

Phase 1 Heritage Impact Assessment of an existing
feedlot on the farm Wanga Nella 994 near Aliwal North,
FS Province.

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Summary

A Phase 1 palaeontological and archaeological impact assessment was carried out for the installation of a water tank and associated pipelines as well as the extension of an existing feedlot on the farm Wanga Nella 994, situated near Aliwal North in the southeastern Free State Province. The study area is located on more or less degraded terrain next to the N6 national road about 6km due northeast of Aliwal North. A new water tank will be installed next to an existing reservoir located on a sedimentary outcrop situated about 400 m west of the existing feedlot. Associated, small-diameter water pipelines will be installed to provide water for the feedlot. The site is located on previously degraded (developed) terrain primarily underlain by Tarkastad Subgroup sediments where no fossils or fossil exposures were observed. Quaternary sediments (unconsolidated overburden) around the study area is made up of thin residual and previously disturbed soils that are not considered to be fossiliferous. The foot survey revealed no evidence of intact Stone Age localities or artefacts distributed as surface scatters on the landscape. There are also no indications of prehistoric structures or remains within or in the immediate vicinity of the survey area. There is no evidence of historical structures in the demarcated area. A small, fenced-off graveyard covering about 50 m², is located within the study area. The cemetery will not be impacted by the proposed development. Due to the degraded condition of the study area potential palaeontological impact with regard to the feedlot footprint is considered to be negligible. Installation of pipelines along sections 1 and 2 will largely impact degraded Tarkastad Subgroup sediments and overburden as a result of previous farming activities. Installation of the water tank and pipelines along section 3 (approximately 460 m) may affect intact Tarkastad Subgroup sediments. However, potential for impacting on in situ fossils is considered low given the relatively small (linear, flat and shallow) footprint that will be affected. Impact on potentially intact Stone Age archaeological remains, rock art, prehistoric and historical structures or graves is considered unlikely. The terrain in general is regarded as of low archaeological significance and is assigned a rating of Generally Protected C (GP.C).

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Introduction

At the request of Enviroworks Environmental Consultants a Phase 1 palaeontological and archaeological impact assessment was carried out for the installation of a water tank and associated pipelines as well as the extension of an existing feedlot on the farm Wanga Nella 994, situated near Aliwal North in the southeastern Free State Province (**Fig. 1**).

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 September 2013. 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.

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 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.

Locality data

Maps: 1:50 000 topographical map 3026DA Aliwal North

1:250 000 geological map 3026 Aliwal North

Site Coordinates

- A) 30°38'32.10"S 26°44'6.55"E
- B) 30°38'23.99"S 26°43'45.52"E
- C) 30°38'34.85"S 26°43'42.12"E
- D) 30°38'41.06"S 26°44'4.79"E

The study area is located on more or less degraded terrain next to the N6 national road about 6km due northeast of Aliwal North (**Fig 2**). A new water tank will be installed next to an existing reservoir located on a sedimentary outcrop situated about 400 m west of the existing feedlot (**Fig. 3**). Associated, small-diameter water pipelines will be installed to provide water for the feedlot.

Geology

The geology of the region has been described by Bruce and Kruger (1983) and is made up of Tarkastad Subgroup, Burgersdorp Formation (Beaufort Group, Karoo Supergroup) sandstones and mudstones (**Fig. 4**), and intrusive dolerites (Karoo Dolerite Suite). Overlying Molteno formation sandstones occur primarily to the east

of Aliwal North. Superficial deposits consist of Quaternary aged valley fill, alluvial sediments and residual soils.

Karoo Fossils

The sedimentary bedrock in the region is assigned to the *Cynognathus* Assemblage Zone (AZ) (Kitching 1995; **Fig. 5**). This biozone is characterized by the presence of the marker taxa *Cynognathus*, *Diademodon* and *Kannemeyeria* and the absence of *Lystrosaurus* (**Fig.6**). Plant fossils include *Dadoxylon* and *Dicroidium*. Several fossil localities have been recorded around Aliwal North (where fossil remains of *Howesia* and *Euperkeria* were discovered) and between Aliwal North and Rouxville, as well as at Beestekraal (**Fig. 7**). No vertebrate fossils have been recorded in the overlying Molteno Formation, but plant fossils are particularly abundant in this formation (Johnson *et al.* 2006). Various species of the seed fern *Dicroidium* make up the bulk of the plant fossils in the Molteno Formation (Anderson & Anderson 1985).

Karoo Dolerites

Dolerite (*Jd*), in the form of dykes and sills are not palaeontologically significant and can be excluded from further consideration in the present palaeontological evaluation. It is however moderately significant from an archaeological point of view as many Stone Age quarry sites (“factory” sites) are found at the foot of dolerite hills where hornfels or other metasediment outcrop occur as a result of contact metamorphism following the intrusion of dykes and sills.

Late Cenozoic Deposits

The archaeological footprint in the region is primarily represented by Stone Age localities and rock art sites, early indigenous farming communities as well as historical structures related to early trek-farmers (Goodwin & Van Riet Low 1929; Lye 1967; Sampson 1968, 1972; Maggs 1976). Examples of stone tool “factory” sites are found at Spitzkop near Smithfield, the Smithfield Townlands (the original Smithfield material used by Goodwin and Van Riet Low to describe the Smithfield Stone Tool Industry in 1929 was a surface collection retrieved from the banks of a stream running through the town, locality unknown), Ventershoek near Wepener and Mooifontein near Zastron. Extensive surveying during the late 1960’s revealed that the Gariep Dam flood basin, including the Orange-Caledon interfluvium has a very rich Stone Age archaeological footprint with multiple open and buried sites (Sampson 1968, 1972) (**Fig. 8**). Stone tool open-sites have been recorded at Goedemoed,

Weenkop and Wesselsdal near Rouxville and at Middelplaats, Melkspruit, Grassridge Farm in the Aliwal North district (**Fig. 9**). Rock art localities recorded in the region include sites on 21 farms in the Aliwal North district, but not including Wanga Nella 994. European trek-farmers crossed the Orange River from the Cape as early as 1819 and settled throughout the region during the 1820's and 1830's (Schoeman 2003). One of the earliest farms in the region was established in 1835 at Klipplaatsdrif, about 24 km from Rouxville on the way to Smithfield (**Fig. 10**). Historical landmarks situated within 5 km of Aliwal North include the Anglo Boer War Concentration Camp Memorial Garden and Graveyard.

