BPI for Palaeontological Research

Private Bag 3, WITS 2050, South Africa • Telephone +27 11 717-6682 • Fax +27 11 717-6694

Email: bruce.rubidge@wits.ac.za

5 April 2013

Mr Shane Turner
JMA Consulting (Pty) Ltd
P O Box 883
DELMAS
2210

E-Mail: shane@jmaconsult.co.za

Dear Mr Turner,

Palaeontological Scoping Report – Dolerite borrow pits Sasol Mining (Pty) Ltd

As requested, herewith a letter of exemption with regard to the palaeontological aspect of environmental management relevant to the proposed development of dolerite borrow pits for coal mining operations within the Secunda area of the Mpumalanga Province of South Africa.

As is evident from my report the establishment of these borrow pits should not have any impact on palaeontological heritage, but have included a mitigation clause.

Yours sincerely

Bruce Rubidge PhD, FGSSA, FRSSA, Pr Sci Nat

PALAEONTOLOGICAL SCOPING REPORT

EXECUTIVE SUMMARY

This is a scoping Palaeontological Impact Assessment report on the proposed development of 8 borrow pits to source dolerite gravel material in order to support the construction of infrastructure for a number of expansion activities for coal mining operations of Sasol Mining (Pty) Ltd within the Secunda area of the Mpumalanga Province. The borrow pits are situated on outcrops of Jurassic dolerites which in turn are surrounded by sedimentary rocks of the Permian aged Vryheid Formation of the Karoo Supergroup.

In my opinion this development will not negatively affect palaeontological heritage as it involves the excavation of dolerite, which is a plutonic igneous rock and will not contain fossils. If, in the extremely unlikely event, that fossils are exposed in the surrounding rocks of the Vryheid Formation or in quaternary alluvial deposits in the process of development activities a qualified palaeontologist must be contacted to assess the exposure for fossils so that the necessary rescue operations are implemented.

INTRODUCTION

The study area is located within the Secunda area of the Mpumalanga Province of South Africa and covers portions of five farms as set out in Table 1. The localities of the borrow pits are indicated in Figure 1.

Borrow Pit Number	Property Name	Portion Number	Zoning Status
BP1	Holgatsfontein 535 IR	Portion 16	Agricultural
BP2	Holgatsfontein 535 IR	Portion 1	Agricultural
BP4	Roodebank 323 IS	Portion 24	Agricultural
BP5	Branddrift 322 IS	Portion 3	Agricultural
BP6	Branddrift 322 IS	Portion 2 and Portion 3	Agricultural
BP7	Grootspruit 279 IS	Remaining Extent	Urban Influence
BP8	Rietvley 320 IS	Portion 8	Utilities
BP9	Rietvley 320 IS	Portion 2	Utilities

Table 1: The portions of farms where the proposed borrow pits will be developed.

The dolerite will be mined from the borrow pits at the surface and the extent of the borrow pit will be limited according to the extent of the dolerite intrusions. The depth of the borrow pits will be restricted by the weathering profile of the dolerite at each of the proposed borrow pits which will be between 0.6 m and 1.6 m.

Sasol Mining (Pty) Ltd wishes to obtain the necessary mining rights to actively mine the dolerite from the eight borrow pits. This paleontological assessment is part of several specialist investigations to be done.

Author:
Professor Bruce Rubidge
PO Box 85346
Emmarentia
Tel: 072 575 7752

Email: bruce.rubidge@wits.ac.za

a. Specialist Expertise
   Palaeontology/ Stratigraphy/ Geology
b. Declaration of Independence

Signature: Date: 5 April 2013

1. Developer:

Sasol Mining (Pty) Ltd.
Private Bag X1015
SECUNDA
2302

Contact Person: Gail Nussey-Vos
Tel: 017 614 2207
Fax: 011 522 9272
E-mail: gail.nussey@sasol.com

2. Consultant:

JMA Consulting (Pty) Ltd
P O Box 883
DELMAS
2210

Contact Person: Mr Jasper Müller
Tel: 013 665 1788
E-Mail: jasper@jmaconsult.co.za

Report Date: 5 April 2013

BACKGROUND INFORMATION

The study area is located within the Secunda area of the Mpumalanga Province of South Africa and covers portions of five farms as indicated in Figure 1.

Sasol Mining (Pty) Ltd needs to source dolerite gravel to support the construction of infrastructure for a number of expansion activities for their coal mining operations within the Secunda area of the Mpumalanga Province of South Africa. Having identified several areas where extensive deposits of dolerite gravel are present, Sasol Mining now wishes to obtain the necessary mining rights to actively mine the dolerite from eight (8) borrow pits. These are namely borrow pits BP-1, BP-2, BP-4, BP-5, BP-6, BP-7, BP-8 and BP-9 (Figure 1).

