

RECOMMENDED EXEMPTION FROM FURTHER PALAEOLOGICAL STUDIES:

PROPOSED SHELL GLENRIDGE SERVICE STATION, PROTEA GLEN EXTENSION 29, SOWETO, GAUTENG PROVINCE

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1. OUTLINE OF PROPOSED DEVELOPMENT

Shell South Africa Marketing (Pty) Ltd (Shell) is proposing to construct and operate a new Service Station located on the corner of the R559 and Adelstein Street, Protea Glen Extension 29, Soweto, Gauteng Province. The proposed project site for the service station (26° 16' 02" S 27° 46' 12" E) is an undeveloped piece of land surrounded by low density residential areas (Fig. 1). The service station will consist of four Under-ground Storage Tanks (USTs) with a capacity of 46 m³ each, with associated fuel infrastructure and further including a shop, restrooms, parking and access routes.

This palaeontological heritage assessment comment for the proposed development was commissioned as part of a comprehensive HIA by Heritage Contracts and Archaeological Consulting CC (Contact details: Mnr Jaco van der Walt. Heritage Contracts and Archaeological Consulting CC (HCAC). Mobile: 082 373 8491. Fax: 086 691 6461), as requested by SAHRA (their ref. Ref. No. 9/2/228/0001, letter dated 15 December 2014). The report contributes to the Basic Assessment required for the service station development project that is being managed by Environmental Resources Management Southern Africa (Pty) Ltd (ERM Ref Number: 0255570).

1.1. Legislative context

This report falls under Sections 35 and 38 (Heritage Resources Management) of the South African Heritage Resources Act (Act No. 25 of 1999), and it will also inform the Environmental Management Plan for this project.

The various categories of heritage resources recognised as part of the National Estate in Section 3 of the National Heritage Resources Act include, among others:

- geological sites of scientific or cultural importance;
- palaeontological sites;
- palaeontological objects and material, meteorites and rare geological specimens.

According to Section 35 of the National Heritage Resources Act, dealing with archaeology, palaeontology and meteorites:

(1) The protection of archaeological and palaeontological sites and material and meteorites is the responsibility of a provincial heritage resources authority.

(2) All archaeological objects, palaeontological material and meteorites are the property of the State.

(3) Any person who discovers archaeological or palaeontological objects or material or a meteorite in the course of development or agricultural activity must immediately report the find to the

responsible heritage resources authority, or to the nearest local authority offices or museum, which must immediately notify such heritage resources authority.

(4) No person may, without a permit issued by the responsible heritage resources authority—

(a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;

(b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;

(c) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or

(d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.

(5) When the responsible heritage resources authority has reasonable cause to believe that any activity or development which will destroy, damage or alter any archaeological or palaeontological site is under way, and where no application for a permit has been submitted and no heritage resources management procedure in terms of section 38 has been followed, it may—

(a) serve on the owner or occupier of the site or on the person undertaking such development an order for the development to cease immediately for such period as is specified in the order;

(b) carry out an investigation for the purpose of obtaining information on whether or not an archaeological or palaeontological site exists and whether mitigation is necessary;

(c) if mitigation is deemed by the heritage resources authority to be necessary, assist the person on whom the order has been served under paragraph (a) to apply for a permit as required in subsection (4); and

(d) recover the costs of such investigation from the owner or occupier of the land on which it is believed an archaeological or palaeontological site is located or from the person proposing to undertake the development if no application for a permit is received within two weeks of the order being served.

Minimum standards for the palaeontological component of heritage impact assessment reports (PIAs) have recently been published by SAHRA (2013).



Fig. 1. Google Earth© satellite image showing the location of the proposed Shell Glenridge Service Station on the corner of the R559 and Adelstein Street, Protea Glen Extension 29, Soweto, Gauteng Province (yellow symbol).

2. GEOLOGICAL BACKGROUND

The Glenridge Service Station study area lies in flat, highly disturbed terrain on the southern side of the R559, c. 5 km north of the N10 trunk road, Soweto, Gauteng. Satellite images show the area is mantled by reddish-brown lateritic soils at an elevation of around 1610 m amsl.

The geology of the area is shown on 1: 250 000 sheet 2626 Wes-Rand (Fig. 2) Council for Geoscience, Pretoria) for which a sheet explanation has not yet been published. The development footprint overlies Precambrian dolomites and associated marine sedimentary rocks that are assigned to the **Malmani Subgroup (Chuniespoort Group)** within the **Transvaal Supergroup** (Eriksson & Altermann 1998, Eriksson *et al.* 2006). The 2 km-thick Malmani Subgroup succession consists of a series of formations of stromatolitic and oolitic carbonates (limestones and dolomites), cherts and black carbonaceous shales. These marine sediments were laid down in a range of supratidal, intertidal and subtidal settings over a major epicontinental carbonate platform in Late Archaean to Early Proterozoic times, roughly 2.55 to 2.50 Ga (billion years ago). The individual Malmani formations are not mapped at 1: 250 000 scale, so the rock units represented within the service station study area have not been identified at that level here. The Malmani carbonates in the study area have probably been subject to karstic weathering processes with near-surface concentration of insoluble materials (chert, ferromanganese minerals *etc*) through downwasting.

