



ARCHAEOLOGICAL DESKTOP STUDY

for the Proposed Kalkfontein Prospecting Project near Warden, Free State

For:
MENCO (Pty) Ltd

Project Ref:
Kalkfontein PR

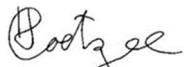
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Archaeological Desktop Study for the Proposed Kalkfontein Prospecting Project near Warden, Free State

Project Ref: Kalkfontein PR
Report No: ME_1206231
Report Version: 1

I, Tobias Coetzee, declare that –

- I act as the independent specialist;
- I am conducting any work and activity relating to the proposed Kalkfontein Prospecting Project in an objective manner, even if this results in views and findings that are not favourable to the client;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have the required expertise in conducting the specialist report and I will comply with legislation, regulations and any guidelines that have relevance to the proposed activity;
- I have not, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this declaration are true and correct.

Author	Qualification	Email	Date	Signature
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Executive Summary

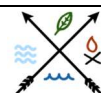
Agri Civils Geo-Tech & Heritage was appointed by Menco (Pty) Ltd to undertake an Archaeological Desktop Study for the proposed prospecting of lime on the Remaining Extents of the Farms Goldia 960, Rietpan 1760, Rooikop 1739, Uitkomst 1736 and the Remaining Extent and Portion 1 of the Farm Uitval 1737 near Warden in the Free State Province. The aim of this report is to contextualise the general study area in terms of heritage resources and will provide the developers with general information regarding potentially sensitive areas. This will also shed light on what is to be expected during a Phase 1 Archaeological Impact Assessment and aid in interpreting finds.

A total of 22 building sites were noted on historical topographical maps and aerial imagery, but since buildings and structures are not always indicated on topographical maps and are not necessarily visible on aerial imagery, additional sites might exist within the demarcated project area. Analysis indicates that 13 of the sites date to historical times, while two sites potentially date to historical times. Four of the historical/potentially historical sites are associated with intact buildings, two are associated with surface remains and nine of the sites seem to have been demolished since no surface infrastructure could be identified on contemporary satellite imagery. Since some sites might be associated with subsurface historical material likely to exceed 60 years of age, the demarcated areas are considered to be sensitive from a heritage perspective. Should building remains dating to historical times be present, the remains might be protected under the National Heritage Resources Act (Act No. 25 of 1999). The 15 historical and potentially historical sites should therefore be avoided by the proposed prospecting activities. Should this not be possible, the sites must first be inspected by a qualified archaeologist.

The remaining seven sites consist of one demolished site, five intact building sites, and one site associated with surface remains. These sites appear not to exceed 60 years of age and are unlikely to be significant from a heritage perspective. However, should impact to the sites be unavoidable, it is recommended that a qualified archaeologist inspect the sites prior to any impact.

Since a significant section of the study area falls within the 500 m river buffer, a zone considered to be potentially sensitive from a heritage perspective, care should be exercised when prospecting. Areas previously/currently associated with cultivated fields are considered to be disturbed and are less sensitive from a heritage perspective. Although the previously/currently cultivated areas are considered to be disturbed, the possibility of encountering subsurface cultural material still exists. Care should therefore still be exercised when prospecting in such areas. The least sensitive areas are areas falling outside of the 500 m river buffer zone, within previously/currently cultivated fields and not within close proximity of potential heritage sites, contemporary infrastructure or shelters.

The possibility also exists that culturally sensitive sites, such as burial sites, might have been created after some cultivated fields fell into disuse, meaning that burial sites might be located on disturbed areas as well. Therefore, should uncertainty regarding heritage remains exist, it is advised that a qualified archaeologist be contacted prior to any impact.



A full Phase 1 Archaeological Impact Assessment must be conducted should any development that triggers an Archaeological Impact Assessment result from the prospecting project, including if the cumulative impact of the proposed prospecting project exceeds 0.5 ha.