DESCRIPTION OF PROPERTY

The borrow pits are situated on portions of the farms Holgatsfontein 535 IR, Roodebank 323 IS, Branddrift 322 IS, Grootspruit 279 IS and Rietvley 320 IS (Table 1) and their positions are shown in Figure 1.

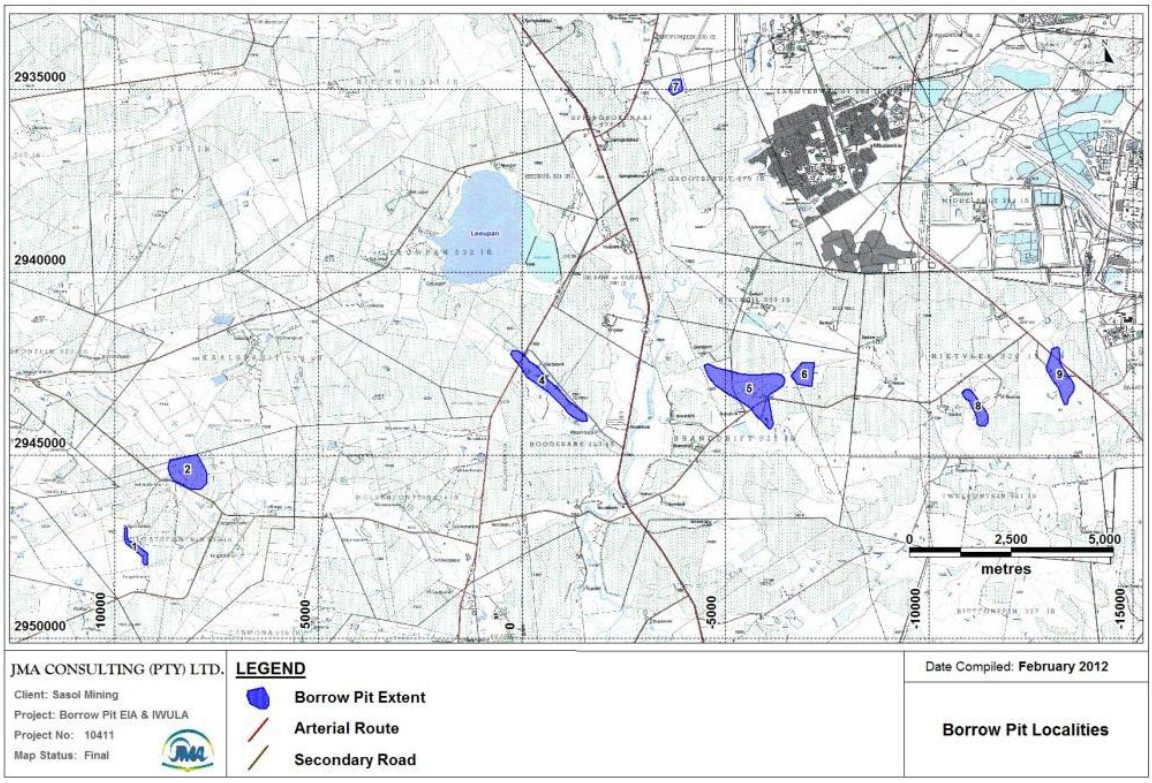

Figure 1. Map showing the geographic localities of each of the eight proposed borrow pits,

GEOLOGICAL SETTING

Following the published 1:250 000 Geological Map Series of South Africa (Sheet 2628 East Rand (1986)) (Figure 2) the area for the proposed development is situated entirely on Jurassic dolerites of the Karoo Supergroup. The geology of the study area is dominated by sedimentary rocks of the Vryheid Formation (Ecca Group, Karoo Supergroup) as well as dolerite intrusives. The Vryheid Formation comprises sandstone and shale layers as well as coal deposits. Quaternary alluvial deposits are present in topographical lower lying areas adjacent to the major surface water drainage bodies within the study area, but do not appear to be affected by the areas of the proposed borrow pits.

The dolerite is present as dykes and sills, the 8 proposed borrow pits will be confined by the extent dolerite outcrops and sub-outcrops and no excavation of the Vryheid Formation lithologies will occur. The dolerite will be mined from the borrow pits at the surface and the extent thereof is thus limited according to the extent of the dolerite intrusions. The depth of the borrow pits is restricted by the weathering profile of the dolerite at each of the proposed borrow pits. It is however indicated that the borrow pits are expected range in depth of between 0.6 m and 1.6 m and are indicated to not extend to depths greater than 2 m below the surface. No blasting will take place during the mining and the material will be transported to the construction area directly from the borrow pit or along existing roads. No additional roads will have to be constructed over areas underlain by rocks of the Vryheid Formation.