Field Assessment

The site is located on previously degraded (developed) terrain primarily underlain by Tarkastad Subgroup sediments where no fossils or fossil exposures were observed. Quaternary sediments (unconsolidated overburden) around the study area is made up of thin residual and previously disturbed soils that are not considered to be fossiliferous. There is currently no record of Quaternary palaeontological exposures in the vicinity. The foot survey revealed no evidence of intact Stone Age localities or artefacts distributed as surface scatters on the landscape. There are also no indications of prehistoric structures or remains within or in the immediate vicinity of the survey area. There is no evidence of historical structures in the demarcated area. A small, fenced-off graveyard covering about 50 m², is located within the study area (**GPS coordinates 30°38'36.10"S 26°43'52.91"E, Fig, 11 & 13**). The cemetery will not be impacted by the proposed development.

Impact Statement and Recommendations

Due to the degraded condition of the study area potential palaeontological impact with regard to the feedlot footprint is considered to be negligible (**Fig. 12**). Installation of pipelines along sections 1 and 2 will largely impact degraded Tarkastad Subgroup sediments and overburden as a result of previous farming activities (**Fig. 13 & 14**). Installation of pipelines along section 3 (approximately 460 m) may affect intact Tarkastad Subgroup sediments. However, potential for impacting on in situ fossils is considered low given the relatively small (linear flat and shallow) footprint that will be affected (**Fig. 13 & 15**).

Impact on potentially intact Stone Age archaeological remains, rock art, prehistoric and historical structures or graves is considered unlikely. The terrain in general is regarded as of low archaeological significance and is assigned a rating of Generally Protected C (GP.C).

Chance Finds Protocol

In the unlikely event of fossil discovery within previously undisturbed Tarkastad Subgroup sediments, a professional palaeontologist must be called in immediately to confirm and record the finds. In the meantime, *ex situ* remains must be wrapped in paper towels or heavy duty tin foil and stored in a safe place. The material should not be washed or cleaned in any way. *In situ* material must be kept in place and protected from further damage by covering it with light but rigid object like a box, bucket or metal sheet until further confirmation by the palaeontologist.

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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. I have no interest in secondary or downstream developments as a result of the authorization of this project.

