Palaeontological Impact Assessment for the proposed Mphahlele MR application, Limpopo Province

Desktop Study (Phase 1)

For

Red Kite Environmental Solutions (Pty) Ltd

29 November 2020

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Expertise of Specialist

The Palaeontologist Consultant: Prof Marion Bamford
Qualifications: PhD (Wits Univ, 1990); FRSSAf, ASSAf
Experience: 31 years research; 23 years PIA studies

Declaration of Independence

This report has been compiled by Professor Marion Bamford, of the University of the Witwatersrand, sub-contracted by Red Kite Environmental Solutions (Pty) Ltd, Pretoria, South Africa. The views expressed in this report are entirely those of the author and no other interest was displayed during the decision making process for the Project.

Specialist: Prof Marion Bamford

Signature: 

Executive Summary

A palaeontological Impact Assessment was requested for the proposed Mining Rights Application by Mphahlele Mine, south of Polokwane, Limpopo Province, to extend the open cast and underground mining operations.

To comply with the South African Heritage Resources Agency (SAHRA) in terms of Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA), a desktop Palaeontological Impact Assessment (PIA) was completed for the proposed development.

The mining area lies mostly on the non-fossiliferous mafic intrusion of the Rustenburg Layered Suite (Bushveld Complex). Only the northern-most margin is on or close to the shales of the Magaliesberg Formation (Pretoria Group, Transvaal Supergroup) that are about 2250 million years old. There is a very small chance that trace fossils such as stromatolites or microbially induced sedimentary structures occur in this formation although none has been recorded from this area. Therefore, a Fossil Chance Find Protocol should be added to the EMPr. Based on this information it is recommended that no palaeontological site visit is required unless fossils are found when the mining activities commence.

Table of Contents

1. Background

The Mphahlele Mining Project Mining Right Application involves the expansion of the mining area (Figures 1 and 2). As such a Palaeontological Impact assessment is required.

As part of the Mining Right Application an Integrated Water Use Licence Application and Environmental Authorisation (Scoping and EIA Process) will be applied for.

The mining project will include the following infrastructure and activities:

- Opencast and underground mining of chrome
- Backfilling of opencast void with waste rock/overburden and tailings
- Haul and access roads (including drainage line crossings)
- Workshop, administrative buildings and parking areas
- Processing plant (including crushing and screening)
- Stockpiles (topsoil, ROM, waste rock/overburden, product)
- Groundwater abstraction (boreholes)
- Storm water management infrastructure (channels, berms and pollution control dams)
- Tailings storage facilities – a tailings drying pad and dry stockpiling
- Ablution facilities
- Process and clean water storage

The method for tailings storage will be a wet tailings pad (likely concrete) and dry tailings stockpile with backfilling of the opencast void with tailings material. Wet tailings from the wash plant will be allowed to dry on cement drying slabs. This is done to facilitate the maximum recovery of water to be reused at the plant. Once tailings have dried sufficiently they will be transferred to the dry tailings stockpile. The dry tailings facility will most likely be constructed with a type 4 barrier.

A palaeontological Impact Assessment was requested for the project. To comply with the South African Heritage Resources Agency (SAHRA) in terms of Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA), a desktop Palaeontological Impact Assessment (PIA) was completed for the proposed development and is reported herein.

Table 1: Specialist report requirements in terms of Appendix 6 of the EIA Regulations (amended 2017)

	A specialist report prepared in terms of the Environmental Impact Regulations of 2017 must contain:	**Relevant section in report**
ai	Details of the specialist who prepared the report	Appendix B
aii	The expertise of that person to compile a specialist report including a curriculum vitae	Appendix B

b	A declaration that the person is independent in a form as may be specified by the competent authority	Page 1
c	An indication of the scope of, and the purpose for which, the report was prepared	Section 1
ci	An indication of the quality and age of the base data used for the specialist report: SAHRIS palaeosensitivity map accessed – date of this report	Yes
cii	A description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change	Section 5
d	The date and season of the site investigation and the relevance of the season to the outcome of the assessment	N/A
e	A description of the methodology adopted in preparing the report or carrying out the specialised process	Section 2
f	The specific identified sensitivity of the site related to the activity and its associated structures and infrastructure	Section 4
g	An identification of any areas to be avoided, including buffers	N/A
h	A map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	N/A
i	A description of any assumptions made and any uncertainties or gaps in knowledge;	Section 5
j	A description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives, on the environment	Section 4
k	Any mitigation measures for inclusion in the EMPr	Section 7, Appendix A
l	Any conditions for inclusion in the environmental authorisation	N/A
m	Any monitoring requirements for inclusion in the EMPr or environmental authorisation	Section 7, Appendix A
ni	A reasoned opinion as to whether the proposed activity or portions thereof should be authorised	N/A
nii	If the opinion is that the proposed activity or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan	N/A
o	A description of any consultation process that was undertaken during the course of carrying out the study	N/A
p	A summary and copies if any comments that were received during any consultation process	N/A
q	Any other information requested by the competent authority.	N/A

