

UNIVERSITY OF THE
WITWATERSRAND,
JOHANNESBURG



DESKTOP PALAEOONTOLOGICAL IMPACT ASSESSMENT

Bloemhof Extensions 11, 12 and 13 Township development in Lekwa-Teemane Local Municipality

Specialist report by:

Bruce Rubidge

Address: PO Box 85346
Emmarentia
Tel: 072 575 7752
Email: bruce.rubidge@wits.ac.za

Subcontracted by environmental consultants

Koot Raubenheimer

Address: Maxim Planning Solutions
Unit 35 Corpus Novem Office Park,
PO Box 6848,
Flamwood, 2572
Tel: 018 468 6366
Fax: 018 468 6378
Cell: 083 263 4960
Email: koot@maxim.co.za | www.maxim.co.za

DATE: 19 June 2018

EXECUTIVE SUMMARY

Bruce Rubidge was appointed by Maxim Planning Solutions on behalf of Lekwa-Teemane Local Municipality to undertake a desktop Palaeontological Impact Assessment for the township development at Bloemhof Extensions 11, 12 and 13, Lekwa Teemane Local Municipality on a portion of the Remaining Extent of Portion 1 and a portion of the Remaining Extent of Portion 15 (a portion of Portion 1) and the Remaining Extent of Portion 26 (a portion of Portion 1) of the farm Klipfontein No. 344-HO at the town of Bloemhof in Northwest Province

Most of the area is underlain by Precambrian rocks of the Ventersdorp Supergroup comprising the Allanridge Formation which in turn are overlain by unconsolidated Quaternary alluvial deposits.

As the Precambrian Ventersdorp Group is of mostly of igneous origin and is not known to host fossils it is highly unlikely that palaeontological heritage will be affected by the proposed township development. The Quaternary alluvial sediments which are covered by vegetation in the study area are the only sedimentary deposits in the area which could host fossils of Quaternary-aged animals and plants. As these deposits are not consolidated it is very unlikely that any fossils will be present.

If in the unlikely event that fossils are exposed in Quaternary sediments in the course of the proposed development, a qualified palaeontologist must be contacted to assess the exposure for fossils so that the necessary rescue operations are implemented.

TABLE OF CONTENTS

1. Introduction and brief	4
2. Legislative Framework	4
3. Details of the study area	5
4. Geological Setting	5
5. Palaeontological Heritage	7
6. Methodology	7
7. Recommendations	7
8. Conclusion	8
9. Bibliography	8

Introduction and Brief

A Palaeontological Impact Assessment was requested by Koot Raubenheimer of Maxim Planning Solutions on behalf of the Lekwa-Teemane Local Municipality. The development is the proposed townships Bloemhof Extensions 11, 12 and 13 on a portion of the Remaining Extent of Portion 1 and a portion of the Remaining Extent of Portion 15 (a portion of Portion 1) and the Remaining Extent of Portion 26 (a portion of Portion 1) of the farm Klipfontein No. 344-HO on behalf of the Lekwa Teemane Local Municipality. The township area is located northwest of the town of Bloemhof situated along the N12 highway in Northwest Province (Figure 1). The proposed development comprises a total area of 235 hectares.

