Phase 1 Heritage Impact Assessment of proposed new chicken broiler facilities on the farm Tulbach Noord 1637, near Edenville, FS Province.

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Summary

A Phase 1 Heritage Impact Assessment was carried out over three different localities designated for construction of new chicken broiler facilities on the farm Tulbach Noord 1637 near Edenville, Free State Province. The extent of two of the affected areas (over 5000 m2) falls within the requirements for a Heritage Impact Assessment (HIA). The study areas lie on gently undulating grassland terrain located about 10 km east east-northeast of Edenville. Areas 1 and 2 each cover a 3 ha surface area, while Area 3 covers approximately 2900 m^2. Footprint Areas 1 and 2 underlain by medium- to coarse-grained Adelaide Subgroup sandstones (*Pa*) considered to be of high palaeontological significance, while Area 3 is capped by geologically recent overbank sediments. However, Areas 1 and 2 are bounded by palaeontological insignificant Jurassic dolerites (igneous intrusions, *Jd*), and are also capped by well-developed residual soils, severely limiting outcrop visibility, with depths that notably lowers potential palaeontological impact, which may result from the proposed development. Given the geological context at Area 3, the likelihood of impact on potential Quaternary fossil exposures is considered negligible. There is no aboveground evidence of historically significant building structures older than 60 years, Stone Age archaeological remains, Iron Age structures, graves or material of cultural significance within the confines of the three development footprints. In addition, the overall size of Area 3 does not trigger an AIA as per conditions listed in NHRA Section 38(1). The archaeological and cultural component of all three proposed project footprints are each assigned a site rating of General Protection C (GP.C). It is recommended that the development may proceed, provided that all construction activities are restricted to within the boundaries of each demarcated footprint.

Introduction

A Phase 1 Heritage Impact Assessment was carried out over three different localities designated for construction of new chicken broiler facilities on the farm Tulbach Noord 1637 near Edenville, Free State Province (**Fig. 1**). The extent of two of the affected areas (over 5000 m2) falls within the requirements for a Heritage Impact Assessment (HIA) as required by Section 38 (Heritage Resources Management) of the South African National Heritage Resources Act (Act No. 25 of 1999). The task involved identification of possible archaeological sites or occurrences in the proposed zone, an assessment of their significance, possible impact by the proposed development and recommendations for mitigation where relevant.

Terms of Reference

- Identify and map possible heritage sites and occurrences using published and database resources;
- Determine and assess the potential impacts of the proposed development on potential heritage resources;
- Recommend mitigation measures to minimize potential impacts associated with the proposed development.

Approach and Methodology

The heritage significance of the affected area was based on existing field data, database information and published literature. A field assessment, using a Garmin Etrex Vista GPS hand model (set to the WGS 84 map datum) and a digital camera for recording purposes followed this. Geological maps, aerial photographs and site records were integrated with data acquired during the on-site inspection. The study area is rated according to field rating categories as prescribed by SAHRA (**Table 1**).

Locality data

Maps: 1:50 000 scale topographical map 2727 DB Karoospruit

1:250 000 scale geological map 2726 Kroonstad

Site coordinates (**Fig. 2**):

Area 1: 27°32'52.82"S 27°46'37.62"E

Area 2: 27°32'39.95"S 27°46'53.08"E

Area 3: 27°32'36.09"S 27°46'5.67"E

The study areas lie on gently undulating grassland terrain on the farm Tulbach Noord 1637, located about 10 km east east-northeast of Edenville (**Fig. 3 - 5**). Areas 1 and 2 each cover a surface area of 3 ha, while Area 3 covers approximately 2900 m^2.

