Phase 1 Heritage Impact Assessment of a sand mine on the farm Glen Alphen 74 near Hobhouse, FS Province.

Report prepared for
EKO Environmental Consultants

by

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Executive Summary

A Phase 1 Heritage Impact Assessment was carried out at an existing open pit sand mine on the farm Glen Alphen 74, located about 6 km southeast of Hobhouse on the banks of the Caledon River in the eastern Free State Province. The study area is underlain by geologically recent (Holocene) and well-developed, but palaeontologically sterile alluvium. The probability of vertebrate fossils occurring within the geologically recent alluvium within the study area is considered to be very low. The palaeontological component of the proposed project footprint is assigned a site rating of General Protection C (GP.C). There is no above-ground evidence of building structures older than 60 years, graves, Stone Age archaeological remains, Iron Age structures or material of cultural significance within the confines of the development footprint. The archaeological and cultural component of the proposed project footprint is assigned a site rating of General Protection C (GP.C).

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Introduction

At the request of EKO Environmental Consultants a Phase 1 Heritage Impact Assessment was carried out at an existing open pit sand mine on the farm Glen Alphen 74, located about 6 km southeast of Hobhouse on the banks of the Caledon River in the eastern Free State Province (**Fig. 1 & 2**).

The extent 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 site visit and subsequent assessment took place during May 2016. 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. The site visit was conducted in July 2016.

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 archaeological significance of the affected area was evaluated through a desktop study and carried out on the basis of existing field data, database information and published literature. This was followed by a field assessment by means of a pedestrian and vehicle survey. A Garmin Etrex Vista GPS hand model (set to the WGS 84 map datum) and a digital camera were used for recording purposes. Relevant archaeological information, aerial photographs and site records were consulted and 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 2927CA / CB Wepener

1:250 000 scale geological map 2926 Bloemfontein

Site Coordinates (**Fig 2**):

A) 29°34'5.13"S 27°11'18.82"E

B) 29°34'3.60"S 27°11'21.11"E

C) 29°34'7.15"S 27°11'32.97"E

D) 29°34'13.15"S 27°11'25.03"E

The study area is part of an existing sand mine operation situated within overbank sediments on the South African side of the Caledon River (**Fig.3**).

Geology

The study area is located in an outcrop area of the late Permian Katberg Formation and the Late Triassic – Early Jurassic Elliot Formation of the Karoo Supergroup (Theron 1963; Johnson *et al.* 2006). The Elliot Formation represents the penultimate phase of Karoo sedimentation (Karoo Supergroup) and is characterized by its fluvially derived red bed deposits that respectively overlies and underlies the

Molteno and Clarens Formations. Sedimentation processes were ended with the advent of extensive volcanic eruptions when basaltic lavas of the Drakensberg Formation and the Lebombo Group were deposited during the Jurassic Period (Duncan et al. 2006). The dykes and sills of resistant Jurassic dolerites (*Jd***)** are not fossiliferous.

Background

The Katberg Formation sedimentary strata are assigned to the *Lystrosaurus* Assemblage Zone (AZ) (Groenewald 1991, Groenewald & Kitching 1995). This biozone is characterized by the abundant genus *Lystrosaurus,* and other common genera including *Procolophon, Moschorhinus, Proterosuchus, Lydekkerina,* and *Thrinaxodon*. The Elliot Formation contains one of richest Late Triassic to Early Jurassic dinosaur faunas that are of international importance and which include early dinosaurs (*Massospondylus* and *Euskelesaurus*) ornithischians, rare theropods and crocodilomorphs as well as rare amphibians, turtles, fish, advanced mammal-like reptiles and early mammals (Kitching 1979; Kitching & Raath 1984; MacRae, 1999; McCarthy & Rubidge 2005; Reisz *et al.* 2012). There is currently no record of Quaternary fossil localities along the Caledon River in the vicinity of Glen Alphen 74.

The archaeological footprint in the area are primarily represented by Stone Age archaeological localities, rock art sites and an extensive footprint related to the distribution of Iron Age settlements and early history of Sotho-speaking communities along the Caledon River Valley. Previously recorded Stone Age sites in the region are found at Bokpoort, Orange Springs Fort Savange, Leliehoek and Rose Cottage Cave. In addition to Later Stone Age levels with European and Iron Age artifacts, Rose Cottage Cave also has a long cultural sequence incorporating several MSA and LSA industries ranging from ca. 70 ka to around 10 ka ago. Rock shelters associated with more recent hunter – gatherer activities are found at Rooikrans, Mauermanshoek, Westbury and Tienfontein. Historical accounts of the middle Caledon Valley indicate that hunter-gatherers survived as communities until the end of the Basuto Wars and the establishment of European farms in 1869. Stow (1905) records traditions about the last "Bushmen" inhabitants of the Korannaberg (Mequatling) and the Platberg situated about 4 km south of Ladybrand.