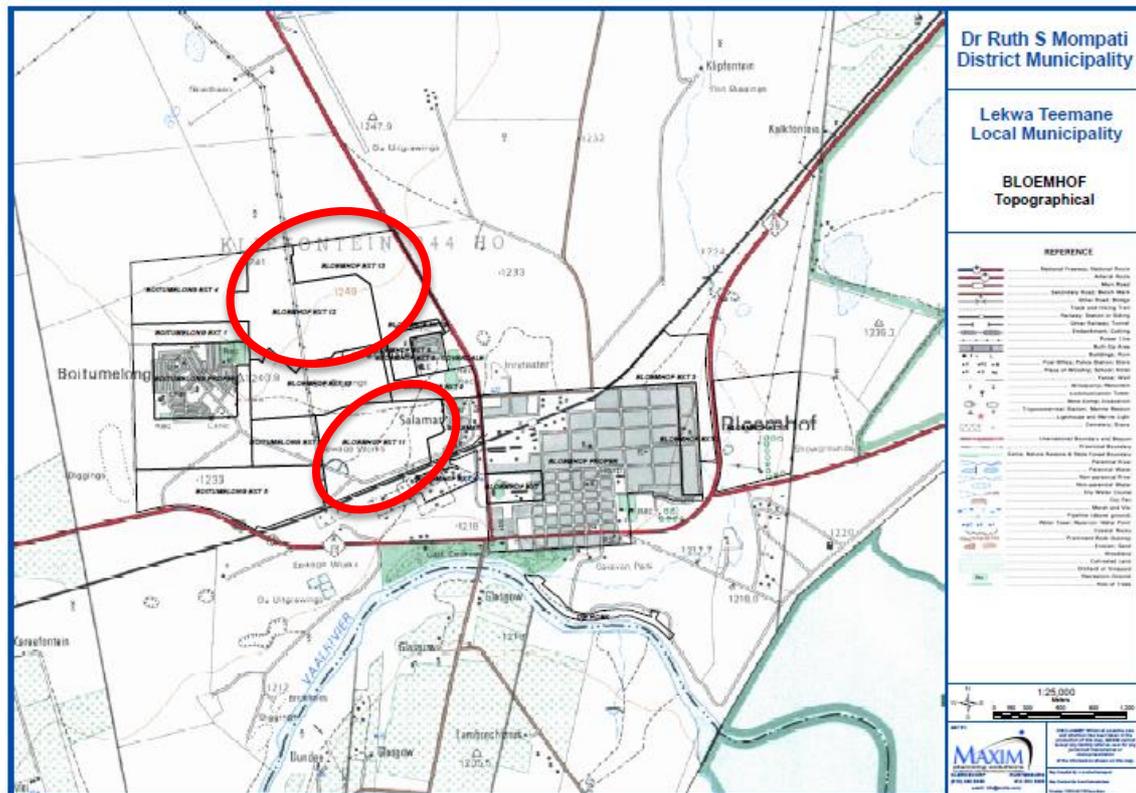


Figure 1. Bloemhof_topographic map (Sheet 2725DA). The areas of the proposed townships Bloemhof Extensions 11, 12 and 13 is encircled in red

Legislative framework

The Department of Environmental Affairs (DEA) through the National Environmental Management Act (NEMA Act 107 of 1998) requires that developers apply to the competent authority for approval of the proposed development as more than 1 hectare of indigenous vegetation is to be removed (Listing Notice 1 of the EIA regulations).

National Heritage is protected by the South African Heritage Resources Act (Act No 25) of 1999. Developers are required to submit development plans to SAHRA for approval. These plans must include documentation detailing the expected impact that the development will have on national heritage.

Categories of heritage resources recognised as part of the National Estate in Section 3 of the Heritage Resources Act include:

- Geological sites of scientific or cultural significance
- Objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects, material, meteorites and rare geological specimens.
- Objects with the potential to contribute to understanding South Africa's natural or cultural heritage.

Accordingly a Heritage Impact Assessment (HIA) is required to assess the possible impacts of a proposed development on archaeological and palaeontological heritage. This report addresses the palaeontological aspects of the HIA as part of the Environmental Management Plan (EMP).