Background

The overall survey area is primarily underlain by medium to coarse-grained sandstones of the Adelaide Subgroup (*Pa*, Beaufort Group, Karoo Supergroup) (Nolte 1995; Johnson *et al*. 2006) (**Fig. 6**). The sedimentological strata are generally accepted to be Late Permian in age, and are assigned to the *Dicynodon* Assemblage Zone (Kitching 1977, 1995) (**Fig. 7**). Sediments assigned to the *Dicynodon* AZ are associated with stream deposits consisting of floodplain mudstones and subordinate, lenticular channel sandstones. Therapsids and other vertebrate fossils from the *Dicynodon* AZ are usually found as dispersed and isolated specimens in mudrock horizons, associated with an abundance of calcareous nodules. Closest known localities are found on the farm Paardenplaats near Lindley. Late Cenozoic Florisian localities are known from alluvial contexts between Senekal and Bloemfontein, south of Edenville. (Rossouw pers comm). There is currently no record of fossil-rich Quaternary sediments in the vicinity of the proposed footprint.

The range of archaeological sites encountered in the Free State is extensive, in terms of both typology and chronology. This include Early Stone Age bifaces, and retouched blades and trimmed points from the Middle Stone Age to the microlithic Wilton and Smithfield Complexes from the Holocene. Surface scatters of Later Stone Age and Middle Stone Age artifacts are frequent archaeological components along erosional gullies (dongas) of rivers and streams in the region. The incidence of surface scatters usually decreases away from localized areas such as riverine sites and dolerite-shale contact zones. Away from riverine contexts, Stone Age artifacts generally occur as contextually derived individual finds in the open veld.

The archaeological footprint in the region is primarily dominated by Late Iron Age stone-wall complexes. The study area lies within the distributional range of Maggs' Type V settlement type, which is predominantly concentrated along the upper reaches of the Renoster, Vals, Sand and Liebenbergsvlei Rivers (**Fig. 8**) (Walton 1956; Maggs 1976; Dreyer 1992). Numerous stone-walled enclosures are mostly found on and around dolerite koppies along the various river valleys between Kroonstad and Petrus Steyn.

Rock art sites have been recorded south, east and southeast of Edenville on several farms in the Lindley, Reitz and Frankfort districts (Van Riet Low 1941).

Field Assessment and Recommendations

Footprint Areas 1 and 2 underlain by medium- to coarse-grained Adelaide Subgroup sandstones (*Pa*) considered to be of high palaeontological significance **Fig. 9**, red area), while Area 3 is capped by geologically recent overbank sediments (**Fig. 9**, green area). However, Areas 1 and 2 are bounded by palaeontological insignificant Jurassic dolerites (igneous intrusions, *Jd*), and are also capped by well-developed residual soils, severely limiting outcrop visibility, with depths that notably lowers potential palaeontological impact, which may result from the proposed development (**Fig. 6 & 7**). Given the geological context at Area 3, the likelihood of impact on potential Quaternary fossil exposures is considered negligible.

There is no above-ground evidence of historically significant building structures older than 60 years, Stone Age archaeological remains, Iron Age structures, graves or material of cultural significance within the confines of the three development footprints. In addition, the overall size of Area 3 does not trigger an AIA as per conditions listed in NHRA Section 38(1).

The archaeological and cultural component of all three proposed project footprints are each assigned a site rating of General Protection C (GP.C). It is recommended that the development may proceed, provided that all construction activities are restricted to within the boundaries of each demarcated footprint.

References

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DECLARATION OF INDEPENDENCE

I, Lloyd Rossouw, declare that I act as an independent specialist consultant. I do not have or will not have any financial interest in the undertaking of the activity other than remuneration for work as stipulated in the terms of reference and have no interest in secondary or downstream developments resulting from the authorization of this project.

11 / 10 / 2021

Tables and Figures

Table 1. Field rating categories as prescribed by SAHRA.

