

## **RECOMMENDED EXEMPTION FROM FURTHER PALAEOLOGICAL STUDIES:**

### **PROPOSED EXTENSION OF A HARD ROCK QUARRY ON PORTION 35 (REMAINING EXTENT) OF THE FARM SANDFORD 291, KU, MPUMALANGA PROVINCE**

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#### **1. OUTLINE OF PROPOSED DEVELOPMENT**

The company Afrimat Aggregates (Trading) (Pty) Ltd has applied for a mining permit to exploit hard rock (dolerite) on a portion of Portion 35 (Remaining Extent) of the farm Sandford 291, KU, Mpumalanga Province (Reference: MP30/5/1/3/2/10419MP). The study site, an existing quarry (Riebs Quarry), is situated on the north side of the R535, c. 64 km ESE of Lydenburg and c. 25 km ESE of Graskop (Fig. 1).

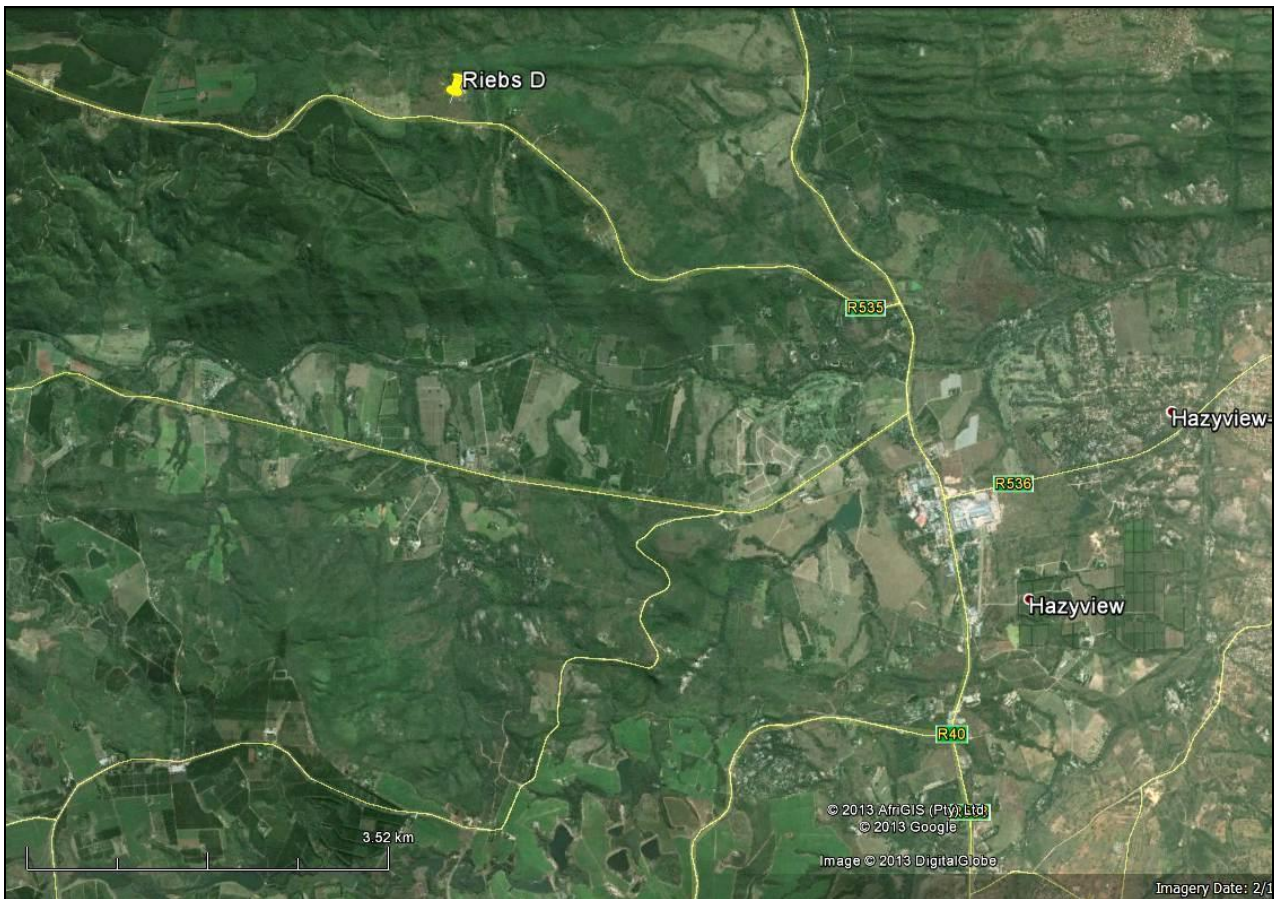
The proposed mining area of 4.9 ha will be an extension of the existing quarry pit. The mining methods will make use of blasting by means of explosives in order to loosen the hard rock; the material will then be loaded and hauled out of the excavation to the mobile crushing and screening plants. The aggregate will be stockpiled and transported to clients using trucks and trailers. Material from the mine will be used for the construction industry, including for upgrading of the roads in the vicinity.

