

RECOMMENDED EXEMPTION FROM FURTHER PALAEOLOGICAL STUDIES:

PROPOSED RAISIN PROCESSING AND PACKAGING FACILITY, ERF 151, BLAAUWSKOP SETTLEMENT, KEIMOES, KAI! GARIB MUNICIPALITY, NORTHERN CAPE

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1. OUTLINE OF THE PROPOSED DEVELOPMENT

The Orange River Wine Cellar is proposing to develop a raisin processing and packaging facility on Erf 151, Blaauwskop Settlement, near Keimoes in the Northern Cape. The property (Erf 151) is situated adjacent to the R359 national road approximately 25 km southwest of Upington and 15 km northeast from Keimoes (Fig. 1). The total area of the property is 298 729 m² and the facility will have a footprint of 16 120 m² (Fig. 2). The raisin processing facility will have an initial capacity of 8000 tons that will be increased annually up to 16000 tons. Processing steps are as follows: Reception of raisins - Storage - Pre-cleaning (removal of dry waste) - Size Grading - Fumigation - Wet Cleaning (washing) – Packaging.

A Palaeo-desktop heritage screener submitted for this project by Cedar Tower Services (26 August 2016) concluded that:

The heritage resources in the area proposed for development are sufficiently recorded. The surveys undertaken in the area adequately captured the heritage resources. There are no known sites which require mitigation or management plans. No further heritage work is recommended. However it is recommended that a fossil finds procedure be implemented during the construction phase.

SAHRA subsequently requested that a desktop PIA conducted by a qualified palaeontologist be submitted before further comment could be provided (SAHRA Case No. 9917; Interim Comment dated 27 Sept 2016). The present desktop palaeontological heritage assessment for the development has accordingly been commissioned by 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).