Field Rating	**Grade**	**Significance**	**Mitigation**
National Significance (NS)	Grade 1	-	Conservation; national site nomination
Provincial Significance (PS)	Grade 2	-	Conservation; provincial site nomination
Local Significance (LS)	Grade 3A	High significance	Conservation; mitigation not advised
Local Significance (LS)	Grade 3B	High significance	Mitigation (part of site should be retained)
Generally Protected A (GP.A)	-	High/medium significance	Mitigation before destruction
Generally Protected B (GP.B)	-	Medium significance	Recording before destruction
Generally Protected C (GP.C)	-	Low significance	Destruction

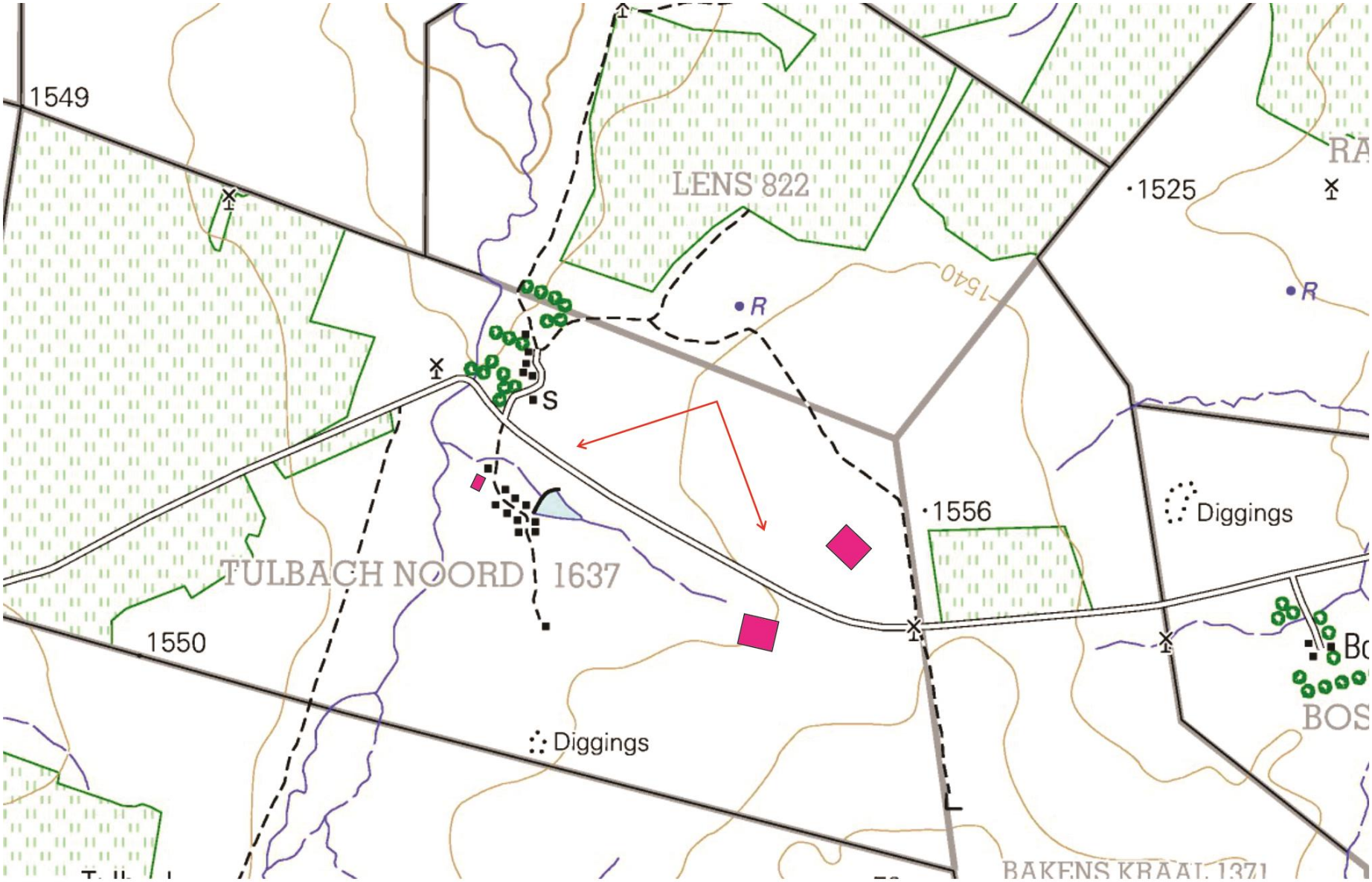

Figure 1. Map of proposed development footprints (portion of 1:50 000 scale topographic map 2727DB Karoospruit).

