Phase 1 Heritage Impact Assessment for a proposed new chicken battery on the farm Tochgeluk 37 near Brandfort, Free State Province.

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Summary

A Phase 1 Heritage Impact Assessment was carried out for a proposed new chicken battery on the farm Tochgeluk 37 situated near Brandfort, Free State Province. A pedestrian survey of the 1.5 ha footprint revealed degraded terrain capped by a well-developed duricrust that is in turn covered by a veneer of reddish brown windblown sand. There is no above-ground of potential fossil exposures or *in situ* Stone Age archaeological material, capped or distributed as surface scatters on the landscape. There is also no above-ground evidence of graves or historically significant building structures older than 60 years within the study area. The proposed development will impact on well-developed (Quaternary) hardpan that, following the field assessment, is not considered to be archaeologically or palaeontologically sensitive. Given the low-relief terrain and scale of the proposed development it is considered highly unlikely that potentially fossil-bearing Adelaide Subgroup strata underlying the calcrete overburden will be affected by the development. The terrain in general is regarded as of low archaeological significance and is assigned a rating of Generally Protected C (GP.C). As far as the archaeological and palaeontological heritage is concerned, the proposed development may proceed with no additional heritage assessments necessary, provided that all excavation activities are restricted to within the boundaries of the development footprint.

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Introduction

A Phase 1 Heritage Impact Assessment was carried out for a proposed new chicken battery on the farm Tochgeluk 37 near Brandfort, Free State Province (**Fig. 1**). The survey is required as a prerequisite for new development in terms of the National Heritage Resources Act 25 of 1999. In terms of Section 38 of the National Heritage Resources Act 25 of 1999, the survey is required as a prerequisite for any development that will change the character of a site exceeding 5 000 m2 in extent. The task involved identification of possible archaeological and paleontological sites or occurrences in the proposed zone, an assessment of their significance, possible impact by the proposed development and recommendations for mitigation where relevant.

In this regard, categories relevant to the proposed development are listed in Section 34 (1), Section 35 (4), Section 36 (3) and Section 38 (1) of the NHR Act and are as follows:

34. (1) No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.

35 (4) No person may, without a permit issued by the responsible heritage resources

authority—

- destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;
- *b)* destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;

36 (3) No person may, without a permit issued by SAHRA or a provincial heritage resources authority—

- (a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;
- (b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or
- (c) bring onto or use at a burial ground or grave referred to in paragraph *(a)* or *(b)* any excavation equipment, or any equipment which assists in the detection or recovery of metals.

38 (1) Subject to the provisions of subsections (7), (8) and (9), any person who

intends to undertake a development categorised as—

- The construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
- The construction of a bridge or similar structure exceeding 50m in length;
- Any development or other activity which will change the character of the site

a) exceeding 5000 m² in extent; or

b) involving three or more existing erven or subdivisions thereof; or

c) involving three or more subdivisions thereof which have been consolidated within the past five years;

- The rezoning of a site exceeding 10 000 m²; or
- Any other category of development provided for in regulations by the South African Heritage Resources Agency (SAHRA).

Terms of Reference

The task involved the following:

- Identify and map possible heritage sites and occurrences using available 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.

Methodology

The heritage significance of the affected area was evaluated on the basis of existing field data, database information and published literature. This was followed by a field assessment by means of a pedestrian survey. A Garmin Etrex Vista GPS hand model (set to the WGS 84 map datum) and a digital camera were used for recording purposes. Maps and aerial photographs (incl. Google Earth) were consulted and integrated with data acquired during the on-site inspection.

Field Rating

Site significance classification standards prescribed by SAHRA (2005) were used to indicate overall significance and mitigation procedures where relevant (**Table 2**).