Numerous rock art sites have been recorded in the region with over 30 farms, listed in the Ladybrand district (Van Riet Low 1941).

A number of Iron Age settlements, which resemble Maggs's Type V settlement pattern in many aspects of their material culture, are found in the Caledon Valley. They appear to date from the seventeenth century. According to historical accounts, the southward migration of early Sotho-speaking communities led to at least one group reaching the Caledon Valley about the mid-

seventeenth century and occupying most of the upper and middle parts of the valley by 1800 AD. A major event to take place among the indigenous tribes of the interior highveld of South Africa before the coming of European settlers was the Difaqane raids and wars. Precipitated by the rise of Shaka's Zulu empire among the coastal Nguni-speaking peoples, it resulted in the creation of large-scale refugee communities that were continued and extended over the whole interior by resident Southern Sotho-speaking peoples who could not resist the advanced military and political system of the Nguni invaders, but rather led to the segmentation of the Southern Sotho into numerous antagonistic communities scattered along the Caledon River Valley. One group was the Leghoya who in 1810 or 1812, were finally conquered and completely absorbed by the Taung under their chief, Moletsane, with whom they settled at Mequatling, to the west of Ladybrand, in 1837. Although the Leghoya were subjects of Moletsane they lived as separate pockets among the Taung and actually retained their own chief. In 1869, by the Treaty of Aliwal North, Moletsane's territory, which had previously been part of Basutoland, was ceded to the Orange Free State, and Moletsane with his Taung and Leghoya followers moved into south Basutoland, between Mafeteng and Mohale's Hoek, where he was granted land by Moshesh.

Field Assessment and Recommendations

The study area is underlain by geologically recent (Holocene) and well-developed, but palaeontologically sterile alluvium (**Fig. 4**). The probability of vertebrate fossils occurring within the geologically recent alluvium within the study area is considered to be very low. The palaeontological component of the proposed project footprint is assigned a site rating of General Protection C (GP.C). The terrain flanking the river cutting consists of previously disturbed farmland. There is no above-ground evidence of building structures older than 60 years, graves, Stone Age archaeological remains, Iron Age structures or material of cultural significance within the confines of the development footprint. The archaeological and cultural component of the proposed project footprint is assigned a site rating of General Protection C (GP.C).

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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

