

RECOMMENDED EXEMPTION FROM FURTHER PALAEOONTOLOGICAL STUDIES:

PROPOSED LOW-COST HOUSING DEVELOPMENT ON ERF 11305, WALMER, NELSON MANDELA BAY MUNICIPALITY, EASTERN CAPE

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1. OUTLINE OF PROPOSED DEVELOPMENT

It is proposed to construct low-cost housing on Erf 11305, Walmer, in the Nelson Mandela Bay Municipality, Eastern Cape, as part of the Walmer Gqebera Low-Cost Housing Development, Port Elizabeth. An Environmental Impact Assessment for this housing project is being conducted by SRK Consulting (South Africa) Pty Ltd., Port Elizabeth, who have commissioned this palaeontological heritage comment (Contact details: Mr Luc Strydom. SRK Consulting. Ground Floor, Bay Suites, 1a Humewood Rd, Humerail, Port Elizabeth, 6001. P O Box 21842, Port Elizabeth, 6000. Tel: +27-041-5094800. Fax: +27-041-5094850. Email: lstrydom@srk.co.za).

2. GEOLOGICAL BACKGROUND

The Erf 11305 study area (33° 59' 53.5" S, 25° 34' 14.4" E) is situated on the western outskirts of Walmer, between the M12 to the north and Victoria Drive to the south (Fig. 2). The terrain is fairly flat to undulating, at c. 110 m amsl., and well-vegetated.

The geology of the study area is shown on the 1: 50 000 geology map 3425BA Port Elizabeth (Council for Geoscience, Pretoria) (Fig. 1). As shown on the map, Erf 11305 is underlain by coastal aeolianites (ancient, wind-blown dune sands) of the **Nanaga Formation (Algoa Group)** of Pliocene to Early Pleistocene age. These ancient dune sands crop out extensively to the west and east of Port Elizabeth (Le Roux 1992). In the present study area they unconformably overlie Palaeozoic sandstones and quartzites of the Peninsula Formation (Table Mountain Group; Op, pale blue in map Fig. 1). The Nanaga beds comprise calcareous sandstones and sandy limestones that often display large scale aeolian cross-bedding - well seen, for example, in deep N2 roadcuts between Colchester and Grahamstown. They may reach thicknesses of 150 m or more (Maud & Botha 2000). The Nanaga aeolianites are normally partially to well-consolidated, although unconsolidated sands also occur west of Port Elizabeth (Le Roux 2000). The upper surface of the aeolianites weathers to calcrete and red, clay-rich soil, and the dune sands themselves may be profoundly reddened. The age of the palaeodunes decreases towards the modern coastline, reflecting marine regression (relative sea level fall) during the period of deposition. The oldest outcrops located furthest from the modern coast are the most elevated, having experienced some 30 m of uplift in the Pliocene, and may even be Miocene in age (Roberts *et al.*, 2006). Typically

the ancient dunes are preserved as undulating ridges of rounded hills trending parallel to the modern shoreline (Le Roux 1992).

3. PALAEOLOGICAL HERITAGE

The sparse palaeontological record of the Pliocene to Early Pleistocene Nanaga Formation is summarised by Le Roux (1992) and Almond (2010). The fossil biota consists of fragmentary marine shells, foraminifera (shelled protozoans), and a small range of terrestrial snails (eg *Achatina*, *Tropidophora*, *Trigonephrus*, *Natalina*). Dense arrays of calcretised rhizoliths (root casts) commonly occur in these and contemporary Plio-Pleistocene aeolianites along the southern and southwestern coast. A wider range of terrestrial fossils might be found here in future, albeit only rarely due to extensive post-depositional diagenesis (e.g. solution and reprecipitation of carbonate by groundwater). They might include mammal remains from hyaena lairs, such as are recorded from contemporary Langebaan Formation aeolianites in the SW Cape (Roberts *et al.*, 2006 and refs therein).

The overall palaeontological sensitivity of the Nanaga Formation is assessed as LOW, although pockets of locally HIGH sensitivity may occur locally.

4. CONCLUSIONS & RECOMMENDATIONS

The proposed low-cost housing development on Erf 11305 Walmer is of LOW significance in terms of local palaeontological heritage since the sedimentary rocks underlying the site are largely unfossiliferous.

It is therefore recommended that exemption from further specialist palaeontological studies and mitigation be granted for this housing development.

Should any substantial fossil remains (e.g. vertebrate bones and teeth, petrified wood, plant fossil assemblages) be encountered during excavation, however, these should be safeguarded, preferably *in situ*, and reported by the ECO to ECPHRA (*i.e.* The Eastern Cape Provincial Heritage Resources Authority. Contact details: Mr Sello Mokhanya, 74 Alexander Road, King Williams Town 5600; smokhanya@ecphra.org.za) and a suitably qualified palaeontologist so that specimens can be examined, recorded and, if necessary, professionally excavated at the developer's expense.

5. KEY REFERENCES

ALMOND, J.E. 2010. Palaeontological heritage assessment of the Coega IDZ, Eastern Cape Province, 112 pp. plus appendix. Natura Viva cc, Cape Town.