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

24 / 01 / 2019

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

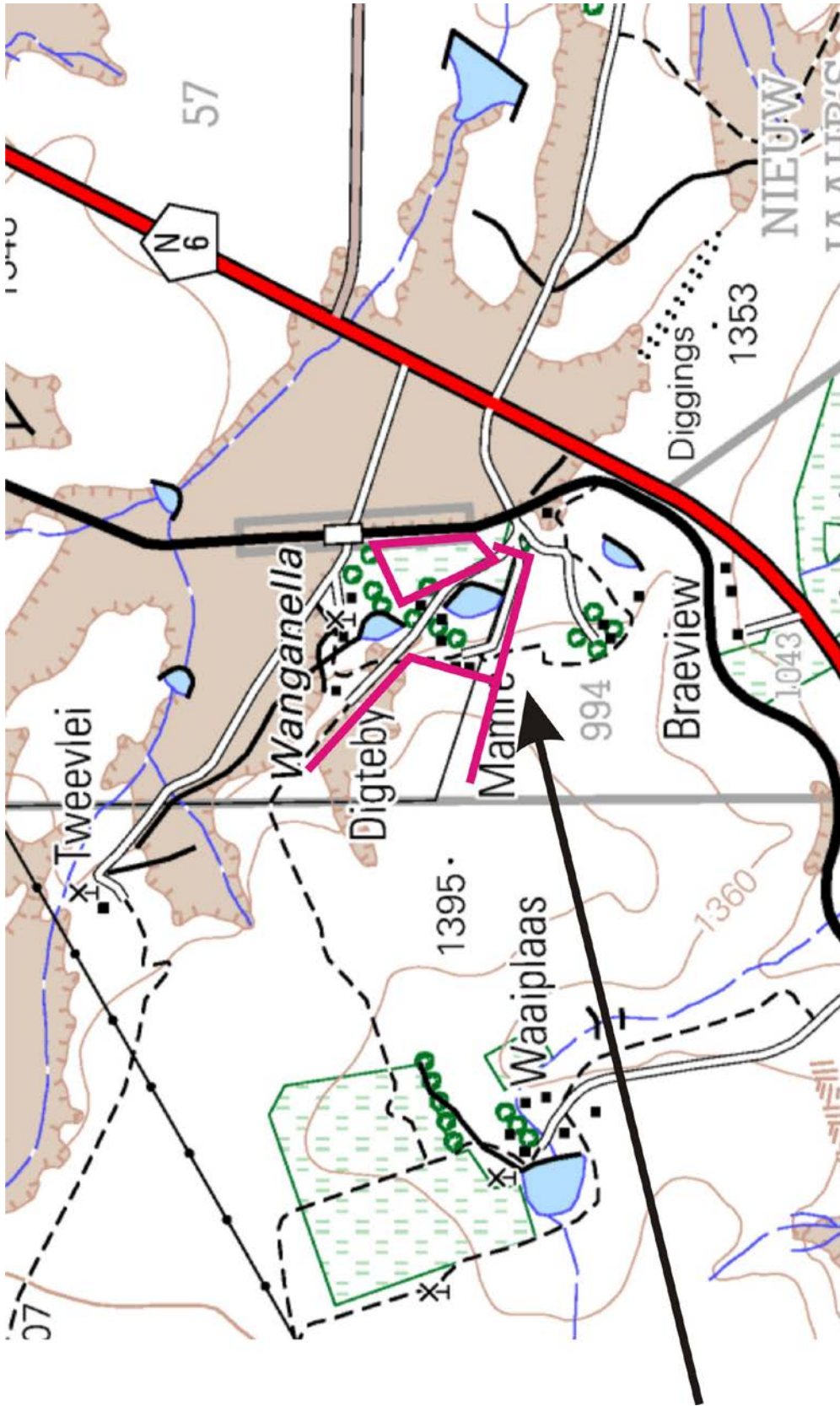


Figure 1. Map of the study area (portion of 1:50 000 scale topographic maps 3026DA Alival North).



Figure 2. General view of the study area, looking north.

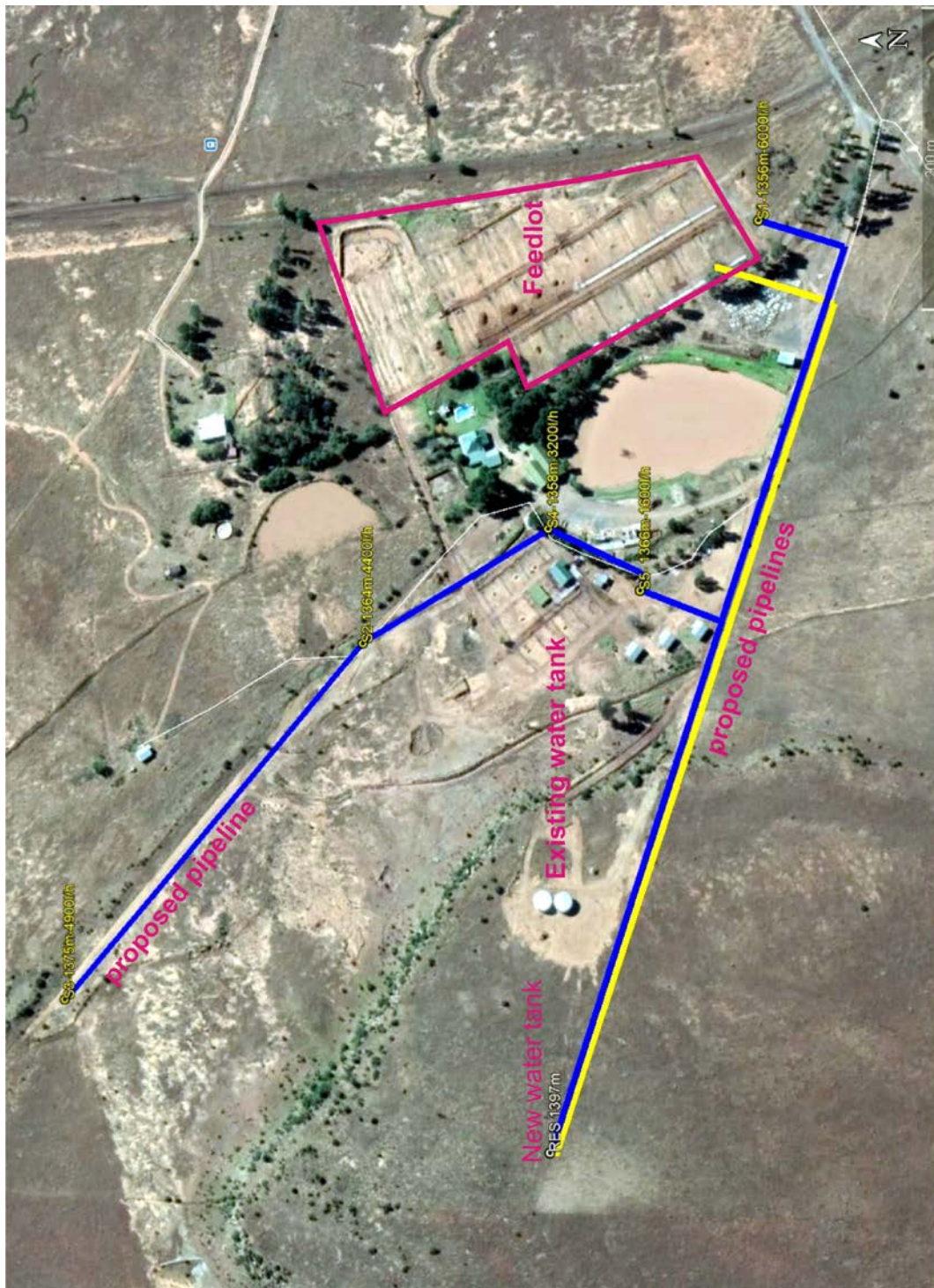


Figure 3. Aerial view of the study area.



