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**ENGAGED BY:**

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**FOR: Lornay Environmental Consulting**

**PALAEONTOLOGICAL IMPACT STATEMENT – HWC CASE 22051606AM0518E**

**PROPOSED NEW VINEYARDS ON HEMEL EN AARDE RE/585, GREATER HERMANUS**

**Caledon District, Western Cape**

The Hemel en Aarde area is situated within the folded and faulted southern part of the Cape Fold Belt (Figure 1). The easternmost proposed new vineyards upslope are on the **Rietvlei Formation (Dr)** which is the uppermost formation of the erosion-resistant sandstones of the Table Mountain Group. Most of the proposed vineyards are on the succeeding **Ceres Subgroup (Dc)** of the lower Bokkeveld Group shaley mudrocks.

The older Rietvlei Formation is dominated by thin sandstones, with some interbedded mudrock intervals (Gresse & Theron, 1992). Deposition on a coastal plain traversed by braided river systems is envisaged, with the mudrock intervals representing estuarine and shallow-marine deposition (Thamm & Johnson, 2006). With ongoing basin subsidence the shoreline transgressed northwards and deeper marine conditions prevailed, with deposition of the shelf mudrocks/shales of the Ceres Subgroup. The transition between the Rietvlei Fm. and the shales of the Ceres Subgroup is gradational over an interval of a few metres (Malan *et al.*, 1994).

On the basis of the fossil content the transition from the coastal deposits of the Rietvlei Fm. to the shelf environments of the Bokkeveld shales occurred during the early Devonian Period about 400 million years ago (Ma). During the Devonian southern Africa was enclosed in the edge of supercontinent Gondwana and was close to the cold South Pole. The fossils in these strata represent a cold-water fauna known as the “Malvinokaffric Faunal Realm” and comprise a diverse shelly invertebrate biota (trilobites, molluscs, brachiopods, echinoderms *etc.*) and trace fossils, rare fish remains, plants and microfossils. The overall palaeontological sensitivity is high (Rietvlei Fm.) to very high (Ceres Subgroup) (Almond & Pether, 2008) (Figure 2).

In this region south of ~34 degrees latitude the Ceres Subgroup is not differentiated into formations due to the monotonous nature of the shale accumulation, the lack of exposures in the denuded, weathered landscape and intense deformation associated with the tectonic forces from the south that pushed up the Cape Fold Belt mountains (Gresse & Theron, 1992). Farther north in the Ceres region the lower Bokkeveld succession is classically developed and the Rietvlei Formation is succeeded by the marine shales of the Gydo Formation.

In conclusion, the default palaeontological sensitivities do not apply at this locality and the establishment of the new vineyards only affects a thin soil on the deformed and weathered bedrock (Figure 3). Consequently, the likelihood of the activity having a palaeontological impact is negligible.