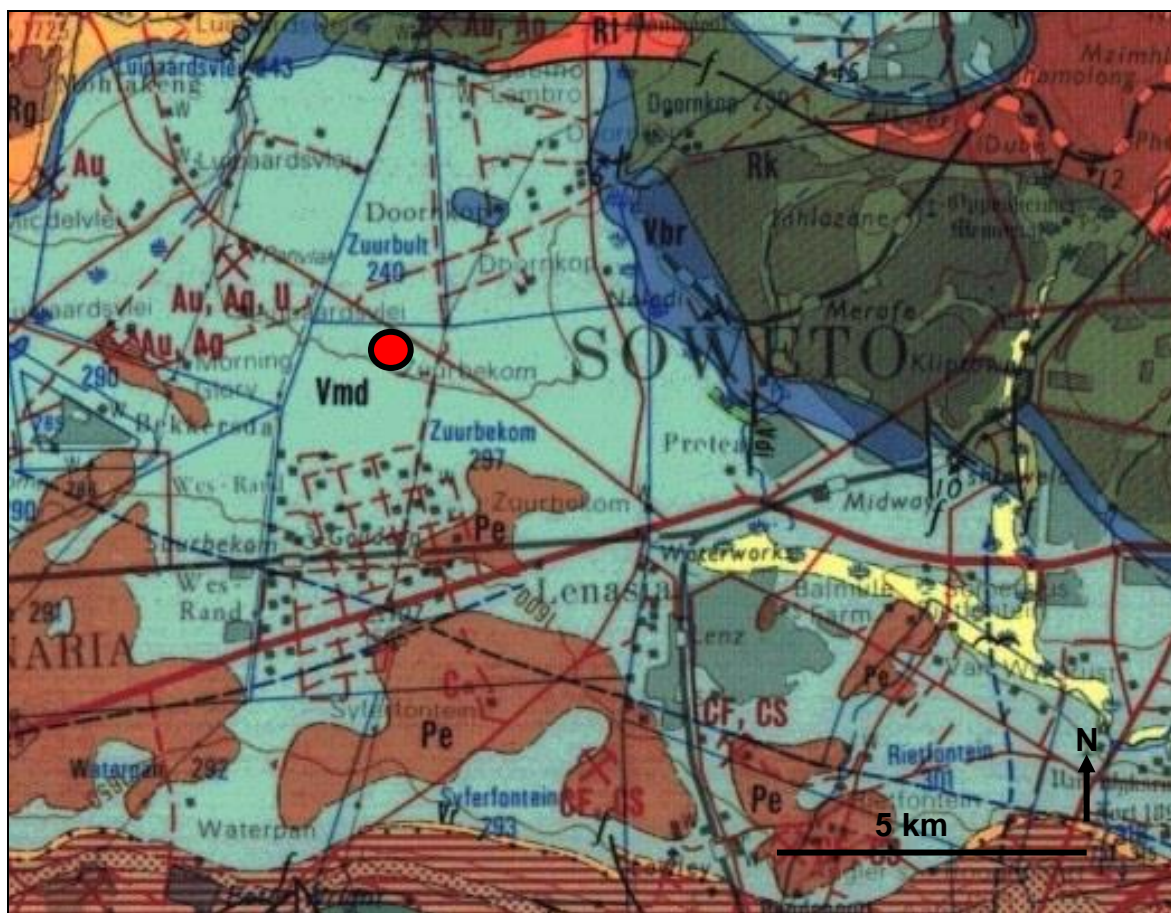


Fig. 2. Extract from 1: 250 000 geological map 2626 Wes-Rand (Council for Geoscience, Pretoria) showing the location of the proposed Shell Glenridge Service Station in Soweto, Gauteng Province (red circle). The study area is underlain by Precambrian carbonate rocks of the Malmani Subgroup (Transvaal Supergroup) (Vmd, pale blue).

3. PALAEOLOGICAL HERITAGE

The Malmani Subgroup platform carbonates of the Transvaal Basin host a variety of stromatolites (microbial laminites), ranging from supratidal mats to intertidal columns and large subtidal domes. These biogenic structures are of biostratigraphic as well as palaeoecological interest; for example, the successive Malmani dolomite formations are in part differentiated by their stromatolite biotas (e.g. Truswell and Eriksson 1972, 1973, and 1975, Schopf 2006 and Eriksson *et al.* 2006, among others). Microbial filaments and unicells have been reported from stromatolites of the Transvaal Supergroup.

The potentially fossiliferous carbonate bedrocks in the study region are mantled by surface sediments (e.g. lateritic soils, gravels) of low palaeontological sensitivity. The chances of palaeontologically significant subsurface stromatolitic horizons being exposed within the small service station development footprint are considered to be very low.

4. CONCLUSIONS & RECOMMENDATIONS

The proposed Glenridge Service Station development is underlain by Precambrian carbonate rocks of the Transvaal Supergroup that are c. 2.5 billion years old. Although important stromatolite (microbial mound) fossils are known from these rocks elsewhere in Gauteng, it is considered unlikely that palaeontologically significant fossils will be directly impacted within the small footprint concerned. The palaeontological sensitivity of the study area is LOW.

It is therefore recommended that exemption from further specialist palaeontological studies is granted for the Glenridge Service Station development.

Any substantial fossil remains (e.g. stromatolites) encountered during excavation should be reported to SAHRA for possible mitigation by a professional palaeontologist (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Phone: +27 (0)21 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za).

5. REFERENCES

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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 APHAP (Association of Professional Heritage Assessment 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 development 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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