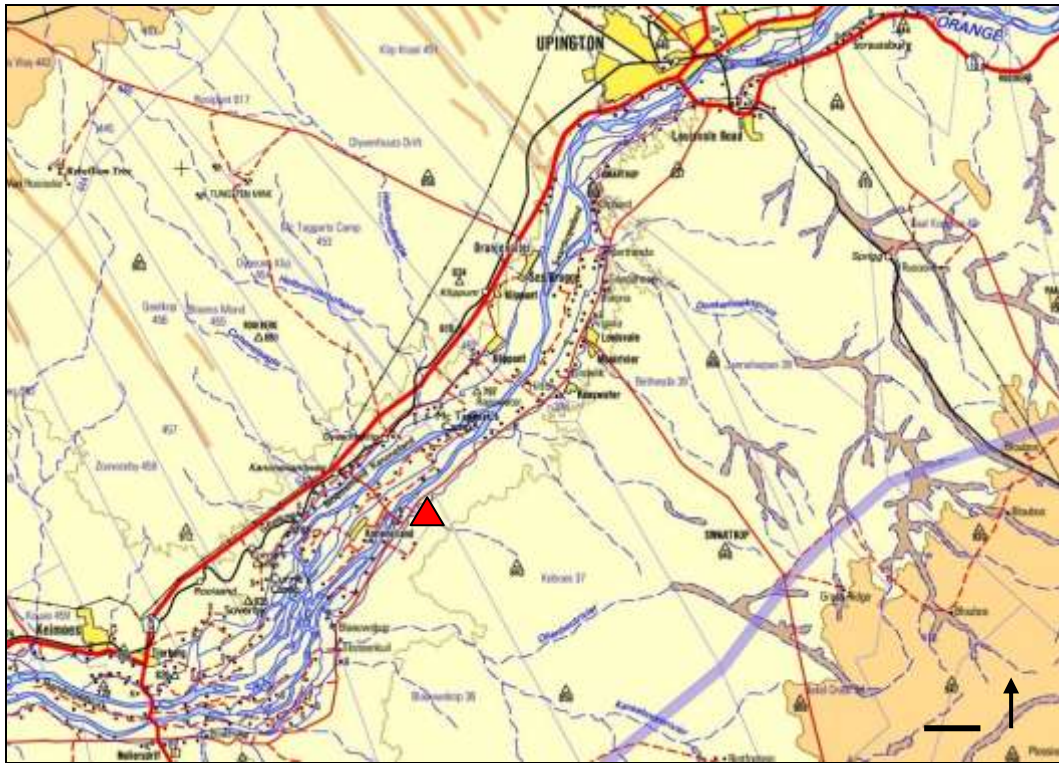


Figure 1: Extract from 1: 250 000 topographical sheet 2820 Upington showing the location (red triangle) of the proposed raisin processing and packaging facility on Erf 151, Blaauwskop Settlement, c. 15 km NE of Keimoes and 25 km SE of Upington, Northern Cape (Map courtesy of the Chief Directorate, National Geo-spatial Information, Mowbray). Scale bar = c. 5 km. Arrow points to North

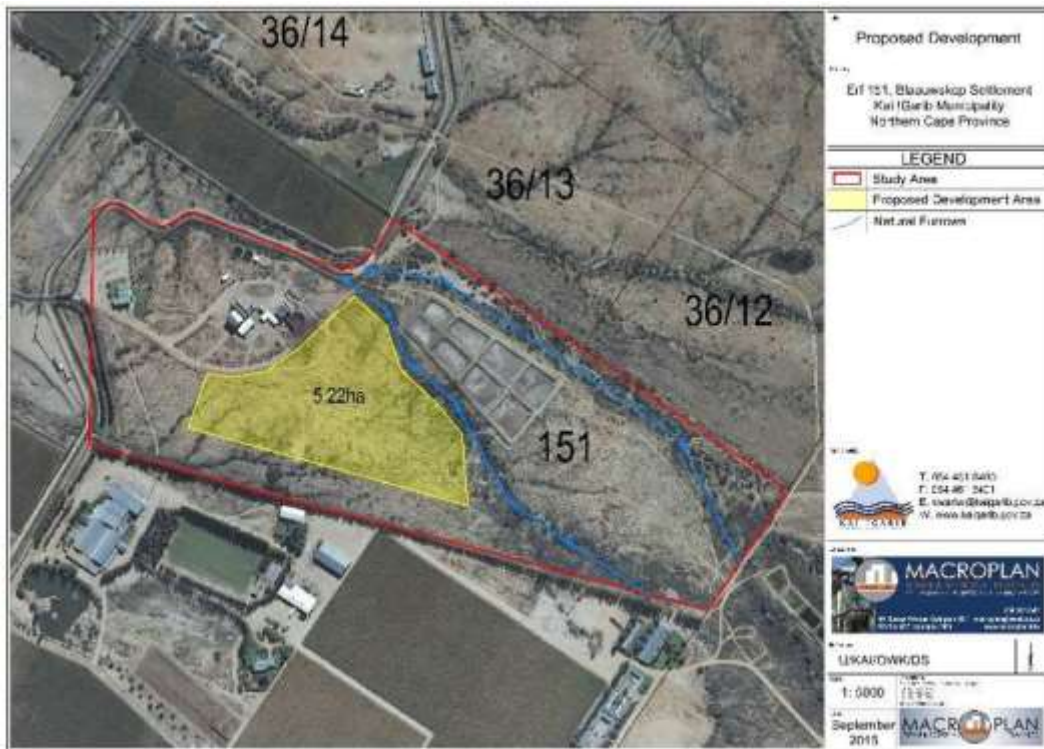


Figure 2: Satellite image of the development area (yellow) for the proposed raisin processing and packaging facility on Erf 151 (red polygon) (Image abstracted from the Draft Basic Assessment Report by EnviroAfrica cc, August 2016).