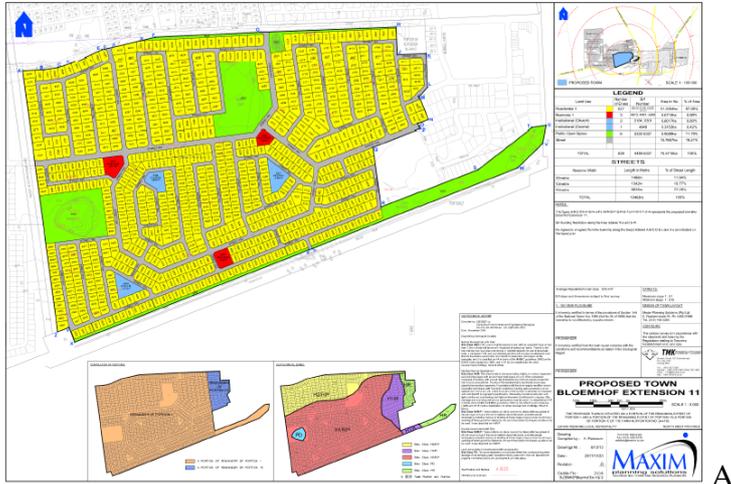
Details of the study area

The study area of the Bloemhof Extensions 11, 12 and 13 township developments is located in Northwest Province on a portion of the Remaining Extent of Portion 1 and a portion of the Remaining Extent of Portion 15 (a portion of Portion 1) and the Remaining Extent of Portion 26 (a portion of Portion 1) of the farm Klipfontein No. 344-HO northwest of the town of Bloemhof on the N12 highway (Figure 2). The study area is covered by the 1:50 000 topographical map Sheet 2725DA (Figure 1). The proposed development area covers 235 hectares.

The main infrastructure expansion is associated with the layout of the new townships which will be developed and will include Residential, Business, Institutional and Public Open Space erven as well as streets. With regard to services infrastructure, the proposed township area will be supplied with potable water. All sewerage generated in Bloemhof Extensions 11, 12 and 13 townships is from a full waterborne system.

Geological Setting

Most of the area is underlain by Precambrian rocks of the Allanridge Formation of the Ventersdorp Group. The igneous Allanridge Formation comprises mainly amygdaloidal lava, porphyritic lava and pyroclastic rocks. The geological map indicates that unconsolidated Quaternary alluvial deposits occur in the southern part of the study area (Figure 3).



A



B



C

Figure 2. Plan layout of development extensions: A – Ext 11; B- Ext 12; C- Ext 13.

