

Phase 1 Heritage Impact Assessment of a proposed
new piggery on the farm Paradys 358 near Thaba
Nchu, FS Province.

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Summary

A Phase 1 Heritage Impact Assessment was carried out for the establishment of a small 2ha piggery on the farm farm Paradys 358 , located about 10 km north of Thaba Nchu in the Free State Province. The residual topsoils (Quaternary sediments) have been completely degraded as a result of prior agricultural activities. The site is underlain by well developed, but degraded superficial (Quaternary) deposits of low to very low palaeontological sensitivity, the latter being that the impact area has been disturbed by previous farming activities and that it is not situated within or near pan, well-developed alluvial or spring deposits (considered to be potentially fossiliferous in the region). The proposed piggery footprint located on previously developed agricultural land. Old topographic maps of the area indicate that the affected area has already been subjected to formal settlement by 1953. Potential impact on *in situ* Stone Age archaeological material, graves, rock engravings, prehistoric structures or historically significant building structures older than 60 years within the impact footprint is considered unlikely. 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 to suggest that historically significant building structures older than 60 years or material of cultural significance or archaeological sites will be affected 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). As far as the archaeological and palaeontological heritage is concerned, the proposed development may proceed with no additional heritage assessments necessary, provided that all industrial activities are restricted to within the boundaries of the development footprint.

Introduction

A Phase 1 Heritage Impact Assessment was carried out for the establishment of a small 2ha piggery on the farm farm Paradys 358 , located about 10 km north of Thaba Nchu in the Free State Province (**Fig. 1 & 2**). The study is required in terms of Section 38 of the National Heritage Resources Act 25 of 1999 as a prerequisite for any development which will change the character of a site exceeding 5 000 m² in extent. The task involved identification and mapping of possible archaeological heritage within the proposed project area, an assessment of their significance, related impact by the proposed development and recommendations for mitigation where relevant.

Terms of Reference

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

Methodology

The heritage 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 of the five poultry facility structures 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. Relevant archaeological information, aerial photographs and site records were consulted and integrated with data acquired during the on-site inspection. Site significance classification standards prescribed by SAHRA (2005) were used to indicate overall significance and mitigation procedures where relevant (Table 1).

Locality data

1 : 50 000 scale topographic map: 2926 BB Thaba Nchu

1 : 250 000 scale geological map 2926 Bloemfontein

General site coordinates: 29° 5'39.65"S 26°49'56.73"E

The impact footprint will cover 2 ha of on previously developed agricultural land on the farm Paradys 358 , located about 10 km north of Thaba Nchu . The affected area is situated on relatively low-relief terrain, covered by well-developed residual soils (**Fig. 3 - 5**). The superficial deposits of are of Quaternary age and consist mainly of degraded topsoils of varying depth.

The geology of the region has been described by Theron (1963) and Johnson (2006). It is situated within the Beaufort Group (Karoo Supergroup), and is primarily represented by late Permian, Adelaide Subgroup sedimentary rocks, which are made up of alternating sandstone and mudstone layers. Dykes and sills of resistant Jurassic dolerites determine the relief in the region (**Fig. 6**).

Background

The local palaeontological footprint is primarily represented by Late Permian Karoo vertebrate fauna and Late Cenozoic (Quaternary) macrofossils (Broom 1909 a, b; Kitching 1977; Churchill *et al* 2000; Rossouw 1999, 2000, 2006). The succession of Beaufort Group sedimentary rocks is subdivided into eight biostratigraphic units, called assemblage zones (Rubidge 1995) and the sedimentary strata underlying the affected area are assigned to the *Dicynodon* Assemblage Zone (AZ) (Kitching 1995) (**Fig. 7**). This biozone is characterized by the presence of a distinctive and fairly common dicynodont genus. Therapsids and other vertebrate fossils from this biozone are usually found as dispersed and isolated specimens in mudrock horizons, associated with an abundance of calcareous nodules. Plant fossils (*Dadoxylon*, *Glossopteris*) and trace fossils (arthropod trails, worm burrows) are also present. The sediments assigned to the *Dicynodon* AZ are associated with stream deposits consisting of floodplain mudstones and subordinate, lenticular channel sandstones. Several fossil localities have been recorded on several farms located to the north of the study area (see **Fig. 6**)

