

RECOMMENDED EXEMPTION FROM FURTHER PALAEOLOGICAL STUDIES:

PROPOSED RESIDENTIAL DEVELOPMENT ON ERF 745, OLYVENHOUTSDRIFT, UPINGTON, SIYANDA DISTRICT MUNICIPALITY, NORTHERN CAPE

John E. Almond PhD (Cantab.)

Natura Viva cc,

PO Box 12410 Mill Street,

Cape Town 8010, RSA

naturaviva@universe.co.za

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1. OUTLINE OF THE PROPOSED DEVELOPMENT

It is proposed to construct a housing development comprising 32 residential units on Erf 745, Olyvenhoutsdrift, located on the southern side of the Orange (Gariep) River and adjacent to the N10 on the outskirts of Upington, Siyanda District Municipality, Northern Cape (Figs. 1 & 2). The chosen site is currently vacant, undeveloped and zoned for agriculture. Access to the housing development will be from the existing Jooste Eiland Road approximately 100 m from an existing intersection with the N10.

The present desktop palaeontological heritage comment for the development has been commissioned on behalf of EnviroAfrica cc (Contact details: Mr Clinton Geyser. EnviroAfrica cc. P.O. Box 5367 Helderberg 7135. Tel: 021 – 851 1616. Fax: 086 – 512 0154. E-mail: clinton@enviroafrica.co.za) by the Agency for Cultural Resource Management (Contact details: Jonathan Kaplan. Address: 5 Stuart Road, Rondebosch. P/F: 021 685 7589. M: 082 321 0172. Email: acrm@wcaces.co.za).

2. GEOLOGICAL BACKGROUND

The study area for the proposed housing development on Erf 745, Olyvenhoutsdrift, comprises fairly flat-lying, semi-arid terrain at an elevation of some 790-800 m amsl situated c. 750 m south of the present banks of the Orange (Gariep) River. The area is already very heavily disturbed (J. Kaplan, pers. comm., Oct. 2016) and is traversed by an irrigation canal (Fig. 2). The geology of the study area on the southern outskirts of Upington is shown on the 1: 250 000 geology map 2820 Upington (Council for Geoscience, Pretoria; Fig. 3). A comprehensive sheet explanation for this map has been published by Moen (2007). The study area is underlain at depth by ancient Precambrian basement rocks that belong to the **Namaqua-Natal Province** of Mid Proterozoic (Mokolian) age (Cornell *et al.* 2006, Moen 2007). They comprise highly metamorphosed migmatitic amphibolites and calc-silicate rocks of the **Jannelsepan Formation (Areachap Group)**. These basement rocks are approximately two to one billion years old and entirely unfossiliferous (Almond & Pether 2008). They are mantled at surface by downwasted rock rubble and surface gravels. Substantial alluvial deposits of the Orange River are not mapped this far to the southeast of the river banks. Field observations of abundant banded ironstone clasts on site (J. Kaplan, pers. comm., Oct. 2016) suggest that older alluvial gravels were originally present here, but are now highly disturbed.