Site Information

The affected area is located on the farm Tochgeluk 37, which is situated approximately 25 km southwest of Brandfort as the crow flies (**Fig. 2**). It covers about 1.5 ha of open, flat terrain that is currently used as a sheep camp (**Fig. 3**)

1 to 50 000 topographical map: 2826 CD Glen

1 : 250 000 geological map 2826 Winburg

General site coordinates: 28°46'20.92"S 26°22'5.33"E

Geology

The geology of the region has been described by Nolte (1995) and Johnson (2006). It is situated within the Beaufort Group, Adelaide Subgroup (Karoo Supergroup), and is primarily represented by late Permian, Balfour Formation sedimentary rocks, which are

made up of alternating sandstone and mudstone layers (*Pa*, **Fig. 4**). These sedimentary rocks form the base on which younger, superficial deposits of Quaternary age have been deposited (Partridge *et al*. 2006). Superficial sediments consist mainly of calcretes (*Qc*) eeolian sand (*Qs*) and well-developed alluvial deposits near river drainages (flying bird symbol, **Fig 4**). Dykes and sills of resistant Jurassic dolerite intrusions (*Jd***)** are present in the region.

Background

The local palaeontological footprint is primarily represented by Late Permian Karoo vertebrate fauna and Late Cenozoic (Quaternary Period, comprising the Pleistocene and Holocene Epochs) mammalian fossils.

The Karoo geological strata within the affected area are assigned to the *Dicynodon* Assemblage Zone (AZ). Therapsids from this biozone occur generally well-preserved in mudrock horizons and are usually found as dispersed and isolated specimens associated with an abundance of calcareous nodules (Kitching 1995). Other vertebrate fossils include fish, amphibians and amniotes. Molluscs, insects, plant (*Dadoxylon*, *Glossopteris*) and trace fossils (arthropod trails, worm burrows) are also occur in the biozone.

The Modder River is a southern tributary of the Vaal River and its alluvial deposits are associated with abundant Quaternary mammalian fossils. A number of palaeontological localities, such as the ones at Erfkroon, Mitasrust, have been found eroding out of Pleistocene alluvial terraces and dongas along the river (Churchill *et al*. 2000; Rossouw 2006), while pan dunes and artesian springs (e.g. Florisbad) also ocassionaly yield Quaternary fossil remains (**Fig**. **5 & 6**). The river's fossil-bearing potential has been known for almost 150 years, with a frontlet and horn cores of *Homoioceras qntiquus* recovered as far back as 1839 (Cooke 1955) and the remains of *Megalotragus priscus* discovered around the turn of the previous century (Broom 1909).

The central Free State region between Bloemfontein and Kroonstad is generally rich in Stone Age open-site assemblages, the majority of which are linked to floodplain deposits (overbank sediments) associated with the Modder and Vet River systems, as well as pan dunes and artesian springs, such as at Florisbad (Brink 1987; Churchill *et al*. 2001;. Rossouw 2006; De Ruiter *et al*. 2011**) (Fig. 7 no. 1 – 3 & Fig. 8).** This may include capped occurrences and surface scatters of long, high-backed blades from the early

Middle Stone Age; typical Florisian retouched blades, trimmed points and Levallois core types; the characteristically large sidescrapers, sub-circular and endscrapers from the Lockshoek Industry (terminal Pleistocene); and the Smithfield Industries of the Holocene.

Maggs' classification of settlement patterns (1976) provided the first major contribution to our knowledge of the Iron Age prehistory of the Free State. It showed that the settlement patterns produced huts of different materials in different styles. Type Z settlements are sparsely scattered over a relatively limited area in the vicinity of Doringberg (Maphororong), at Sandrivierspoort (Mariba) adjacent to the main road between Winburg and Ventersburg (**Fig. 7 no. 4 - 7 & Fig. 9**) and to the northwest along the Vals River in the districts of Kroonstad and Bothaville, including a few sites on the Renoster River, east of Viljoenskroon (Walton 1956; Maggs 1976; Dreyer 1997). Type Z dwellings consisted of a cylindrical hut with stone-walled courtyards at the front and rear, representing a bilobial layout (**Fig. 9**). An excavation conducted at a stone-walled complex on the farm Doornpoort near Winburg, suggest that variations on the arrangement of stone-walled structures as defined for Type V, Type N and Type Z also occurred (Dreyer 1992) (**Fig. 7 no. 4**). Maggs (1976) ascribes the occupation of the sites with bilobial dwellings to early Sotho-speaking Thlaping and Rolong groups. According to radio-carbon dating and oral history, Type Z sites were occupied from the 16th and 17th to early 19th century (Maggs 1976; Dreyer 1992).

