

UNIVERSITY OF THE
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DESKTOP PALAEOONTOLOGICAL IMPACT ASSESSMENT

Geluksoord Extensions 4 and 5 Township developments at Christiana in Lekwa-Teemane Local Municipality

Specialist report by:

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DATE: 19 June 2018

EXECUTIVE SUMMARY

Bruce Rubidge was appointed by Maxim Planning Solutions on behalf of Maquassi Hills Local Municipality to undertake a desktop Palaeontological Impact Assessment for the township developments at Geluksoord Extensions 4 and 5, situated on a portion of the Remaining Extent of Portion 1 of the farm Christiana Town and Townlands No. 325-HO. The study area is northwest of the town of Christiana and situated north of the N12 main road in Northwest Province

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Most of the area is underlain by Precambrian rocks of the Ventersdorp Supergroup comprising the Bothaville and Allanridge formations which in turn are overlain by Tertiary and Quaternary calcrete and river terrace 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 Tertiary and Quaternary sediments, which are covered by vegetation in the study area, are the only sedimentary deposits in the area which could host fossils of Tertiary to Quaternary-aged animals and plants. As many of 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 the Tertiary-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.

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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 Geluksoord Extension 4 and Geluksoord Extension 5 situated on a portion of the Remaining Extent of Portion 1 of the farm Christiana Town and Townlands No. 325-HO. The township areas are located northwest of the town of Christiana on the N12 main road in Northwest Province (Figure 1). The proposed development comprises a total area of 133.43 hectares.

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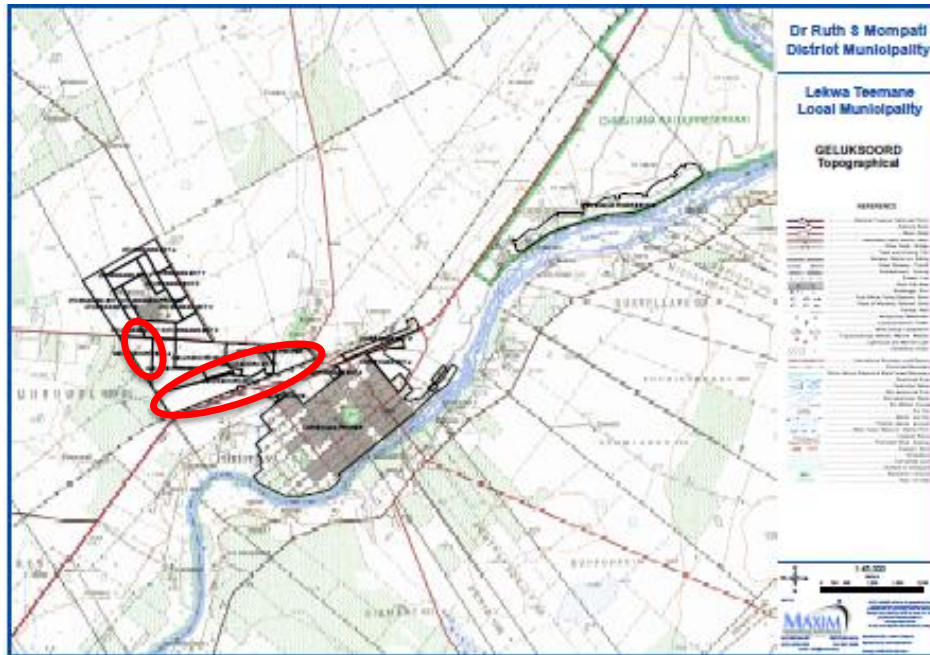


Figure 1: Topographic map (Sheet 2725CC). The proposed township development areas of Extensions 4 and 5 are encircled in red

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 Geluksoord Extension 4 and Extension 5 township developments (Figure 2) is located in Northwest Province on a portion of the Remaining Extent of Portions 1 of the farm Christiana Town and Townlands No. 325-HO at the town of Christiana. The study area is covered by the 1:50 000 topographical map Sheet 2725CC (Figure 1). The proposed development area covers 133.43 hectares.

The main infrastructure expansion is associated with the layout of two 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 areas will be supplied with potable water. All sewerage generated in Geluksoord is from a full waterborne system.

