

RECOMMENDED EXEMPTION FROM FURTHER PALAEOLOGICAL STUDIES:

Proposed VaalwaterSolar Park, Modimolle Local Municipality, Limpopo Province

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1. OUTLINE OF DEVELOPMENT

Jisep Trading Proprietary Limited (Registration No: 2011/011070/07) is proposing to develop a solar photovoltaic solar facility, known as the VaalwaterSolar Park, of 20.5 MW generation capacity at a site some 6 km southeast of the small settlement of Vaalwater, Waterberg District Municipality, Limpopo Province. Vaalwaterliesc. 47 km northwest of Modimolle (Nylstroom). The solar park study site at 24° 20' S, 28° 09'E is 88.8 hectares in extent and is located on Portion 17 of the farm Wolwenfontein 149 K.R. (Fig. 1).

In addition to the photovoltaic panels and their foundations, associated infrastructure includes a new transmission line (power line or underground cable) connection to the Eskom grid via the Vaalwater Substation, service roads, as well as water and sewerage lines for administrative and accommodation areas. The estimated footprint of the proposed solar park development is about 55 hectares.

The present palaeontological heritage comment has been commissioned by Africa Geo-environmental Services (AGES), Polokwane, as part of a Heritage Impact Assessment of the proposed development (Contact details: Ms Engela Grobler, AGES (Pty) Ltd, 120 Marshall Street, Polokwane 0699; Tel: +27 15 291 1577; Fax: +27 15 291 1577; Cell: +27 83 557 6494).

2. GEOLOGICAL BACKGROUND

The geology of the study area is shown on 1: 250 000 sheet 2428 Nylstroom / Modimolle (Council for Geoscience, Pretoria). This geological map is currently out of print, but a metallogenic map at the same scale is available (Ehlers & Du Toit 2002) (Fig. 2). The footprint of the proposed Vaalwater solar park is underlain by the **Sandriviersberg Formation**, a subunit of the Early to Mid Proterozoic (Mokolian) **Waterberg Group** (Kransberg Subgroup) in the southern part of the main Waterberg Basin (Callaghan *et al.* 1991, Barker *et al.* 2006). The Sandriviersberg bedrocks consist primarily of cross-bedded sandstones with interbedded pebble horizons and lenticles, and occasional very thin (mm) mudrock horizons. These sediments were deposited between 2 and 1.7 Ga (billion years ago) by large braided river systems flowing from a source area to the NE towards a marine depository in the SW. The Waterberg Group succession as a whole is of considerable geological interest because these Proterozoic "red beds" provide evidence for the development of an oxygenated atmosphere on Earth soon after c. 2Ga (Eriksson & Cheney 1992) and because they show unusual fluvial sedimentology (Eriksson *et al.* 2008).

The Vaalwater solar park study area is situated in flat-lying lands at c. 1200-1240m amsl on the east side of the R33 with rocky sandstone slopes to the north and east. These relate to the incision of the Groot-Wolwefontein stream that runs along the northern edge of the property and is associated with sandy alluvial deposits. Google earth© satellite images as well as field photographs in the Heritage Impact Assessment report by Hutten (2011) suggest that there is very little or no bedrock exposure in the study area. The rocky escarpment of the Sandrivierberge runs east to west some 7 km south of the study area.