GEOLOGIESE LEGENDE

GEOLOGICAL LEGEND

**SEDIMENTÊRE EN VULKANIESE GESTEENTES
SEDIMENTARY AND VOLCANIC ROCKS**

**INTRUSIEWE GESTEENTES
INTRUSIVE ROCKS**

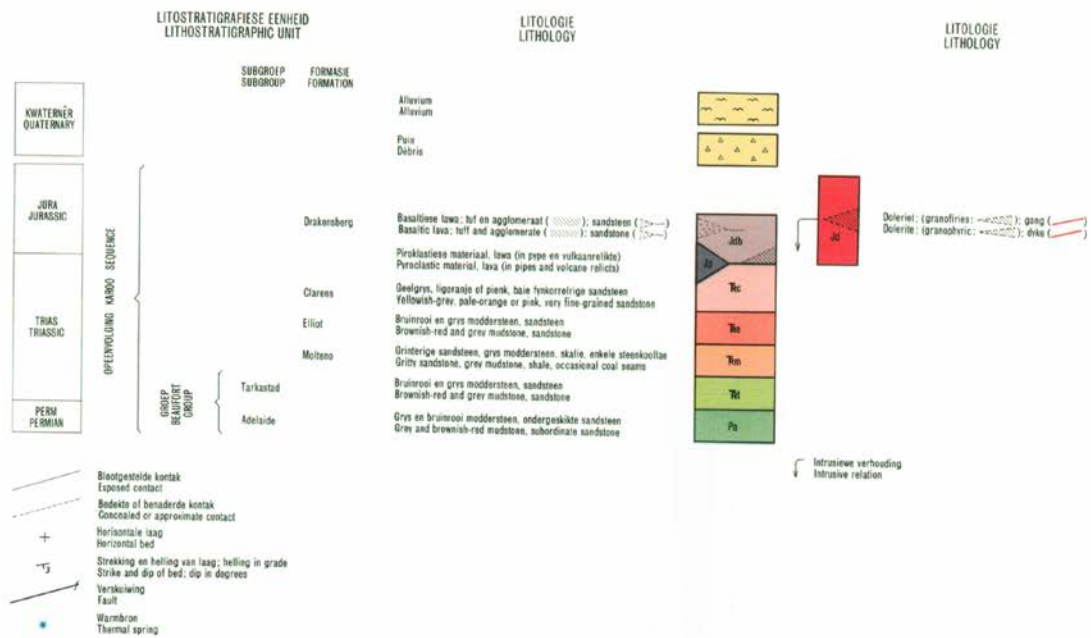


Figure 4. Portion of 1:250 000 scale geological map 3026 Aliwal North. The study area is indicated by the yellow star.

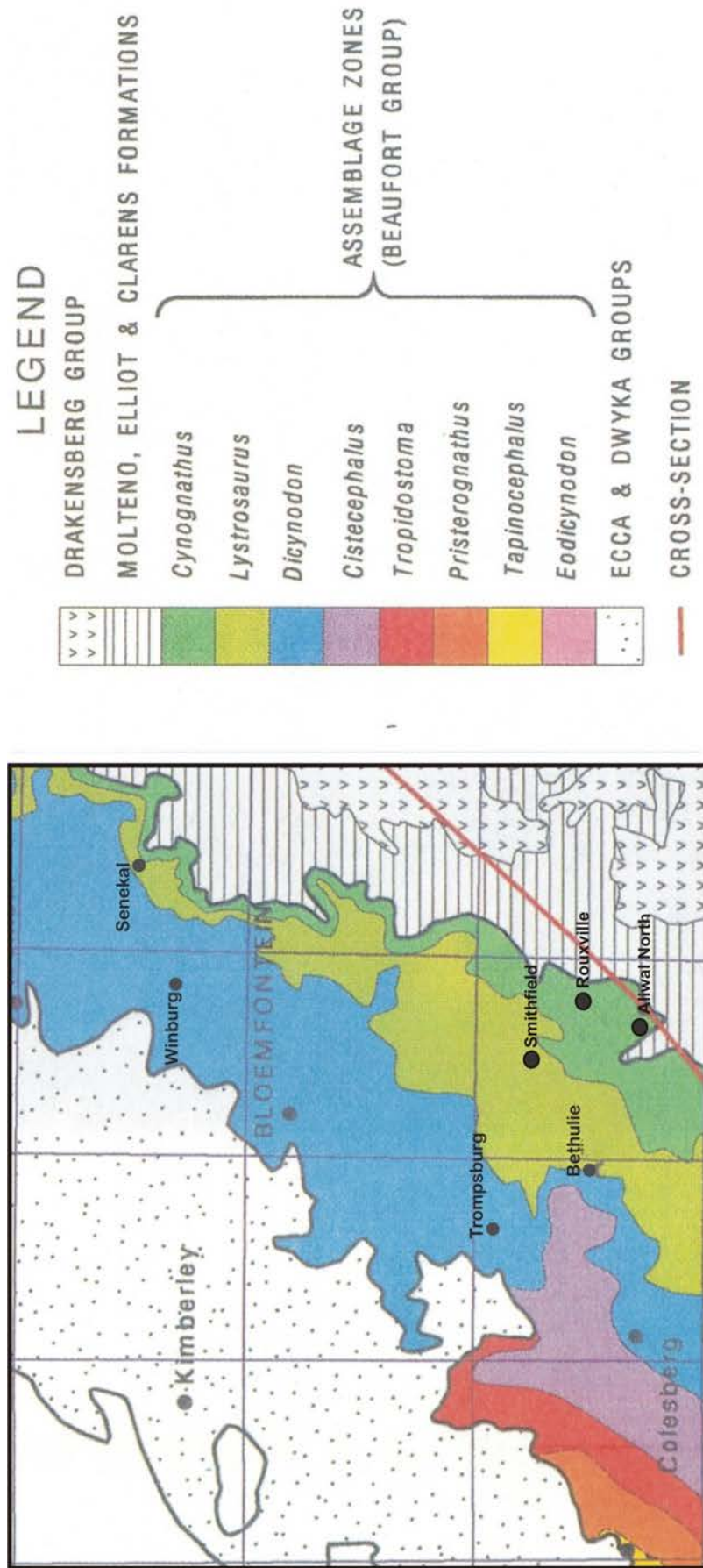


Figure 5. Geographical distribution of vertebrate biozones of the Beaufort Group (after Rubidge 1995).