More recently and closer to the study area, the Battle of Karee Siding took place on 29 March 1900 when Boer forces temporarily resisted the advance of British troops north of the Modder River, with 188 and 21 casualties on the British and Boer sides, respectively (**Fig. 7 no. 9**).

Field Assessment

A pedestrian survey of the terrain revealed degraded terrain capped by a well-developed duricrust (*Qc*) that is in turn covered by a veneer of reddish brown windblown sand (*Qs*) (**Fig. 10 & 11**). There is no above-ground of potential fossil exposures or *in situ* Stone Age archaeological material, capped or distributed as surface scatters on the landscape There is also no above-ground evidence of graves or historically significant building structures older than 60 years within the study area.

Impact Statement & Recommendation

The proposed development will impact on well-developed (Quaternary) hardpan (calcrete) that, following the field assessment, is not considered to be archaeologically or palaeontologically sensitive (**Table 1**). Given the low-relief terrain and scale of the proposed development it is considered highly unlikely that potentially fossil-bearing Adelaide Subgroup strata underlying the calcrete overburden will be affected by the development.

In accordance with the types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999) there is no above-ground evidence of building structures older than 60 years or material of cultural significance or archaeological and palaeontological sites within the demarcated area. The terrain in general is regarded as of low archaeological significance and is assigned a rating of Generally Protected C (GP.C) (**Table 2**). As far as the archaeological and palaeontological heritage is concerned, the proposed development may proceed with no additional heritage assessments necessary, provided that all excavation activities are restricted to within the boundaries of the development footprint.

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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 as a result of the authorization of this project.

Yours truly,

07 /10 / 2018

Table 1. Summary of Impacts at Tochgeluk 37.

Geological Unit	Rock types and Age	Potential Palaeontological / Archaeological heritage	Archaeological / Palaeontological Significance	Impact by Development	Heritage potential at the site
Regolith	Residual soils, calcrete (Superficial deposits) Quaternary to Recent	Large vertebrate skeletal remains; freshwater molluscs, coprolites, microfossils Stone tools Rock art Prehistoric structures (IA; Stone Age open sites) Historical structures	High	High	Low
Karoo Dolerite (*Jd*)	Intrusive igneous bedrock. Jurassic	None	Low	None	Low
Adelaide Subgroup (*Pa*)	Fluvial and lacustrine mudstones and sandstones. Late Permian	*Dicynodon* Assemblage Zone Therapsids, amphibians, fish, amniotes, invertebrates, plant fossils, trace fossils.	High	Very low	Low