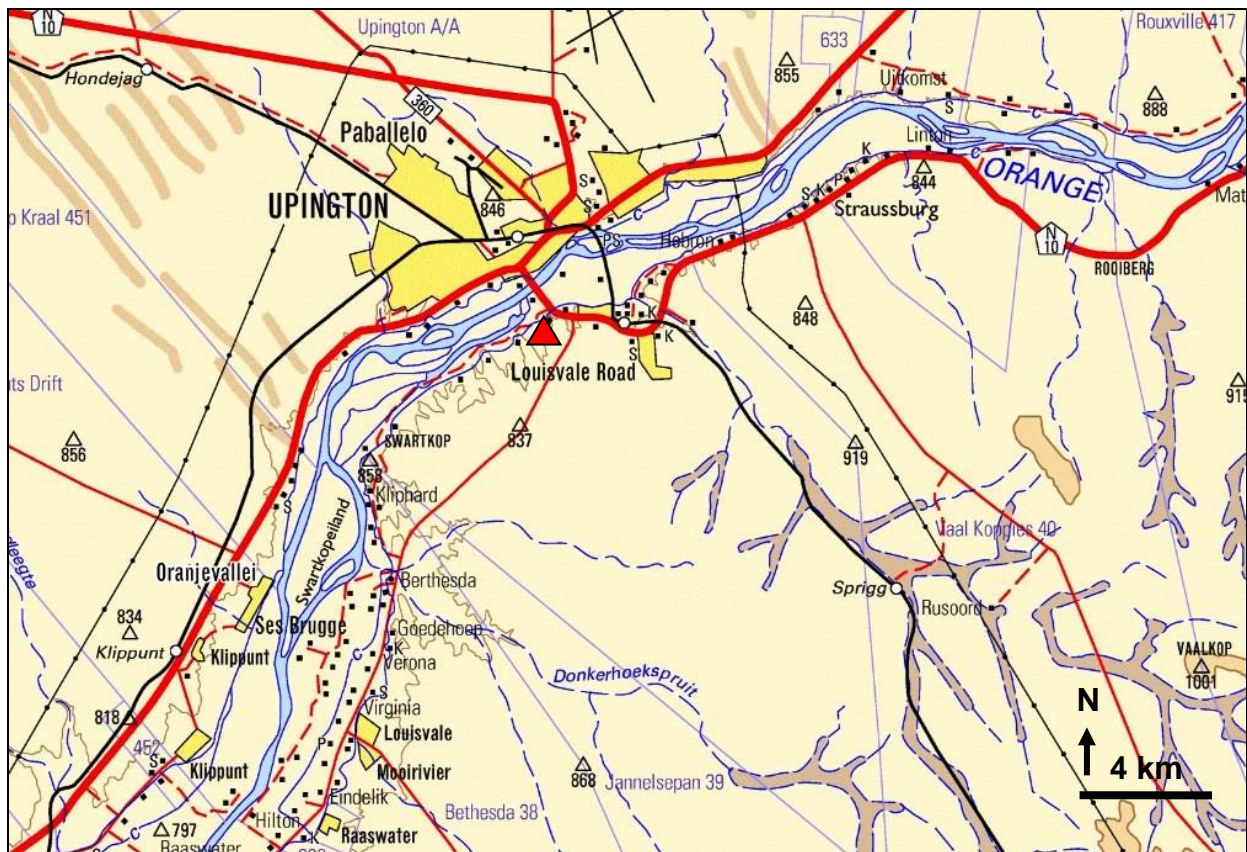


Figure 1: Extract from 1: 250 000 topographical map 2820 Upington (Courtesy of the Chief Directorate: National Geo-spatial Information) showing the location of the study area (red triangle) for the proposed residential development on Erf 745, Olyvenhoutsdrift, situated on the southern side of the Orange (Gariep) River at Upington, Northern Cape.



Figure 2: Google earth© satellite image of the development area (red polygon) for the proposed residential development on Erf 745, Olyvenhoutsdrift, Upington, Northern Cape.