In more recent times the central interior and what is now the Free State Province, was once a vast and highly productive grassland ecosystem. Numerous mammal fossils stretching as far back as the Middle Pleistocene are regularly discovered in the Free State Province, especially in fluvial sediments along river courses like the nearb Modder River and the Renosterspruit. Quaternary palaeontological sites, often associated with Stone Age artefacts, are found eroding out of Pleistocene alluvial terraces and dongas along the Modder River and its tributaries near Maselspoort and Mockesdam and further east along the Honingspruit near Sannaspos (**Fig. 8**). Fossils discovered at various fossil sites along the Modder River

and its tributaries revealed the existence of a number of open grassland adapted herbivores (*Equus capensis*, *Megalotragus priscus*, *Pelorovis antiquus*, *Antidorcas bondi* and *Equus lylei*). The abundance of these different sized grazers in the Free State is a reflection of the availability of abundant seasonal grassland and offers strong evidence for a stable and sustainable grassland ecosystem in the central interior of South Africa thousands of years ago.

Stone Age heritage

The archaeological footprint in the region is primarily represented by Stone Age surface occurrences, structural remnants dating back to the Anglo Boer War and its aftermath, graveyards and other historical structures older dating more than 60 years ago. The Stone Age archaeological record of Modder River catchment east of Bloemfontein spans back to the early Middle Stone Age. Prehistoric archaeological remains previously recorded in the region include stone tools and mammal fossil remains from sealed and or exposed contexts. Along much of the course of Modder River and its tributaries between Sannaspos and Bloemfontein south of the study area, alluvial deposits contain numerous occurrences of *in situ* Middle and Later Stone Age material eroding out of the overbank sediments where they are often found in association large mammal fossil remains (Churchill *et al.* 2000; Rossouw 1999, 2000, 2006). The incidence of surface scatters usually decreases away from localized areas such as alluvial contexts and dolerite-shale contact zones when stone tools largely occur as contextually derived individual finds in the open veld. Stone tools are mostly made of hornfels, a fine-grained isotropic rock found in the hot-contact zone between the dolerites and shales in the area.

Historical heritage

During the 19th century the Thaba Nchu area was occupied by the Barolong under the chieftainship of Moroka until it was incorporated into the Free State Republic in 1880. The history is in part represented by numerous circular stone-walled kraals found in the area between Thaba Nchu and Excelsior (**Fig. 7**). The region has also witnessed several skirmishes between British and Boer forces during the Anglo-Boer War. Following the capture of Bloemfontein by British forces during the Anglo-Boer War, military movements occurred well towards the east of Bloemfontein around Thaba Nchu.

Site Assessment

The site is underlain by well developed, but degraded superficial (Quaternary) deposits of low to very low palaeontological sensitivity, the latter being that the impact area has been

disturbed by previous farming activities and that it is not situated within or near pan, well-developed alluvial or spring deposits (considered to be potentially fossiliferous in the region).

The proposed piggery footprint located on previously developed agricultural land. Old topographic maps of the area indicate that the affected area has already been subjected to formal settlement by 1953 (**Fig. 9**). Potential impact on *in situ* Stone Age archaeological material, graves, rock engravings, prehistoric structures or historically significant building structures older than 60 years within the impact footprint is considered unlikely.

Impact Statement and Recommendations

The residual topsoils (Quaternary sediments) have been completely degraded as a result of prior agricultural and residential activities. 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 to suggest that building structures older than 60 years or material of cultural significance or archaeological sites will be affected 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 1**). As far as the archaeological and palaeontological heritage is concerned, the proposed development may proceed with no additional heritage assessments necessary, provided that all industrial activities are restricted to within the boundaries of the development 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 as a result of the authorization of this project.