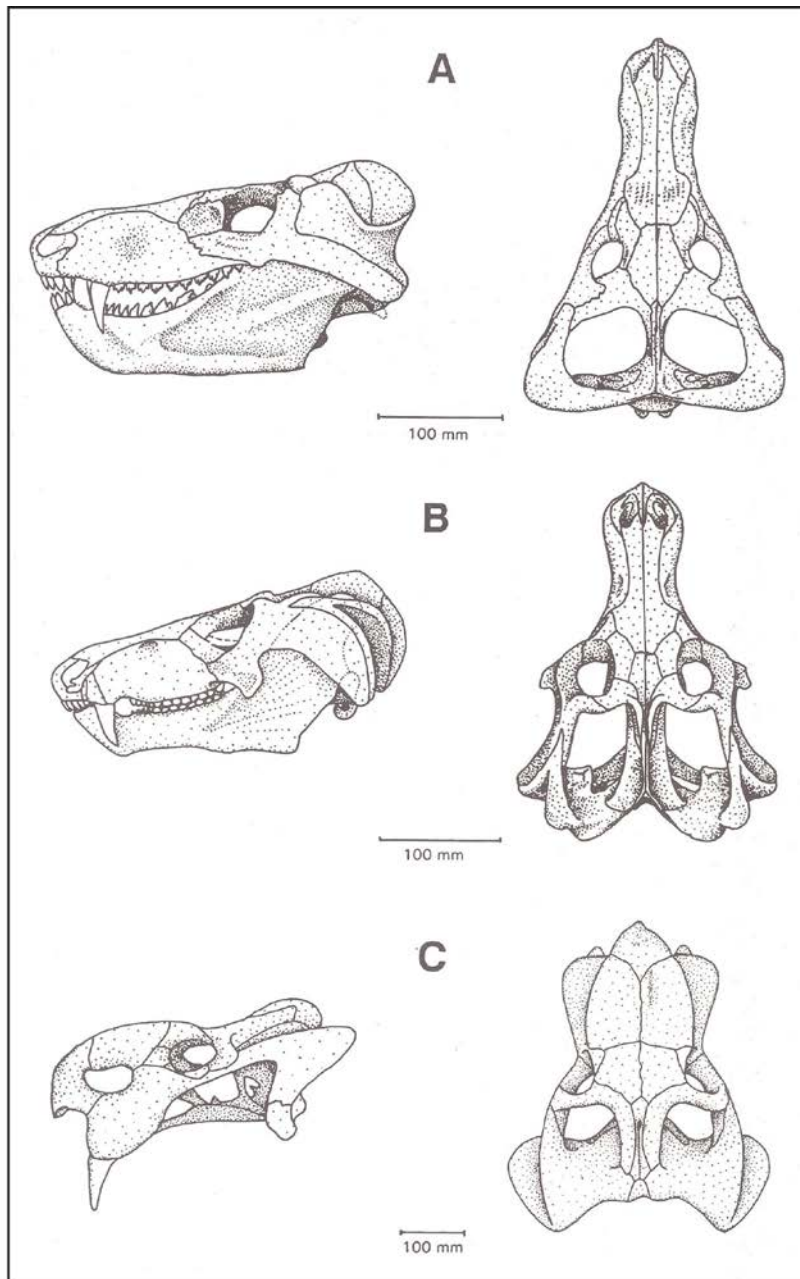
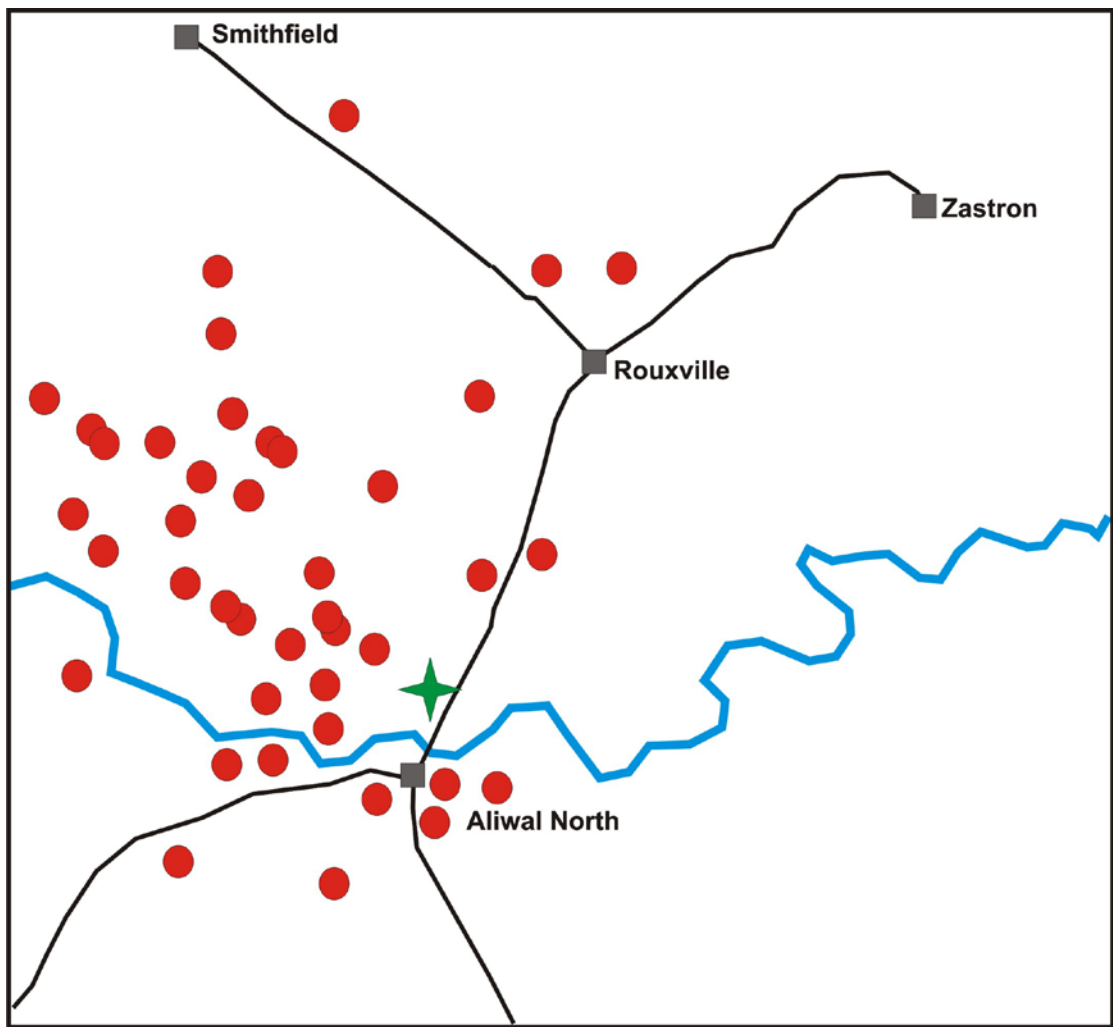


