DESKTOP PALAEONTOLOGICAL IMPACT ASSESSMENT

Shopping Centre Development on Portion 216 and Portion 36 of the Farm Zandfontein 317-JR, Tshwane Metropolitan Municipality, Gauteng Province

Specialist report by:

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EXECUTIVE SUMMARY

Bruce Rubidge was appointed by AB Enviro Consult under instruction from GH DevCo Pty Ltd to undertake a desktop Palaeontological Impact Assessment for the proposed clearance of 10,9205ha of indigenous vegetation to establish a shopping centre with associated access and parking on Portion 36 and the Remaining Extent of Portion 216 of the Farm Zandfontein 317, JR, Gauteng Province.

The entire study area is deeply underlain by rocks of the Pretoria Group of the Precambrian Transvaal Supergroup and more superficially by Quaternary sediments. Rocks of the Pretoria Group are not known to contain fossils and there is a slight, but unlikely, possibility that the unconsolidated Quaternary sediments could contain fossils.

As the Precambrian Transvaal Supergroup rocks are overlain by thick Quaternary sediments, neither of which are sensitive for palaeontological heritage, it is highly unlikely that palaeontological heritage will be affected by the proposed shopping centre development. The overlying Quaternary sediments are not consolidated and it is very unlikely that any fossils will be present.

This desktop study has indicated that no rocks of the Pretoria Group are exposed and are overlain by thick Quaternary alluvial deposits which have the potential to host fossils. If in the unlikely event that fossils are discovered in the Quaternary alluvial deposits it would create an opportunity for palaeontological research. It is recommended that if, in the unlikely event that fossils are exposed in Quaternary sediments during 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 JP de Villiers of AB Enviro Consult under instruction from GH Devco Pty Ltd to undertake a desktop Palaeontological Impact Assessment for a proposed shopping centre development on Portion 216 and Portion 36 of the Farm Zandfontein 317-JR, Tshwane Metropolitan Municipality, Gauteng Province. (Figure 1&2). The proposed development comprises a total area of approximately 10.9205 hectares.

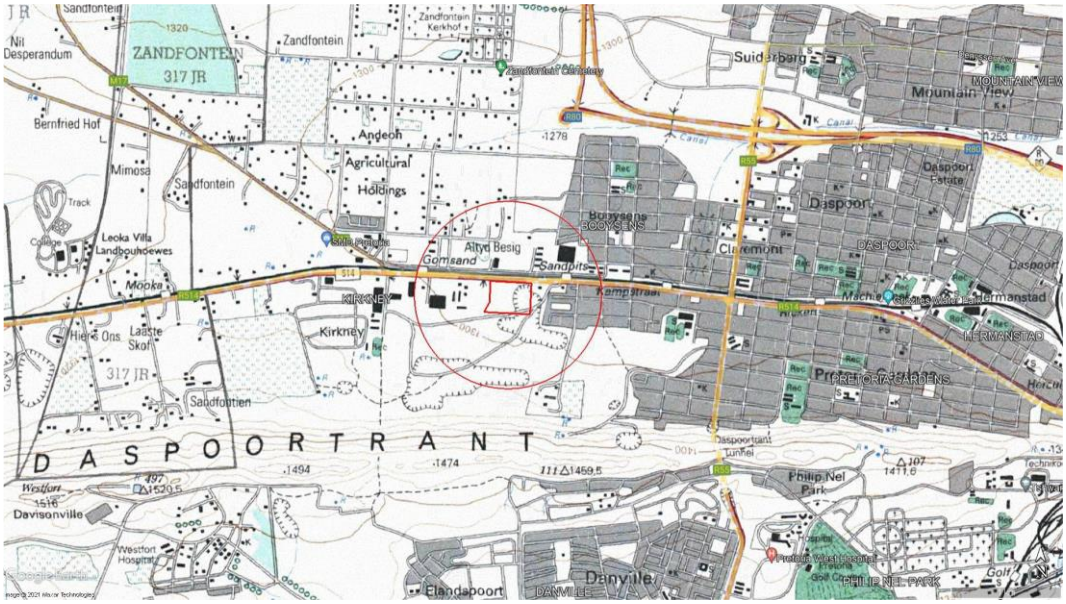

Figure 1. 1:50 000 topographic map (2528CA) showing the site (red quadrangle) for the proposed shopping centre development on Portion 216 and Portion 36 of the Farm Zandfontein 317-JR, Tshwane Metropolitan Municipality, Gauteng Province.

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).

Figure 2. Google Earth image of the study area (outlined in red quadrangle) on Portion 216 and Portion 36 of the Farm Zandfontein 317-JR, Tshwane Metropolitan Municipality, Gauteng Province.