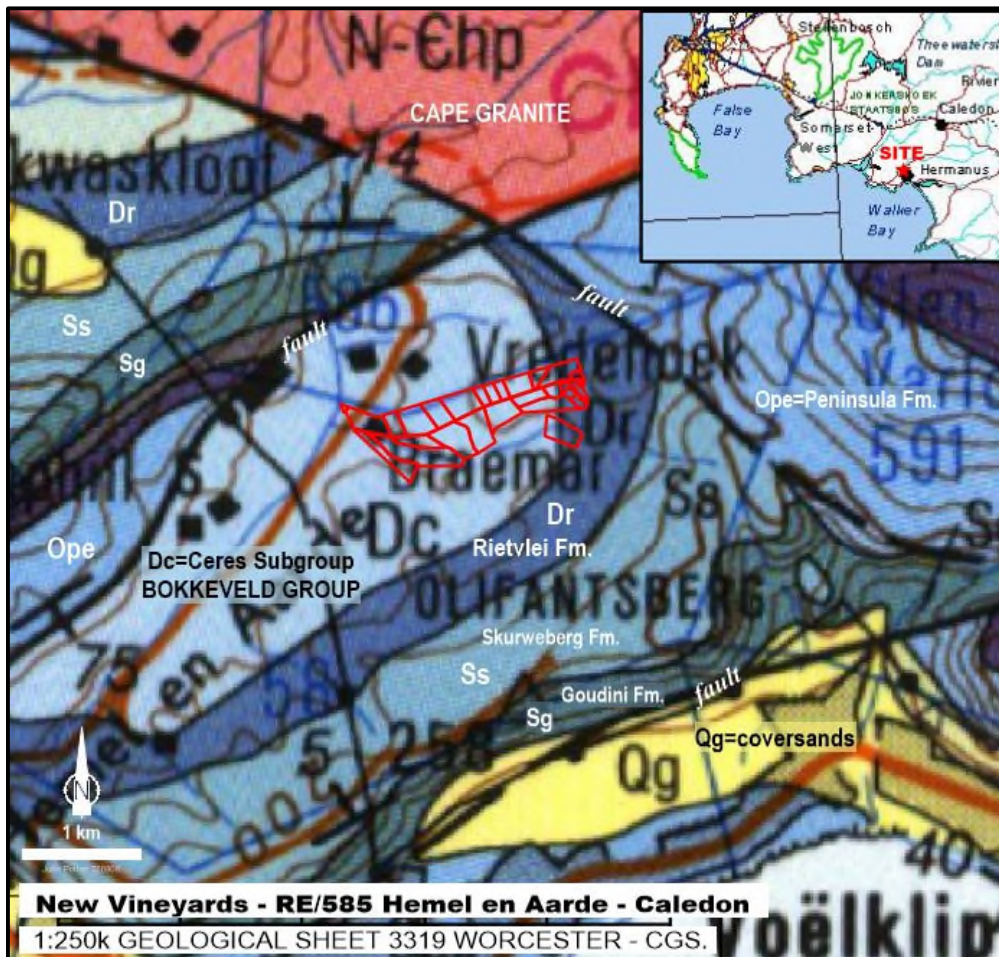


Figure 1. Geological context of the proposed development.

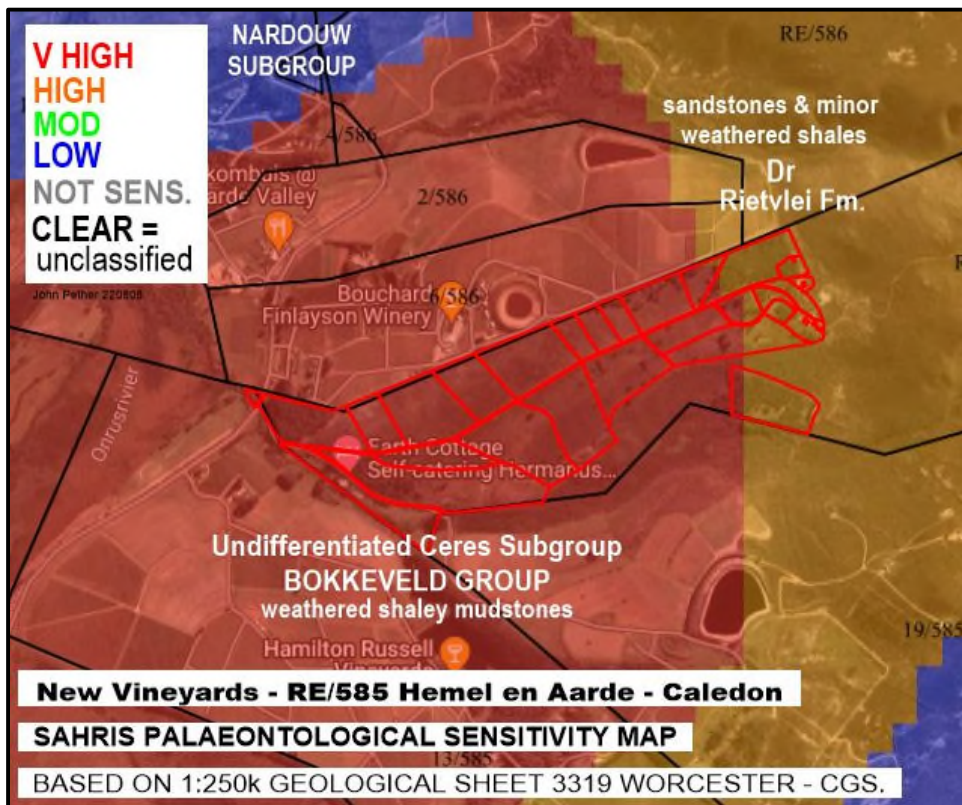


Figure 2. Palaeontological sensitivities of formations in the area.



**Figure 3. Road cutting near the development site showing the weathered Bokkeveld shales.**

### **References**

- Almond, J.E. & Pether, J. 2008. Palaeontological Heritage of the Western Cape. Interim SAHRA technical report, 20 pp. Natura Viva cc., Cape Town.
- Gresse, P.G. & Theron, J.N. 1992. The Geology of the Worcester area: Explanation to 1: 250 000 geology sheet 3319 Worcester, 89pp. Council for Geoscience, Pretoria.
- Malan, J.A., Viljoen, J.H.A., Siegfried, H.P. & Wickens, H. De V. 1994. Die Geologie van die gebied Riversdale. Explanation to 1: 250 000 Geology sheet 3420 Riversdale, 63 pp. Council for Geoscience, Pretoria.
- Thamm, A.G. and Johnson, M.R. 2006. The Cape Supergroup. In: Johnson, M.R., Anhaeusser, C.R. and Thomas, R.J. (Eds), The Geology of South Africa. Geological Society of South Africa, Johannesburg/Council for Geoscience, Pretoria, 443-460.

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