List of Abbreviations

AIA – Archaeological Impact Assessment

CRM – Cultural Resource Management

DMR – Department of Mineral Resources

EIA – Environmental Impact Assessment

ESA – Early Stone Age

ha – Hectare

HIA – Heritage Impact Assessment

km – Kilometre

LIA – Late Iron Age

LSA – Later Stone Age

m – Metre

MASL – Metres Above Sea Level

MEC – Member of the Executive Council

MSA – Middle Stone Age

NHRA – National Heritage Resources Act

SAHRA – South African Heritage Resources Agency

SAHRIS – South African Heritage Resources Information System



Table of Contents

Executive Summary	3
List of Abbreviations	5
1. Project Background	8
1.1 Introduction.....	8
1.2 Legislation	10
1.2.1 The EIA (Environmental Impact Assessment) and AIA processes	10
1.2.2 Legislation regarding archaeology and heritage sites	11
2. Study Area and Project Description	14
2.1 Location & Physical Environment	14
2.2 Project Description	18
3. Methodology	19
3.1 Limitations	23
4. Archaeological Background	23
4.1 The Stone Age.....	23
4.2 The Iron Age & Historical Period	24
4.2.1 Warden Archaeo-History	25
5. Sources of Information	25
5.1 Historical aerial Imagery and topographical maps.....	25
5.2 Previous Heritage Studies	28
5.3 SAHRIS Database.....	28
5.4 Ceramics associated with the study area	29
5.5 Examples of Heritage Sites	29
6. Archaeological and Historical Remains	33
6.1 Stone Age Remains.....	33
6.2 Iron Age Farmer Remains	33
6.3 Historical Remains.....	33
6.4 Contemporary Remains.....	34
6.5 Graves.....	34
7. Evaluation	35
7.1 Field Ratings.....	35
8. Statement of Significance & Recommendations	36
8.1 Statement of Significance.....	36
8.2 Recommendations.....	39
9. Conclusion	40
10. Addendum: Terminology	41
11. References	42
Appendix A: Historical Aerial Imagery & Topographical Maps	A



List of Figures

Figure 1: Regional and provincial location of the study area.....	9
Figure 2: Segments of SA 1:50 000 2728 DB and 2729 CA indicating the area demarcated for prospecting.	16
Figure 3: Proposed prospecting area portrayed on a 2020 satellite image.....	17
Figure 4: Preliminary Drill Site Plan (Provided by Menco 2023).	19
Figure 5: Potential Sites.....	21
Figure 6: Site Status.	22
Figure 7: ESA artefacts (Mazel 1989).....	29
Figure 8: MSA artefacts (Mazel 1989).	29
Figure 9: LSA artefacts (Mazel 1989).	30
Figure 10: Example of undecorated Iron Age potsherds.....	30
Figure 11: Example of a decorated Iron Age potsherd.....	30
Figure 12: Example of dilapidated linear walling.....	31
Figure 13: Example of a stone-walled Iron Age site.....	31
Figure 14 : Example of a broken lower grinding stone dating to the LIA.....	31
Figure 15: Example of a dilapidated stone-walled site dating to the LIA.....	32
Figure 16: Example of a historical building.	32
Figure 17: Example of a potential informal grave.....	32
Figure 18: Site Sensitivity.....	38
Figure 19: 1957 Aerial image of the study area.	B
Figure 20: 1963 Aerial image of the study area.	C
Figure 21: Segments of 1969 and 1971 1:50 000 2728 DB and 2729 CA indicating the study area.	D
Figure 22: 1975 Aerial image of the study area.	E
Figure 23: Segments of 1978 and 1987 1:50 000 2728 DB and 2729 CA indicating the study area.	F
Figure 24: 1991 Aerial image of the study area.	G
Figure 25: Segments of 2004 1:50 000 2728 DB & 2729 CA indicating the study area.....	H

List of Tables

Table 1: Land parcels & coordinates.....	14
Table 2: Potential Sites.....	20
Table 3: Site age & type as identified on historical aerial images and topographical maps.	27
Table 4: Historical Sites.....	34
Table 5: Contemporary Sites.....	34
Table 6: Prescribed Field Ratings.....	35
Table 7: Sensitive Sites.....	37



1. Project Background

1.1 Introduction

MENCO (Pty) Ltd appointed Agri Civils Geo-Tech & Heritage to undertake an Archaeological Desktop Study for the proposed Kalkfontein Prospecting Project on the Remaining Extents of the Farms Goldia 960, Rietpan 1760, Rooikop 1739, Uitkomst 1736 and the Remaining Extent and Portion 1 of the Farm Uitval 1737 within the Thabo Mofutsanyane District Municipality in the Free State Province. The study area is located roughly 15 km north-northeast of Warden (**Figure 1 & Table 1**). The purpose of this study is to contextualise the demarcated study area in order to determine the scope of heritage resources that might be encountered during the prospecting phase and subsequent heritage studies, as well as to provide recommendations for the safeguarding of archaeological resources during prospecting. The aim of this report is to provide the developer with information regarding heritage resources in the vicinity of the study area based on results from previous studies, written historical information and historical topographical maps and aerial photographs.

In the following report, a broad overview of the proposed prospecting right application for lime is provided and the study area is contextualised in terms of heritage resources. The legislation section included serves as a guide towards the effective identification and protection of heritage resources and will apply to any such material unearthed during the prospecting phase.



1.2 Legislation

The South African Heritage Resources Agency (SAHRA) aims to conserve and control the management, research, alteration and destruction of cultural resources of South Africa and to prosecute if necessary. It is therefore crucially important to adhere to heritage resource legislation contained in the Government Gazette of the Republic of South Africa (Act No.25 of 1999), as many heritage sites are threatened daily by development. Conservation legislation requires an impact assessment report to be submitted for development authorisation that must include an AIA if triggered.