2. GEOLOGICAL BACKGROUND

The OKW Raisin Processing Facility study area is small, WNW-ESE-trending strip of fairly flat-lying, arid terrain at elevations of around 780-790 m amsl, much of which is already disturbed. It is located on the southern side of, and c. 600 m away from the banks of the Gariep (Orange) River, c. 25 km SW of Upington, Northern Cape. It is traversed by several shallow, ephemeral water courses trending roughly southeast to northwest (Fig. 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 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), notably the **Keboes Granite** of the **Keimoes Suite**. These basement rocks are approximately one billion years old and entirely unfossiliferous (Almond & Pether 2008). Parts of the study area are covered by downwasted granitoid rock rubble, Late Caenozoic stream sediments (both unmapped at 1: 250 000 scale) as well as areas of fine-grained aeolian (wind-blown) sands of the **Gordonia Formation (Qg)**, pale yellow in Fig. 1), the youngest, Pleistocene to Recent, subunit of the **Kalahari Group**. The geology of the Late Cretaceous to Recent Kalahari Group is reviewed by Thomas (1981), Dingle *et al.* (1983), Thomas & Shaw 1991, Haddon (2000) and Partridge *et al.* (2006). The Gordonia dune sands are considered to range in age from the Late Pliocene / Early Pleistocene to Recent, dated in part from enclosed Middle to Later Stone Age stone tools (Dingle *et al.*, 1983, p. 291).

3. PALAEOLOGICAL HERITAGE

The fossil heritage associated with each of the main rock units represented in the Bloemsmond study area has been previously outlined in previous desktop studies for the region to the southwest of Upington by Almond (2014a, 2014b, 2015, 2016).

The granitoid (igneous) basement rocks of the **Namaqua-Natal Province** are entirely unfossiliferous. The fossil record of the **Kalahari Group** is generally sparse and low in diversity. The **Gordonia Formation** dune sands were mainly active during cold, drier intervals of the Pleistocene Epoch that were inimical to most forms of life, apart from hardy, desert-adapted species. Porous dune sands are not generally conducive to fossil preservation. However, mummification of soft tissues may play a role here and migrating lime-rich groundwaters derived from the underlying bedrocks (including, for example, dolerite) may lead to the rapid calcretisation of organic structures such as burrows and root casts. Occasional terrestrial fossil remains that might be expected within this unit include calcretized rhizoliths (root casts) and termitaria (e.g. *Hodotermes*, the harvester termite), ostrich egg shells (*Struthio*) and shells of land snails (e.g. *Trigonephrus*) (Almond 2008, Almond & Pether 2008). Other fossil groups such as freshwater bivalves and gastropods (e.g. *Corbula*, *Unio*) and snails, ostracods (seed shrimps), charophytes (stonewort algae), diatoms (microscopic algae within siliceous shells) and stromatolites (laminated microbial limestones) are associated with local watercourses and pans. Microfossils such as diatoms may be blown by wind into nearby dune sands. These Kalahari fossils (or subfossils) can be expected to occur sporadically but widely, and the overall palaeontological sensitivity of the Gordonia Formation is therefore considered to be low. Underlying calcretes of the **Mokolanen Formation** might also contain trace fossils such as rhizoliths, termite and other insect burrows, or even mammalian trackways. Shallow stream sediments and downwasted surface rock rubble overlying granitoid basement rocks are unlikely to be fossiliferous, or at most very sparsely so. No potentially fossiliferous older alluvial deposits associated with the Gariep River (as mapped just to the south) are represented in the study area.