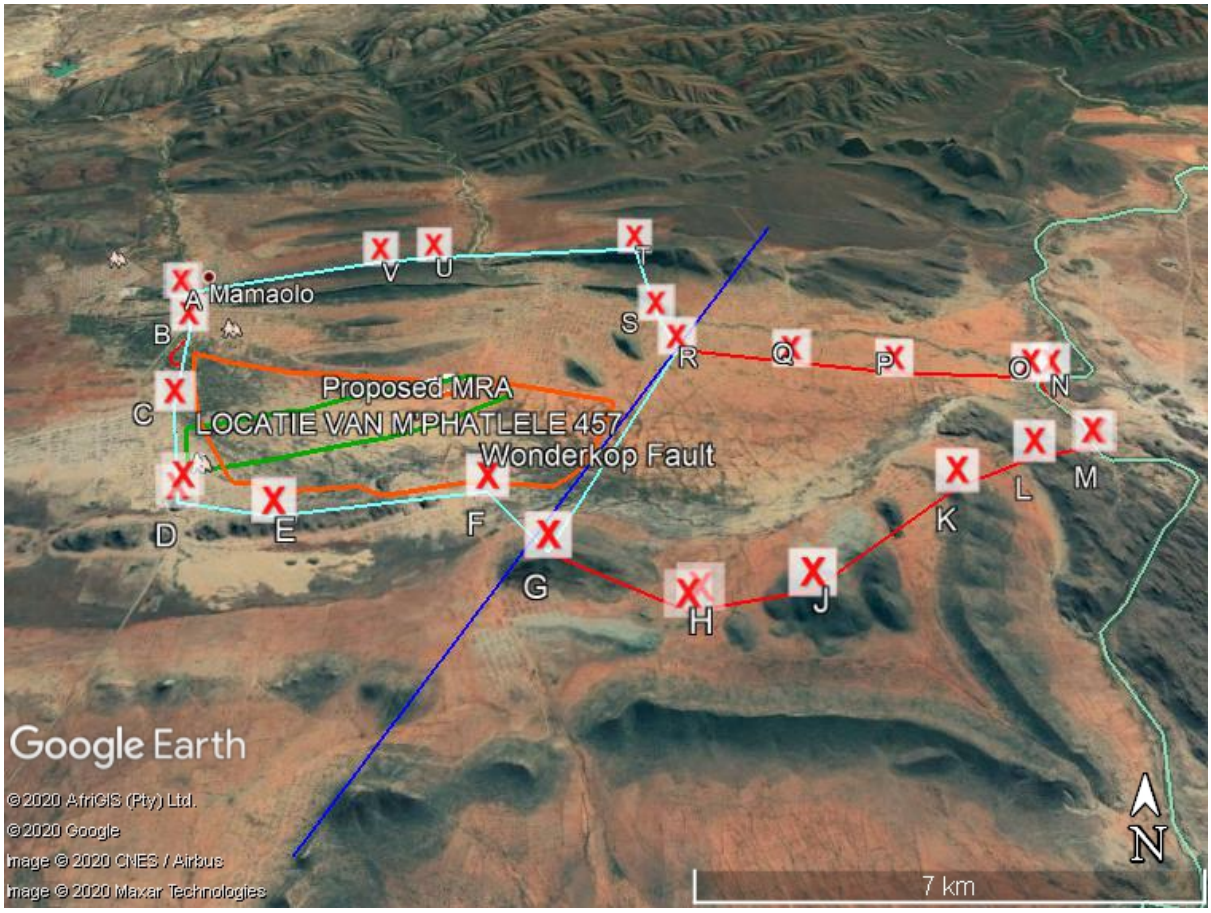

Figure 1: Google Earth map of the proposed Mphahlele Mining Rights application area development shown within the green outline. Map supplied by Red Kite.