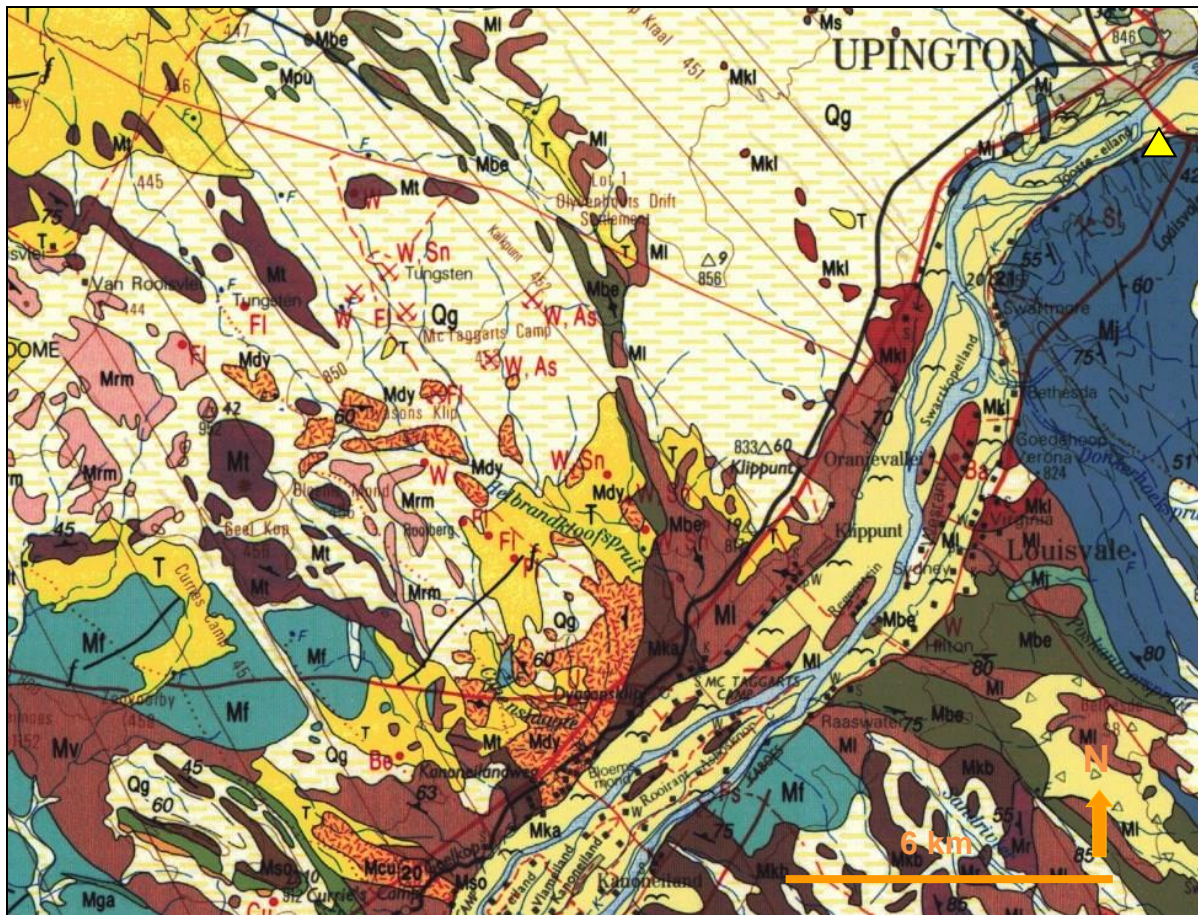


Figure 3. Extract from 1: 250 000 geological map 2820 Upington (Council for Geoscience, Pretoria) showing the location of the study area for the proposed housing development on Erf 745, Olyvenhoutsdrift, Upington, Northern Cape Province (yellow triangle). The study area is underlain at depth by unfossiliferous Precambrian (Middle Proterozoic / Mokolian) basement rocks of the Namaqua-Natal Metamorphic Province. These comprise high grade metamorphic rocks, namely migmatitic amphibolites and calc-silicate rocks of the Jannelsepan Formation of the Areachap Group (Mj, dark blue). Outside and to the northwest of the project area the basement rocks are extensively mantled by alluvial sediments of the Orange River (pale yellow with flying bird symbol on map). Older alluvial gravels (banded ironstone clasts) noted on site are already highly disturbed. The overall palaeontological sensitivity of the entire study area is LOW.

3. PALAEOLOGICAL HERITAGE

The Precambrian metamorphic **basement rocks** are entirely unfossiliferous (Almond & Pether 2008, Almond 2016). Potentially fossil-bearing alluvial gravels of the Orange River noted on site are now highly disturbed. The overall palaeontological sensitivity of the study area is accordingly assessed as LOW.

4. CONCLUSIONS & RECOMMENDATIONS

The Precambrian metamorphosed basement rocks underlying the residential development study area on Erf 745, Olyvenhoutsdrift are entirely unfossiliferous. The footprint of the proposed facility is very small and already highly disturbed. It is concluded that construction of the proposed residential development near Upington is unlikely to have significant impacts on local palaeontological heritage resources.

It is therefore recommended that, pending the discovery of significant new fossils remains before or during construction, exemption from further specialist palaeontological studies and mitigation be granted for the proposed residential development on Erf 745, Olyvenhoutsdrift near Upington, Northern Cape.

Should any substantial fossil remains (*e.g.* mammalian bones and teeth) be encountered during excavation, however, these should be safeguarded, preferably *in situ*, and reported by the ECO to SAHRA, *i.e.* The South African Heritage Resources Authority, as soon as possible (SAHRA Contact details: Dr Ragna Redelstorff. 111 Harrington Street, Cape Town 8001. P.O. Box 4637, Cape Town 8000. Tel: 021 202 8651. Fax: 021 202 4509. Email: rredelstorff@sahra.org.za) so that appropriate action can be taken by a professional palaeontologist, at the developer's expense. Mitigation would normally involve the scientific recording and judicious sampling or collection of fossil material as well as associated geological data (*e.g.* stratigraphy, sedimentology, taphonomy) by a professional palaeontologist.

5. KEY REFERENCES

ALMOND, J.E. 2014a. Proposed RE Capital 3 Solar Development on the property Dyason's Klip near Upington, Northern Cape. Palaeontological heritage basic assessment: desktop study, 13 pp. Natura Viva cc, Cape Town.

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CORNELL, D.H., THOMAS, R.J., MOEN, H.F.G., REID, D.L., MOORE, J.M. & GIBSON, R.L. 2006. The Namaqua-Natal Province. In: Johnson, M.R., Anhaeusser, C.R. & Thomas, R.J. (Eds.) The geology of South Africa, pp. 461-499. Geological Society of South Africa, Marshalltown.

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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, Mpumalanga, Limpopo, Free State and Northwest Province under the aegis of his Cape Town-based company *Natura Viva cc*. He has been 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.



Dr John E. Almond,
Palaeontologist, *Natura Viva cc*