministry of Mining Sangwani Phiri described Trimble Land Administration as a trusted firm not only in Malawi but also in many African countries.

He said: "Trimble is a company that keeps all files for many organizations, countries and other entities' high profile exclusive information and it is kept in the clouds under amazon."

"Before Trimble came, Spatial Dimension used to do the work but it stopped on reasons best known to itself that necessitated Trimble to buy shares from Spatial to own, manage and support those using this system."

"This is paid for by Malawi Government and it is the treasury which is responsible for payments."

Under the phased out World Bank and European Union financed Mining Governance and Growth Support Project,

Malawi's Ministry of Mining and another Canadian firm Spatial Dimension developed the Mining Cadastral Portal to improve transparency and promote investment in Malawi's mining sector.

Trimble started working on the cadastral system in April 2017 after acquiring shareholding in Spatial Dimension, and is now offering hosting and support services.

Trimble's Land Administration solutions automate and integrate land registries, cadastral mapping, and the permitting and licensing of land for surveyors, governments and businesses worldwide.

Through the integration of a broad portfolio of technologies with workflow management tools, and consulting services, Trimble provides a fully configurable, scalable solution to help drive the efficient administration of land and its associated transactions, rights, and agreements.

In May 2016, Spatial Dimension, a Trimble company, won, on an open tender, a Work Bank funded project to establish a Mineral Rights Cadastral System for then Ministry of Natural Resources, Energy and Mining, Malawi.

Currently, there is ongoing controversy between some licenses applicants and Minister of Mining Rashid Gaffar with the applicants accusing the Minister of acting in breach of the Mines and Minerals Act by failing to sign off their licenses within the mandated 45 days after being granted by the Committee.

But Gaffar reacted in a recent exclusive interview with Mining & Trade Review that he has signed all the licenses coming to his desk, since he became Minister, within the mandated 45 days prescribed in the Act but has just refused to sign off a few due to reasons bordering on public interest.

He said: "The Tonse Alliance philosophy championed by His Excellency the State President Dr. Lazarus Chakwera and his Vice Dr. Saulos Chilima commits me as Minister to reform the mining sector by ensuring that it benefits Malawians at large and not just a few privileged individuals."

"I cannot sign licenses which I suspect were corruptly issued by some technocrats sitting in the Mineral Resources Committee. As Minister, I have a duty to root out corruption at the Ministry, it should not be the same people owning mineral licenses when there are more deserving companies including local ones."

Gaffar said he will not be corrupted to sign off licenses to serve the interest of selfish and corrupt individuals and not that of all Malawians who expect the minerals sector to contribute to the country's development.

"I do not want to sign raw deals as the case was with Kayelekera where Paladin was mining but there is no development to show in terms of corporate social responsibility," he said.But MD for Akatswiri Mineral Resources Hilton Banda asked the Minister to first consider the Law which was crafted to save the interest of the public before bringing in his personal judgment in undertaking his duties as government may be sued for his actions.



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Malawi engages Mozambique to end ASM boarder wrangles over gold deposits

By Brown Mdalla and Wahard Betha

The Malawi Government says it is working with Mozambican authorities to end wrangles between artisanal and small scale miners (ASMs) from the two countries over alluvial gold deposits in Malawi-Mozambique boarder area in Mangochi-Makanjira.

The squabbles between miners from the two countries in the boarder area has resulted in deaths and injuries of some miners from the two countries.

Director of Mines in the Ministry of Mining Burnet Msiska said governments of the two countries are dealing with the issue "at a higher level" and that things will improve soon so that people from the two countries benefit from mineral resources in the boarder lines.

Msika said: "It is true that there have been differences between small-scale Mozambican and Malawian gold miners at Makanjira, but as government we are not quite on the matter. We are doing everything possible to end the conflicts."

"As we speak, the two governments have already instituted committees that comprise officials from their mining ministries, foreign affairs and the police to resolve the issue."

Meanwhile, Police in Mangochi say they are succeeding in containing differences among Malawian and Mozambican ASMs in Makanjira.

Mangochi Police station spokesperson Amina Tepani Daudi told Mining and Trade Review in an interview that they have managed to pacify the situation and that there is currently calm and co-existence among miners from the two countries.

Daudi explained that, among other interventions, officers from Mangochi Police have been visiting the area to sensitize people on the importance of co-existence, the type of message she said has helped to bring peace among the miners.

She, however, complained about misinformation on the matter, which she said created unnecessary tension.

"As Mangochi Police, we are pleased to announce that we have managed to mediate on wrangles among Artisanal Small-Scale gold miners at Makanjira. Essentially, the place has gold deposits that attract various nationals and consequently lead to differences among them,"said Daudi.

Mining & Trade Review's previous visit to Makanjira established that there are a number of socio-economic problems that are thriving in the area as a result of prevalence of illegal mining activities including drug and alcohol abuse, marriage breakages, teenage pregnancies and early marriages as the miners bring money to coax married women and young girls.

Drug Fight Malawi (DFM) Executive Director Nelson Zakeyu admitted receiving reports of drug abuse from Makanjira and other mines. He said his organization is currently working on conducting sensitization meetings with miners to enlighten them on the dangers of drug and alcohol abuse.

Ministry of Mining Spokesperson Sangwani Phiri said government is aware of problems associated with illegal ASM mining and has launched a programme to formalize ASM activities to ensure proper regulation.

"We are calling on ASMs across the country to form and register cooperatives which we can easily train in profitable and sustainable mining practices," he said.

But the Parliamentary Committee on Natural Resources and Climate Change has directed the Ministry of Mining to stop taking formalization of ASMs as a way to curb illegal gold mining in the country.

Speaking in an interview after meeting officials from the Ministry, Vice-Chairperson for the committee George Million said wasting resources on formalization of illegal miners will have no impact as the activity is infiltrated by foreign nationals.

Million said: "Understanding that the foreigners are part and parcel of the illegal miners, we are afraid those miners will also be part of the cooperatives directly or indirectly."

"So as the cluster we say no to that arrangement until such a time the industry is reorganized."

"As a parliamentary committee we will keep on engaging them up until we reach a compromise because as a nation at this stage of mining in the country we still believe we are going to lose out if we are going to use cooperatives as game charger of the sector."



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Small scale mining is still informal business

Million also said it is unfortunate to see the entire government making plans of formalizing the illegal gold miners instead of making them face justice as the Malawian laws stipulate.

He said the country would have advertised the gold hotspot areas to potential investors instead of letting the law offenders grouping for the same illegal areas.

The Government through the Reserve Bank of Malawi (RBM) recently launched a structured market for gold and so far the central bank has managed to purchase gold worthy over MK60-million.

Apart from the illegal mining activities, the committee also expressed eagerness on how the Ministry intends to utilize its projected MK1.9-billion allocation for 2021/22 financial year.

In his presentation, Director of Geological Survey Department Kondwani Dombola explained to the committee that the Ministry has planned a number of activities for the period including: establishment of Mining Regulatory Authority; finalization of the state owned mining company; completion of construction and rehabilitation works for the Ministry of Mining Headquarter Offices and mineral laboratory and; facilitation of exploration and exploitation of strategic minerals of national importance.



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