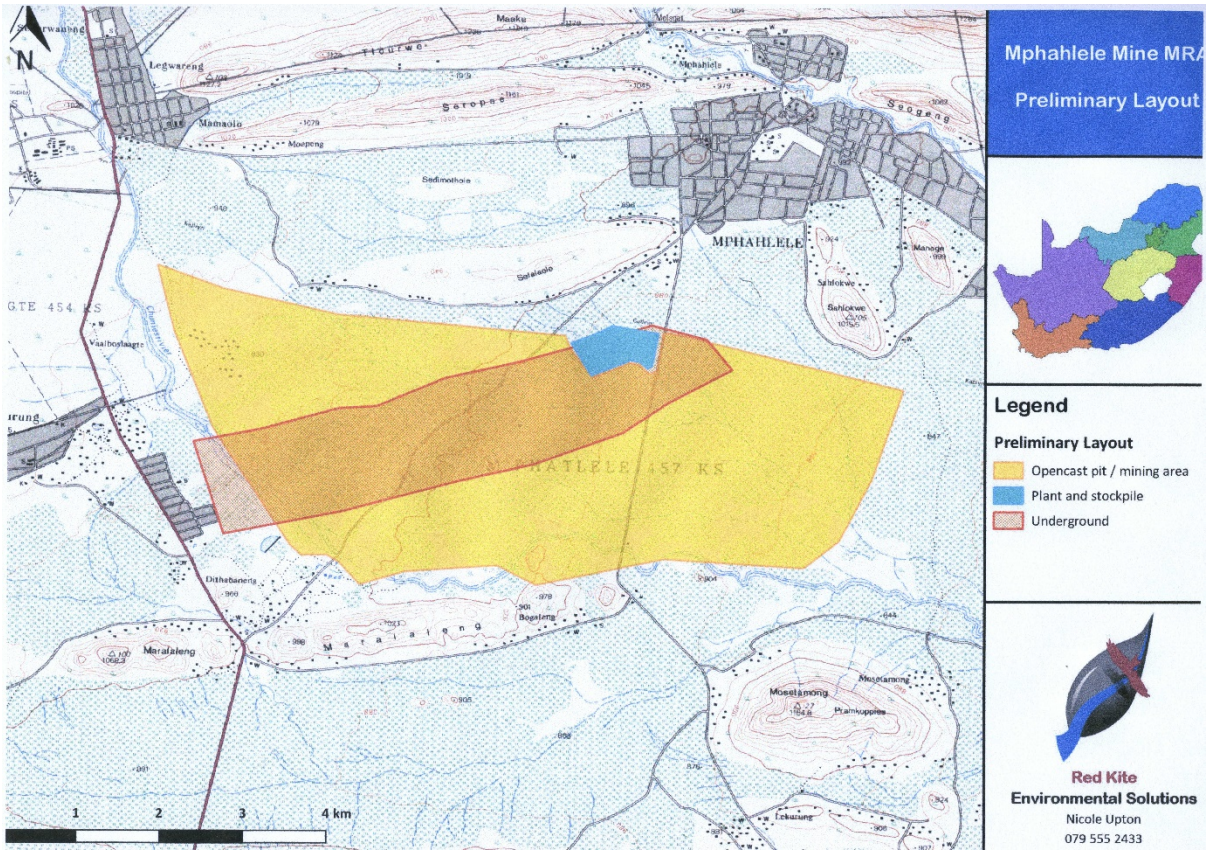

Figure 2: topographic map showing details of the MRA for Mphahlele Mine.

2. Methods and Terms of Reference

The Terms of Reference (ToR) for this study were to undertake a PIA and provide feasible management measures to comply with the requirements of SAHRA.

The methods employed to address the ToR included:

1. Consultation of geological maps, literature, palaeontological databases, published and unpublished records to determine the likelihood of fossils occurring in the affected areas. Sources included records housed at the Evolutionary Studies Institute at the University of the Witwatersrand and SAHRA databases;
2. Where necessary, site visits by a qualified palaeontologist to locate any fossils and assess their importance (*not applicable to this assessment*);
3. Where appropriate, collection of unique or rare fossils with the necessary permits for storage and curation at an appropriate facility (*not applicable to this assessment*); and
4. Determination of fossils' representivity or scientific importance to decide if the fossils can be destroyed or a representative sample collected (*not applicable to this assessment*).