Table 2. 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

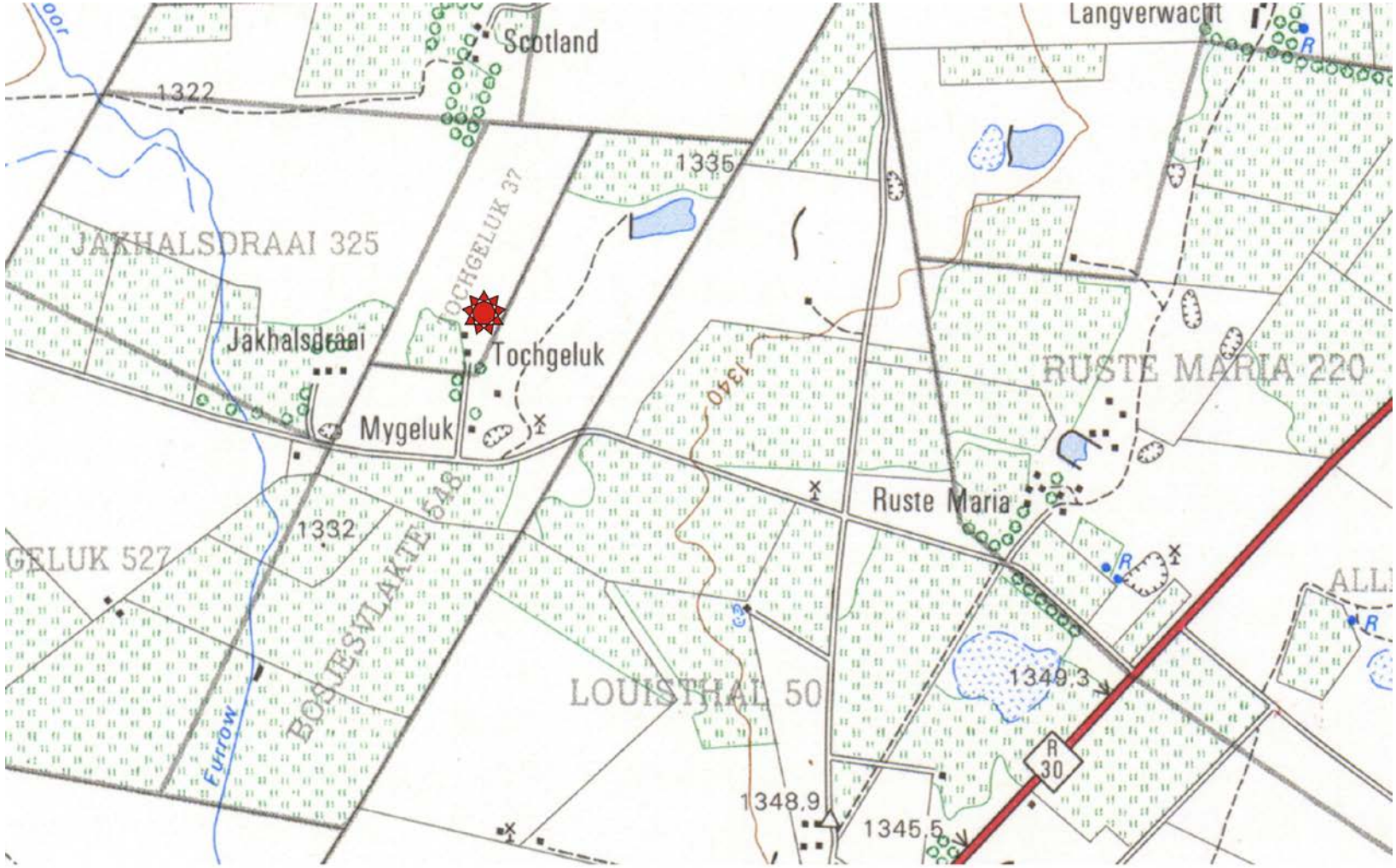

Figure Map and location of proposed footrint on the farm Tochgeluk 37 (portion of 1:50 000 scale topographic map 2826 CD Glen).