Figure 6. Lateral and dorsal views of biozone-defining fossils of the Cynognathus Assemblage Zone. A) Cynognathus; B) Diademodon; C) Kannemeyeria (after Kitching 1995).



★ Study area

Figure 7. Karoo vertebrate localities recorded between Aliwal North and Rouxville (after Kitching 1977).

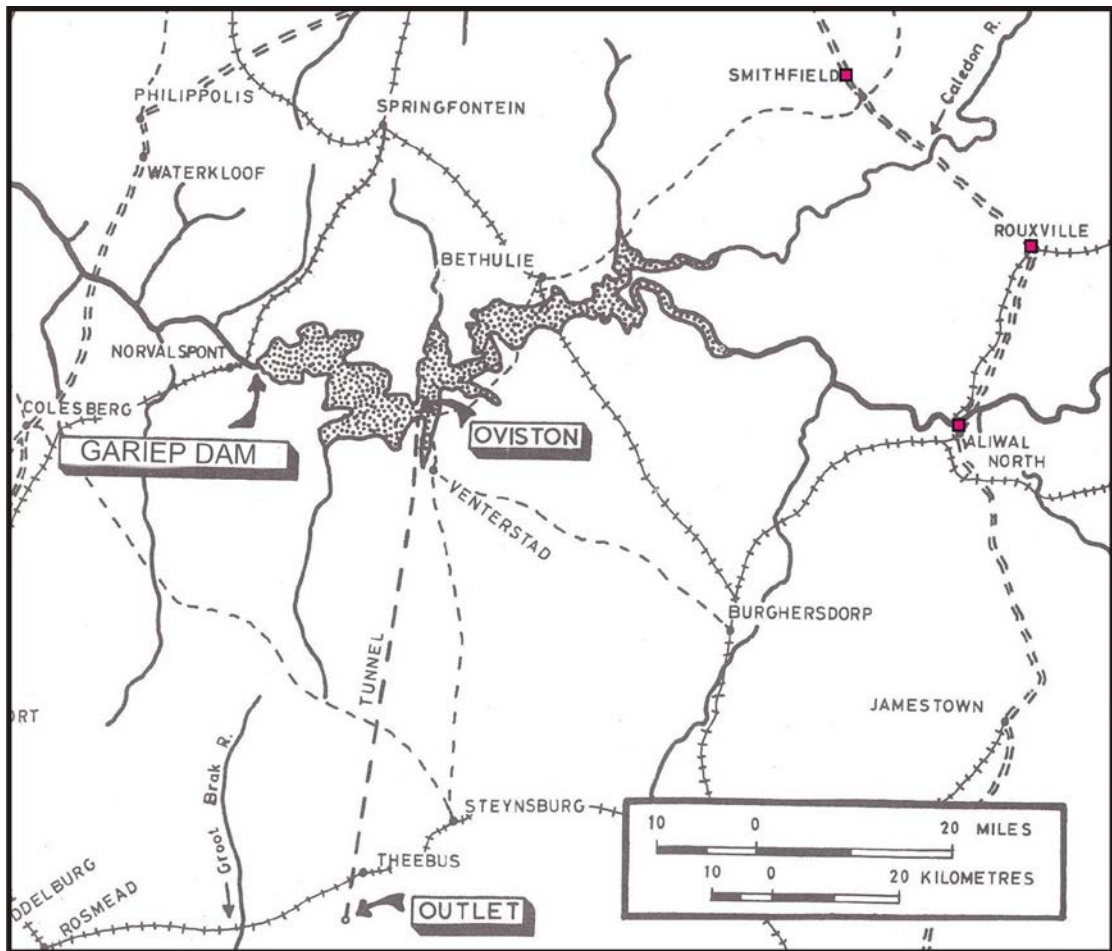


Figure 8. Map of the area surveyed by Sampson during the late 1960's (after Sampson 1968).