3. Geology and Palaeontology

i. Project location and geological context

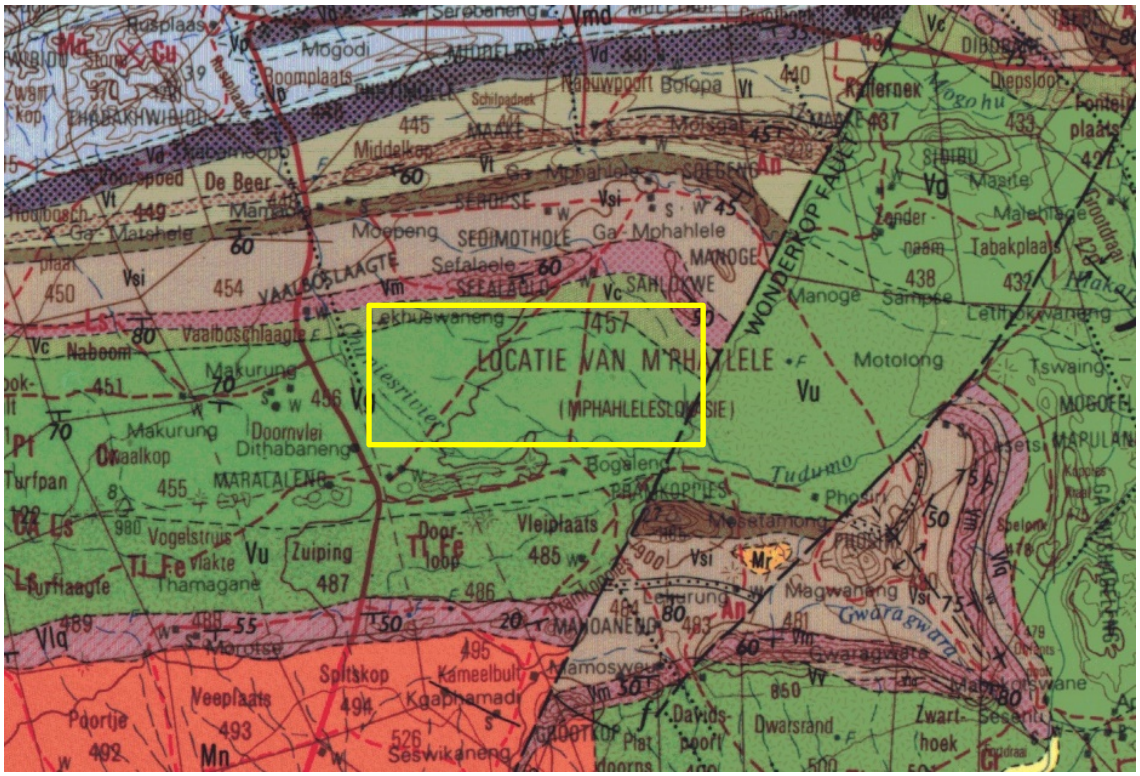

Figure 2: Geological map of the area around the Mphahlele Mine MRA shown within the yellow outline. Abbreviations are explained in Table 2. Map enlarged from the Geological Survey 1: 250 000 map 2428 Nylstroom.

Table 2: Explanation of symbols for the geological map and approximate ages (Eriksson et al., 2006. Johnson et al., 2006; Schroder et al., 2016). SG = Supergroup; Fm = Formation; Ma = million years; grey shading = formations impacted by the project.

Symbol	Group/Formation	Lithology	Approximate Age
di	diabase	Diabase or dolerite dyke	<2050 Ma
Vu	Upper Zone, Rossenekraal subsuite, Rustenburg Layered Suite, Bushveld Complex	Ferrogabbro, troctotite, anorthosite	Ca 2060 Ma
Vc	Critical Zone, Dwars River subsuite, Rustenburg Layered Suite, Bushveld Complex	Pyroxenites	Ca 2060 Ma
Vm	Magaliesberg Fm, Pretoria Group, Transvaal SG	Quartzite, minor hornfels	Ca 2150 Ma
Vsi	Silverton Fm, Pretoria Group, Transvaal SG	Quartzite, mudrock, shale	Ca 2300 Ma

Symbol	Group/Formation	Lithology	Approximate Age
Vd	Duitschland Fm, Pretoria Group, Transvaal SG	Sandstone, siltstone, diamictite	Ca 2350 Ma

The site is the north central part of the Transvaal Basin that was being infilled about 2600 to 2050 million years ago by marine sediments and volcanic rocks. The rocks are known as the Transvaal Supergroup and have been divided into four groups, with the basal Protobasinal Rocks, Black Reef Formation, Chuniespoort Group (with seven formations), a break of about 80 million years with no deposits and the top group, the Pretoria Group which has twelve formations (Eriksson et al., 2006, 2012; Lenhardt et al., 2012). The Silverton Formation (Pretoria Group) was laid down in a shallow to deep marine environment in an intercratonic sag basin (ibid) and the sediments are composed of shales, tuffaceous shales and a pyroclastic volcanic member. According to Eriksson et al., (2009), the basal Boven Shale Member is present to the east of Rustenburg. Although the Silverton Formation deposition style is a Shaw-Irwin model there are some differences because the inshore low-energy zone is missing and instead there seems to have been a strongly tidal coastline (Eriksson and Reczko, 1995; Eriksson et al., 2002, 2012).

Intruding into the sediments above the Vermont and Houtenbek Formations of the upper Pretoria Group, are the metamorphosed volcanic rocks of the Rustenburg Layered Suite of the Bushveld Complex. This is the largest mafic layered intrusion in the world (Cawthorn et al., 2006) and was emplaced about 2060 Ma. The Bushveld Complex has been well studied because of its rich mineral reserves but there is still debate about how it formed.

ii. Palaeontological context

The palaeontological sensitivity of the area under consideration is presented in Figure 4. The site for both above and below ground mining is in the Upper Zone of the Rustenburg Layered Suite with the north eastern most corner in or close to the Critical Zone surface exposure. None of these rocks preserved fossils because they are of volcanic origin and have been metamorphosed.

To the north of the mining area are exposures of the Magaliesberg Formation (Transvaal Supergroup) that comprise sedimentary rocks that were deposited in warm shallow coastal settings. There is a chance that trace fossils such as stromatolites or microbially induced sedimentary structures (MISS) might be preserved. Stromatolites are the layers of calcium carbonate, calcium sulphate and magnesium sulphate that were laid down but eh colonies of algae that were photosynthesising in the shallow marine environments (Beukes, 1987). No algal cells are preserved but they indicate the activity of these primitive organisms. MISS are patterns in the sand caused by microbes, mucilage, wave patterns (Noffke et al., 2006; Bosch and Eriksson, 2017; Eriksson et al., 2012). Again, the microbes have not been preserved, only evidence of their activity.