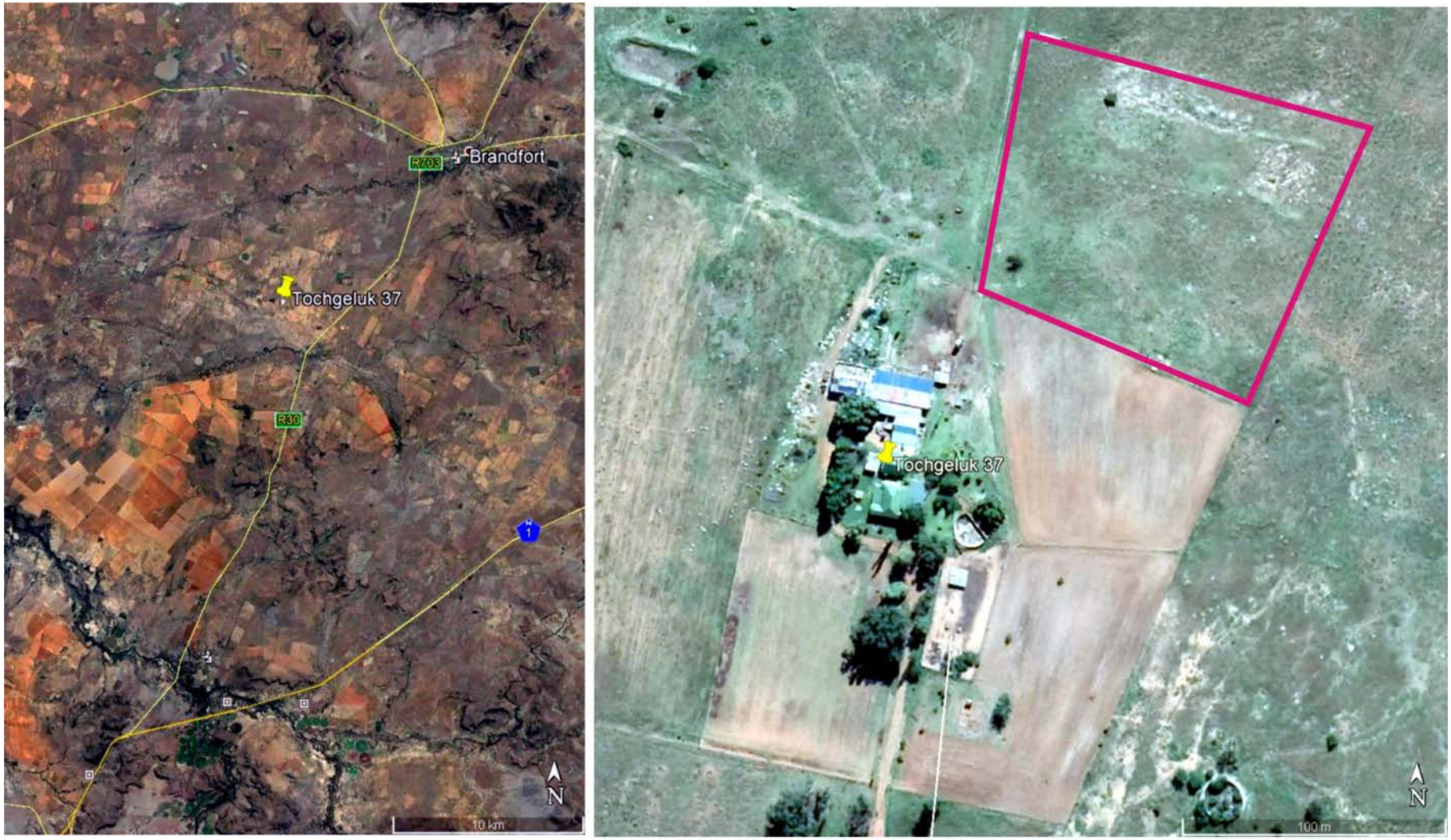

Figure 2. Aerial view of the site.

Figure 3. General view of the site looking north (above) and south towards the farmstead (below).