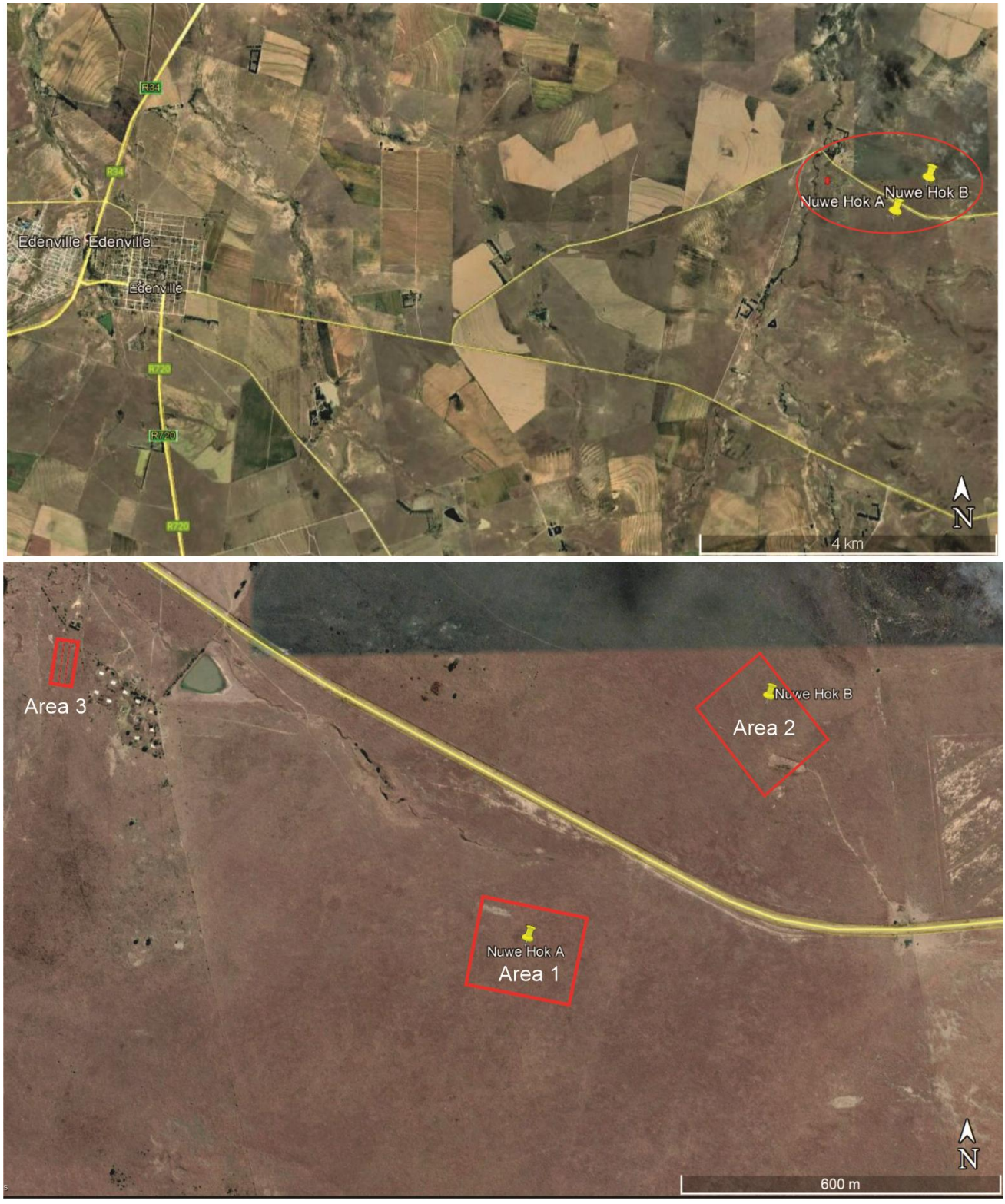

Figure 2. Aerial view of the study areas.

