

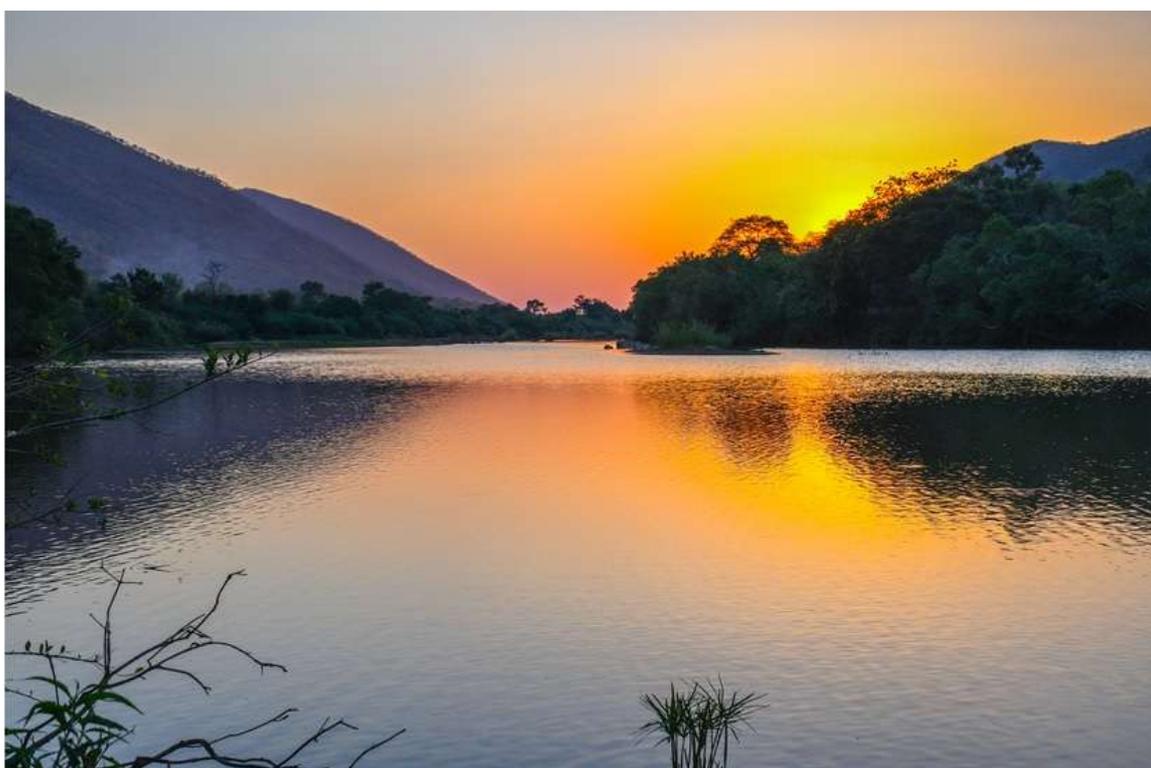
Geological Society of Zimbabwe



Newsletter

June 2019

No. 2 of 3 of 2019



Nyagande Pools, Sunungukai, UMP, the final stop on the Macgregor Memorial Field Trip led by Dr Heilke Jelsma. Photo: Tony Martin

www.geologicalsociety.org.zw

The Geological Society of Zimbabwe, P.O. Box CY 1719, Causeway, Harare

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Editorial

A lot has already happened this year with respect to the staging of talks, field trips and presentation of the prestigious 12th A.M. Macgregor Memorial Lecture delivered by Dr Hielke Jelsma in May. These events are reported on in this Newsletter variously by the Chairman and **Houda Bouammar**, who is the organizing force behind their staging. The Macgregor Lecture was delivered to pleasing audiences in Bulawayo, Zvishavane and Harare. Further details of events are posted on and Power Point presentations can be downloaded in pdf format from the Society website. www.geologicalsociety.org.zw

Tony Martin is thanked for his efforts in preparing articles on various stratigraphic units as are found within the Belingwe Greenstone Belt, in this issue a description of the exposures along the Dohwe River of the Hokonui Formation rocks. Next up in this series will be a record of exposures as seen in the Hokonui Vent Agglomerate. This we understand is with the aid of a drone survey. The records should prove invaluable to students and researchers alike when incorporated as aids on future field excursions.

Our regular contributors continue to represent the mainstay of this Newsletter, and they are thanked sincerely for their support. Contributions include those updates from the Geology Department, UZ, the MSU Campus in Zvishavane, the Geological Survey and for the Mining Industry. News of the latter is always carefully and accurately compiled by Forbes Mugumbate who's cumulative record represents a real epistle as to happenings within our mining world. Hard copies of the Newsletter are lodged in the A.E. Phaup Library at the Geological Survey and in the National Archives. Back copies from 2006 can be viewed and downloaded from our website.

It is fitting here to congratulate **Hielke Jelsma**, for his delivery of the Macgregor Memorial Lecture, and **Forbes Mugumbate**, for his achievements in fostering the furtherance of Geology within Zimbabwe, as being appointed Honorary Members of our Society.

Another deserving congratulations is **James Abson** for in April he participated in the Iron Will hiking, biking and orienteering event, this year hosted over three days by Camp Dwala in the eastern Matopos. For his uncalled for concern over the plight of fellow competitors who may have found themselves in trouble in various ways and at various stages during this Eco-challenge event, James was elected for the *Spirit of Iron Will* Award.



*James Abson, Spirit of Iron Will Award winner 2019. The Mishabezi Gorge, Eastern Matopos.
Photos: Lucy Broderick and Tim Broderick*

We welcome Nevison Chikandiwa to the Society Chairmanship for 2019 as do we his new Committee and look forward to their continuing leadership. A brief resume for Nevison follows.

NEVISON CHIKANDIWA – Chairman, Geological Society of Zimbabwe, 2019

Nevison Chikandiwa has worked in Zimbabwe and surrounding African countries for the past 15 years where he has gained valuable experience in both exploration for and the mining of many different mineral commodities. He was educated at the University of Zimbabwe and started his career with Zimasco. He later spent some of his formative years involved in copper and uranium exploration with Coffey Mining in the SADC region. After 2010 he has been involved in the exploration for and mining of Archaean gold deposits within Zimbabwe.

Nevison has been actively involved with affairs of the Geological Society of Zimbabwe since 2016, serving on the Committee in various capacities. He is a member of SACNASP and has since formed Deadalus Inc, a consulting company.

The long-awaited appearance of the tome on *Mining in Zimbabwe from the 6th to the 21st Centuries*, as published by the Chamber of Mines and supported financially and logistically by Anglo American's Unki Mines (Pvt) Ltd, was launched in Harare on 28th May 2019. Edited by Martin Prendergast and John Hollaway with copy editing by Roger Stringer, this *magnum opus* incorporates the literary efforts of 17 professionals in the mining world who record and present the history of our industry. Details of the book and its availability are to be found elsewhere in this Newsletter. All concerned with its production are to be roundly congratulated. We hope to invite a review of the book for our October edition of the Newsletter.