The mining activities will consist of the following:

- Stripping and stockpiling of topsoil (although very little is available);
- Blasting;
- Excavating;
- Crushing;
- Stockpiling and transporting;
- Sloping and landscaping;
- Replacing the topsoil and vegetating the disturbed area.

Access roads to the mining area will be established in consultation with the landowner and existing roads will be used as far as practicable.

This palaeontological heritage assessment comment for the proposed hard rock quarry development was commissioned by Heritage Contracts and Archaeological Consulting CC (HCAC) (Contact details: Mnr Jaco van der Walt. Postnet Suite No. 426, Private Bag X4, Wierda Park, 0149. E-mail: [contracts.heritage@gmail.com](mailto:contracts.heritage@gmail.com). Tel: 012 771 3137. Fax: 086 691 6461).



**Figure 1: Google earth© satellite image showing the location of the Riebs Quarry study site (yellow symbol) on the north side of the R535, c. 64 km ESE of Lydenburg and c. 25 km ESE of Graskop, Mpumalanga Province. Brownish areas indicate Precambrian dolerite outcrop. The east-west trending ridges are dolerite dykes.**

## 2. GEOLOGICAL BACKGROUND

The existing Riebs Quarry site is situated at c. 700 m amsl in hilly, well-wooded terrain on the lower slopes to the east of the Mpumalanga Escarpment (Fig. 1). The pronounced west-east trending ridges seen in satellite images of the region are formed by more resistant-weathering facies within the granitoid basement rocks.

The geology of the study area near Wolmaransstad is shown on 1: 250 000 geological map 2530 Baberton (Council for Geoscience, Pretoria), for which a short sheet explanation has been published by Walraven (1989a) (Fig. 2). The quarry study area is underlain by a sizeable **dolerite intrusion** (probably a sill) of undetermined Precambrian age (Vdi, green) that intrudes high grade granitoid rocks (gneiss, migmatite, granodiorite) of the Archaean **Nelspruit Suite** (Znm, orange). The thin green lines to the east of the quarry on the geological map are dolerite dykes. The geology of these ancient unfossiliferous igneous rocks is outlined by Walraven (1989a) as well as Robb *et al.* (2006).

## 3. PALAEOLOGICAL HERITAGE

The Precambrian dolerites underlying the Riebs Quarry study area are igneous in origin and entirely unfossiliferous. The igneous bedrocks are probably mantled by a thin blanket of superficial sediments (weathered regolith, soils) of very low palaeontological sensitivity. Fossil-bearing superficial sediments (*e.g.* alluvium) are not expected in this area.

The Riebs Quarry study area is generally of VERY LOW palaeontological sensitivity.

#### 4. CONCLUSIONS & RECOMMENDATIONS

The Precambrian dolerites underlying the Riebs Quarry study area, Mpumalanga, are igneous in origin and entirely unfossiliferous. The igneous bedrocks are probably mantled by a thin blanket of superficial sediments (weathered regolith, soils) of very low palaeontological sensitivity. Fossil-bearing superficial sediments (*e.g.* alluvium) are not expected in this area.

