



Palaeontological Assessment Door de Kraal Erf 39170, Bellville (3318DC Bellville)

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Executive Summary

Dr G Avery, Archaeozoologist, Iziko South African Museum was commissioned by Nicolas Baumann on behalf of Barinor Holdings to conduct a survey of the palaeontological potential on Door de Kraal Erf 39170, Bellville where Barinor Holdings is proposing to develop a new residential area.

Applicant: Barinor Holdings

Proposed activity: New Residential Area

Location: Door de Kraal Erf 39170, Bellville, Western Cape

A review of potential sources indicates that no palaeontological material is known from the surface of Door de Kraal, nor is this likely. A foot survey traversing the vineyard concerned supported this; the area has been ploughed over time and no evidence of surface deposits likely to include fossils was seen. A very sparse scatter of crude stone artefacts of probable Early Stone Age on the surface, indicates that these sediments are of considerable age, possibly as old as 700 ka (thousand) to 1 Ma (million years).

Details of the underlying sediments are derived from Theron (1992) and, particularly, Knight (2010).

Observations are made regarding the occurrence of sub-surface archaeological material.

The occurrence of fossils in underlying sediments is unlikely. However, any excavation for foundations and/or infrastructure that penetrates into underlying older sediments may encounter wetland deposits and/or fossils. Collaboration between the contractor and a suitably-qualified palaeontologist will be required during excavations for foundations and infrastructure that extend below the plough zone monitored so that information and/or material can be recorded appropriately.

Provided that the recommendations of this assessment are complied with, there is no palaeontological reason why the proposed development should not proceed.

Location of Door de Kraal, Bellville

The proposed area falls on 1:50 000 topographical map (3318 DC Bellville) (Figures 1, 2, 3).