Lastly I need to record the happening of the 2019 fossil expedition to Dande, a follow-on from the successful 2017 event. Chris Griffin, together with his PhD supervisor from Virginia Tech in Blacksburg Va, Prof. Sterling Nesbitt, spent nearly three weeks in the field following up the notion that we host the earliest sauropodomorph in association with Rhynchosaur fossils in the Pebbly Arkose Formation west of Mashumbi Pools. Yours truly joined the team together with Darlington Munyikwa and other members of the Natural History Museum for the last 10 days in late May. Chris had spent time in Brazil examining similar bone assemblages found in similar Carnian-age environments there. Agreement is general that we have in Zimbabwe, as wholly supported by our 2019

excavations, a combination of early sauropodomorph and herrerasaurid theropod dinosaur remains, rhynchosaurs, cynodonts and those of an aetosaur, an early Triassic crocodile relative. Bridging the palaeolatitude gap between South America and India means that we have science in the making! Chris presented his summary talk to a mixed-age audience at St John's Prep School in Harare and at the Museum in Bulawayo, to which Members of the Geological Society were invited.



Members of the Virginia Tech/Natural History Museum Dande Fossil Expedition 2019. L to R: Chris Griffin, Edward Mbambo, Darlington Munyikwa, Tim Broderick, Kudzai Madzana, Hazel Taruvinga. Missing Sterling Nesbitt, George Malunga, Zach Murphy. Photo: Tim Broderick

Tim Broderick



Chairperson's Chat

Nevison Chikandiwa

It is a great honour to serve the geological community of Zimbabwe as the Chairperson of the Society's 2019 Committee. I will endeavour to do my best in championing the geological interests of our society's membership.

The year started off on a busy note with a talks by John Clark, as introduced by Brent Barber, entitled *The re-interpretation of the Mobil Legacy Geophysical Data* and then by Godfrey Gundani on *Exploration of blind copper ore bodies - Discovery, evaluation and resource estimation - A case Study from South of Angola*. The latter highlighted the importance of geophysics in deep-seated minerals exploration. A talk *Integrating outcrop, aeromagnetic and gravity data: Examples from Zimbabwe Geological Bulletins* was also presented at the School of Mines venue in Bulawayo. Talks and presentations will be the highlight of this year as we have several others lined up. We also have short courses in view, the first one being on base metals, which will be offered in August. We

applaud our membership for the support they have given us thus far and look forward to massive attendances at meetings as we progress through 2019.

The prestigious A.M. Macgregor Memorial Lecture was held in May, and was presented in Harare, Bulawayo and Zvishavane. Our invited lecturer, **Dr Hielke Jelsma**, highlighted new thinking as to the stratigraphic age of the Harare-Shamva Greenstone Belt. He also emphasized the tremendous work done by A.M. Macgregor in unraveling the geology of Zimbabwe through his tireless mapping achievements.

Preparations for the forthcoming 2020 Mineral Resource Conference have now been geared up. The success of this conference is anchored on the participation of our geological membership and the wider community in general. Dates and the programme for the conference will be flighted on our website, www.geologicalsociety.org.zw, to ensure that everyone is well informed leading up to the event.

The Society's executive committee is being led by a team of dedicated geologists, and it is my great pleasure to introduce them as listed at the end of this Newsletter.

Articles and Reports

The Hokonui Dohwe River Exposures

Tony Martin

The Hokonui Formation is the lowermost unit of the Mtshingwe Group, which also contains the Bend and Koodoovale Formations. It occurs along the southwestern corner of the Belingwe Greenstone Belt, is 8km across strike and consists of intermediate to felsic pyroclastic rocks, which in the lower part are intercalated with fine- to medium-grained mafic rocks. Some of these are interpreted to be conformably intrusive but others are probably volcanic. There is a greater thickness of the mafic material to the south and John Orpen assigned these rocks to the Bvuti Formation. The Chingezi Tonalite intrudes the Hokonui, and the Manjeri Formation unconformably overlies it.

All of these rocks have undergone lower greenschist metamorphism but the lithological names in this article refer to the original rock types.

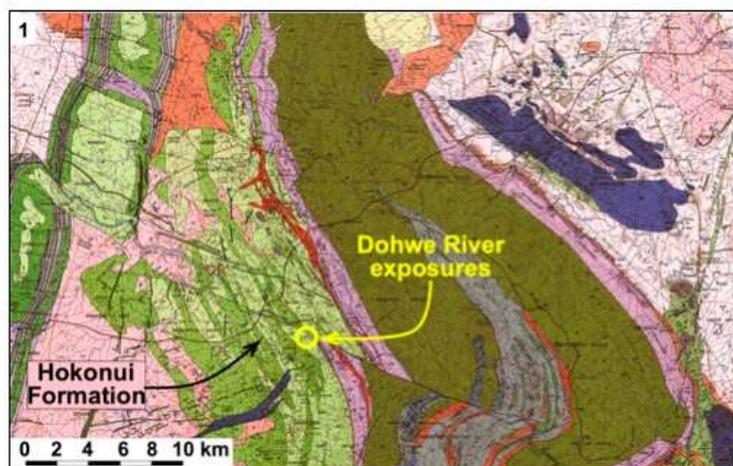


Fig. 1: Map of the Dohwe River locality

Large parts of the Hokonui are very poorly exposed, but the Dohwe and Mtshingwe rivers provide some excellent outcrops and those from the former are described in this article.

The bulk of the outcrops are of andesitic agglomerates, but there are many intriguing lithologies that provide evidence of the processes that formed these rocks.

The andesitic agglomerate is typical of explosive volcanism with angular to sub-rounded clasts in a fine-grained matrix of similar composition, although in some exposures there is very little matrix (see Figure 4). Some clasts show alteration rims suggesting sub-aqueous deposition.

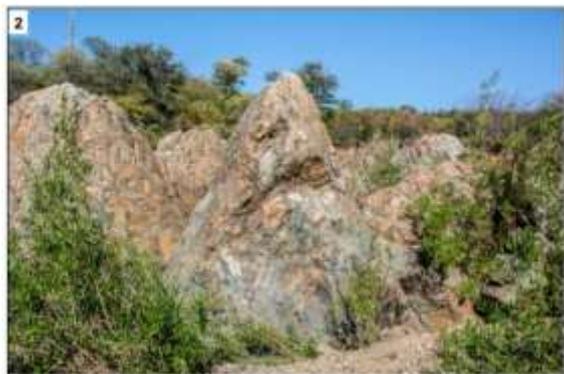


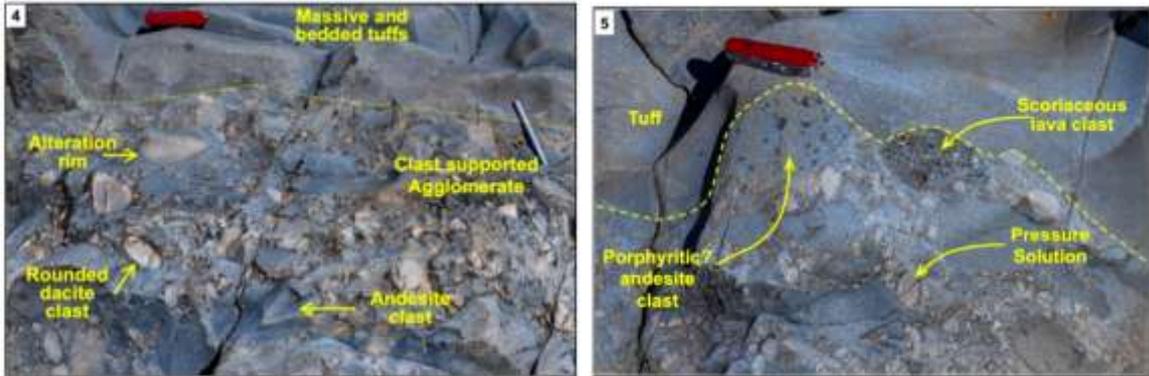
Fig. 2: Outcrops of Andesitic agglomerate



Fig. 3: Andesitic agglomerate

There is a wide range of clast types from volcanic (andesite to dacite) to sedimentary (terrigenous to chemical) and reworking of earlier deposits is common. Tuffs are also a common component of the Hokonui succession and Figure 4 shows an irregular contact between tuff and agglomerate and other features these units are the result of sedimentary re-deposition.