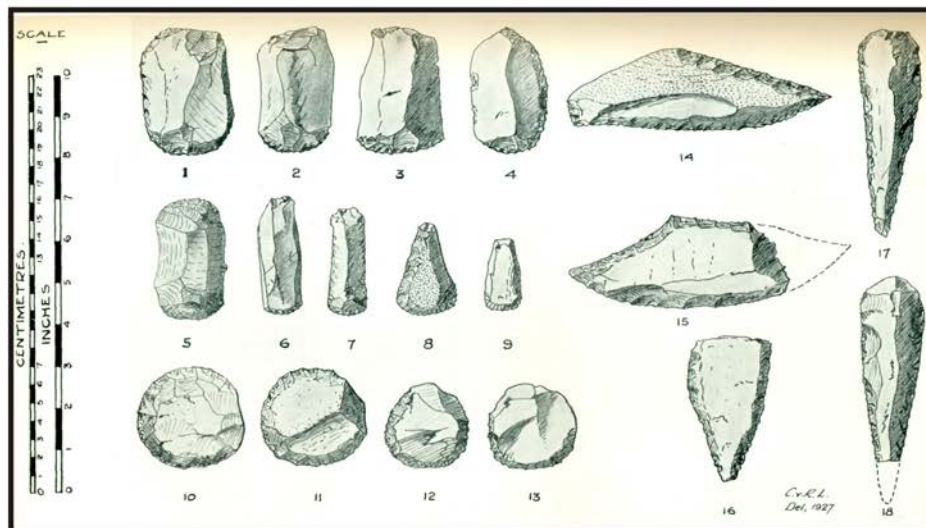
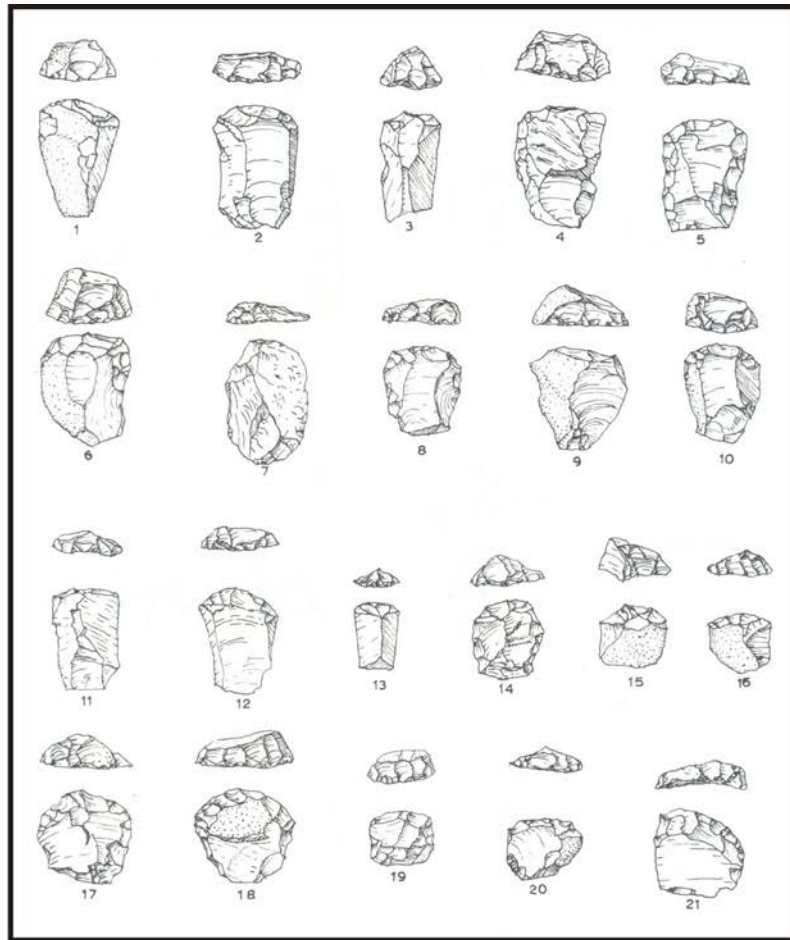


Figure 9. Examples of Smithfield Industry stone tools described from Ventershoek, northeast of Rouxville (above) and the Smithfield Townlands (Smithfield Industrial Complex type site, below).