Yours truly,

A handwritten signature in black ink, appearing to read 'L Rossouw', written in a cursive style.

19/08/2019

Tables and Figures

Table1. 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. Aerial view of the proposed footprint.



Figure 2. Aerial view of the area around the site (white star).



Figure 3. General view of the site, looking north.



Figure 4. General view of the site, showing old agricultural land.

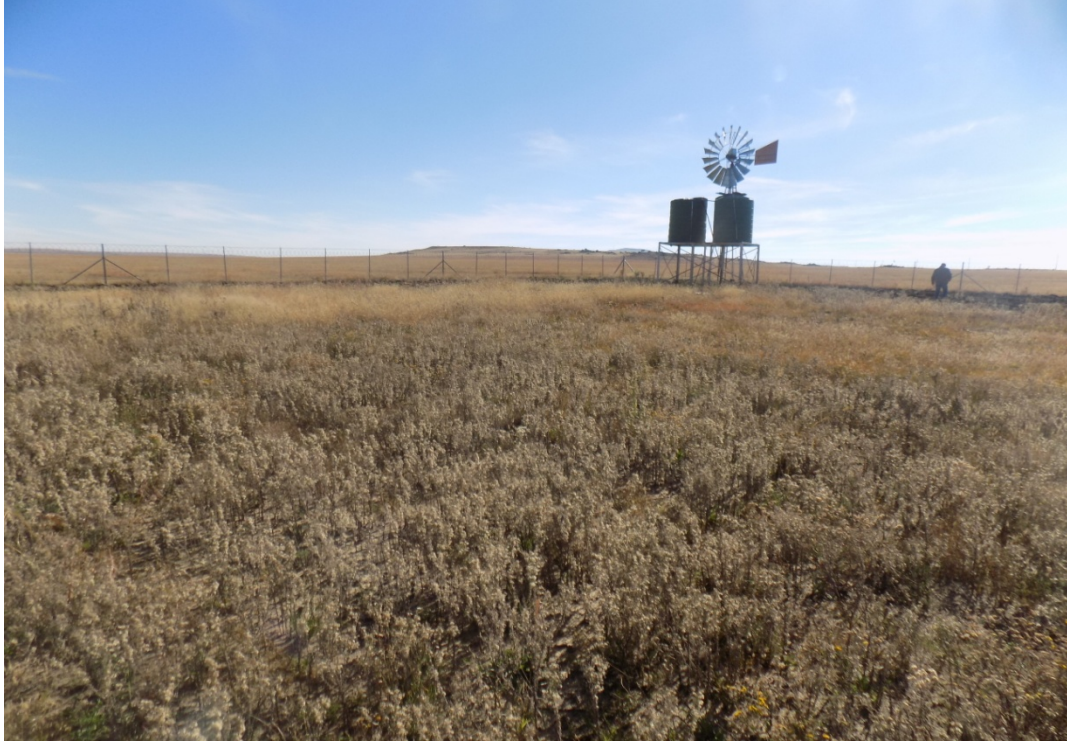


Figure 5. General view of the site, showing old agricultural land.



Figure 6. Portion of the 1:250 000 scale geological map Bloemfontein 2926. The site (white star) is situated within the Beaufort Group, Adelaide Subgroup (Karoo Supergroup, green areas) and on top of weather-resistant Jurassic dolerites (red areas). Several therapsid localities have been recorded to the north of the study area (orange dots).