Figure 3. General view of Area 1, looking south (above) and west (below).

Figure 4. General view of Area 2, looking north (above) and northeast (below).

Figure 5. General view of Area 3, looking north towards a modern dilapidated building (above), south (below left) and west (below right).
Scale 1 = 10 cm.

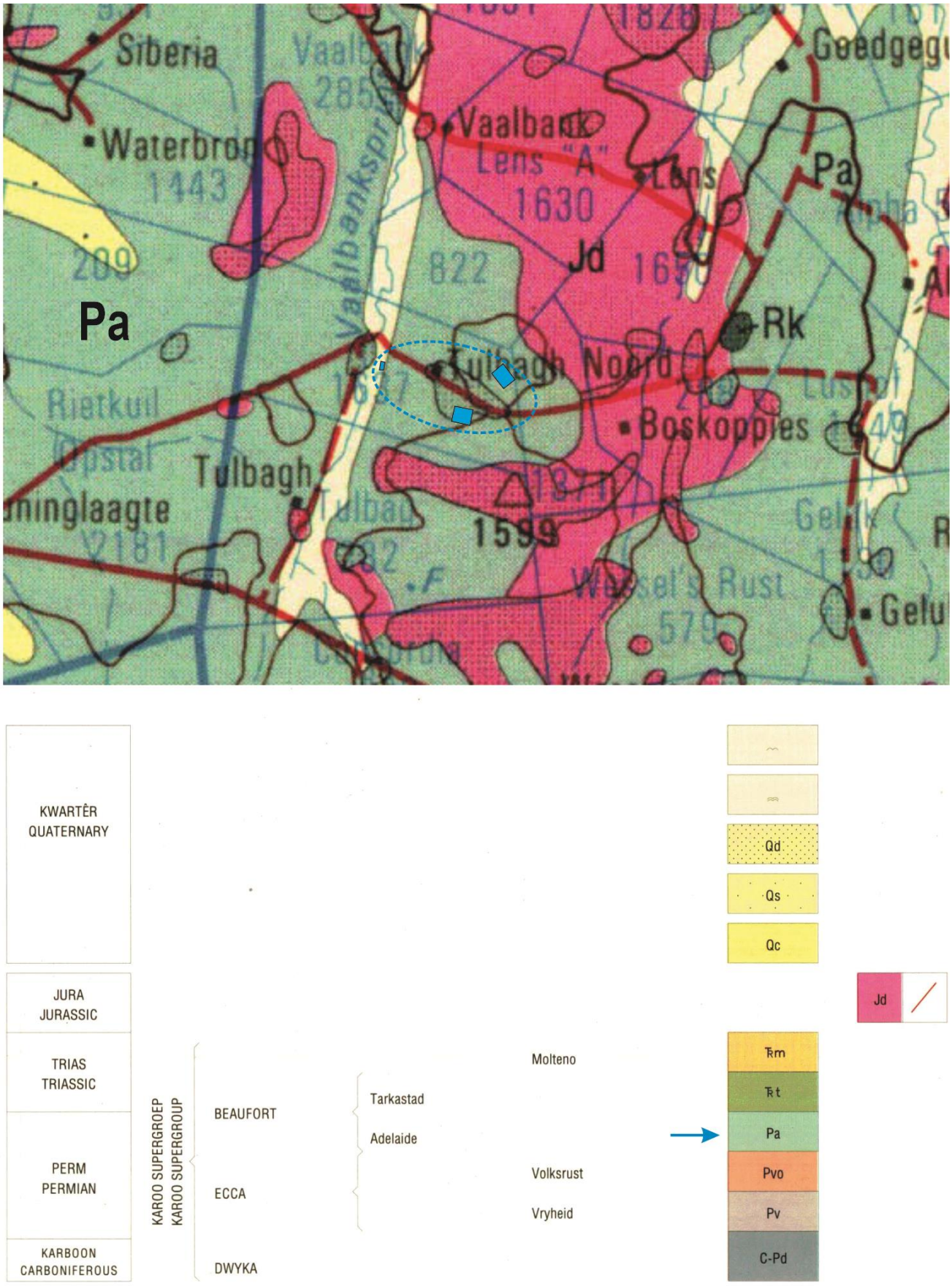

Figure 6. Development footprints (blue polygons) marked on portion of 1:250 000 scale geological map 2726 Kroonstad.