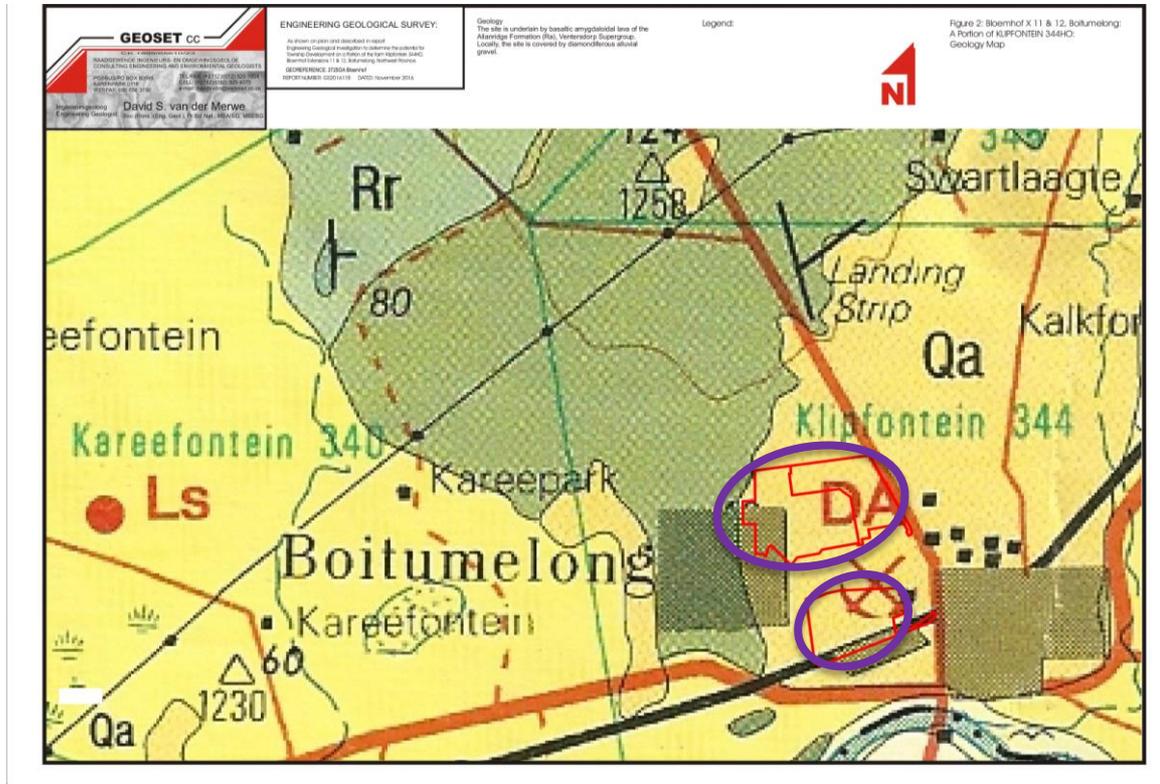


Figure 3: Geological map (2724 Christiana) showing the position of the study locality in relation to the regional geology (refer township areas outlined in red within purple circles). Ventersdorp Supergroup includes Ra – Allanridge Formation (green); Qa – Quaternary alluvial deposits (yellow).

Palaeontological Heritage

As the Precambrian Ventersdorp Supergroup Group is of largely of igneous origin and is not known to host fossils it is highly unlikely that palaeontological heritage will be affected by the proposed township development. The Quaternary alluvial sediments could possibly host fossils of Quaternary-aged animals and plants. As these deposits are not consolidated it is very unlikely that any fossils will be present.

Methodology

Because the study area is underlain by Precambrian rocks of low palaeontological sensitivity, a desktop Palaeontological Impact Assessment was undertaken to identify possible sensitive fossil occurrences, assess the significance of possible fossil occurrences, comment on the impact of the proposed development, and to make mitigating recommendations.

Recommendations

From the documentation supplied regarding the development it is extremely unlikely that the proposed development will have any affect on palaeontological heritage. However if fossils are exposed in the Quaternary alluvial deposits it will create a unique opportunity to explore the area for fossils. It is thus recommended that, in the unlikely event that fossils are exposed as a result of construction activities, a qualified palaeontologist must 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).

Conclusion

The proposed Bloemhof Extensions 11, 12 and 13 township development areas are underlain by Precambrian aged rocks of the Ventersdorp Group which in turn is overlain by unconsolidated Quaternary aged alluvial deposits. It is extremely unlikely that fossils will be exposed as a result of the development. From a palaeontological perspective, the proposed township development should proceed but, if fossils are uncovered in the course of construction activities, the developer immediately calls in a qualified palaeontologist to assess the situation and, if necessary, undertake excavation of the fossils.

Bibliography

Mac Rae C. 1999. *Life etched in stone: fossils of South Africa*. The Geological Society of South Africa, Johannesburg, pp 305.

Meintjies PG., Visser JNJ., & Grobler NJ. 1989 Evolution of the late Archaean volcano-sedimentary basins of the Platberg Group near Welkom, Orange Free State. *South African Journal of Geology*, **92**, 235-249.

McCarthy TS., & Rubidge BS. 2005. *The story of Earth and Life – a southern African perspective on the 4.6 billion year journey*. Struik Publishers, Cape Town. pp 333.

Partridge TC., Botha GA., & Haddon IG. 2006. Cenozoic deposits of the interior. In: Johnson MR, Anhaeusser and Thomas RJ (Eds). *The Geology of South Africa*. Geological Society of South Africa, Johannesburg/Council for Geoscience, Pretoria. pp. 585-604.

SAHRA. 2013. Minimum standards: palaeontological component of heritage impact assessment reports. South African Heritage Resources Agency, Cape Town. pp15.

van der Westhuizen WA., de Bruijn H., & Meintjies PG. 2006 The Ventersdorp Supergroup. *In: Johnson MR, Anhaeusser and Thomas RJ (Eds). The Geology of South Africa.* Geological Society of South Africa, Johannesburg/Council for Geoscience, Pretoria. pp. 187-208.

A handwritten signature in blue ink, appearing to read 'B. Rubidge'.

Bruce Rubidge PhD, FGSSA, FRSSA, Pr Sci Nat

19 June 2018