Figure 5 shows another similar tuff/agglomerate contact and illustrates the variation in composition and angularity of the clasts and the presence of feldspar phenocrysts in the tuff and some of the andesitic clasts.



Figs. 4 & 5: Contact relationships between agglomerate and tuff

A sedimentary clast is shown in Figure 6. This may be reworking of Hokonui volcanic material but the possibility of a distal terrigenous provenance cannot be discounted. This clast contains a smaller fragment indented into a sedimentary layer that gives a younging direction for that clast.



Fig. 6: Detail of a bedded clast

A number of outcrops provide evidence of sedimentary processes that attest to subaqueous reworking of volcanic ejectamenta and these are shown in Figures 7 to 9. The bedded layers show evidence of soft-sediment deformation and very similar material is seen elsewhere as clasts within a lapilli tuff (Figure 8).

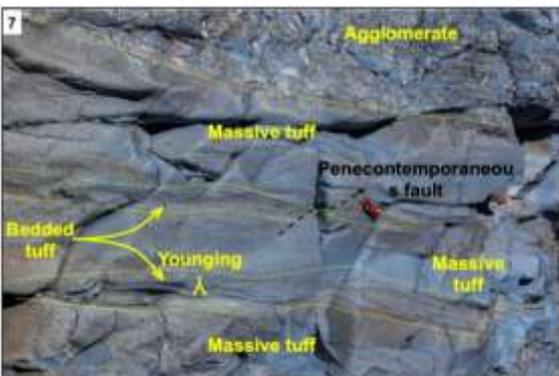


Fig. 7: Bedded and massive tuffs

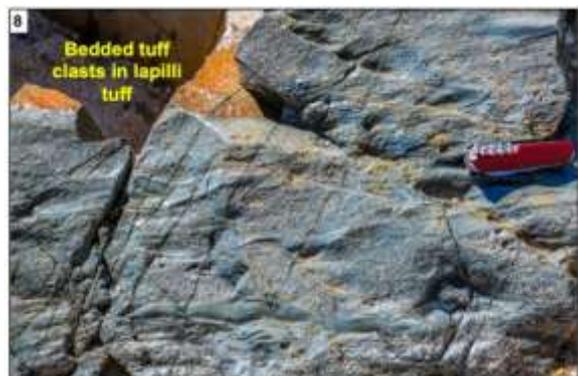


Fig. 8: Clast of bedded tuff in lapilli tuff

Chert and small BIF clasts also occur in the reworked deposits. Some of these are angular but others are rounded and an extreme example of this is shown in Figure 9,

which also illustrates deposition deformation with a very fine-grained matrix and bimodal clast sizes. The slush matrix squeezes into and around the larger chert clasts and surrounds smaller, well-rounded clasts. This texture is assumed to be the result of a mass flow that has rounded and broken up clasts (which were probably not lithified) and subsequently rapidly buried under other sediments, which has caused the injection of the fine matrix into and around the clasts.



Fig. 9: Mass-flow breccia

There are also felsic dykes cutting the sequence that require study.



Fig. 10: Porphyritic rhyolite dyke

Finally there is the intriguing possibility of an ignimbrite flow, the contact of which is shown in Figure 11. This unit has a very irregular outline and a suggestion of layering in one area, but it requires detailed mapping and further study, as it may just be an intrusion.



Fig. 11: Ignimbrite or intrusive rhyolite?

The last in this series will cover the so-called Hokonui Vent Agglomerate (although maybe not in the next newsletter). This and four other river exposures in the Belingwe Greenstone Belt have recently been surveyed and the registered orthophoto images developed will form the base maps for future detailed work.

Talks and Presentations

Houda Bouammar

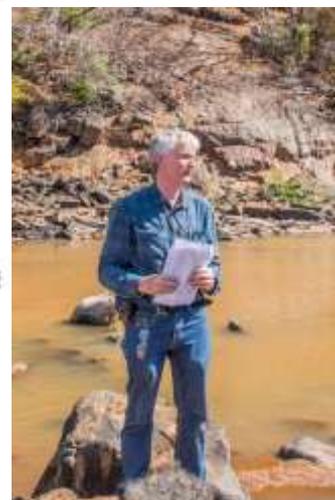
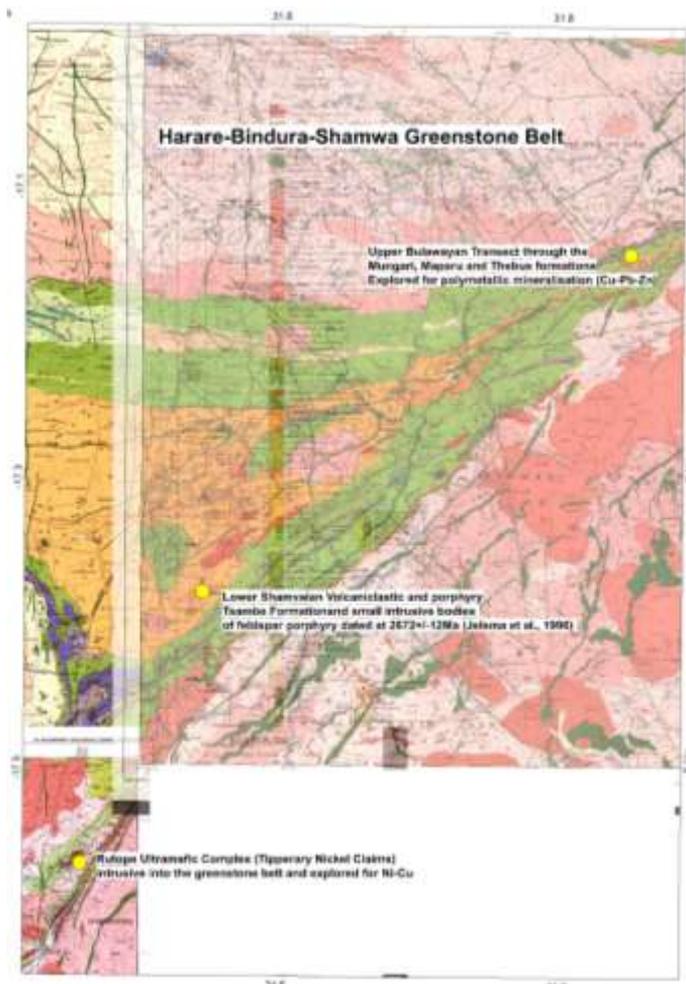
This year the A.M. Macgregor Memorial Lecture was presented by Dr Hielke Jelsma in both Harare and Bulawayo on 17th and 15th May respectively, and then by popular demand, in Zvishavane. From Harare a field excursion, led by Hielke, followed the next day to visit selected sites in the Shamva Greenstone Belt.

