RECOMMENDED EXEMPTION FROM FURTHER PALAEONTOLOGICAL STUDIES:

Proposed improvements to Sections 6 & 7 of the N14 between Kathu and Oliphantshoek, Gamagara Municipality, Northern Cape Province

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1. OUTLINE OF THE PROPOSED DEVELOPMENT

Please see the Heritage Impact Assessment for details of the proposed roadworks along Sections 6 and 7 of the N14 near Kathu, Gamagara Municipality, Northern Cape (Figure 1).

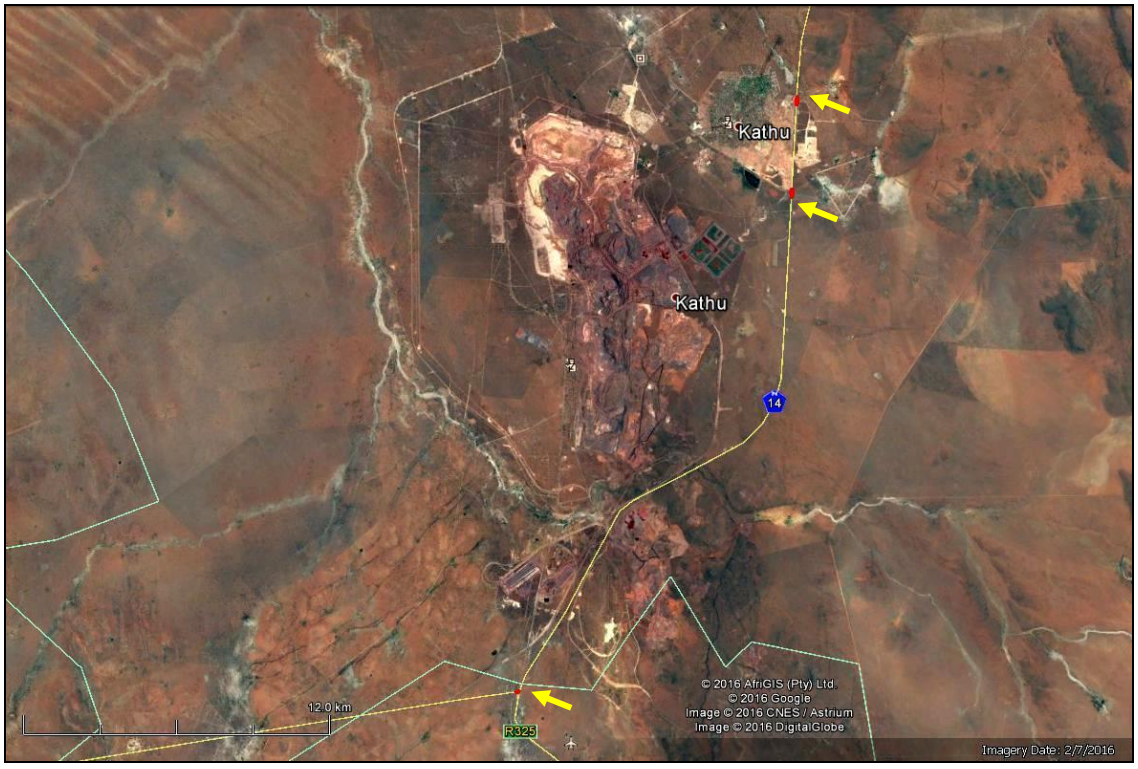

Figure 1. Google earth© satellite image of the study area near Kathu, Northern Cape showing the three locations of proposed roadworks along Sections 6 and 7 of the N14 (arrowed short red sectors). All work will take place within the existing road reserve.

2. GEOLOGICAL BACKGROUND

The geology of the Kathu region is shown on 1: 250 000 geological map 2722 Kuruman (Council for Geoscience, Pretoria) (Fig. 2), for which a sheet explanation has not yet been published, and is also outlined in previous palaeontological assessment reports by the author and others (e.g. Almond 2014, 2015a, 2015b, Pether 2011). The Kathu region is largely underlain by Late

Caenozoic continental sediments of the Kalahari Group (Partridge *et al.* 2006). Much of the study area overlies thick calcretes of the Mokolanen Formation which could be up to 5 million years old (Tl, yellow in Fig. 2). Locally overlying these are gravels of the Obobogorop Formation (not mapped) and finally the red Kalahari sands of the Gordonia Formation that are of Pleistocene to Recent age (Qs, pale yellow in Fig. 2).