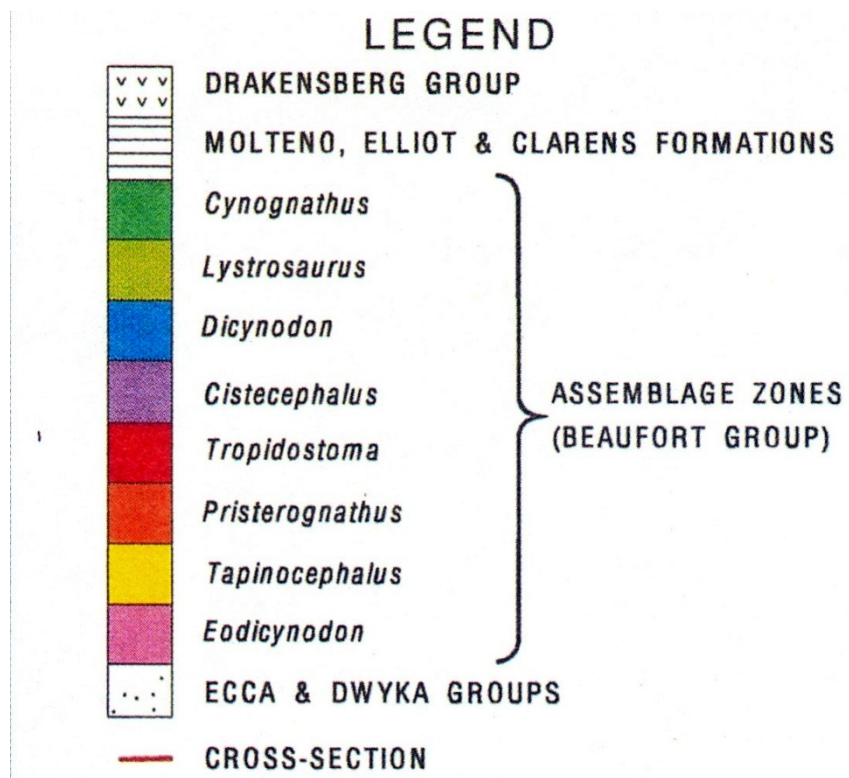
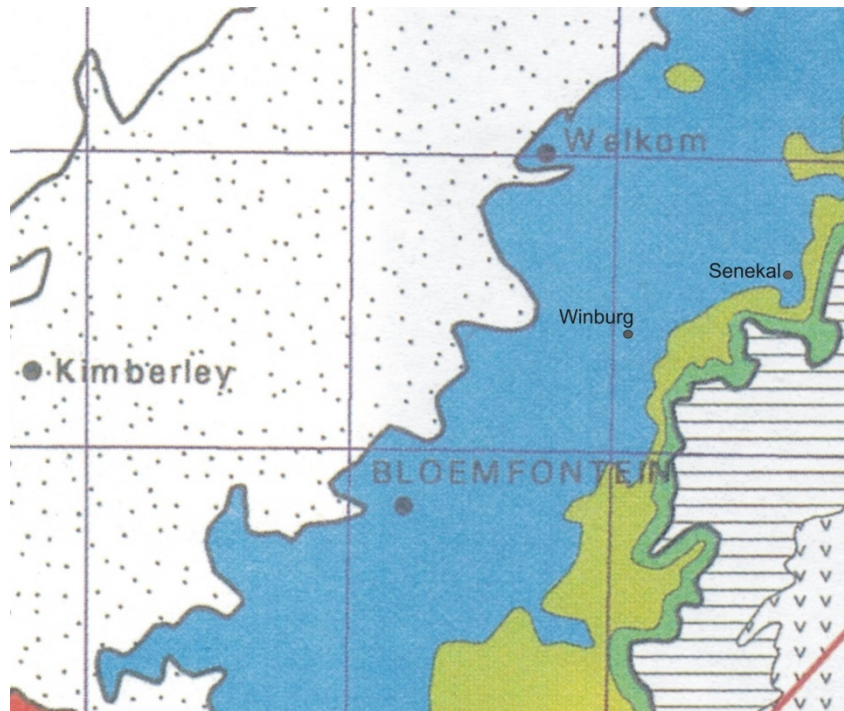


Figure 7. Geographical distribution of vertebrate biozones of the Beaufort Group around Bloemfontein (Rubidge 1995).