Dr Jelsma's (PhD, FGSSA, Pr Nat Sci, Principal Geologist, Anglo American) lecture entitled '**Gregarious Batholiths and a Tripartite Subdivision of the Greenstone Belt Stratigraphy - Exploring our Understanding of the Geological Evolution and Mineral Endowment of the Zimbabwe Craton**', was well attended by over 50 professionals and students in Harare and similarly in Bulawayo. Dr Jelsma presented a review of the regional geology of Zimbabwe in the light of new geochronological data and re-interpretations of the some aspects of greenstone belt stratigraphy. He also explored the mineral prospectivity of the Zimbabwe Craton in relation to the major geological domains. The full record of the lecture can be downloaded from the Society website, as can the excursion guide book.

During the one-day fieldtrip to the Shamva Greenstone Belt (SGB), three outstanding sites were visited as indicated on the map below.



Participants on the Shamva field excursion, 18th May 2019. Photo: Tony Martin



Sites visited during the excursion led by Dr Hielke Jelsma. Photo: Tony Martin

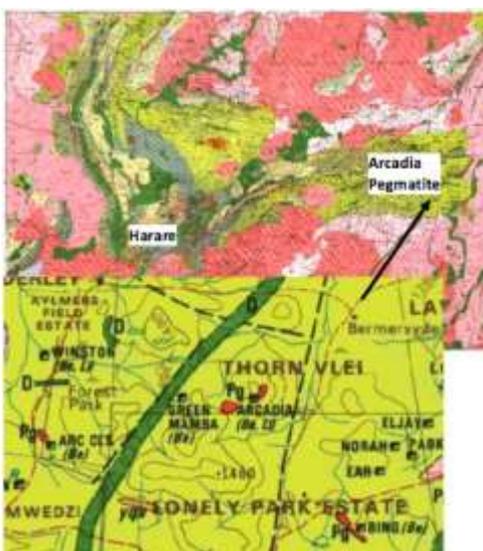
Arcadia Lithium

On 7th June 2019 Prospect Resources hosted 25 members of the Geological Society of Zimbabwe at their Arcadia Lithium Project 38km east of Harare where stacked pegmatite intrusions penetrate the Arcturus Formation of the Upper Bulawayan. Roger Tyler and Adam Moodley, our hosts, explained how the drilling of 12,000m of diamond core and more than 15,000m of reverse circulation has revealed these flat-lying pegmatites that have little surface expression.

Members had the opportunity to get their eye in and distinguish the main lithium minerals, petalite and spodumene. Along with lithium assays, Prospect Resources have carried out over 3200 X-ray diffraction determinations to quantify the relative mineral proportions, a key input to the metallurgical design process.

The exploration phase is now complete and the mining project is poised to begin production. Details can be viewed on the company website www.prospectresources.com.au and are summarised as follows:

Mine	Hard Rock, Open Pit
Ore Reserve	26.9Mt @ 1.31% Li ₂ O
Total Mineral Resources	43.2Mt @ 1.41% Li ₂ O (1% cut off)
Strip Ratio	3.0:1 (including pre-strip)
Products	Spodumene (6% Li ₂ O; Petalite (4% Li ₂ O)
By-Product	Tantalum
Life of Mine	12 Years



Location of the Arcadia Project



Roger Tyler in his introductory talk. A. du Toit



Inspecting pegmatite in the Arcadia open pit, June 2019. Photo: Tony Martin

News



Geology Department, University of Zimbabwe

Maideyi Meck

The Department of Geology continues to survive under the current economic circumstances. The semester was quiet with no major events. We have managed to achieve the following since February:

- Twenty out of the 40 students needing attachment have found employment.
- The curriculum review continued.
- The Part 1 students did four one-day field trips around parts of the Harare-Shamva Greenstone Belt.
- One 4-day field trip was done by the Part 4 students around the Murehwa-Sunungukai area.
- Ten days were spent by Part 2 students in the Mberengwa and Mushandike area.
- We hosted a GSZ workshop, and three talks including the Macgregor Memorial Lecture.

- Department members participated in the Macgregor field trip to Shamva led by Dr Hielke Jelsma.

The Department has been donated over 2000 SEG volumes by Nick Graham, and all are welcome to use them. Thanks are extended to Nick.



The Mennell Geological Society

Audiosh Kashesha (Chairperson) Bernatrix Makenah (Secretary)
audieckm@gmail.com panashebp@gmail.com

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Mr. P. Mangingaaisa	Lecturer		0783042494		
Mr. F.B. Mupaya	Lecturer	fbmupaya@gmail.com	0773599433	26	
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Mr S. Mabhanga	Lecturer				
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MIDLANDS STATE UNIVERSITY

FACULTY OF MINING AND MINERAL PROCESSING ENGINEERING

ZVISHAVANE CAMPUS

Introduction

Faculty students are currently on vacation and the second Semester commences on 29th July 2019, at which time the Faculty will also welcome new students to our five programmes: Mining Engineering, Metallurgical Engineering, Materials Engineering, Applied Geology and Exploration Geophysics. A 6th programme, Mechanical Engineering, is expected to commence in the second semester. The Faculty's third stream of students will be proceeding on industrial placement (Work-related Learning) in August 2019.

Staff Recruitment

From 31st March 2019 the Faculty advertised for 35 positions using an open advert, which will only be closed when all posts are filled. Interviews for the bulk of the posts are expected before the commencement of the second semester. The advert can be accessed from: <https://ww5.msu.ac.zw/job/faculty-of-mining-vacancies/>

Royal Academy of Engineering Project

The Royal Academy of Engineering Industrial Minerals Project is progressing well with characterisation of selected industrial minerals available within Zimbabwe taking place. Five project partner institutions in Zimbabwe are expected to send students, academic staff and industry personnel to South African and the United Kingdom partner institutions for further characterisation of the industrial minerals in August 2019. A GIS / Remote Sensing short course for student academic staff and industry participants will be facilitated this semester at MSU by the Scientific and Industrial Research and Development Centre (SIRDC), one of the local project partners.

Hielke Jelsma Mining Industry Lecture

Anglo American (RSA) Principal Geologist, Dr. Hielke Jelsma who visited Zimbabwe to deliver the Macgregor Memorial Lecture to Zimbabwe's geological community, accepted an invitation to deliver a Mining Industry Lecture at MSU on the 16th May 2019. In his lecture, *Geological evolution and mineral endowment of the Zimbabwe Craton*, which was attended by 150 participants, Hielke showed that favourable geological history and favourable geological architecture are responsible for the country's unparalleled mineral endowment. Zimbabwe's geology, dominated by granite-greenstone architecture, is being increasingly better understood through over a century of scientific enquiry by dedicated geologists, but continues to fascinate and puzzle geoscientists. Hielke

underscored the need for geological discovery through geological mapping, stating that there is no substitute for mapping. He implored researchers to continue seeking the truth while remaining open to alternative opinions.