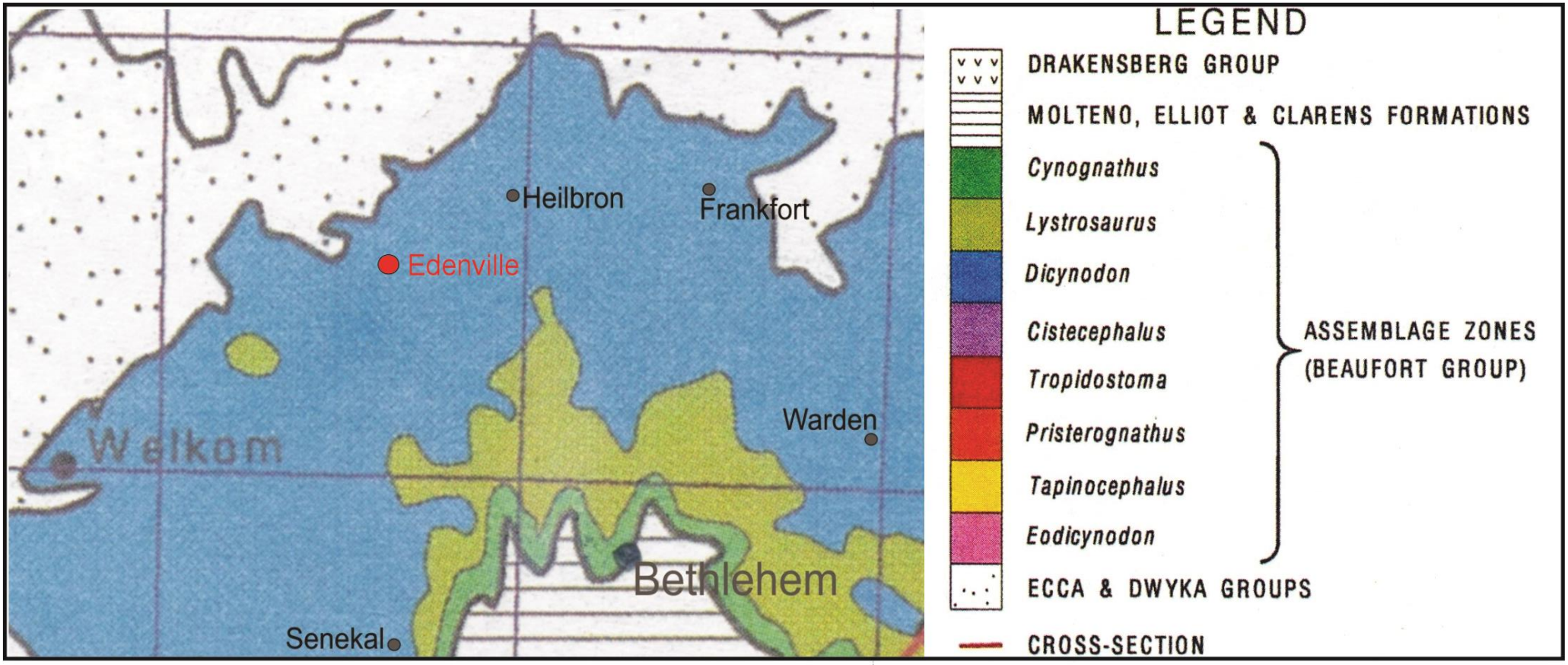

Figure 7. Geographical distribution of vertebrate biozones in vicinity of Edenville (after Rubidge 1995).

