RECOMMENDED EXEMPTION FROM FURTHER PALAEONTOLOGICAL STUDIES:

PROPOSED LOUISVALE AGRICULTURAL DEVELOPMENT ON FARM BETHESDA 38 NEAR UPINGTON, NORTHERN CAPE

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1. OUTLINE OF THE PROPOSED DEVELOPMENT

The Strauss Groep, Upington, is proposing to plant about 13.4 ha of vineyards on farm Bethesda 38/225, situated near Louisvale *c*. 11.7 km southwest of Upington, Northern Cape (Fig. 1). Water will be supplied *via* a new storage dam (2000 m^3 capacity, 3 m deep), pump station and pipeline situated on farm Bethesda 38/238 immediately to the west (Fig. 2). The preferred layout for the dam and pipeline is shown in Fig. 2 while an alternative layout is shown in Fig. 3.

The dam and pump station will be sited on existing disturbed land. The pecan plantation land will be prepared for planting by deep breaking of the soil and then digging for the vineyards. Please note that the layout for planting might change depending on further specialist input. In any case no planting will be indicated within 32 m of any watercourse.

A Basic Assessment for this agricultural project is being conducted by Pieter Badenhorst Environmental Services, Wellington (Contact details: PO Box 1058, Wellington 7654. Cell: 0827763422. Fax: 0866721916). The present palaeontological comment has been commissioned on behalf of Pieter Badenhorst Environmental Services 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@wcacces.co.za).

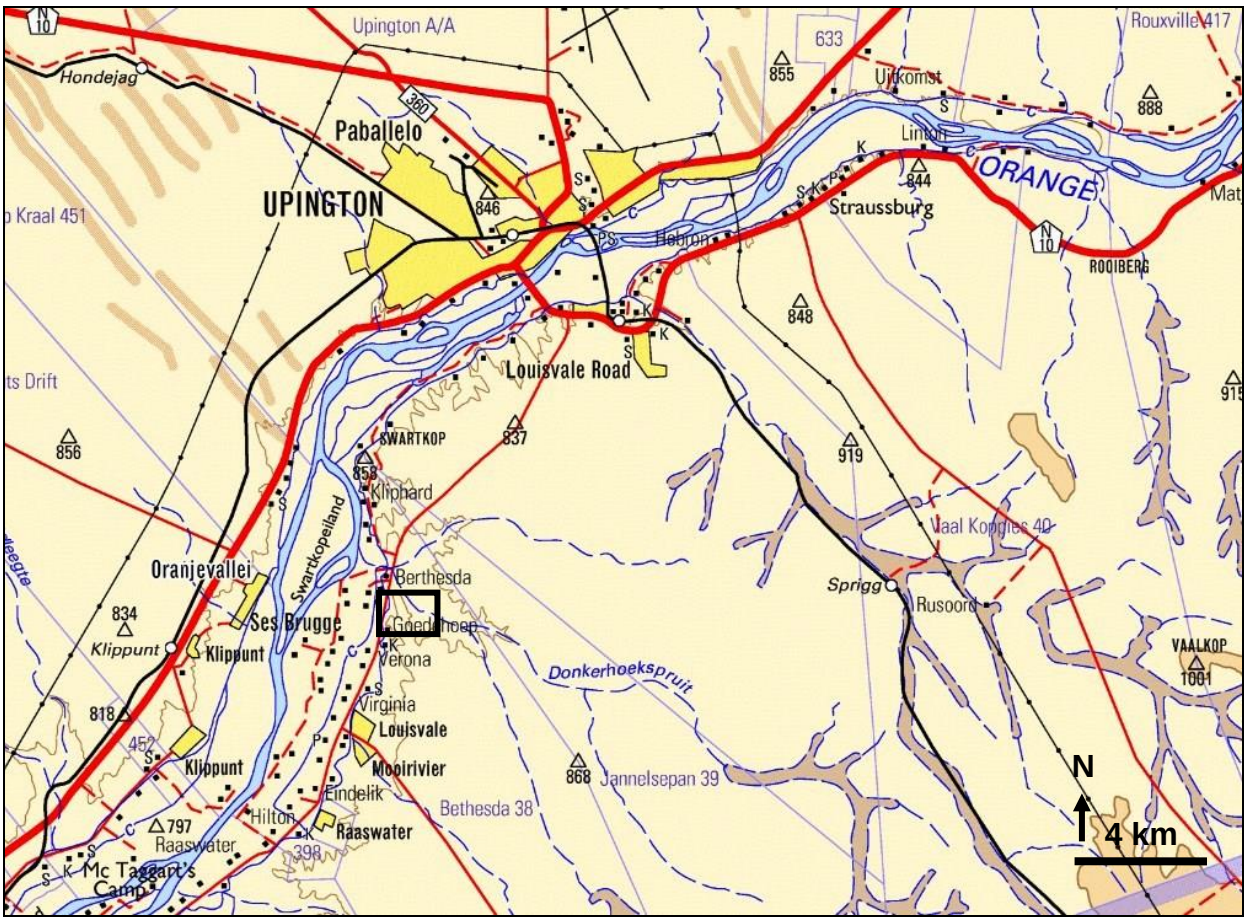

Figure 1: Extract from 1: 250 000 topographical map 2820 Upington (Courtesy of the Chief Directorate: National Geo-spatial Information) showing the location of the study area for the proposed Louisvale agricultural development on two portions of the Farm Bethesda 38/335 and 38/238, situated on the eastern side of the Orange River *c*. 11.7 km southwest of Upington, Northern Cape.