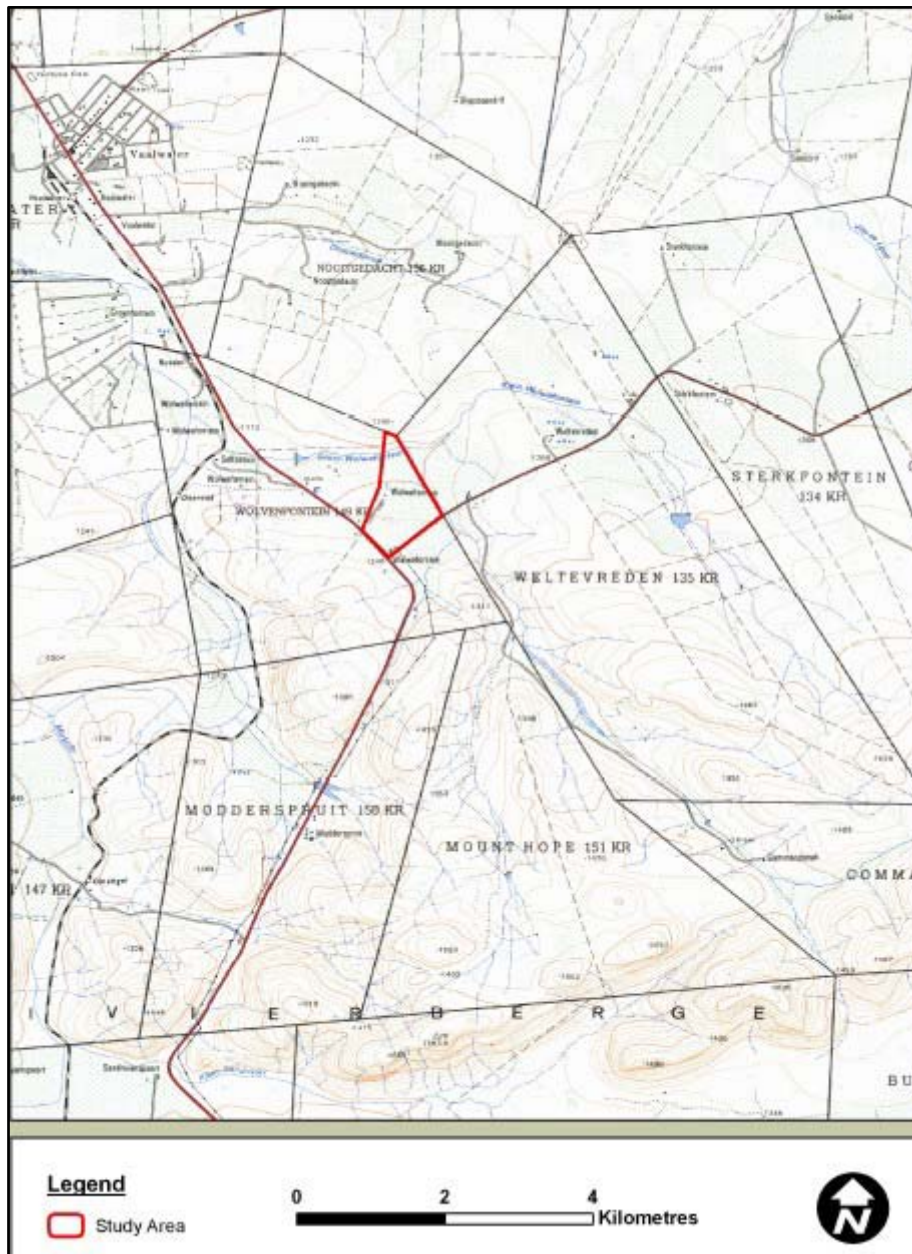


Fig. 1. Map showing location of the Vaalwater Solar Park study area (red polygon) some 6 km southeast of Vaalwater, Modimolle Local Municipality, Limpopo Province (Image abstracted from the Heritage Impact Assessment by Hutton 2011).