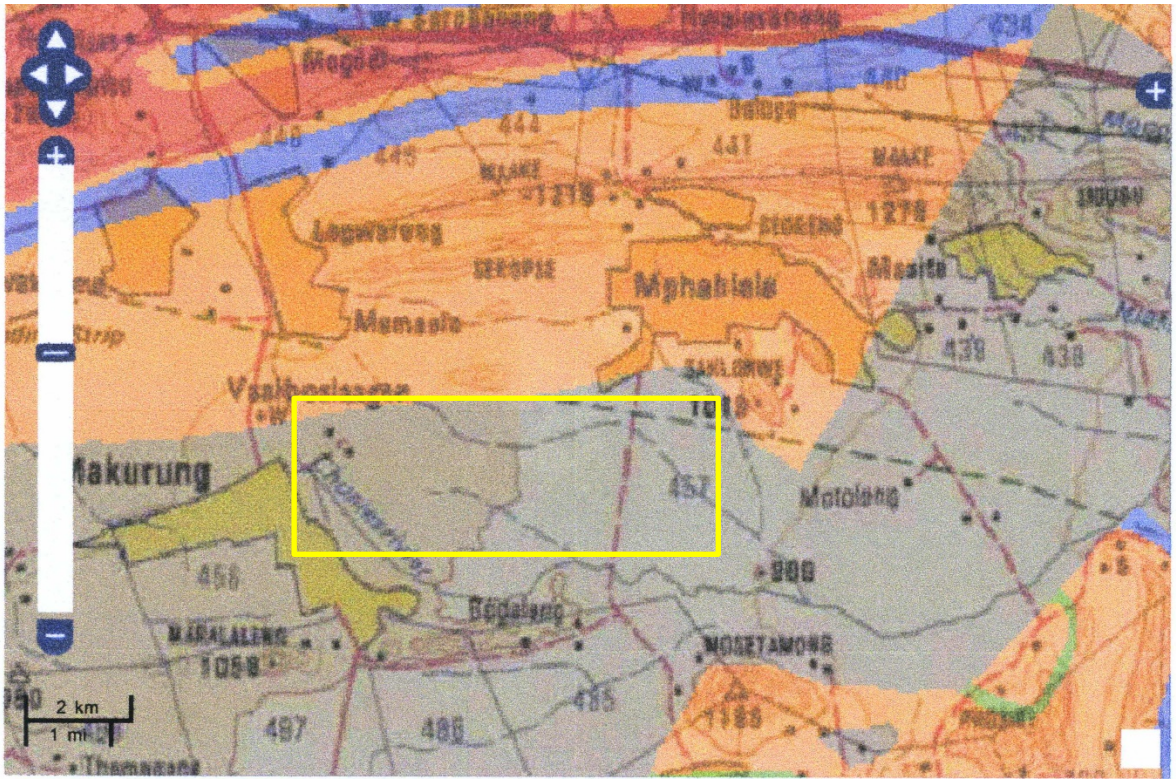

Figure 3: SAHRIS palaeosensitivity map for the site for the Mphahlele MRA shown within the yellow rectangle. Background colours indicate the following degrees of sensitivity: red = very highly sensitive; orange/yellow = high; green = moderate; blue = low; grey = insignificant/zero.

From the SAHRIS map above most of the area is indicated as having zero sensitivity and this applies to the Upper and the Critical Zones of the Rustenburg Layered Suite. Only the northern-most margin of the area (if even in the footprint) is highly sensitive (orange). The latter applies to the Magaliesberg Formation.

4. Impact assessment

An assessment of the potential impacts to possible palaeontological resources considers the criteria encapsulated in Table 3:

TABLE 3A: CRITERIA FOR ASSESSING IMPACTS

PART A: DEFINITION AND CRITERIA		
Criteria for ranking of the SEVERITY/NATURE of environmental impacts	**H**	Substantial deterioration (death, illness or injury). Recommended level will often be violated. Vigorous community action.
	M	Moderate/ measurable deterioration (discomfort). Recommended level will occasionally be violated. Widespread complaints.
	L	Minor deterioration (nuisance or minor deterioration). Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints.
	L+	Minor improvement. Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints.

	M+	Moderate improvement. Will be within or better than the recommended level. No observed reaction.
	H+	Substantial improvement. Will be within or better than the recommended level. Favourable publicity.
Criteria for ranking the DURATION of impacts	**L**	Quickly reversible. Less than the project life. Short term
	M	Reversible over time. Life of the project. Medium term
	H	Permanent. Beyond closure. Long term.
Criteria for ranking the SPATIAL SCALE of impacts	**L**	Localised - Within the site boundary.
	M	Fairly widespread – Beyond the site boundary. Local
	H	Widespread – Far beyond site boundary. Regional/ national
PROBABILITY (of exposure to impacts)	**H**	Definite/ Continuous
	M	Possible/ frequent
	L	Unlikely/ seldom