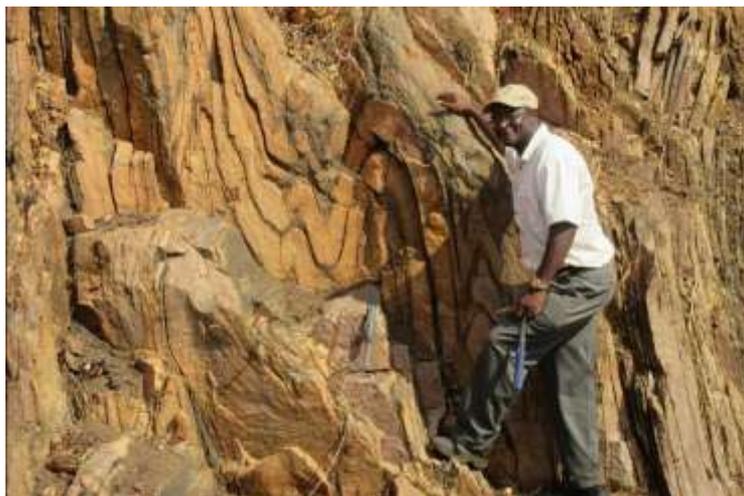
Student Industrial Placement

The Faculty would like to thank industrial players and other stakeholders for assisting our students with places for industrial placement. We ask industry and stakeholders to continue assisting us to ensure that every student achieves appropriate placement. Our next batch of students due for industrial placement from August 2019 are 30 students from Mining Engineering and 18 students from Metallurgical Engineering.

Conclusions

The Faculty continues to value partnerships in research and development with local and international entities and with government to advance the sustainable exploitation and utilisation of Zimbabwe's resources for the country's maximum equitable socio-economic benefit. Additional partnerships are being sought to provide requisite infrastructure and equipment for our programmes in order to effectively help address the national critical skills shortages in engineering and science.

Submitted by Dr Antony Mamuse, Executive Dean
antony.mamuse@graduate.curtin.edu.au



Join the Geological Society of Zimbabwe Facebook Group



Geological Survey

Forbes Mugumbate

fmugumbate@gmail.com

We congratulate **Brian Muteta**, geologist, for successfully completing a Master of Science degree in Economic Geology from a university in Japan. Brian is now back at work having spent more than two years in Japan.

Congratulations are also due to **Frank Muzanhamo** for being promoted to the substantive position of Deputy Provincial Mining Director for Manicaland Province. His position at the Geological Survey automatically falls vacant.

Ms **Rumbadzai Shereni**, geologist, tendered her resignation from the department. We wish her success in her new endeavours.

As per our promise in the October 2018 issue of the Newsletter, we give below, the names of mining geologists and geological technicians in the Ministry of Mines provincial offices. Please note that, in terms of the current structure of the Ministry, these are not part of the Geological Survey Staff. They are, however, expected to submit results of any geological work in the provinces to the Geological Survey for archiving.

Province	Geologist	Geological Technician
Mashonalad Central	Mangwiro Sibanda Brighton Shirichena	Samuel Bakasa Ms Precious Simbarasi
Mashonaland West	Ms Junior Mudyawabikwa Tinashe Dingaana	Trust Beji-Ndebele Clarence Marange Monalisa Dzapasi Tatenda Waza
Mashonaland East	Ms Portia Mungate Godfrey Dadirai	Zvinodashe Mubairi Rudairo Kapito Kudzi Gwazai
Manicaland	Ms Eileen Savieri	Mkhululi Moyo

	Tendai Mataruse	Welton Chinhamora
Masvingo	Benedict Malunga Joseph Chimhini	Joseph Zvavamwe Ms Gladys Chavunduka Clifford Mlilo
Matabeleland South	Ngwarai Chibaira Theminkosi Mutseka Gift Donga Fine Mafirakureva	Alfred Tafirenyika Linox Dube
Midlands	Chrispen Mazuru Takudzwa Muzopa	Ms Portia Mashambanhaka Stevious Mutyambizi Ms Chelsea Sibanda S. Barreto
Matabeleland North	Ms Gwendolene Mpofo Sindiso Masendeke	Nhlahla Ngwenya Buhlebenkosi Mnkadla

NEW PUBLICATIONS AT THE ZIMBABWE GEOLOGICAL SURVEY

Forbes Mugumbate, Director,

Zimbabwe Geological Survey (ZGS)



Under the Governance Institutional Strengthening Project (GISP), ZGS managed to have 12 new publications printed with 18 being reprinted. Four new maps were printed and 14 were reprinted as listed below. All were delivered in early October, 2018 and are now on sale. The support came through the African Development Bank (AfDB) who facilitated the editing of the new publications under the auspices of Tailjet Consultancy. The printing was done by Kadimah Print Global in the Republic of South Africa. In the table B = Bulletin, SR = Short Report and MRS = Mineral Resource Series.

No.	Status	Title	Author(s)	Editor
B 95 text	New	The Geology of the Country around Dorowa-Shawa	J. N. LAUDERDALE	<i>Mr. D. E. H. Murangari</i>
B 99 + map	New	The Geology of the Western Portion of the Chewore Inliers, Zambezi Valley	P. FEY	<i>Prof. Tom Blenkinsop</i>
B 103	New	The National Gravity Dataset of Zimbabwe	K. P. FISK; M. T. HAWADI	
B 104 text	New	The Geology of the country South of Mataga, Mberengwa, Mwenezi, Gwanda and Beitbridge Districts	N. E. H. BOUAMMAR	<i>Mr Tim J. Broderick</i>
B 105 + map	New	The Geology of the Country between Chireya and Goredema, Gokwe North and Gokwe South Districts	A. AIT- KACI AHMED	<i>Dr Dennis S. M. Shoko</i>
B 107 text	New	Review of the Geology and Summary of the Known Fossil Fuel Potential of the Karoo and Younger rocks in Zimbabwe	B. BARBER; P. M. OESTERLEN; A. AIT-KACI AHMED; M. A. MUKANDI.	<i>Dr Dennis S. M. Shoko</i>
Map	New	Gravity Map of Zimbabwe	K. P. FISK; M. T. HAWADI	
MRS 26	New	An Assesment of the Lesser Known Coal Localities IN North Western Zimbabwe	B. BARBER	<i>Dr Dennis S. M. Shoko</i>
MRS 28	New	Tantalum and Niobium in Zimbabwe	G. NASCHEL- WESCHKE	<i>Mr Peter Fey</i>
MRS 29	New	Copper Deposits in Zimbabwe	F. B. MUPAYA	<i>Dr Kosmas Chenjerai</i>
MRS 30	New	Gemstone Deposits of Zimbabwe	M.T. HAWADI; L. S. MAFARA	<i>Dr Maideyi Mabvira-Meck</i>
SR 51 text	New	The Geology of the country around Belingwe Peak.	J. L. ORPEN ; A. MARTIN; F. MUGUMBATE.	<i>Dr Kosmas Chenjerai</i>
SR 55 + map	New	Geology of the Country Southwest of the Chewore Inliers, Hurungwe District	P.T. ZIZHOU; S. LUNGA	<i>Mr Peter Fey</i>
B 32	Reprint	The Geology of the Mutare Gold belt	A. E. PHAUP	
B 40 + map	Reprint	The Geology of the lower Sabi Coal Field	W. H. SWIFT; W.C. WHITE; J. W. WILES; B. G. WORST.	
B 44/2 + map	Reprint	Gold Deposits and Mines	J. W. WILES	
B 46 + map	Reprint	The Geology of the Country around Mangula Mines, Makonde and Hurungwe Districts	J. G. STAGMAN	
B 47 + 1 sheet (Snake Head)	Reprint	The Great Dyke of Zimbabwe	B. G. WORST	
B 49 + map	Reprint	The Geology of the Country around Chinhoyi and Banket Makonde District	J. G. STAGMAN	
B 52 + map	Reprint	The Geology Middle Sabi Valley	W. H. SWIFT	
B 58 + map	Reprint	The Geology of the Country around Masvingo & The Bikita Tinfield	J. F. WILSON	
B 59 + map	Reprint	The Geology of the Country south and West of Shurugwi	C. W. STOWE	