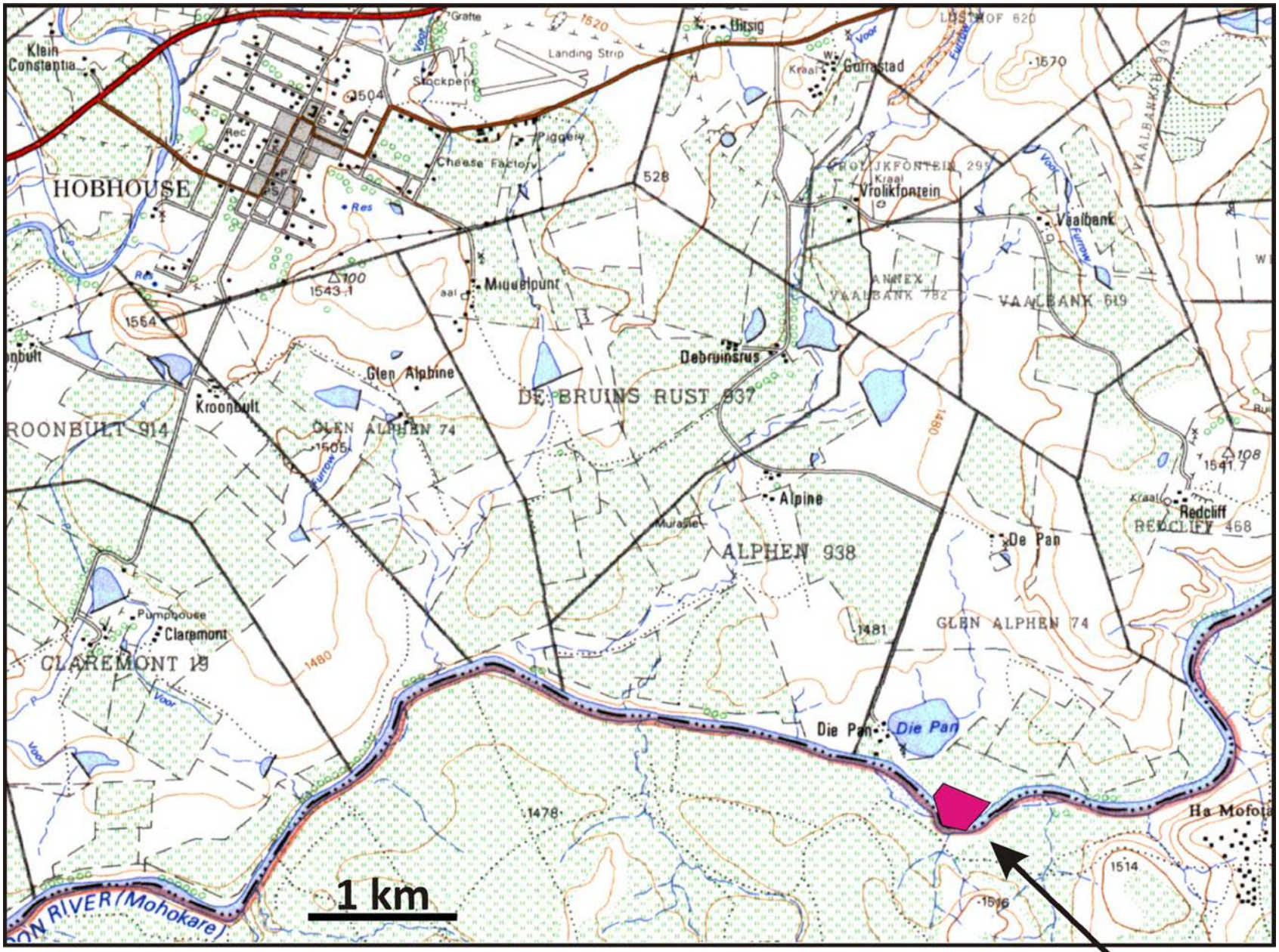

Figure 1. Map of the study area (portion of 1:50 000 scale topographic 2927CA / CB Wepener).

Figure 2. Aerial view of the study area.