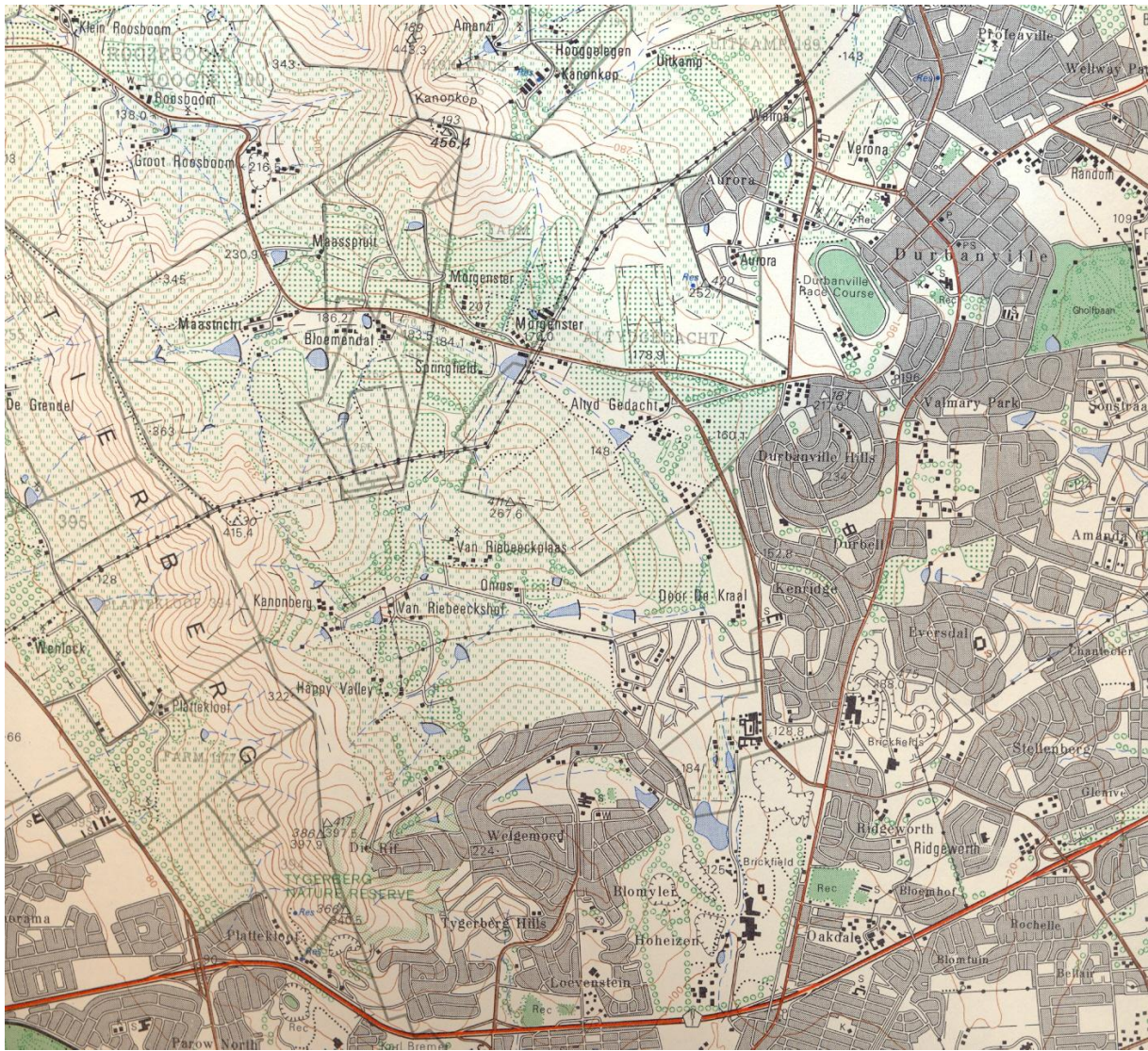


Figure 1: The location of Door de Kraal, Bellville (3318 DC Bellville).

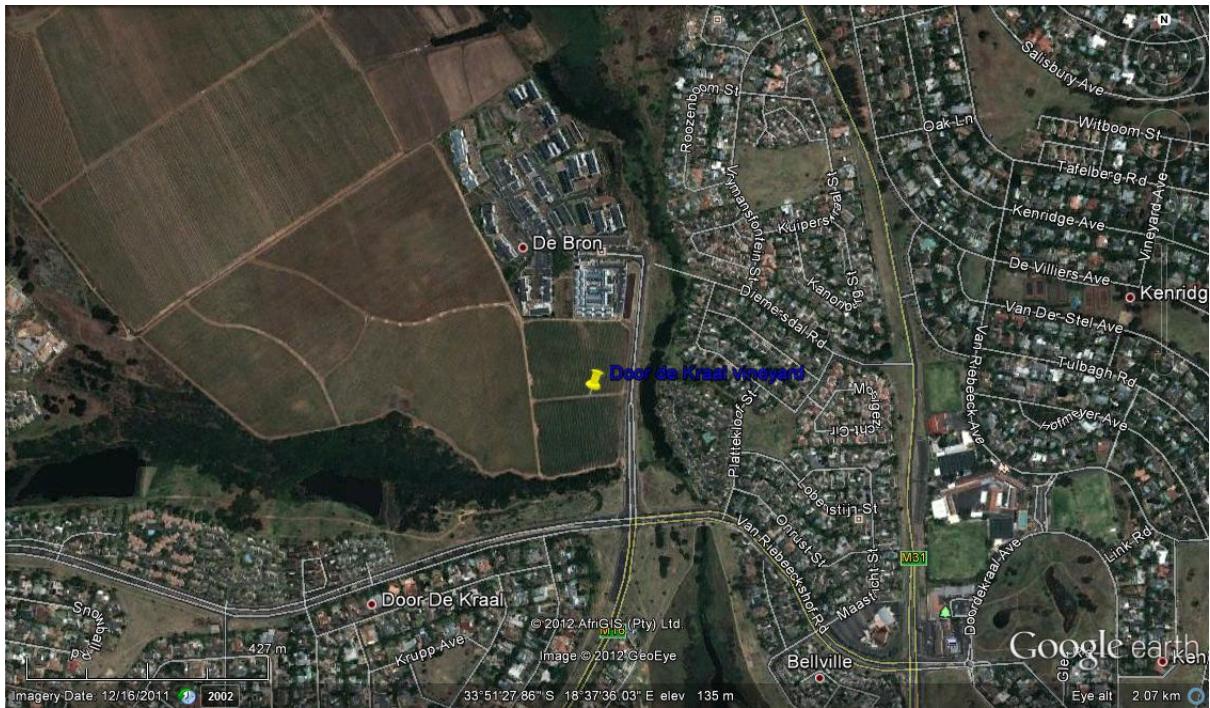


Figure 2. Google Earth view of Door de Kraal, Bellville and developed surrounds.