LE ROUX, F.G. 1992. Lithostratigraphy of the Nanaga Formation (Algoa Group). Lithostratigraphic Series, South African Committee for Stratigraphy, 15, 9 pp. Council for Geoscience, Pretoria.

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MAUD, R.R. & BOTHA, G.A. 2000. Deposits of the South Eastern and Southern Coasts. Pp. 19-32 in Partridge, T.C. & Maud, R.R. (Eds.) The Cenozoic of Southern Africa. Oxford Monographs on Geology and Geophysics No 40. Oxford University Press. Oxford, New York.

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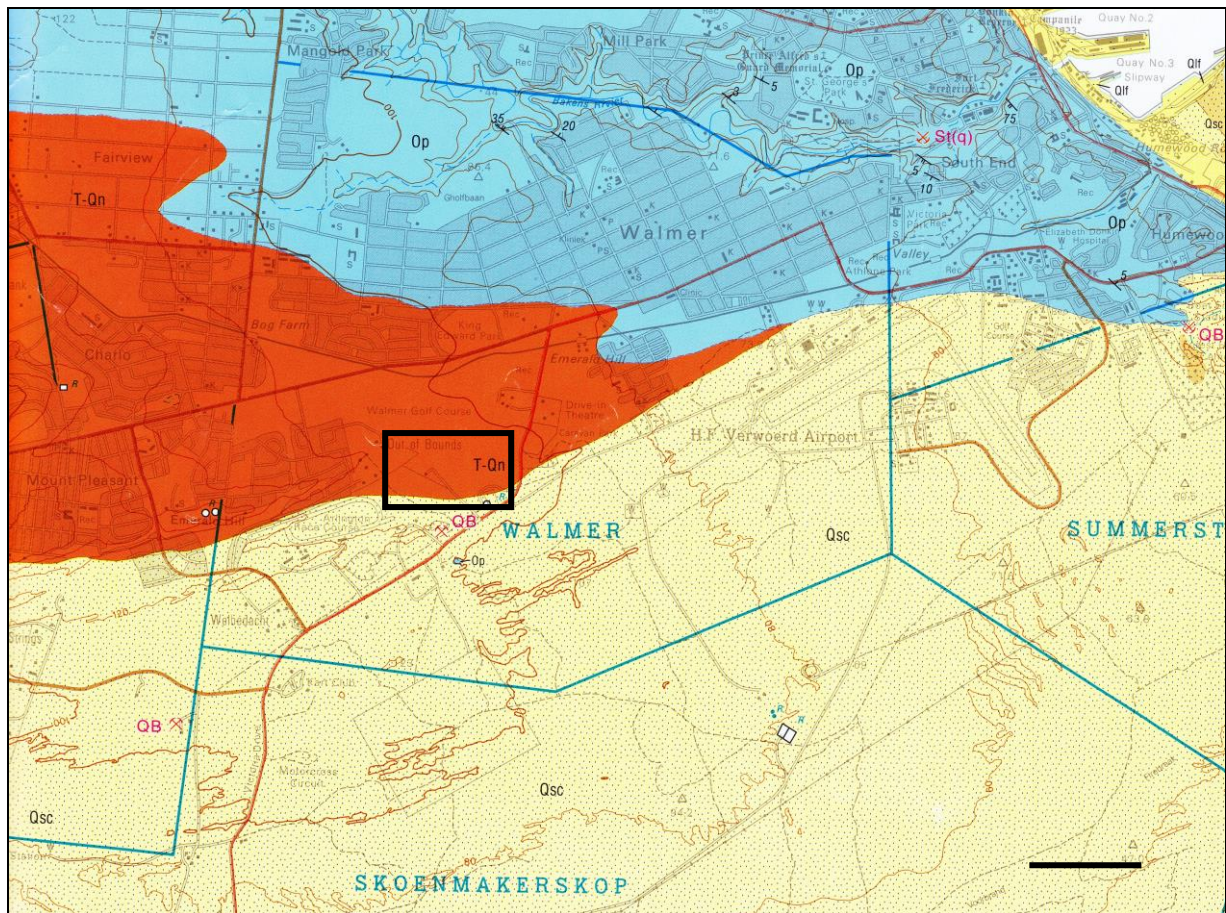


Figure 1: Extract from 1: 50 000 geology map 3425BA Port Elizabeth (Council for Geoscience, Pretoria) showing the location of the study area on Erf 11305 Walmer, Port Elizabeth (black rectangle). The scale bar = 1 km. North is towards the top of the map. The study area is underlain by Plio-Pleistocene aeolian sands of the Nanaga Formation (Algoa Group) (T-Qn, orange) that overlie Palaeozoic quartzites and sandstones of the Peninsula Formation (Table Mountain Group) (Op, blue).



Figure 2: Satellite image showing the location of the study area Erf 11305 (red polygon on left) in the Port Elizabeth suburb of Walmer, Nelson Mandela Bay Municipality, Eastern Cape (Image kindly supplied by SRK Consulting, PE).

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 APHP (Association of Professional Heritage 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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