2. GEOLOGICAL BACKGROUND

The small Louisvale study area comprises fairly flat-lying, arid terrain at c. 790-800 m amsl on the eastern side of the Orange or Gariep River *c*. 11.7 km SW of Upington, Northern Cape. The proposed plantation is situated about 3 km east of the banks of the Orange River (Figs. 1 to 2).

The geology of the study area near 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 on the eastern side of the Louisvale road 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 east of the riverbanks.

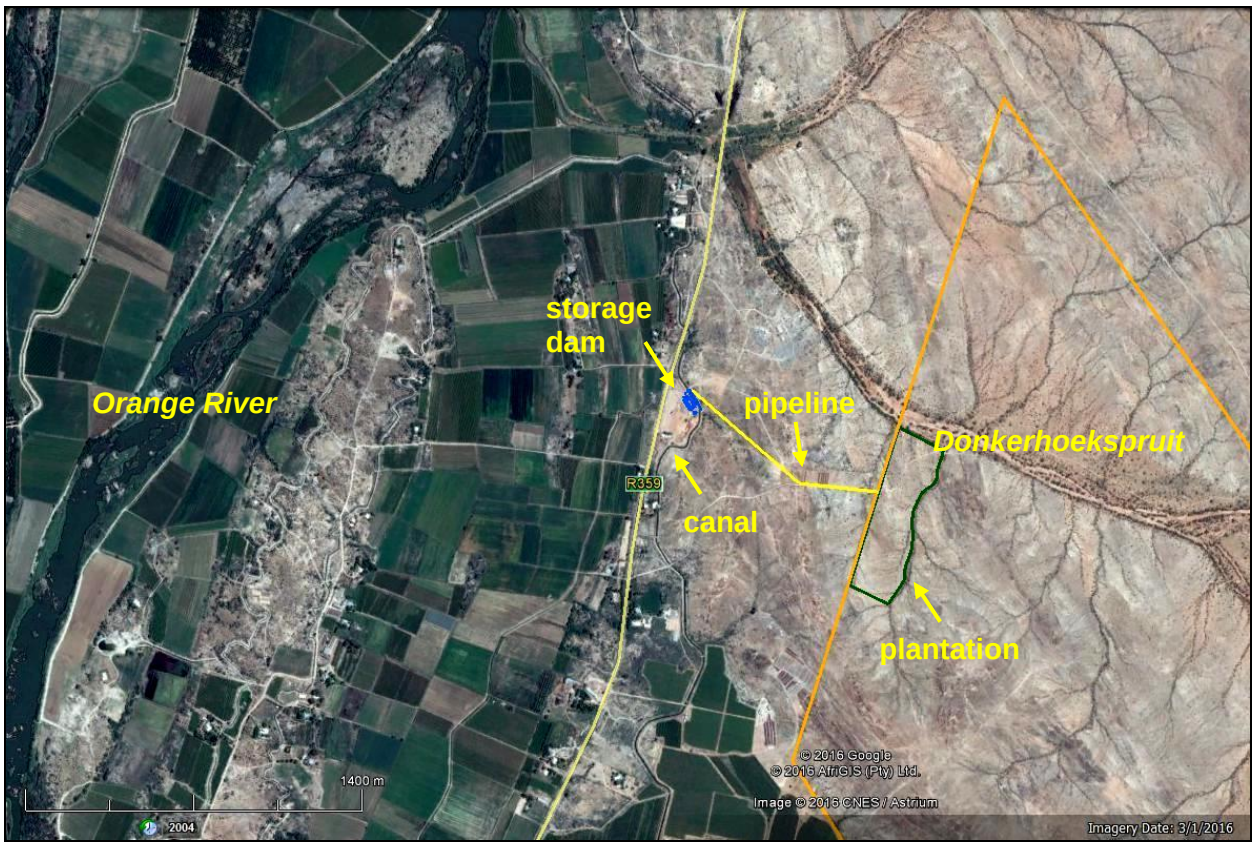

Figure 2: Google earth© satellite image of the Louisvale agricultural development study area on Farms Bethesda portions 38/335 and 38/238, on the eastern side of the Orange River *c*. 11.7 km southwest of Upington, Northern Cape. The preferred layout for the pecan nut plantation (green polygon on Bethesda 38/335), pipeline and storage dam (yellow line and blue polygon on Bethesda 38/238) are indicated here.