Figure 3. General view of Door de Kraal roughly NE from Jip de Jager Boulevard. The darker line left of the vineyard marks the upper extent of the proposed development.

Method

A desktop study and site visit was conducted, by Dr G. Avery Archaeozoologist in the Cenozoic Studies Section, Natural history Collections Department, Iziko South African Museum. The ground survey involved slow walking along every 3rd inter-vine line and, when I was satisfied that I had established the pattern, every 4th line. Visibility along the lines was good (Figure 4).



Figure 4. View along an inter-vine line.

Results of Survey

No surface palaeontological material was recorded in the literature or during a foot survey.

The area has been heavily modified by agricultural activity. As can be expected from sediments on the slopes of hills in the region (Deacon and Deacon , a very sparse scatter (a mere handful over the whole area) of weathered silcrete stone artefacts (possible cores) and probably Early Stone Age, was visible on the surface (Figure 5). Their context is disturbed (Ploughing) and Pinto (2011) states that no mitigation is required. Bone is not normally preserved in these deposits. However, it is possible that fossils could be encountered during any excavation that cuts into older sediments.



Figure 5. Example of stone artefact and gravelly substrate.

Geological and Palaeontological potential

The available report on the soil sampling on Door de Kraal (Knight 2010) gives no indication of features that might include fossil material. However, since the area is in a depression along a drainage line, the possibility that ancient wetland deposits, which could yield pollens, may be encountered during excavations cannot be ruled out. Such material, if encountered, would be a potentially important source of information on past environments. Underlying the subsoil is a saprolite (clayey decomposed rock) base of the Malmesbury Group.

The more recent sediments overlying the basement rocks in the Cape Flats area have been summarized (Rogers, 1982, Roberts, et al., 2009, Theron, et al., 1992, Theron, 1984, Pether, 2007

Comments

As predicted, no surface palaeontological material was visible on the areas covered and, given the sandy nature of the heavily-disturbed surface; this is considered adequate for assessment. Geological and palaeontological observations in the surrounding cape Flats area indicate a long history of sedimentation under periods of sea level and environmental change and the presence of palaeontological and, possibly, palynological (pollen) material.

Although sea level change would not have affected the door de Kraal area due to its altitude (Figure 5), it is possible that wetland deposits of Pleistocene age, at least, could be encountered during any excavation of depth into alluvium. Good communication with contractors and periodic on-site monitoring during excavations will be required.