The impact significance of the proposed hard rock quarry development on local fossil heritage resources is considered to be VERY LOW.

**It is therefore recommended that, pending the discovery of substantial new fossil remains during excavation, exemption from further specialist palaeontological studies is granted for the proposed Riebs Quarry development.**

Any substantial fossil remains (*e.g.* stromatolites, fossil shells, petrified wood or plant remains, vertebrate bones, teeth) encountered during excavation should be reported to SAHRA (Contact details: Ms. Colette Scheermeyer, South African Heritage Resources Agency, 111 Harrington Street. P.O. Box 4637, Cape Town 8000. Tel: 021 462 4502. Email: cscheermeyer@sahra.org.za. Fax: +27 (0)21 462 4509. Web:www.sahra.org.za) for possible mitigation by a professional palaeontologist at the developers expense.

#### 5. KEY REFERENCES

McCARTHY, T. & RUBIDGE, B. 2005. The story of Earth and life: a southern African perspective on a 4.6-billion-year journey. 334pp. Struik, Cape Town.

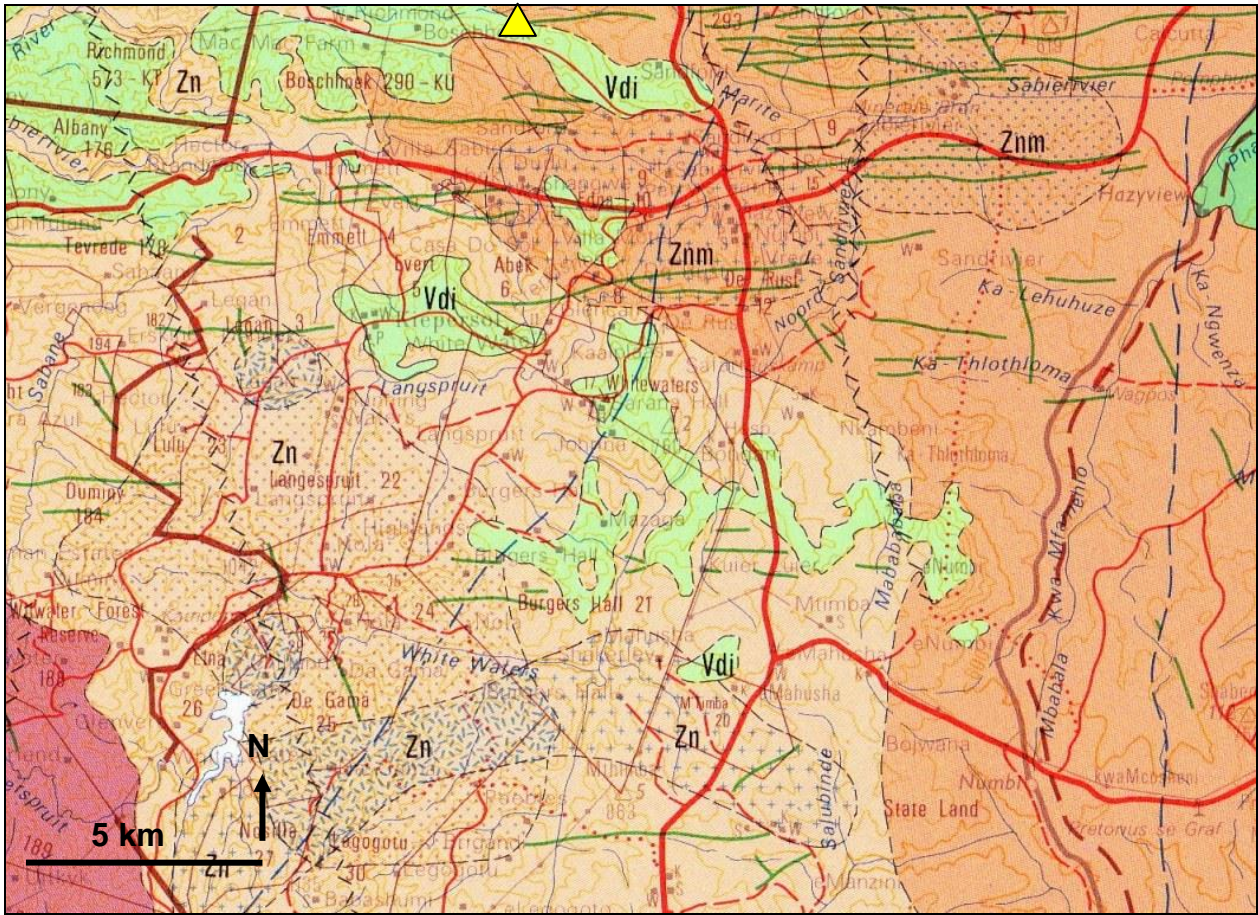
ROBB, L.J., BRANDL, G., ANHAEUSSER, C.R. & POUJOL, M. 2006. Archaean granitoid intrusions. In: Johnson, M.R., Anhaeusser, C.R. & Thomas, R.J. (Eds.) The geology of South Africa, pp. 57-94. Geological Society of South Africa, Marshalltown.