Details of the study area

The study area for the proposed shopping centre development is located on Portion 216 and Portion 36 of the Farm Zandfontein 317-JR, Ward 55, Region 3, City of Tshwane Metropolitan Municipality, Gauteng Province (Figure 1). The erven are situated south of Van Der Hoff Road (R514), between Theo Slabbert and Richards Bay Streets, north of the east-west striking Witwatersberg range (Figure 2). The street addresses are known as 1311 and 1321 Van der Hoff Street as for Portion 216 and Portion 36, respectively. The topography of the study area is flat with no rocky outcrops and is largely covered with invasive vegetation. The ground surface is highly disturbed by historic works, excavations, fill and foundations.

Geological Setting

Referral to the geological map (2528 Pretoria; 1:250 000 series) indicates that the entire area is deeply underlain by Precambrian volcanic diabase and sedimentary rocks of the Pretoria Group of the Transvaal Supergroup comprising shale of the Silverton Formation overlain by quartzite of the Daspoort Formation. These Precambrian rocks are are overlain by thick unconsolidated Quaternary alluvial sediments.

Figure 3: 1: 250 000 scale geological map (2528 Pretoria; 1:250 000 series) showing the position of the proposed shopping centre development (red quadrangle) on Portion 216 and Portion 36 of the Farm Zandfontein 317-JR, Tshwane Metropolitan Municipality, Gauteng Province. Di – diabase intrusion; Vdg – Daspoort Formation; Vsi – Silverton Formation; Q Quaternary alluvial deposits.

Palaeontological Heritage

The shales of the Silverton Formation and quartzites of the Daspoort Formation of the Pretoria Group of the Precambrian Transvaaal Supergroup are not known to host fossils. The overlying alluvial Quaternary sediments could potentially host much younger fossils but this is unlikely.

Methodology

The study area is underlain by Precambrian volcanic diabase and sedimentary rocks of the Pretoria Group of the Transvaal Supergroup which are overlain by thick unconsolidated Quaternary sediments in the study area (Figure 4). As all of these

sedimentary sequences are 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 on palaeontological heritage, and to make mitigating recommendations. The thick covering of Quaternary sediment over the study area, which is largely covered by vegetation and historical rubble, means that a field study will not yield anything of palaeontological significance.

Figure 4: Photographs of the study area to show the vegetation AND RUBBLE covering the Quaternary sediments

Recommendations

From the documentation supplied regarding the development it is extremely unlikely that the proposed development will have any affect on palaeontological heritage. The underlying Precambrian rocks of the Pretoria Group are not exposed in the study area and it is unlikely that fossils will be preserved in the overlying Quaternary alluvial deposits.

It is thus recommended that, in the unlikely event that fossils are exposed as a result of construction activities, this will provide a unique opportunity for palaeontological research and 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 of fossils to a registered palaeontological museum collection. A list of professional palaeontologists is available from South African Heritage Resources Agency (SAHRA).

Conclusion

The proposed shopping centre development on Portion 216 and Portion 36 of the Farm Zandfontein 317-JR, Tshwane Metropolitan Municipality, Gauteng Province is underlain by Precambrian aged rocks of the Pretoria Group of the Transvaal Supergroup, which in turn are 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 shopping centre development should proceed but if fossils are uncovered in the course of construction activities, the developer must immediately call in a qualified palaeontologist to assess the situation and, if necessary, undertake excavation of the fossils (see Appendix A).

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APPENDIX A – CHANCE FIND PROTOCOL (CFP)

It is noted that following the findings of this desktop Palaeontological Impact Assessment it is unlikely that fossils will be recovered as a result of the macadamia orchard development. The following procedure is required if fossils are exposed by excavations.

1. If fossils are exposed by excavation in unconsolidated Quaternary deposits they must be inspected by the environmental officer or designated person.
2. If fossils are noted in the unconsolidated Quaternary sands (includes bones, insects or plants) a suitably qualified palaeontologist must be approached for a verdict.
3. Fossil material displaced by excavation should be placed in a protected area, in this way development activities will not be held up.
4. Appropriate photographs of the fossils which have been noted should be sent to a qualified palaeontologist for a verdict on how to proceed. This may require a site inspection and excavation by the palaeontologist.
5. Fossils that are deemed to be of good quality or of scientific importance by the palaeontologist must be removed and curated in a recognised palaeontological museum collection where they can be made available for further study.
6. Before fossils are removed from the site a collecting permit must be obtained from SAHRA, and the required permitting procedures and requirements must be followed.
7. If the fossil material is deemed by the registered palaeontologist (as a result of photographic evidence or a site visit) to not be worthy of excavation and curation in a museum collection, the material will not be removed.
8. Mitigation will involve an attempt to capture all rare fossils and systematic collection of all fossils discovered by a registered palaeontologist. This will require routine collecting protocols involving descriptive, diagrammatic and photographic recording of fossils and exposures. The fossils and appropriate contextual samples will be processed to create an archive collection.
9. Should a major *in situ* occurrence be exposed, excavation will immediately cease in that area so that the discovery is not disturbed or altered in any way until the appointed palaeontologist has investigated the find.
10. Should no fossils be discovered in the process of development and excavations have been completed, no further monitoring will be required.
11. Any site visits by a registered palaeontologist and/or excavation of fossil material required, will be undertaken at the cost of the developer.