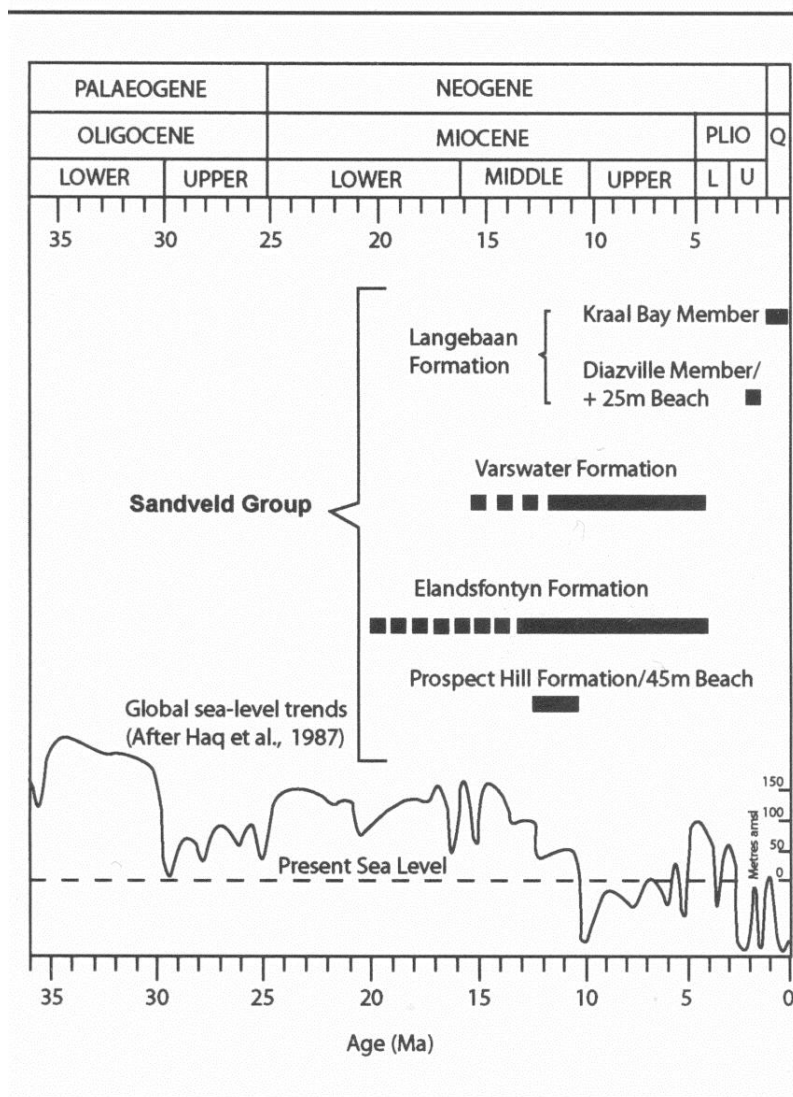


Figure 5. Illustration of changing sea levels (Figure 3 of Roberts and Brink (2002)). Note that Miocene and Pliocene sea levels reached much higher stands (>100 m) above present sea level than those of the Pleistocene (Figure 6) by which time a 100 ka periodicity of high/low sea levels coinciding with warmer (interglacial) and colder (glacial) conditions had developed.

Conclusion

Palaeontological remains are likely to be rare but, if encountered, must be recorded by an appropriately qualified person. As an example of potential, the richness of the Swartklip hyaena accumulation (Klein 1975) and its important contribution to knowledge of local biodiversity and glacial (Ice Age) palaeoenvironments should not be lost sight of.

The earliest (Late Miocene and Pliocene) deposits are unlikely to be disturbed by normal housing development.

Provided that the recommendations in this report are followed, current information indicates that the proposed development will not impact significantly on palaeontological remains. Appropriately conducted the development may provide opportunities to access rare fossil material and to better understand the local geological sequence.

From the palaeontological perspective the development can be allowed to proceed.

Recommendations

Bulk earth works and excavation for deep foundations/infrastructure should be monitored by a palaeontologist. The frequency of this to be worked out *a priori* with the contractor to minimize time spent on site.

If possible, geotechnical information together with the proposed depths of excavations for foundations and/or infrastructure should be provided prior to the commencement of construction. This may enable a better estimation of the time(s) when monitoring would be necessary.

Protocols for dealing with palaeontological/palynological monitoring/mitigation must be included in the Environmental Management Plan (EMP). Any such material is likely to be fragile and due care must be exercised.

Any material recovered will be lodged in the collections of Iziko South African Museum.

Funds must be available *a priori* to cover costs.

Heritage Permits Required

The primary heritage legislation that needs to be considered is The South African Heritage Resources Act 25 of 1999 and regulations (details at www.sahra.org.za).

Clearance in terms of the National Heritage Act of 1999 will be required before the development can proceed.

Although not required by the Act, it is suggested that, to obviate possible delays should fossil material be encountered, a permit be applied for ahead of any excavation. This would enable the monitor to readily recover material, should it be encountered during construction activities.

Acknowledgements

Mr. Hannes Krynauw and Mr Gerard Erasmus provided locality and other background information.

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