TABLE 3B: IMPACT ASSESSMENT

PART B: ASSESSMENT		
SEVERITY/NATURE	**H**	-
	M	-
	L	Rustenburg Layered mafic intrusive rocks do not preserve fossils. The Magaliesburg Fm is close to the margin of the opencast mine in the north but and so far there are no records of microbial or trace fossils from this area and so it is very unlikely that fossils occur on the site. The impact would be very unlikely.
	L+	-
	M+	-
	H+	-
DURATION	**L**	-
	M	-
	H	Where manifest, the impact will be permanent.
SPATIAL SCALE	**L**	Since the only possible fossils within the area would be microbial or trace fossils from the Magaliesberg Fm, the spatial scale will be localised within the site boundary.
	M	-
	H	-
PROBABILITY	**H**	**-**
	M	**-**
	L	It is extremely unlikely that any fossils would be found in the Magaliesburg Fm because none has been recorded to date. He intrusive rocks are likely to have destroyed any fossils in their vicinity. Nonetheless, a Fossil Chance Find protocol should be added to the eventual EMPr.

Based on the nature of the project, surface activities may impact upon the fossil heritage if preserved in the development footprint. The geological structures suggest that the rocks are much too old to contain body fossils as they are about 2060 million years old and are volcanic in origin. There is a very small chance that trace fossils such as stromatolites and microbial mats or vermiform traces (e.g. *Manchuriphycus*) do occur in the shales of the Magaliesberg Formation (Pretoria Group, Transvaal Supergroup), but it is unlikely that they fall in the mine footprint. Nonetheless, a Fossil Chance Find Protocol has been added to this report. Taking account of the defined criteria, there are no fossils in the main mining area, only on the northern margin, so the potential impact to fossil heritage resources is extremely low.

5. Assumptions and uncertainties

Based on the geology of the area and the palaeontological record as we know it, it can be assumed that the formation and layout of the mafic volcanic rocks , diabase dykes, sandstones and shales are typical for the country and do not contain fossils. The Magaliesberg Formation is on the northern-most margin but is not the target of the mining operation. No trace fossils have been reported from here, and the proximity to the intrusive rocks means that any fossils are likely to have been destroyed when the hot magma intruded.

6. Recommendation

Based on experience and the lack of any previously recorded fossils from the area, it is very unlikely that any fossils would be preserved in the shales of the Magaliesberg Formation (Pretoria Group, Transvaal Supergroup) because none has been recorded from here, and other records are rare. Since there is a very small chance that stromatolites or MISS might occur only on the northern-most margin, a Fossil Chance Find Protocol should be added to the EMPr: if fossils are found once excavations, drilling or blasting have commenced then they should be rescued and a palaeontologist called to assess and collect a representative sample.

7. References

Beukes, N.J., 1987. Facies relations, depositional environments, and diagenesis in a major early Proterozoic stromatolitic carbonate platform to basinal sequence, Campbell Rand Subgroup, Transvaal Supergroup, southern Africa. Sedimentary Geology 54, 1-46.

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Eriksson, P.G., Bartman, R., Catuneanu, O., Mazumder, R., Lenhardt, N., 2012. A case study of microbial mats-related features in coastal epeiric sandstones from the Palaeoproterozoic Pretoria Group, Transvaal Supergroup, Kaapvaal craton, South Africa; the effect of preservation (reflecting sequence stratigraphic models) on the relationship between mat features and inferred palaeoenvironment. Sedimentary Geology 263, 67-75.

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Johnson, M.R., van Vuuren, C.J., Visser, J.N.J., Cole, D.I., Wickens, H.deV., Christie, A.D.M., Roberts, D.L., Brandl, G., 2006. Sedimentary rocks of the Karoo Supergroup. In: Johnson, M.R., Anhaeusser, C.R. and Thomas, R.J., (Eds). The Geology of South Africa. Geological Society of South Africa, Johannesburg / Council for Geoscience, Pretoria. Pp 461 – 499.

Lenhardt, N., Bleeker, W., Ngwa, C.N., Aucamp, T., 2020. Shallow marine basaltic volcanism of the Machadodorp Member (Silverton Formation, Pretoria Group), Transvaal Basin, South Africa — An example of Paleoproterozoic explosive intraplate volcanic activity in an epeiric embayment. Precambrian Research 338, 105580.
https://doi.org/10.1016/j.precamres.2019.105580

Noffke, N., Eriksson, K.A., Hazen, R.M., Simpson, E.L. 2006. A new window into Early Archean life: Microbial mats in Earth's oldest siliciclastic tidal deposits (3.2 Ga Moodies Group, South Africa). Geology 34, 253–256

Plumstead, E.P., 1969. Three thousand million years of plant life in Africa. Geological Society of southern Africa, Annexure to Volume LXXII. 72pp + 25 plates.

Schröder, S., Beukes, N.J., Armstrong, R.A., 2016. Detrital zircon constraints on the tectonostratigraphy of the Paleoproterozoic Pretoria Group, South Africa. Precambrian Research 278, 362 – 393.

8. Chance Find Protocol

Monitoring Programme for Palaeontology – to commence once the mining / excavations / drilling activities begin.