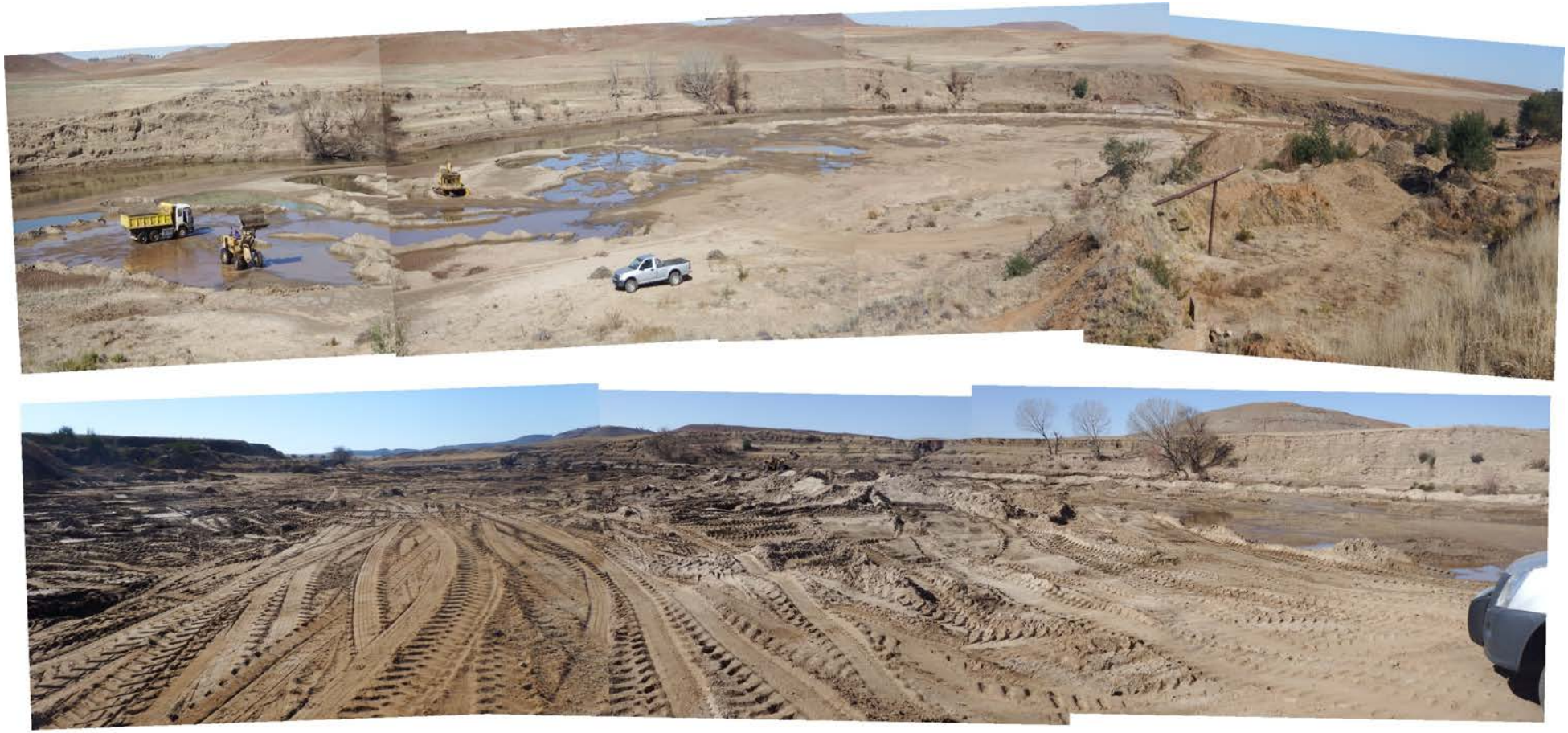

Figure 3. Sand mine operations within the study area, looking south towards Lesotho (top) and northeast (bottom).

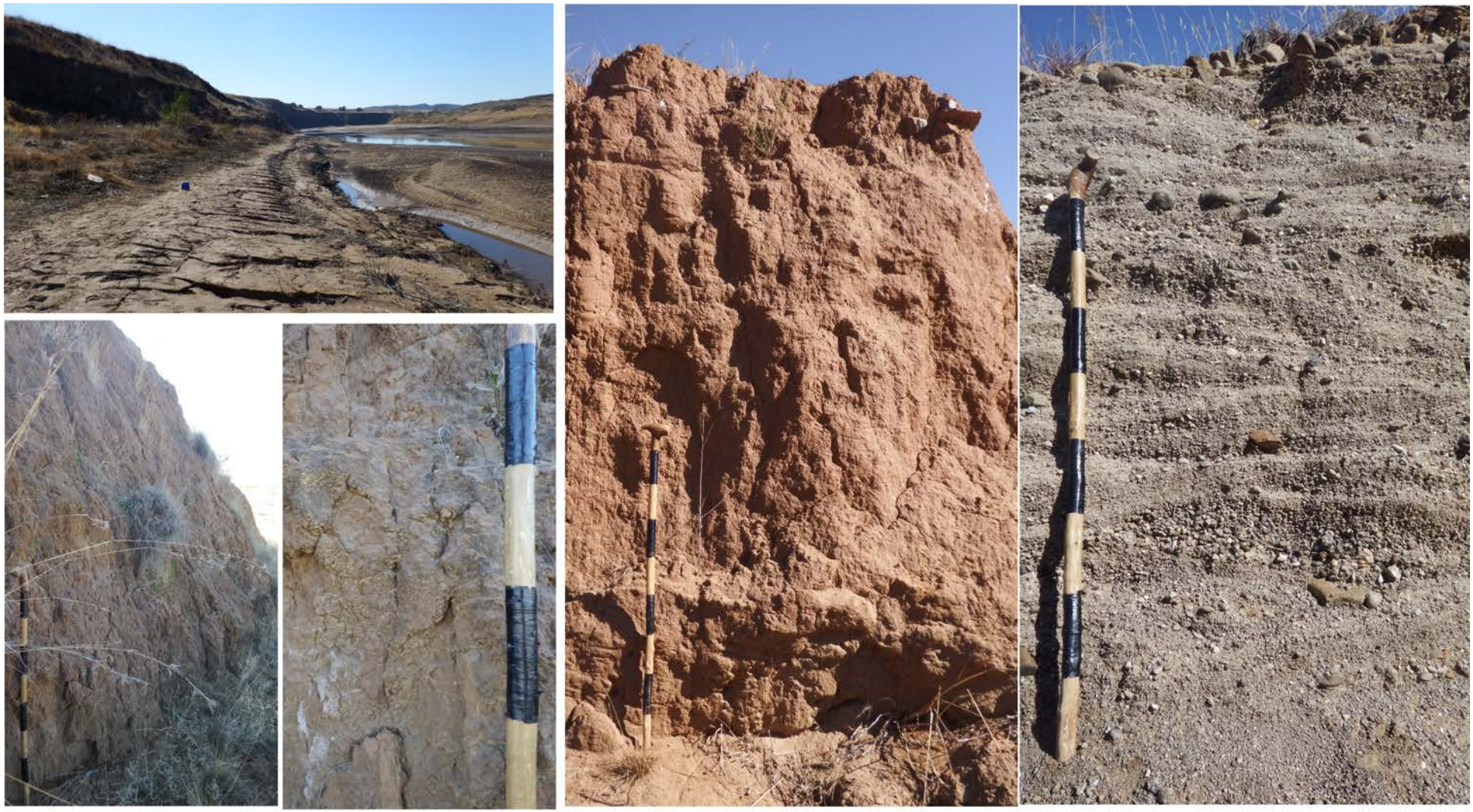

Figure 4. The study area is underlain by well-developed alluvial sediments. Exposures appear to be palaeontologically and archaeologically sterile. Scale 1 = 10 cm.