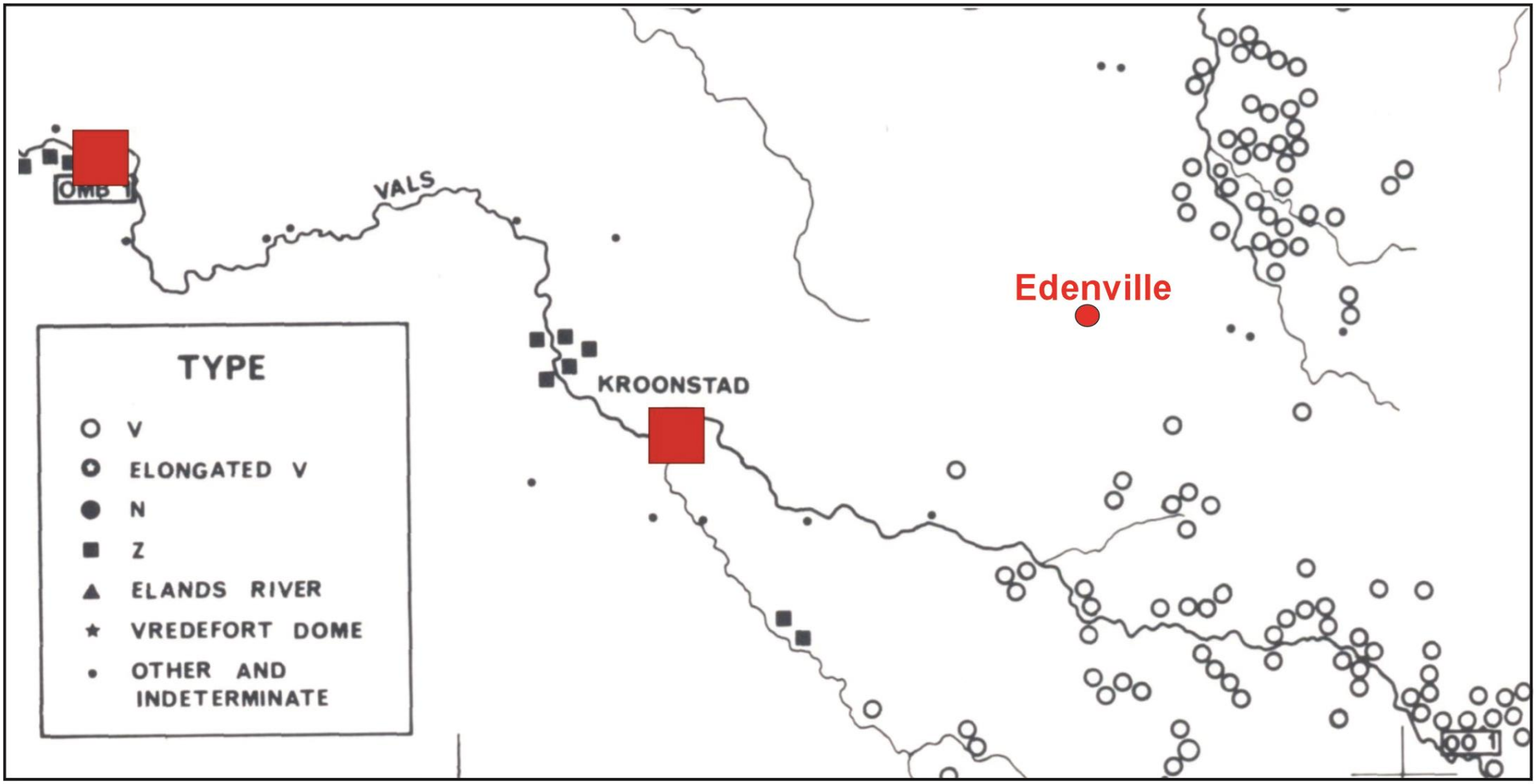

Figure 8. Geographical distribution of Type V stone-walled settlements in Edenville region (after Maggs 1976).