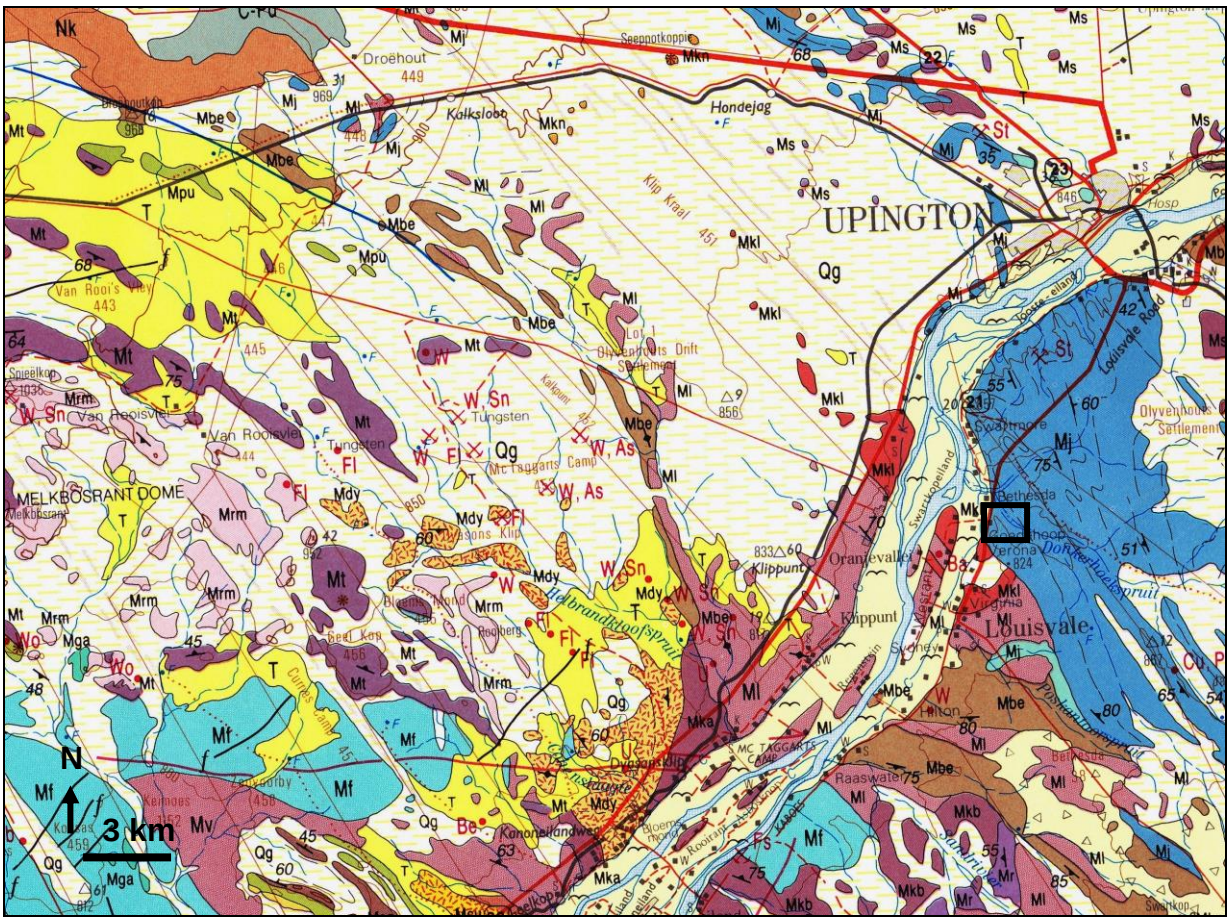

Figure 3. Extract from 1: 250 000 geological map 2820 Upington (Council for Geoscience, Pretoria) showing the location of the study area for the Louisvale agricultural development on the farm Bethesda 38 (black rectangle), *c*. 11.7 km southwest of Upington, Northern Cape Province. The study area is 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, blue). Outside and to the west 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). The overall palaeontological sensitivity of the entire study area is LOW.

3. PALAEONTOLOGICAL HERITAGE

The Precambrian metamorphic **basement rocks** are entirely unfossiliferous (Almond & Pether 2008). The overlying downwasted rock rubble and gravels are also unfossiliferous. Potentially fossil-bearing alluvial deposits of the Orange River are not mapped this far east of the river banks. The project footprint is small and largely disturbed.

4. CONCLUSIONS & RECOMMENDATIONS

Given the low palaeontological sensitivity, small area and disturbed character of the study area, it is concluded that the proposed Louisvale agricultural development is very 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 development, exemption from further specialist palaeontological studies and mitigation be granted for the proposed agricultural development on Farm Bethesda 38 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 the South African Heritage Resources Authority as soon as possible so that appropriate action can be taken by a professional palaeontologist, at the developer's expense (SAHRA contact details: Mrs Colette Scheermeyer, P.O. Box 4637, Cape Town 8000. Tel: 021 462 4502. Email: cscheermeyer@sahra.org.za). 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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ALMOND, J.E. & PETHER, J. 2008. Palaeontological heritage of the Northern Cape. Interim SAHRA technical report, 124 pp. Natura Viva cc., Cape Town.

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.

MOEN, H.F.G. 2007. The geology of the Upington area. Explanation to 1: 250 000 geology Sheet 2820 Upington, 160 pp. Council for Geoscience, Pretoria.

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 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.

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