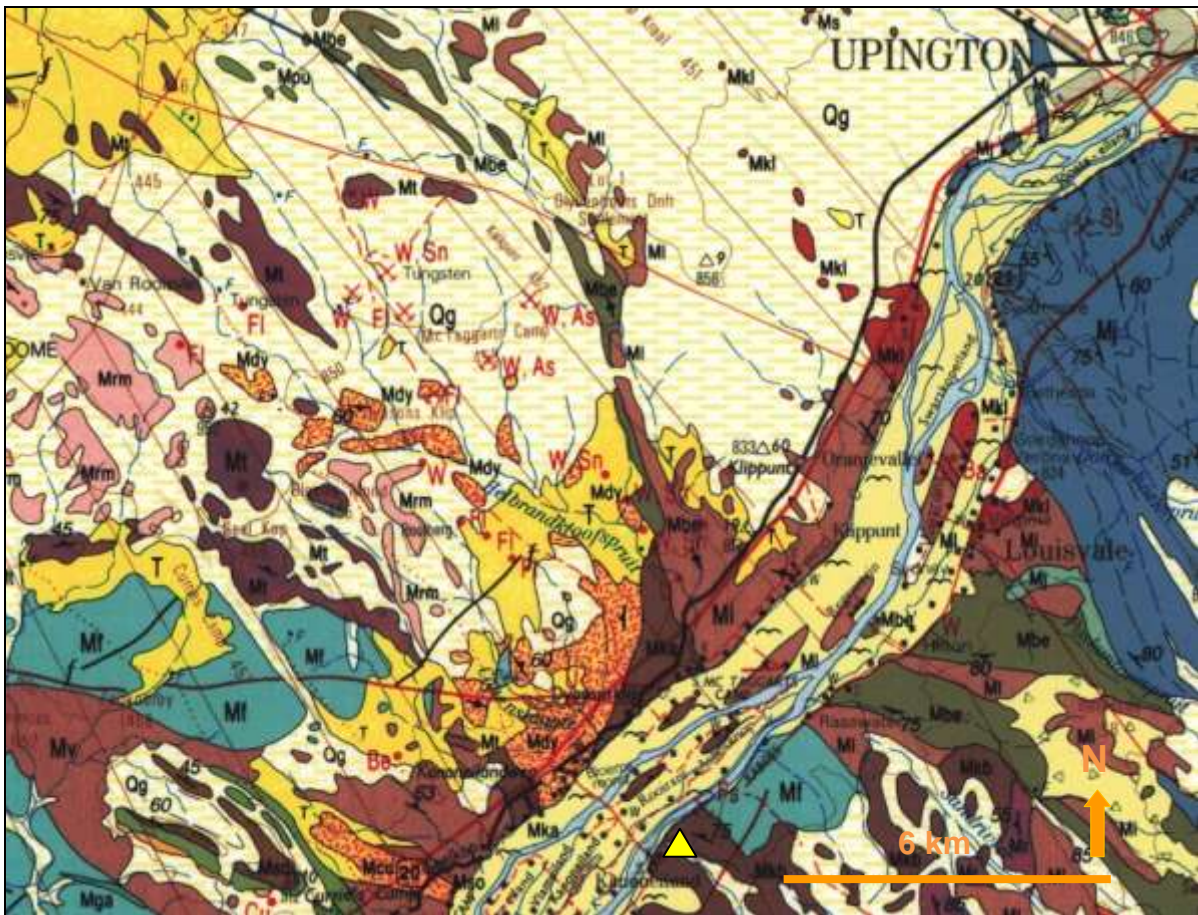


Figure 1. Extract from 1: 250 000 geological map 2820 Upington (Council for Geoscience, Pretoria) showing the location of the study area (yellow triangle) for the proposed raisin processing and packaging facility on Erf 151, Blaauwskop Settlement, c. 15 km NE of Keimoes and c. 25 km SE of Upington, Northern Cape Province. The study region is underlain at depth by unfossiliferous Precambrian (Middle Proterozoic / Mokolian) basement rocks of the Namaqua-Natal Metamorphic Province, including intrusive igneous rocks such as the Keboes Granite (Mkb, brown) within the Keimoes Suite. The basement rocks are extensively mantled by red aeolian (wind-blown) sand of the Gordonia Formation (Kalahari Group) (Qg, white with yellow stripes) and Late Caenozoic alluvium. The overall palaeontological sensitivity of the entire study area is LOW.

4. CONCLUSIONS & RECOMMENDATIONS

The Precambrian granitoid basement rocks underlying the OKW Raisin Facility study area are entirely unfossiliferous. The overlying aeolian sands and stream gravels of the Kalahari Group mantling the older bedrocks are generally of low to very low palaeontological sensitivity. The footprint of the proposed facility is very small. It is concluded that construction of the proposed OKW Raisin Processing and Packaging Facility near Keimoes 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 raisin processing and packaging facility on Erf 151, Blaauwskop Settlement near Keimoes, 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

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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 AHP (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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