SCHOPF, J.W. 2006. Fossil evidence of Archaean life. Philosophical Transactions of the Royal Society B361, 869-885.

WALRAVEN, F. 1989a. Die geologie van die gebied Barberton. Explanation to 1: 250 000 geology sheet 2530 Baberton / Nelspruit, 35 pp. Council for Geoscience, Pretoria.

WALRAVEN, F. 1989b. The geology of the Pilgrim's Rest area. Explanation to 1: 250 000 geology sheet 2430 Pilgrim's Rest, 24 pp. Council for Geoscience, Pretoria.





**Fig. 2. Extract from 1: 250 000 geology map 2530 Barberton / Nelspruit (Council for Geoscience, Pretoria) showing the location of the Riebs Quarry study area some 64 km ESE of Lydenburg, Mpumalanga (yellow rectangle). The study area is underlain by Precambrian dolerites (Vdi, green) that intrude high grade metamorphic rocks (gneiss, migmatite) of the Archaean Nelspruit Suite (Znm, orange). The thin green lines to the east of the quarry are dolerite dykes.**

## 6. QUALIFICATIONS & EXPERIENCE OF THE AUTHOR

Dr John Almond has an Honours Degree in Natural Sciences (Zoology) as well as a PhD in Palaeontology from the University of Cambridge, UK. He has been awarded post-doctoral research fellowships at Cambridge University and in Germany, and has carried out palaeontological research in Europe, North America, the Middle East as well as North and South Africa. For eight years he was a scientific officer (palaeontologist) for the Geological Survey / Council for Geoscience in the RSA. His current palaeontological research focuses on fossil record of the Precambrian - Cambrian boundary and the Cape Supergroup of South Africa. He has recently written palaeontological reviews for several 1: 250 000 geological maps published by the Council for Geoscience and has contributed educational material on fossils and evolution for new school textbooks in the RSA.

Since 2002 Dr Almond has also carried out palaeontological impact assessments for developments and conservation areas in the Western, Eastern and Northern Cape under the aegis of his Cape Town-based company *Natura Viva* cc. He is a long-standing member of the Archaeology, Palaeontology and Meteorites Committee for Heritage Western Cape (HWC) and an advisor on palaeontological conservation and management issues for the Palaeontological Society of South Africa (PSSA), HWC and SAHRA. He is currently compiling technical reports on the provincial palaeontological heritage of Western, Northern and Eastern Cape for SAHRA and HWC. Dr Almond is an accredited member of PSSA and APHP (Association of Professional Heritage Practitioners – Western Cape).

### Declaration of Independence

I, John E. Almond, declare that I am an independent consultant and have no business, financial, personal or other interest in the proposed project, application or appeal in respect of which I was appointed other than fair remuneration for work performed in connection with the activity, application or appeal. There are no circumstances that compromise the objectivity of my performing such work.



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