B 64 text	Reprint	THE Geology of the Country around Kadoma	N. W. BLISS
B 67/1 + map	Reprint	Geology of the Country around Kwekwe	N. M. HARRISON
B 69 text	Reprint	Check List of the Minerals of Zimbabwe	SUSAN M. WARNER
B 80 text	Reprint	An Outlook of the Geological History of Zimbabwe	J. G. STAGMAN; N. M. HARRISON; T. J. BRODERICK; V. R. STOCKLMAYER. A. MARTIN
B 83 + map	Reprint	The Geology of the Belingwe- Shabani Schist Belt	
MRS 22 map	Reprint	Base Metal and industrial Mineral Deposits of Zimbabwe	D. S. BARTHOLOMEW
MRS 23 map	Reprint	Gold Deposits of Zimbabwe	D. S. BARTHOLOMEW
SR 43 + map	Reprint	Explanation of the Geological map of the Country east of Kariba	T. J. BRODERICK
SR 45 text	Reprint	Explanation of the Geological Map of the country West of Beitbridge	M. K. WATKEYS
SR 46 text	Reprint	Explanation of the Geological Map of the country South of Mwenezi, Mwenezi and Beitbridge Districts	T. J. BRODERICK
SR 48 text	Reprint	Explanation of the Geological Map Vungu and Gweru river Valleys, Gweru , wekwe and Bubi districts	N.M. HARRISON

NEWS from the MINING INDUSTRY

Forbes Mugumbate
fmugumbate@gmail.com

The Chamber of Mines Annual Conference

The biggest news on Zimbabwe's mining industry calendar at this time of year has been the Chamber of Mines Annual Conference. The conference, with the theme '*Realising Vision 2030 through mineral resource-led growth*', was held at Victoria Falls from 29th May 2019 to 1st June 2019. President E.D. Mnangagwa officially opened the well-attended conference, and reconfirmed the mantra that 'Zimbabwe is open for business'. Our own fellow geologist, **Allan Mashingaidze**, again proved his mettle as one of the foremost 'masters of ceremonies' when he flawlessly led proceedings at the conference.

The following are some of the highlights of the Conference.

New office bearers

Mimosa's **Elizabeth Nerwande** was elected the new Chamber of Mines President, becoming the second woman after our own member, **Ellah Muchemwa**, to hold such post. Nerwande will be deputized by **Collins Chibafa** of Unki Mine and **Demand Gwatinetsa**, a geologist, from Metallon Gold. The out-going president, **Batirai Manhando**, remains in the presidium as the 'past president' for continuity purposes.

Vision 2023 mineral production

There was general agreement that the Government vision of production of 100 tonnes of gold and 50 tonnes of PGMs per annum by 2023 is achievable. This will be anchored through revamping capacities at producing mines, re-opening closed mines and opening up new mines. The assumption here is that the government will have continued to improve the investment climate to attract funding for exploration, the re-opening of closed mines, re-tooling at operating mines, and also enhance energy supplies, the availability of cash, an arrest to inflation, and provide quick resolutions to claim ownership disputes, especially those involving the removal of illegal miners who have forcefully occupied some old mines. It therefore remains an enormous task for us to create conditions that are favourable for achieving the desired production goals.

As a consequence of the above, John Hollaway questioned the production projections for gold, especially considering that about 60% of the current gold delivery comes from small-scale miners, *makorokoza*, who are largely robbing pillars at old mines often with disastrous outcomes. John's observations dovetail well with our warning in the previous issue of the GSZ Newsletter that our gold sales face the danger of being sanctioned due to the frequency of uncontrolled fatal accidents.

RBZ Monopoly challenged

The Zimbabwe Miners Federation implored Government to end the monopoly of Fidelity Printers and Refiners as Zimbabwe's sole authorised gold buyer in order to improve bullion deliveries from the sector in light of fears relating to rampant leakage of the metal. This comes as deliveries to Fidelity Printers and Refiners dropped 10% in the first quarter of 2019 to 6.5 tonnes from 7.7 tonnes for the same period last year. This is due to suspected gold smuggling. A slowdown in performance of the gold mining sector, especially small-scale miners who accounted for 60 percent of the 35 tonne haul achieved last year, is a cause for concern for Zimbabwe.

Meanwhile Caledonia Mining has requested clarity from Fidelity Printers & Refiners, regarding a proposed new gold support price. Fidelity recently announced that, to promote gold production in the country, it would pay an incentive price over and above the contractual purchase price. It is the sustainability of such an undertaking that Caledonia seeks assurances of.

Foreign exchange headache

The 'elephant in the room' remains foreign exchange shortages for the mining sector, which has affected production, with the gold sector being the worst hit. Gold and platinum mines are paid dollars for half of their output, while the balance is paid in the local RTGS dollar. The partial liberalisation of the foreign currency regime has failed to address the problem. It is feared that gold producers may suspend operations because a foreign-exchange shortage has left them with insufficient funds to cover production costs. This crisis militates against Government's projection for a production of 100t gold per annum by 2023.

Meanwhile Metallon Corporation is said to be taking the Reserve Bank of Zimbabwe to court demanding nearly \$132-million it says it is owed. The central bank denies it is in arrears with the company.

Zimbabwe remains under-explored

The delegates agreed with our Chairman, Nevison Chikandiwa, in his statement that Zimbabwe remains under-explored despite the huge geological potential. Nevison compared the current state of exploration activities in Zimbabwe with those in neighbouring countries. It is clear that Zimbabwe is lagging far behind, which suggests problems with our mining investment policies.

Indigenization Law scrapped?

The delegates wanted clarity on the indigenization law regarding PGMs and diamonds. Government had initially indicated that these were not removed from the indigenization requirements. However, Finance Minister, Mthuli Ncube, had indicated that the policy requiring local investors to control platinum mines had been scrapped in a bid to revive investment confidence. The delegates wanted the assurances to be captured in a legal instrument. The Ministry of Mines and Mining Development promised to make a follow-up with the Ministry responsible for effecting the amendments.

Amendments to the Mines and Minerals Act

The amendments to the Mines and Minerals Act appear to be taking forever. Nevison put it figuratively when he is told the audience that the process started when he was an infant - now he is a father. Someone then jokingly responded by suggesting that he is likely to be a grandfather before the process is finally completed. Amendments to the Act have bearings on the development of the mining industry. Some companies are not comfortable with investing during amendment processes in case the new Act brings unpleasant surprises. The Chairperson of the Parliamentary Portfolio Committee on Mines, however, allayed the fears and promised to push for completion of the process during this current Parliament.

Makorokoza accidents

Stories of accidents involving small-scale and artisanal miners continue to hit newspaper headlines, painting a very bad picture of the sector that is hyped to be contributing over 60% to national gold output, and which is said to employ over 1,000,000 people.