1. The following procedure is only required if fossils are seen on the surface and when drilling/excavations commence.

2. When excavations begin the rocks and must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (stromatolites, microbial traces) should be put aside in a suitably protected place. This way the project activities will not be interrupted.
3. Photographs of similar trace fossils must be provided to the developer to assist in recognizing the fossil plants in the shales and mudstones (for example see Figures 5, 6). This information will be built into the EMP's training and awareness plan and procedures.
4. Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
5. If there is any possible fossil material found by the developer/environmental officer/miners then the qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.
6. Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.
7. If no good fossil material is recovered then no site inspections by the palaeontologist will be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils.
8. If no fossils are found and the excavations have finished then no further assessment is required.

Appendix A – Examples of trace fossils from the Transvaal Supergroup

Figure 5: Stromatolites as seen from the surface.

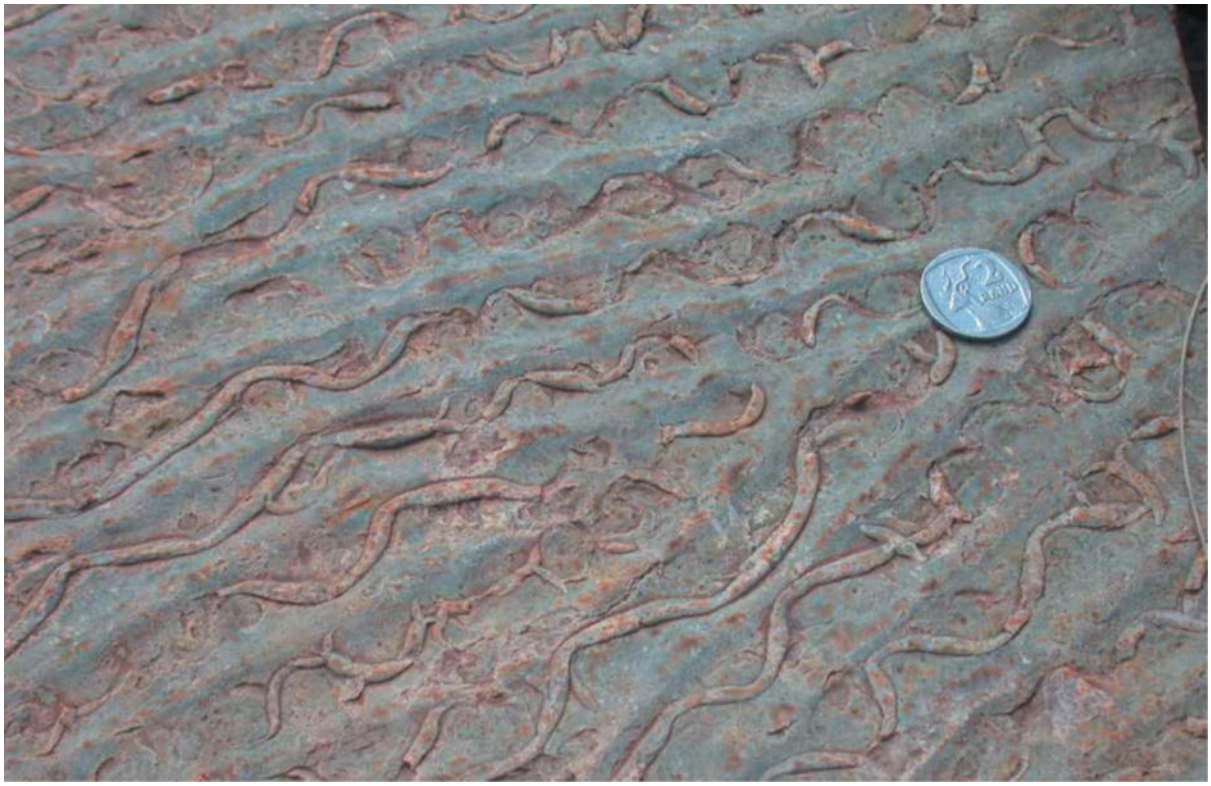

Figure 6: Vermiform trace fossil *Manchuriophycus* from a bedding plane in the Magaliesberg Formation east of Pretoria. Figure taken from Bosch and Eriksson (2017; Fig 7).

Appendix B – Details of specialist

Curriculum vitae (short) - Marion Bamford PhD
November 2020

I) Personal details

Surname	:	**Bamford**
First names	:	**Marion Kathleen**
Present employment	:	Professor; Director of the Evolutionary Studies Institute. Member Management Committee of the NRF/DST Centre of Excellence Palaeosciences, University of the Witwatersrand, Johannesburg, South Africa-
Telephone	:	+27 11 717 6690
Fax	:	+27 11 717 6694
Cell	:	082 555 6937
E-mail	:	marion.bamford@wits.ac.za ; marionbamford12@gmail.com

ii) Academic qualifications

Tertiary Education: All at the University of the Witwatersrand:
1980-1982: BSc, majors in Botany and Microbiology. Graduated April 1983.
1983: BSc Honours, Botany and Palaeobotany. Graduated April 1984.
1984-1986: MSc in Palaeobotany. Graduated with Distinction, November 1986.
1986-1989: PhD in Palaeobotany. Graduated in June 1990.