Geological Setting

Most of the area is underlain by Precambrian rocks of the Ventersdorp Group and includes the Allanridge and Bothaville formations. The Bothaville Formation which has only minor exposure in the study area consists of quartzites and conglomerates. The overlying igneous Allanridge Formation comprises mainly amygdaloidal lava, porphyritic lava and pyroclastic rocks. The geological map indicates that Tertiary-Quaternary calcrete and Quaternary river terrace deposits occur in the area proposed for Extension 5 (Figure 3).



A



B

Figure 2: Plan layout of the proposed township developments. A - Ext 4; B - Ext 5.

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 Tertiary-Quaternary calcretes and Quaternary river terrace deposits are the only sedimentary deposits in the area which could possibly host fossils of Tertiary-Quaternary-aged animals and plants. As these deposits cover a very small area it is very unlikely that any fossils will be present.

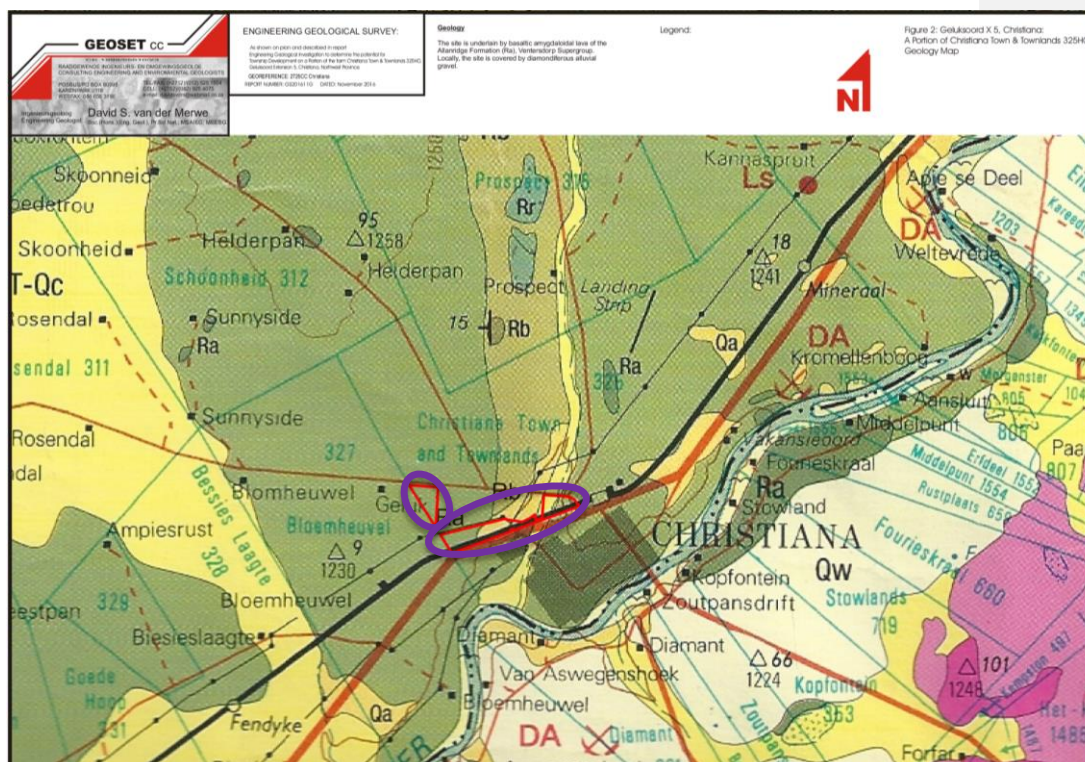


Figure 3: Geological map (2724 Christiana) showing the position of the study locality in relation to the regional geology (refer township areas outlined in red within purple circles). Ventersdorp Supergroup includes Rb- Bothaville Formation, Ra – Allanridge Formation; T-Qc – Tertiary-Quaternary calcrete deposits, Qa Quaternary river terrace gravel. The study area is encircled in red.

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 Tertiary-Quaternary calcrete deposits or Quaternary river terrace gravel 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 Geluksoord Extension 4 and Extension 5 township development areas are underlain by Precambrian aged rocks of the predominantly Ventersdorp Group which in turn is overlain by unconsolidated Tertiary-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 must immediately calls in a qualified palaeontologist to assess the situation and, if necessary, undertake excavation of the fossils.

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19 June 2018