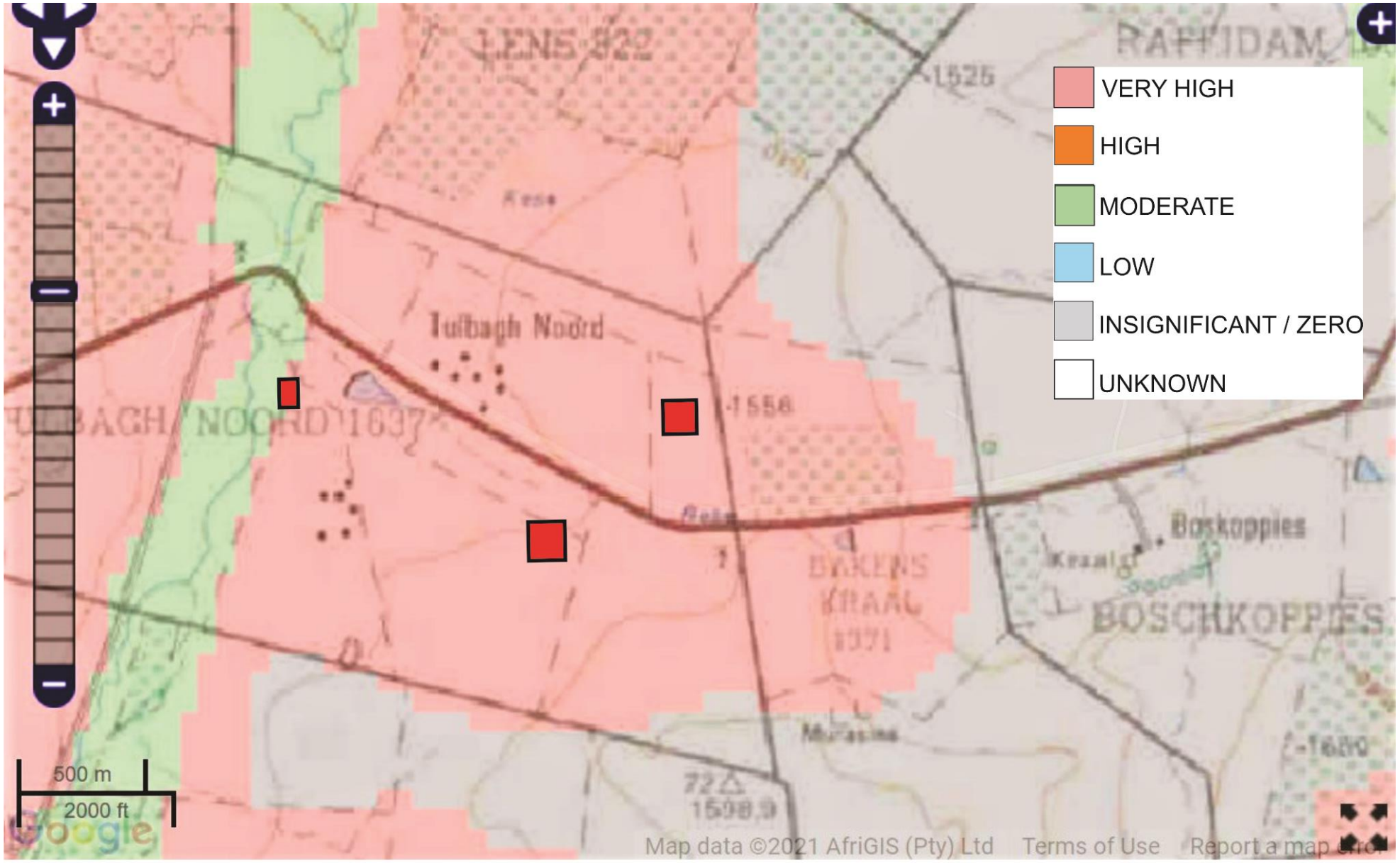

Figure 9. Portion of SAHRIS palaeosensitivity map with study areas marked by red polygons.

Figure 10. Area 1 is capped by a well-developed residual soil overburden with zero outcrop visibility. Scale 1 = 10 cm.

Figure 11. Area 2 is capped by a well-developed residual soil overburden with sporadic outcrop visibility towards the east. Scale 1 = 10 cm.