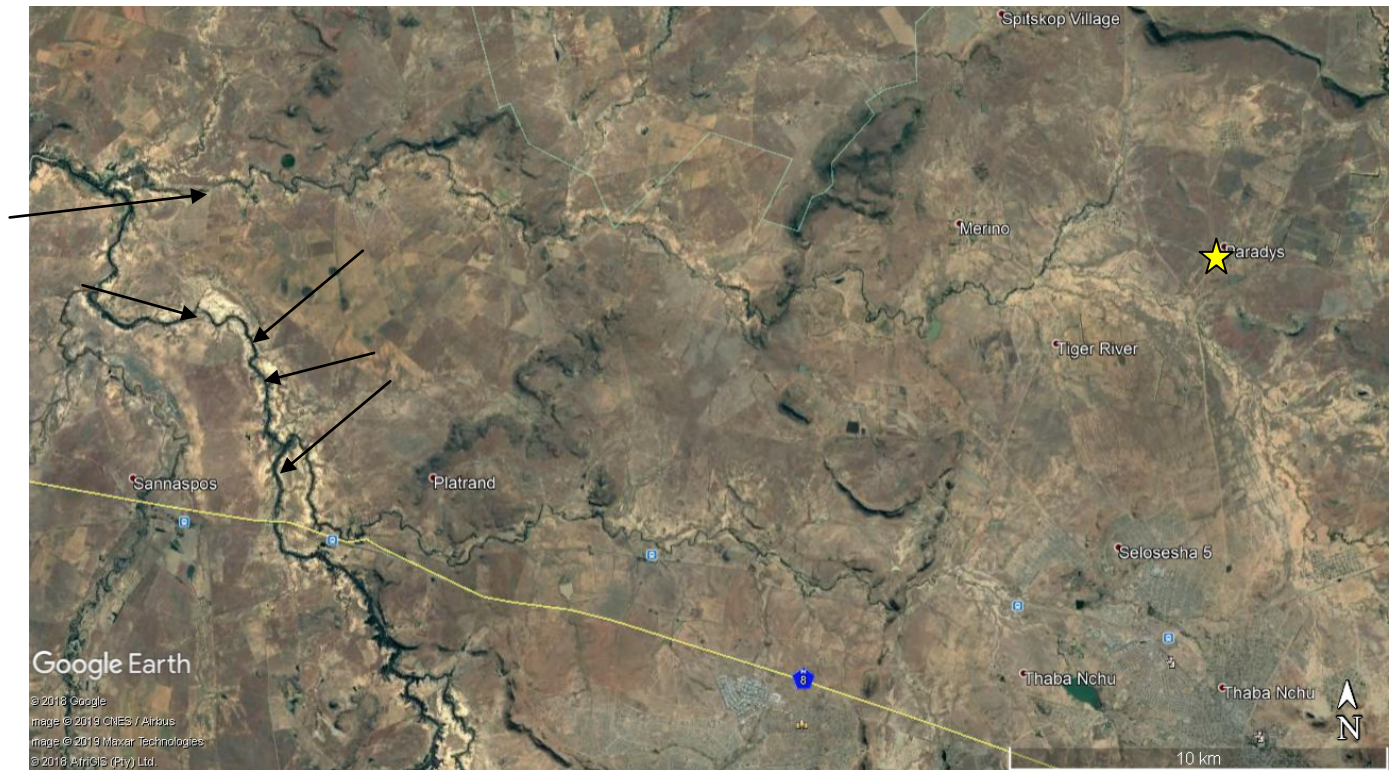


Figure 8. Map of Quaternary fossil sites (arrows) located within alluvial sediments to the west of the affected (area marked by yellow star)