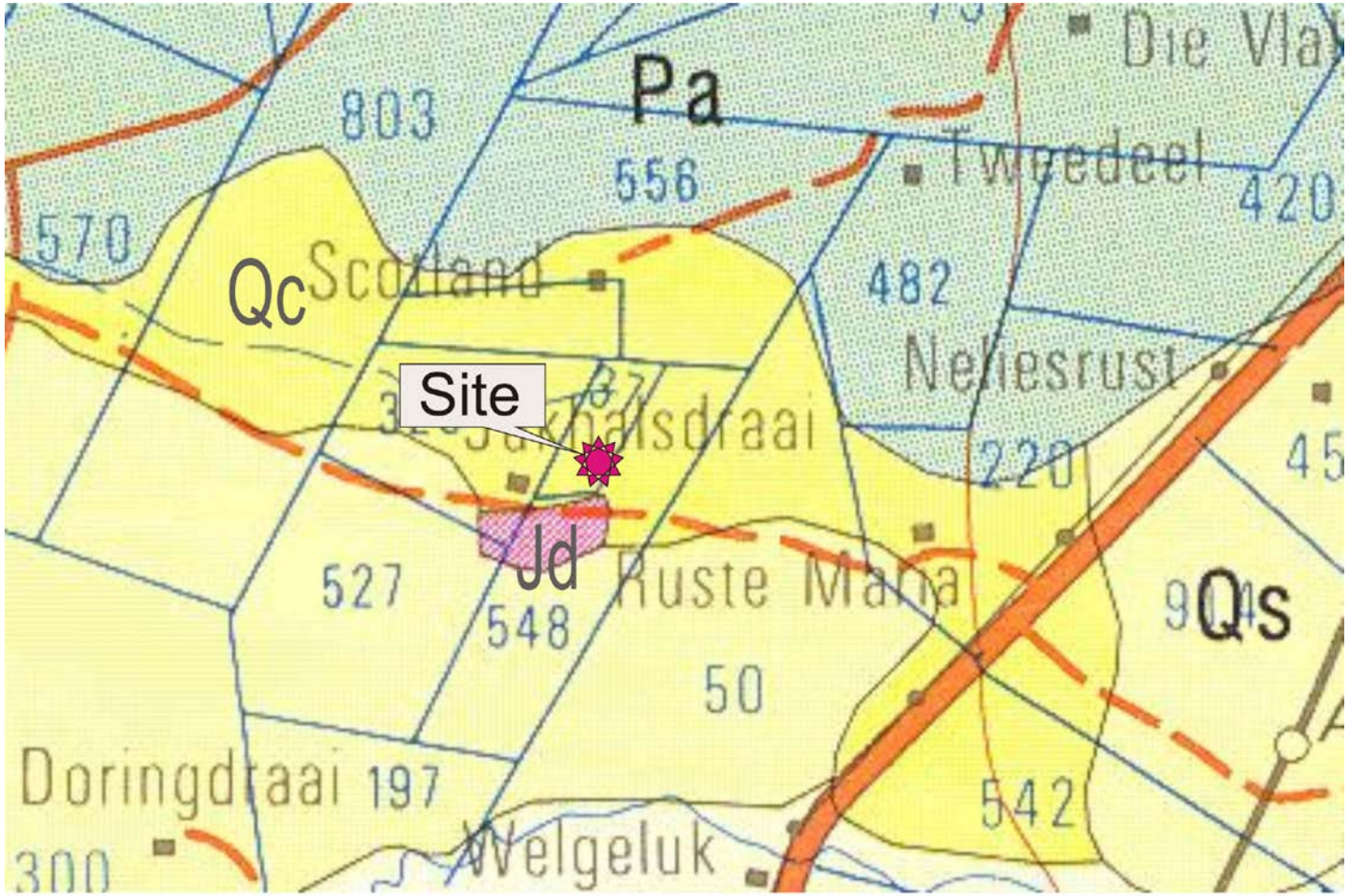

Figure 4. The deposits of the Karoo Supergroup are assigned to the Late Permian Adelaide Subgroup (*Pa*) These sedimentary rocks form the base on which younger, superficial deposits of late Cenozoic age (*Qc*, *Qs*) has been deposited. Dykes and sills of resistant Jurassic dolerites (*Jd*) largely determine landscape topography as indicated by the distinctive koppies and flat-topped inselbergs in the region. (Portion of 1:250 000 scale geological map 2826 Winburg, Council for Geoscience, Pretoria).

Figure 5. Aerial view of Tochgeluk 37 in relation to positions of Erfkroon, Florisbad and Mitasrust.

Figure 6. View of palaeontologically and archaeologically important alluvial terraces and dongas on the Modder River at Mitasrust (above) and Erfkroon (below).