iii) Professional qualifications

Wood Anatomy Training (overseas as nothing was available in South Africa):
1994 - Service d'Anatomie des Bois, Musée Royal de l'Afrique Centrale, Tervuren, Belgium, by Roger Dechamps
1997 - Université Pierre et Marie Curie, Paris, France, by Dr Jean-Claude Koeniguer
1997 - Université Claude Bernard, Lyon, France by Prof Georges Barale, Dr Jean-Pierre Gros, and Dr Marc Philippe

iv) Membership of professional bodies/associations

Palaeontological Society of Southern Africa
Royal Society of Southern Africa - Fellow: 2006 onwards
Academy of Sciences of South Africa - Member: Oct 2014 onwards
International Association of Wood Anatomists - First enrolled: January 1991

International Organization of Palaeobotany – 1993+
Botanical Society of South Africa
South African Committee on Stratigraphy – Biostratigraphy - 1997 - 2016
SASQUA (South African Society for Quaternary Research) – 1997+
PAGES - 2008 –onwards: South African representative
ROCEEH / WAVE – 2008+
INQUA – PALCOMM – 2011+onwards

vii) Supervision of Higher Degrees

All at Wits University

Degree	Graduated/completed	Current
Honours	9	2
Masters	9	5
PhD	11	5
Postdoctoral fellows	10	4

viii) Undergraduate teaching
Geology II – Palaeobotany GEOL2008 – average 65 students per year
Biology III – Palaeobotany APES3029 – average 25 students per year
Honours – Evolution of Terrestrial Ecosystems; African Plio-Pleistocene Palaeoecology; Micropalaeontology – average 2-8 students per year.

ix) Editing and reviewing
Editor: Palaeontologia africana: 2003 to 2013; 2014 – Assistant editor
Guest Editor: Quaternary International: 2005 volume
Member of Board of Review: Review of Palaeobotany and Palynology: 2010 –
Cretaceous Research: 2014 –
Journal of African Earth Sciences: 2020 -

Review of manuscripts for ISI-listed journals: 25 local and international journals

x) Palaeontological Impact Assessments

Selected – list not complete:

- Thukela Biosphere Conservancy 1996; 2002 for DWAF
- Vioolsdrift 2007 for Xibula Exploration
- Rietfontein 2009 for Zitholele Consulting
- Bloeddrift-Baken 2010 for TransHex
- New Kleinfontein Gold Mine 2012 for Prime Resources (Pty) Ltd.
- Thabazimbi Iron Cave 2012 for Professional Grave Solutions (Pty) Ltd
- Delmas 2013 for Jones and Wagener
- Klipfontein 2013 for Jones and Wagener
- Platinum mine 2013 for Lonmin
- Syferfontein 2014 for Digby Wells

- Canyon Springs 2014 for Prime Resources
- Kimberley Eskom 2014 for Landscape Dynamics
- Yzermyne 2014 for Digby Wells
- Matimba 2015 for Royal HaskoningDV
- Commissiekraal 2015 for SLR
- Harmony PV 2015 for Savannah Environmental
- Glencore-Tweefontein 2015 for Digby Wells
- Umkomazi 2015 for JLB Consulting
- Ixia coal 2016 for Digby Wells
- Lambda Eskom for Digby Wells
- Alexander Scoping for SLR
- Perseus-Kronos-Aries Eskom 2016 for NGT
- Mala Mala 2017 for Henwood
- Modimolle 2017 for Green Vision
- Klipoortjie and Finaalspan 2017 for Delta BEC
- Ledjadja borrow pits 2018 for Digby Wells
- Lungile poultry farm 2018 for CTS
- Olienhout Dam 2018 for JP Celliers
- Isondlo and Kwasobabili 2018 for GCS
- Kanakies Gypsum 2018 for Cabanga
- Nababeep Copper mine 2018
- Glencore-Mbali pipeline 2018 for Digby Wells
- Remhoogte PR 2019 for A&HAS
- Bospoort Agriculture 2019 for Kudzala
- Overlooked Quarry 2019 for Cabanga
- Richards Bay Powerline 2019 for NGT
- Eilandia dam 2019 for ACO
- Eastlands Residential 2019 for HCAC
- Fairview MR 2019 for Cabanga
- Graspan project 2019 for HCAC
- Lieliefontein N&D 2019 for Enviropro
- Skeerpoort Farm Mast 2020 for HCAC
- Vulindlela Eco village 2020 for 1World
- KwaZamakhule Township 2020 for Kudzala
- Sunset Copper 2020 for Digby Wells
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xi) Research Output

Publications by M K Bamford up to December 2019 peer-reviewed journals or scholarly books: over 140 articles published; 5 submitted/in press; 8 book chapters.
Scopus h-index = 29; Google scholar h-index = 36; -i10-index = 80
Conferences: numerous presentations at local and international conferences.

xii) NRF Rating

NRF Rating: B-2 (2016-2020)
NRF Rating: B-3 (2010-2015)
NRF Rating: B-3 (2005-2009)
NRF Rating: C-2 (1999-2004)