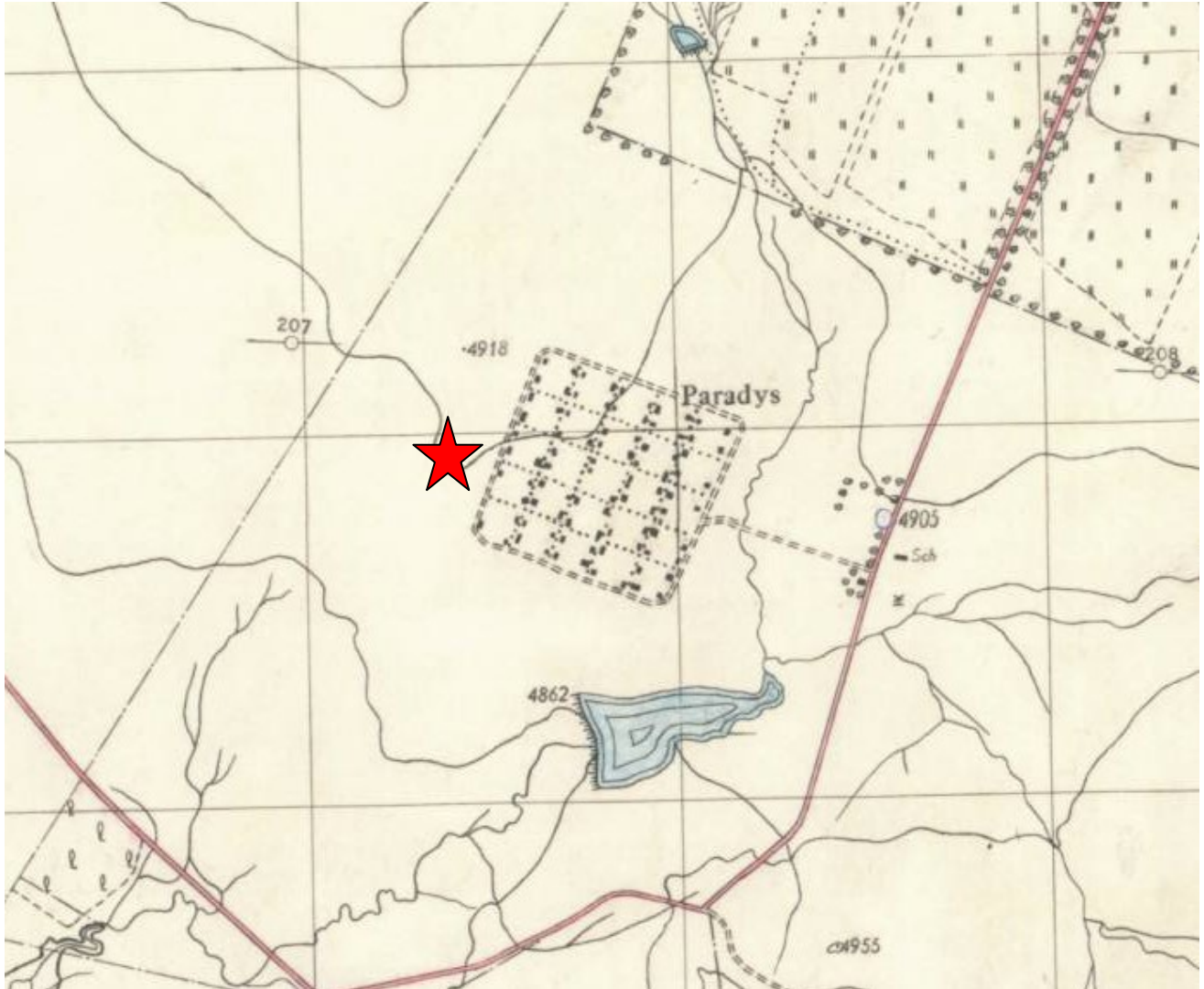


Figure 9. Informal structures or buildings indicated on 1:18 000 scale topographic map 2926 B7 Thaba Nchu dated ca. 1953. Site indicated by red star.