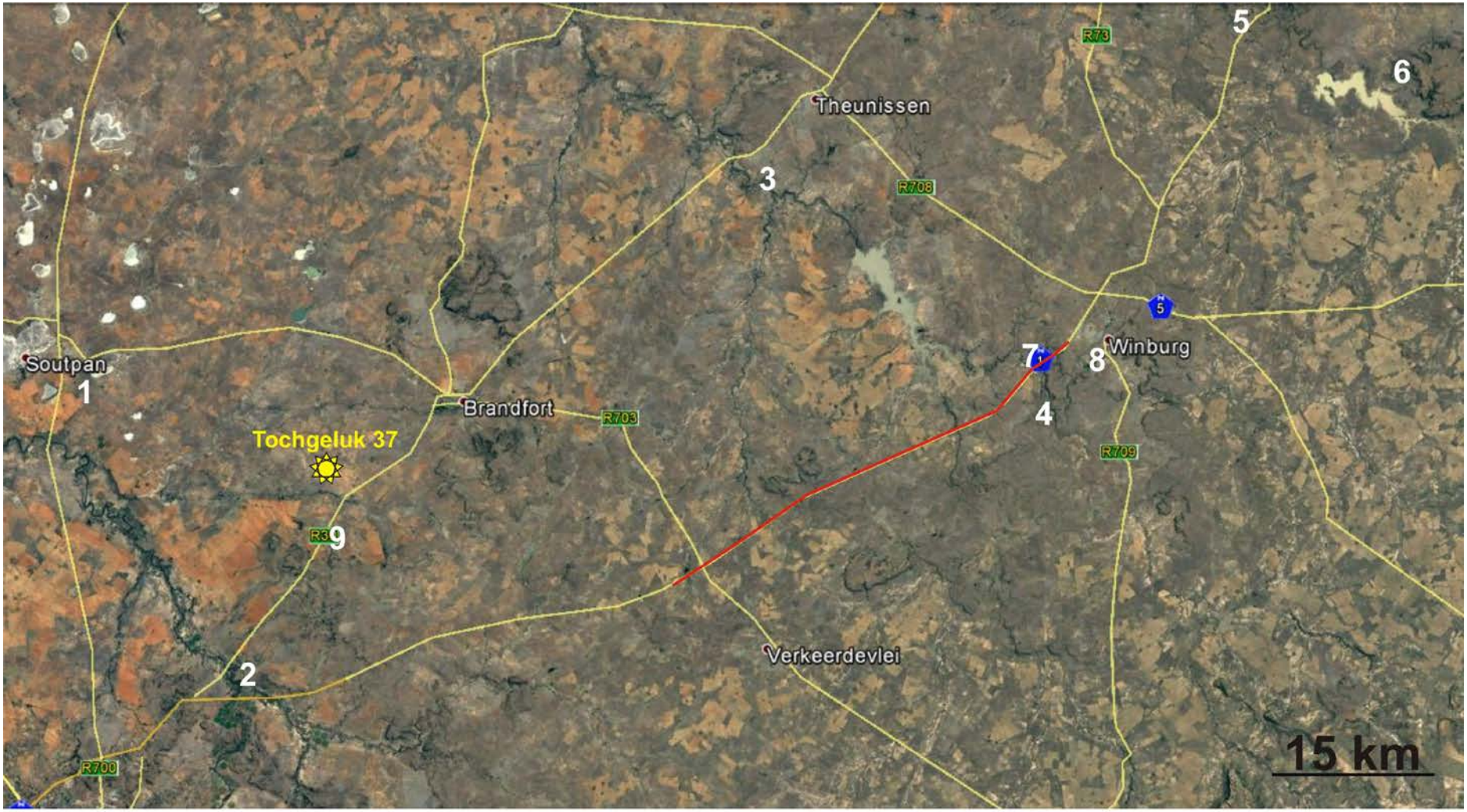

Figure 7. Map of archaeological and historical sites discussed in the Background section of the report .

Figure 8. Stone Age open-site assemblages in the region are primarily associated with artesian springs, e.g. Frorisbad (A - D) and floodplain deposits (overbank sediments) associated with the Modder and Vet Rivers (E).