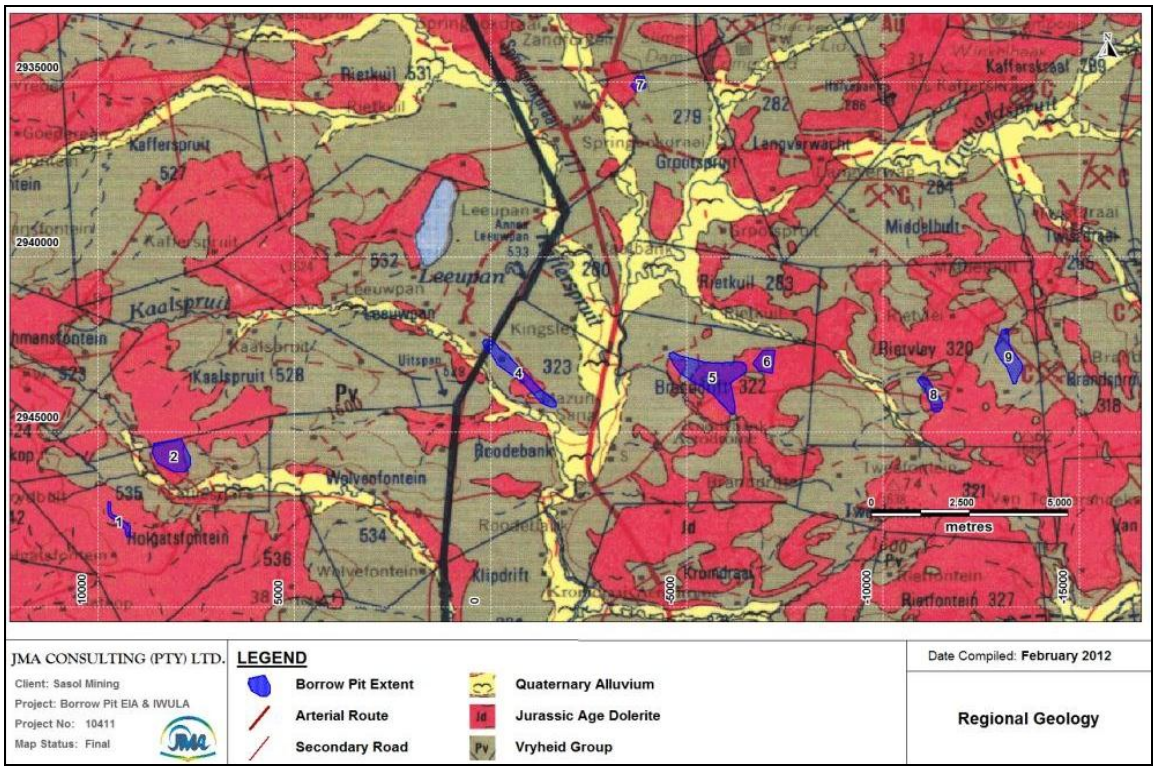

Figure 2: Geological map of the study area showing the position of the borrow pits relative to the geology.

BACKGROUND TO PALAEONTOLOGY OF STUDY AREA

As the dolerites of the Karoo Supergroup are of plutonic igneous origin there is no possibility of fossils being present.

The rocks of the Vryheid Formation of the Ecca Group are renowned for their wealth of plant fossils of the famous Gondwanan *Glossopterus* flora which has been described from Permian-aged rocks. This flora is the source of the coal which is mined from the Vryheid Formation in South Africa and is the reason for the coal mining operations. Within the Vryheid Formation there are occurrences of well-preserved elements *Glossopteris* flora comprising wood and/or leaves. Large collections of fossil flora from this Formation are present in the collections of the Council for Geoscience in Pretoria and the BPI Palaeontology at the University of the Witwatersrand in Johannesburg.

There is a slight chance that the Quaternary alluvial deposits could contain fossils, but this is unlikely.

RECOMMENDATION

In my opinion this development will not negatively affect palaeontological heritage and suggest that, from a paleontological perspective, this development should proceed. If construction activities expose extensive mudrocks of the Vryheid Formation or in the Quaternary alluvial deposits, it will create a unique opportunity to explore the area for fossils. It is thus recommended that, should fossils be exposed, a qualified palaeontologist be contacted to assess the exposure for fossils before further development takes place so that the necessary rescue operations are implemented. Depending on the nature of the fossils discovered this could entail excavation and removal to a registered palaeontological museum collection. A list of professional palaeontologists is available from South African Heritage Resources Agency (SAHRA).

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