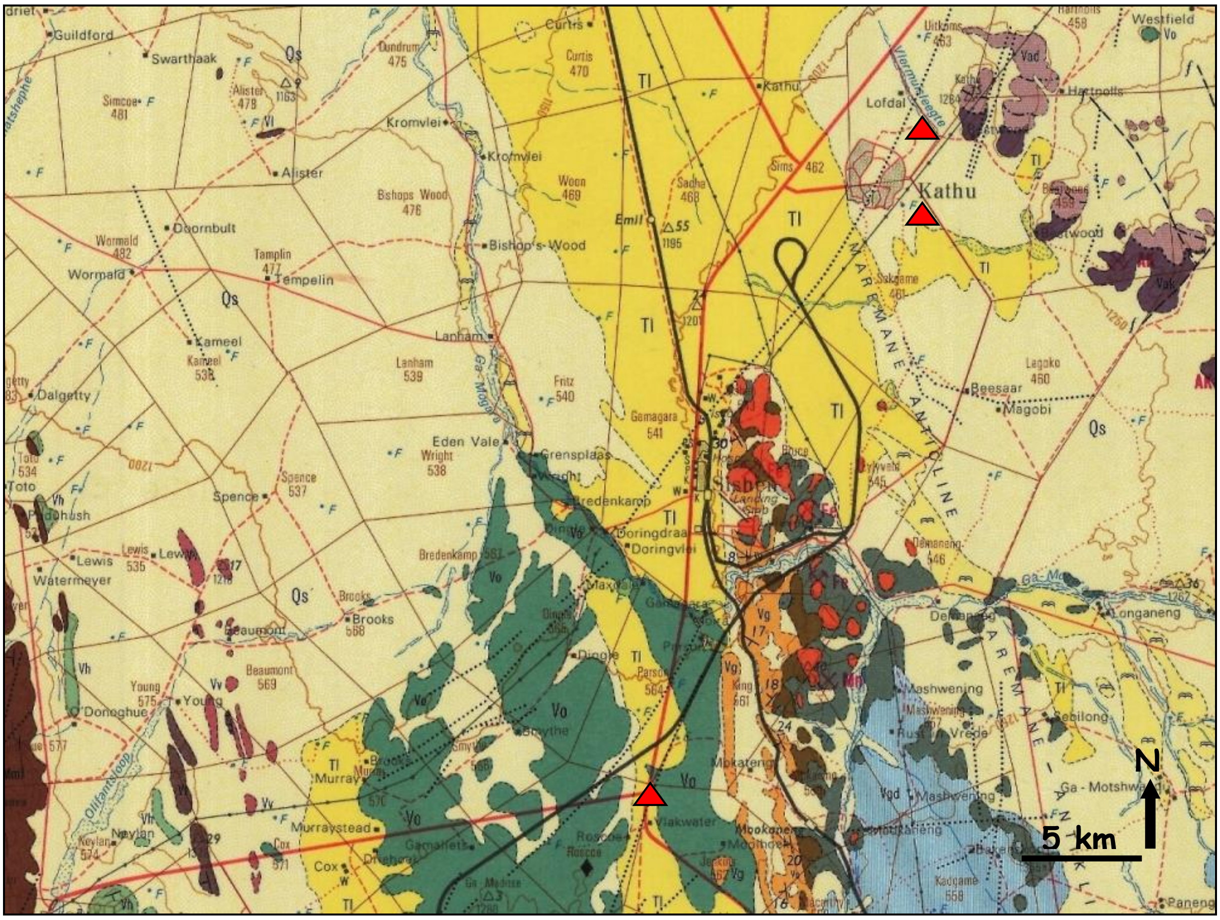

Figure 2. Extract from 1: 250 000 geological map 2722 Kuruman (Council for Geoscience, Pretoria) showing the approximate location of the three study areas for the proposed road developments along Sections 6 and 7 of the N14 near Kathu, Northern Cape (red triangles). Note that the road and railway networks shown here are out of date. Geological units represented within the broader study region on sheet 2722 Kuruman include the following (*N.B.* Some of these units are only represented subsurface within the study area itself):**

CAENOZOIC SUPERFICIAL DEPOSITS (Quaternary to Recent)
Tl (dark yellow) – calcretes ("surface limestone") of the Kalahari Group
Qs (pale yellow) – aeolian sands of the Gordinia Formation, Kalahari Group
Blue stippled areas = pans

3. PALAEONTOLOGICAL HERITAGE

The Kalahari Group deposits in the Kathu area are considered to be of generally low palaeontological sensitivity (Almond 2014, 2015a, 2015b, Pether 2011), although localised areas of high sensitivity may occur. The main palaeontological heritage concern in the present case would be Quaternary mammalian remains associated with solution hollows along drainage lines, such as have been recorded from the well-known Kathu Pan site situated *c*. 5.5. km NW of Kathu town (Beaumont 1990, Beaumont 2004, Beaumont *et al.* 1984). Satellite images of the present study

areas (Fig. 1) indicate that the northern site is along strike to the southeast from Vlermuisleegte, the central site is near a pan, and the southern site lies along a shallow drainage line.

4. CONCLUSIONS & RECOMMENDATIONS

The three proposed construction areas are small and the two in the north appear to be heavily disturbed by previous road construction as well as the installation of services. The area to the south is less disturbed. All three areas lack bedrock exposure. The proposed roadworks are unlikely to result in extensive excavations into fresh (*i.e.* unweathered) bedrock and because of the relatively small scale of the activities the proposed development is unlikely to have significant impacts on local palaeontological heritage resources.

It is therefore recommended that, pending the discovery of significant new fossil remains during construction, exemption from further specialist palaeontological studies and mitigation be granted for the proposed road improvements along Sections 6 and 7 of the N14 near Kathu.

Should any substantial fossil remains (*e.g.* mammalian bones and teeth, horncores) 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. A valid fossil collection permit from SAHRA would be required before mitigation could proceed and all fossil material collected would need to be curated within an approved repository.

5. KEY REFERENCES

ALMOND, J.E. 2014. Residential development on Remainder and Portion 3 of Farm Bestwood RD 459 in Kathu, Gamagara Municipality, Northern Cape Province. Palaeontological specialist assessment: desktop study , 33 pp. Cape Town: Natura Viva cc.

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PETHER, J. 2011. Brief palaeontological impact assessment (desktop study) proposed Kathu and Sishen Solar Energy Facilities Portions 4 & 6 of the farm Wincanton 472 Kuruman District, Northern Cape. Unpublished report prepared for Savannah Environmental (Pty) Ltd. Kommetjie: John Pether.

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, Gauteng, 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.

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