An accident occurred on the 6th May 2019 at Nugget mine south of Bulawayo after a gang of illegal miners from Kwekwe invaded the site during the night chasing away local miners. The gang drilled and blasted support pillars before retreating with the ore loot before daybreak, thus allowing the local illegal miners to start mining again. The crown pillar suddenly collapsed resulting in the death of five people and injuries to four others.

Eight illegal miners recently died at Metallon's Jumbo Mine in Mazowe following an unannounced explosion in the area where they were mining. Mazowe Mine was put on care and maintenance in September 2018, when viability problems were cited. The mine collapse happened when illegal miners gained access to underground shafts and detonated explosives.

These accidents come a few months after 24 miners died in February 2019 when underground shafts were flooded at two abandoned mines in Battlefields.

Gold worth billions smuggled out of Africa

A disorganised small-scale mining sector such as ours is characterised by frequent accidents, environmental degradation and mineral pilferages. It follows that the sector is not contributing to what amounts to the sustainable exploitation of the country's finite mineral resources.

Reuters has reported that billions of dollars worth of gold is being smuggled out of Africa every year through the United Arab Emirates (UAE), a gateway to markets in Europe, the United States and beyond.

<https://www.reuters.com/investigates/special-report/gold-africa-smuggling/>

Customs data shows that the UAE imported \$15.1 billion worth of gold from Africa in 2016, more than any other country, up from \$1.3 billion in 2006. The total weight was 446t, up from 67t in 2006. Much of the gold was not recorded in the exports of African States. This indicates that large amounts of gold are leaving Africa with no taxes being paid to the states that produce them. Studies indicate that illegal miners, including children, produce the gold. The need to foster an organised small-scale mining sector cannot therefore be over emphasised.

PLATINUM, the beacon of the mining industry in ZimbabweForeign platinum miners to control operations

As the government continues to improve the investment climate, the law that denies foreign platinum mining companies control of their operations in the country has been scrapped. The controversial law introduced during Robert Mugabe's rule was aimed at increasing black Zimbabweans' stake in the mining sector, but foreign investors argued that the implementation was often murky and open to abuse. The new government of President E.D. Mnangagwa had removed all other minerals except platinum and diamonds from the indigenization process. This new development, however, is still to be legislated.

New platinum mines on the cards?

Following announcements by the Government in April that Zimbabwe will soon unveil two new platinum mines in a bid to increase mining earnings to \$12bn annually by 2023, a new company was introduced on 29th May 2019 to the platinum arena. Bravura Holdings, a company linked to Nigerian billionaire Benedict Peters, signed an agreement to mine platinum on the so-called Maflox claims in the Hartley Complex of the Great Dyke. Peters, who is based in Ghana, is the founder of the Aiteo Group, which has interests in oil production.

Mines Minister, Winston Chitando, is still to name the other new investors intending to develop separate platinum mining projects on the Great Dyke.

Unki Smelter Commissioned

The Government's quest to encourage the beneficiation of minerals is bearing fruit as indicated by the recent commissioning of a US\$62 million platinum group metal smelter at Unki Mine near Shurugwi by His Excellency, the President of Zimbabwe E.D. Mnangagwa on the 16th May 2019. Heat up of the smelter's furnace started in early August 2018 and produced matte for the first time at the end of September. The first export of crushed matte commenced in mid-November 2018. This facility sees to the

primary smelting of Unki concentrate to produce a furnace matte. The furnace receives filtered concentrate from the Unki plant and uses a coal-fired drier to remove the remaining moisture to feed a 12m-diameter, 8.5MW electric smelting furnace, which also handles the resultant slag, matte and off-gas. The final furnace matte is crushed on site and transported for further processing at Anglo American Platinum's converter process facility in Rustenburg, South Africa.

Zimbabwe and Russia sign \$4 billion platinum mine deal

Polite Kambamura, the Deputy Minister of Mines and Mining Development announced that Zimbabwe had signed an agreement with Russia to build a new platinum mine on the Great Dyke. This finalizes a deal that stalled in 2014. The mine is being developed on a prospect held by Great Dyke Investment, a company jointly owned by a Russian state-controlled company and the Zimbabwe Government. The mine and associated infrastructure will cost \$4 billion.

Karo Resources developments on schedule

Karo Resources exploration on their platinum prospect in the Ngezi area of the Great Dyke is reported to be ahead of schedule, and the company is expected to confirm the underground platinum resources by the end of the year in preparation to start production in 2020.

Energy matters

Power cuts

The State power utility imposed the worst rolling blackouts to have been experienced over the past three years. Households and industries, including mines are set to be without electricity for up to eight hours daily. Mining, which accounted for more than two-thirds of Zimbabwe's \$4.8 billion in total export earnings last year, will be greatly affected by these power cuts. The Zimbabwe Electricity Transmission and Distribution Company (ZETDC) cites reduced output at Kariba hydroelectric station due to low water levels in Lake Kariba and to ageing coal-fired generators at Hwange. Zimbabwe, now produces 969MW of electricity daily against a peak demand of 2100MW.

The energy crisis has caused the sacking of the former Minister, Joram Gumbo, who has been replaced by Fortune Chasi.

RioZim's US\$200m solar deal

As a way of alleviating the effects of the power cuts, RioZim Limited, has signed a US\$200 million agreement with Chinese infrastructure development company, China Gezhouba Group International Engineering Corporation (CGGC), for the construction of solar power plants with a combined output of 178 megawatts. The agreement will result in phased construction of solar power stations that will provide power to the group's mining operations, including gold producers Renco, Cam and Motor and Dalny mines, as well as to the diamond producer at Murowa.

Mines allowed to pay for power in foreign currency to secure supply

Minister Fortune Chasi has indicated that mining companies can pay for electricity in foreign currency to guarantee supplies, hinting that there could be deeper power cuts in the country. Power imports are cushioning platinum mining companies against electricity cuts, but gold mines could face production cuts as they continue to rely on an unstable national grid.

China's Tsingshan expands plans for a Zimbabwe steel plant

Mines Minister Winston Chitando announced that Tsingshan Holding Group is expanding its plans for a steel plant in Zimbabwe that will include a power plant and exploration for lithium. Tsingshan signed an agreement to build a 2 million tonne-per-annum steel plant in Zimbabwe. Its original agreement included chrome, nickel, iron and coal concessions, but the new deal allows it to build a 600-megawatt power plant in two phases as well as to mine lithium. Tsingshan's subsidiary, Afrochine, already has a ferrochrome operation at Selous. It is currently the largest producer of the commodity in Zimbabwe.

'Use it or lose it' policy to be invoked

Government has threatened that it will invoke the policy of 'use it or lose it' to prevent companies from holding on to ground. The current Act has many provisions to ensure that companies work their mining concessions. Speaking at a mining conference in Johannesburg, the Deputy Minister of Mines and Mining Development, Polite Kambamura, indicated that the Ministry will be calling owners of idle mining claims to show cause why their claims should not be cancelled. If the explanations are not satisfactory, then the claims will be cancelled in terms of the current laws.



Editors and authors at the launch of Mining in Zimbabwe, 28th May 2019

L to R, Standing: Martin Prendergast, John Hollaway, Caston Musa

Seated: Sunny Kalenjeka, Walter Nemasasi, Harald Solberg, Alexander Mukwekwezeke, Farai Makwara, Forbes Mugumbate, Paul Markham, Charles Castelin, Tony Hawkins, Andrew du Toit, Herbert Mashanyare Photo: Anglo American photo library.