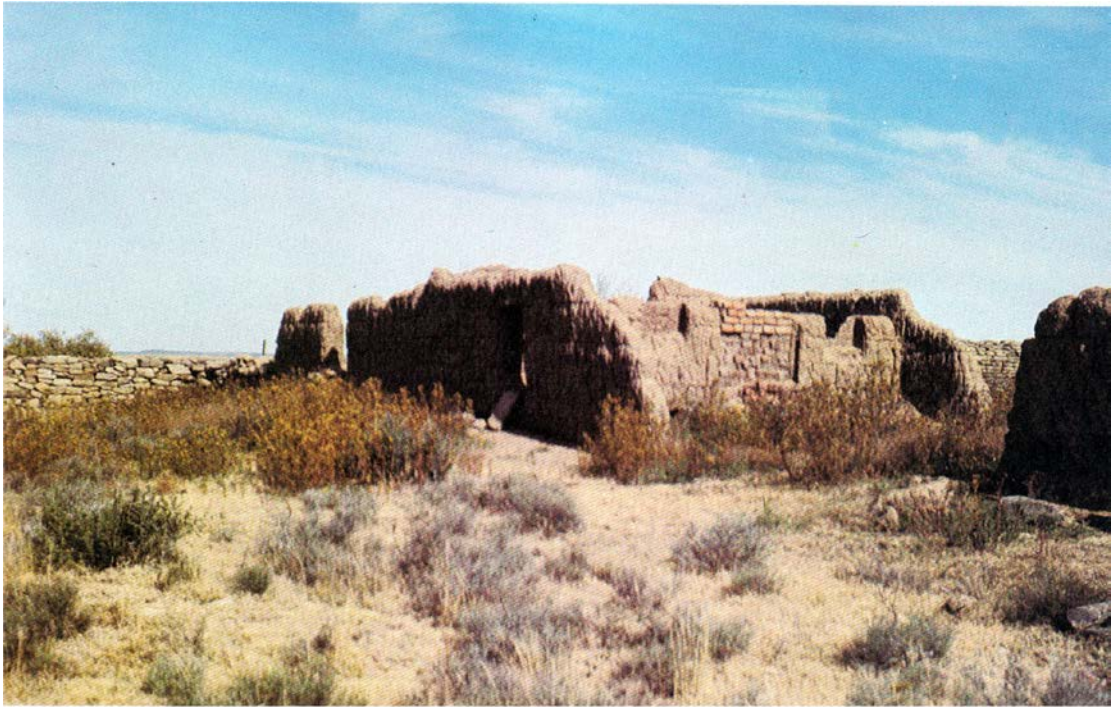


Figure 10. The “kleihuis” ruins at Klipplaatsdrif built ca the 1830’s, one of the earliest Trekboer dwellings north of the Orange River.



Figure 11. Small cemetery, fenced off and visible.



Figure 12. The feedlot area has been severely degraded by previous farming activities.

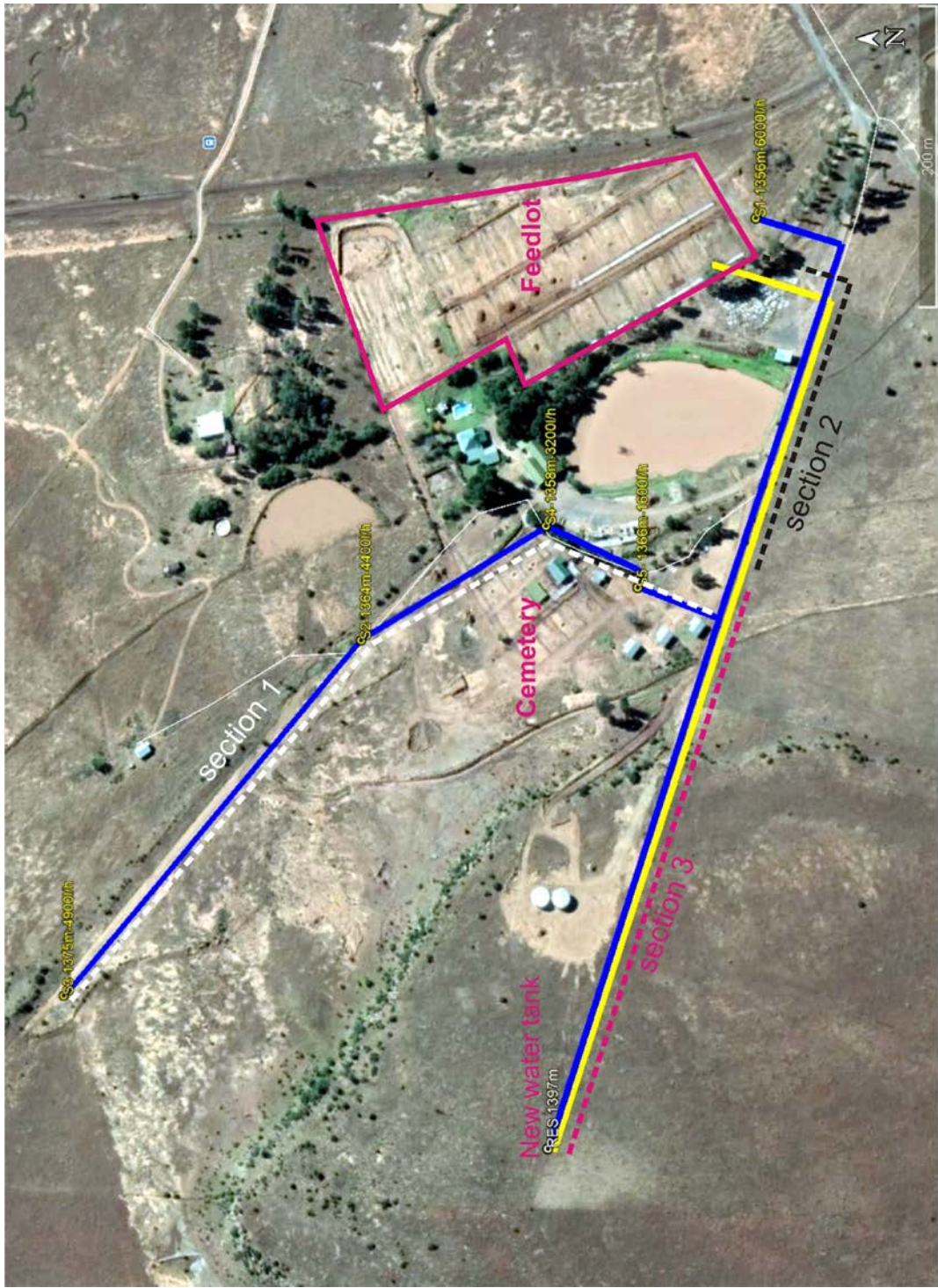


Figure 13. Aerial view of the study area with location of cemetery and relevant pipeline sections indicated.



Figure 14. Condition of pipeline sections 1 (top & center) and 2 (bottom).



Figure 15. Pipeline section 3, located on low topography terrain underlain by intact Tarkastad Subgroup strata.