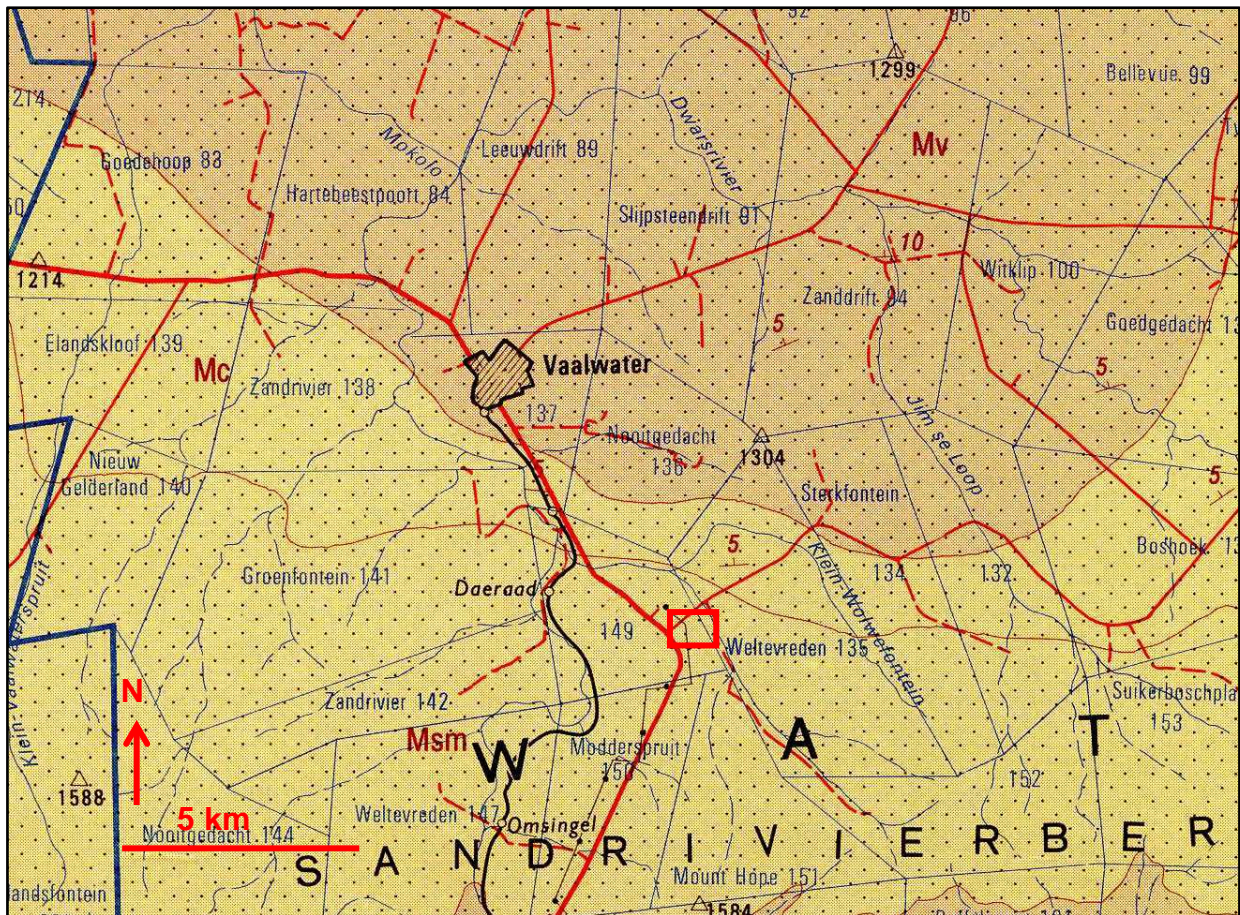


Fig. 2. Extract from 1: 250 000 metallogenicmap 2428 Modimolle / Nylstroom(Council for Geoscience, Pretoria) showing approximate location (small red rectangle) of theVaalwater Solar Park study area. 6 km southeast of Vaalwater, Limpopo Province.The study area is underlain by Precambrian braided fluvial deposits of the Waterberg Group (Sandriviersberg Formation, Msm, dark yellow) that are well-exposed in the Sandriviersberge Range some 7 km to the south.

3. PALAEOONTOLOGICAL HERITAGE

The only macrofossil remains reported so far from the continental sediments of the Waterberg Group are muddy “roll-up structures” from the Makgabeng Plateau (N.E. Waterberg outcrop area) that are interpreted as indirect evidence for the earliest known terrestrial cyanobacterial mats (Eriksson *et al.* 2000). These microbial mat structures come from the Makgabeng Formation that is probably slightly older than the Sandriviersberg sediments of the present study area in the southern portion of the Main Waterberg Basin (Barker *et al.* 2006). There are no fossil records from the Sandriviersberg Formation itself.

4. CONCLUSIONS & RECOMMENDATIONS

The proposed Vaalwater Solar Park Development nearVaalwater, Limpopo Province, is of LOW significance in terms of local palaeontological heritage because:

- The ancient Precambrian sediments underlying the development footprint are not known to contain any fossils;

- Extensive, deep bedrock excavations are not envisaged for this sort of solar park development.

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

Should any substantial fossil remains (e.g. stromatolites, trace fossils) be encountered during excavation, however, these should be reported to SAHRA for possible mitigation by a professional palaeontologist.

5. REFERENCES

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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 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 as well as Limpopo, Free State and Gauteng 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 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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