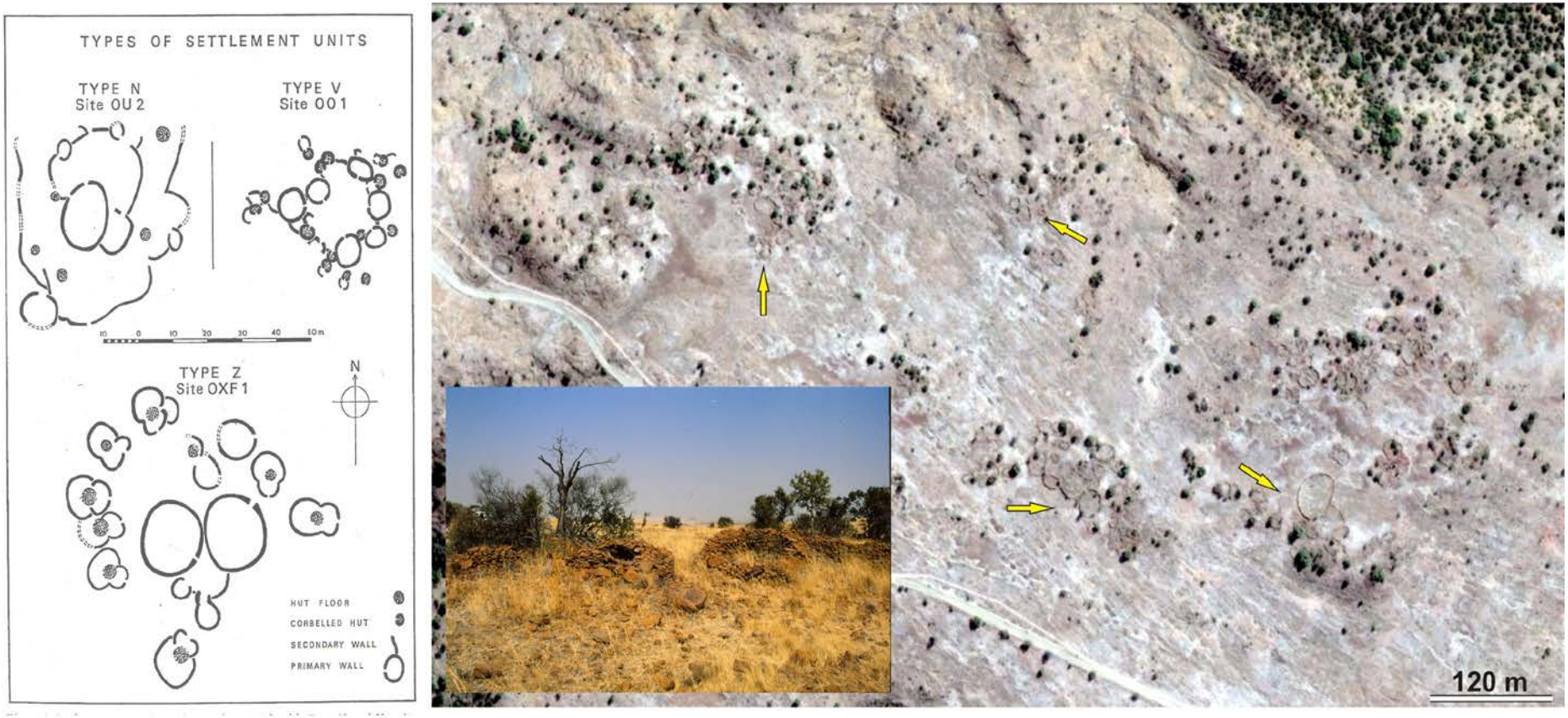

Figure 9. Iron Age settlement types from the southern Highveld according to classification by Maggs (1976). Aerial view of bilobial dwellings at Doringberg arranged around a cluster of central cattle byres.

Figure 10. Exposed hardpan deposit (duricrust).

Figure 11. The footprint is capped by a well-developed duricrust (white nodules / breccia in foreground) that is in turn covered by a veneer of reddish brown windblown sand (looking east).