Missing: Roger Stringer (Copy Editor), Tom Blenkinsop, Oliver Maponga, Susan and Vernon Stocklmayer.

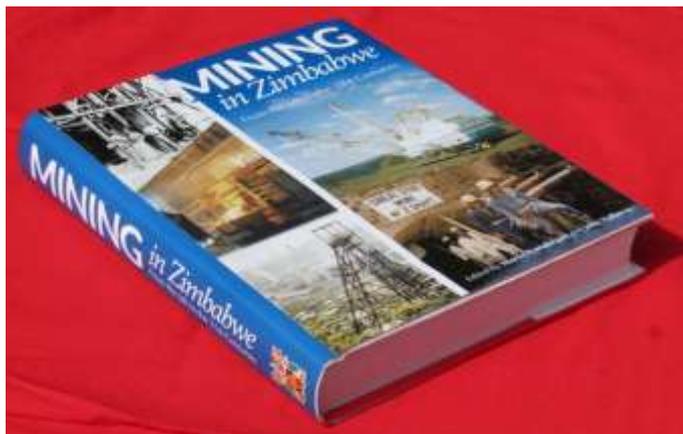
Mining in Zimbabwe: From the 6th to the 21st centuries

Published by the Chamber of Mines of Zimbabwe with funding from Unki Mines (Pvt) Ltd, an Anglo American Company in Zimbabwe.

Written and compiled by a group of seventeen mining professionals with extensive experience of the local industry over many years, and edited by Martin Prendergast and John Hollaway, the book opens with two chapters on the country's geology, the source of its mineral wealth, and on government's important role in fostering the industry. Three short chapters then deal with Zimbabwe's rich, 1500 year-long pre-colonial heritage of gold-, iron- and copper-mining. The main body of the book comprises twelve chapters on the fortunes of the modern (colonial and post-colonial) mining industry since 1890. These chapters deal in succession with the gold, coal, asbestos, chrome, copper, tin, iron and steel, nickel, diamonds and platinum sectors, as well as the diverse range of industrial minerals and minor minerals and metals produced within the country. Throughout the chapters, emphasis is placed on the geological, mining engineering and metallurgical factors that have determined the course of the industry, the economic and technical problems it has faced over the years, and the solutions employed to deal with them; aspects of the mining communities are also described. The individual commodity chapters are followed by an account of the industry's importance to the country's economic development. Finally, a postscript covers the momentous events and varying difficulties that affected the industry during the long editorial process between 2016 and end-2018.

Numbering almost 700 pages, with a hard cover and handsome dust jacket, the text is well supported by more than 300 tables, line drawings, charts and photographs (both old and new).

Mining in Zimbabwe aims to provide a comprehensive account of Zimbabwe's mining industry as it evolved over time. The book will be of immediate interest to a wide range of readers, including the mining industry worldwide, investors, technical and financial managers, politicians, government officials, economists and historians, as well as mining professionals and members of Zimbabwe's mining community, both past and present.



If you would like to purchase a copy of *Mining in Zimbabwe*, please contact either Joyful Muzvidziwa (00263772242238, Joyful.Muzvidziwa@angloamerican.com) at the Unki Mine office at 47 Broadlands Road, Emerald Hill in Harare, or Sikhangele Ngwenya (00263772105360), Sikhangele.Ngwenya@angloamerican.com) at Unki Mine.

The price is USD170 whilst the first copies last. Payment should be made into the Unki nostro account for which details will be supplied by the above.

The books will be couriered (not posted) to external purchasers, at the purchaser's cost.



GSZ Research and Development Fund

Enquiries relating to the distribution of funds through this facility should be made through the standing Chairperson.



SEG Timothy Nutt Memorial Fund (Up to US\$1500.00 available for 2018)

This fund will be available to provide financial support for geology students and young economic geologists located in Zimbabwe or in southern Africa with ties to Zimbabwe. The fund may be used to support SEG student chapter activities, travel to meetings, field trips, for research or study grants, technical lectures or any other activities approved by the SEG Regional Vice President for Africa.

Strong preference will be given to those applicants who are SEG Student Members.

To become an SEG Student member visit www.segweb.org/join

Applicants must describe what the project is, why the research is important and how it is to be done.

An estimate of expenses for the project must be included with the application.

Grants are expected to be fully utilized by April 30 following the calendar year in which they are awarded / dispersed. .

Grant recipients are required to provide a year-end accounting of how the money was spent together with a suitable progress report or final abstract.

**A 2018 Research Grant application form may be downloaded from
www.segweb.org/StudentResearchGrants**

Student Research Grants Committee c/o Assistant for Student Affairs, Society of Economic Geologists Foundation 7811 Shaffer Parkway, Littleton, CO 80127-3732 USA

Phone: +1.720.981.7882/Fax: +1.720.981.7874

Conferences

Geological Society of Zimbabwe

Summer Symposium 2019

Friday 29th November 2019

Department of Geology, UZ

The summer symposium will be held in November this year.

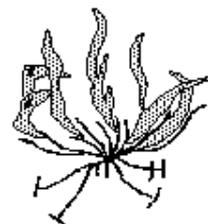
We are starting to allocate speaking slots. If you would like to present, please let us know (andrewdutoitzim@gmail.com). We welcome presentations on a broad range of subjects of general interest to Geologists.

Please put this date in you diary now



Geological Society of Zimbabwe

PO Box 1719
Causeway, Harare
Zimbabwe



Zimbabwe Mineral Resource Conference

HARARE - 2020

Pre-conference Field Trips : 22-23 June 2020

Conference: Harare 24- 25 June 2020

Post –conference Field trips : 26- 28 June 2020

The 2020 Zimbabwe Mineral Resources Conference and associated field trips will:-

- Highlight the exploration and mining potential in the country
- Bring together geologists working in research, exploration projects and operational mines to share ideas for more effective exploration.
- Foster the interest of young geologists

The conference will be divided into four conference sessions:

1. Base Metals and Industrial Rock and Minerals
2. Chrome and Platinum
3. Gold
4. Carbon – Diamonds + Fossil Fuels

Keynote speakers and or moderators will include Hielke Jelsma, Mark Tsomondo, Martin Prendergast, Paul Dirks, Tony Martin, Sharad Master, Oliver Maponga and others.

Details for the pre- and post-conference field trips will be communicated soon and will include trips to the Great Dyke, selected greenstone belts, operating mines as well as explorations projects at various stages of development.

Abstracts for oral and or poster presentation are invited from interested contributors. Extended abstracts will be required for all papers and posters accepted for presentation. These abstracts will be published in the Conference Proceedings.

Important Dates to note:

- 31 August 2019 – response to first circular indicating interest in attending and or presenting
- 30 November 2019 – 2nd Circular and final call for papers
- 31 January 2020 – Submission of abstracts and end of early registration
- 31 March 2020 – Notification of acceptance of papers/posters
- 31 April 2020 – Third and Final Circular

Interested contributors and or participants are requested to submit abstracts of their proposed papers or any enquiries to the Chairman of the Organising Committee at ellah.muchemwa@outlook.com or geol.soc.zimbabwe@gmail.com

GEOLOGICAL SOCIETY OF ZIMBABWE: CONTACT DETAILS OF MEMBERS OF THE EXECUTIVE COMMITTEE FOR 2019		
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