Archaeological Impact Assessments (AIAs) should be done by qualified professionals with adequate knowledge to (a) identify all heritage resources that might occur in areas of development and (b) make recommendations for protection or mitigation of the impact of the sites.

1.2.1 The EIA (Environmental Impact Assessment) and AIA processes

Phase 1 Archaeological Impact Assessments generally involve the identification of sites during a field survey with assessment of their significance, the possible impact that the development might have, and relevant recommendations.

All Archaeological Impact Assessment reports should include:

- a. Location of the sites that are found;
- b. Short descriptions of the characteristics of each site;
- c. Short assessments of how important each site is, indicating which should be conserved and which mitigated;
- d. Assessments of the potential impact of the development on the site(s);
- e. In some cases a shovel test, to establish the extent of a site, or collection of material, to identify the associations of the site, may be necessary (a pre-arranged SAHRA permit is required); and
- f. Recommendations for conservation or mitigation.

This AIA report is intended to inform the client about the legislative protection of heritage resources and their significance and make appropriate recommendations. It is essential to also provide the heritage authority with sufficient information about the sites to enable the authority to assess with confidence:

- a. Whether or not it has objections to a development;
- b. What the conditions are upon which such development might proceed;
- c. Which sites require permits for mitigation or destruction;



- d. Which sites require mitigation and what this should comprise;
- e. Whether sites must be conserved and what alternatives can be proposed to relocate the development in such a way as to conserve other sites; and
- f. What measures should or could be put in place to protect the sites which should be conserved.

When a Phase 1 AIA is part of an EIA, wider issues such as public consultation and assessment of the spatial and visual impacts of the development may be undertaken as part of the general study and may not be required from the archaeologist. If, however, the Phase 1 project forms a major component of an AIA it will be necessary to ensure that the study addresses such issues and complies with Section 38 of the National Heritage Resources Act.

1.2.2 Legislation regarding archaeology and heritage sites

National Heritage Resource Act No.25 of April 1999

Buildings are among the most enduring features of human occupation, and this definition therefore includes all buildings older than 60 years, modern architecture as well as ruins, fortifications and Farming Community settlements. The Act identifies heritage objects as:

- objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects, meteorites and rare geological specimens;
- visual art objects;
- military objects;
- numismatic objects;
- objects of cultural and historical significance;
- objects to which oral traditions are attached and which are associated with living heritage;
- objects of scientific or technological interest;
- books, records, documents, photographic positives and negatives, graphic material, film or video or sound recordings, excluding those that are public records as defined in section 1(xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996), or in a provincial law pertaining to records or archives;
- any other prescribed category.



With regards to activities and work on archaeological and heritage sites this Act states that:

“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.” (34. [1] 1999:58)

and

“No person may, without a permit issued by the responsible heritage resources authority:

- (a) 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;*
- (c) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or*
- (d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.”(35. [4] 1999:58)*

and

“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;*
- (c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) and excavation equipment, or any equipment which assists in the detection or recovery of metals.” (36. [3] 1999:60)*

On the development of any area the gazette states that:

“...any person who intends to undertake a development categorised as:

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



- i. *exceeding 5000m² in extent; or*
 - ii. *involving three or more existing erven or subdivisions thereof; or*
 - iii. *involving three or more erven or divisions thereof which have been consolidated within the past five years; or*
 - iv. *the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;*
- (d) *the re-zoning of a site exceeding 10000m² in extent; or*
- (e) *any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.” (38. [1] 1999:62-64)*

and

“The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection (2)(a): Provided that the following must be included:

- (a) *The identification and mapping of all heritage resources in the area affected;*
- (b) *an assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6(2) or prescribed under section 7;*
- (c) *an assessment of the impact of the development on such heritage resources;*
- (d) *an evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;*
- (e) *the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;*
- (f) *if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and*
- (g) *plans for mitigation of any adverse effects during and after the completion of the proposed development.” (38. [3] 1999:64)*

Human Tissue Act and Ordinance 7 of 1925



The Human Tissues Act (Act No. 65 of 1983) and Ordinance on the Removal of Graves and Dead Bodies (Ordinance 7 of 1925) protects graves younger than 60 years. These fall under the jurisdiction of the National Department of Health and the Provincial Health Departments. Approval for the exhumation and re-burial must be obtained from the relevant Provincial MEC as well as the relevant Local Authorities. Graves 60 years or older fall under the jurisdiction of the National Heritage Resources Act as well as the Human Tissues Act, 1983.

2. Study Area and Project Description

2.1 Location & Physical Environment

The proposed Kalkfontein Prospecting Project is situated on the land parcels listed in **Table 1** and is illustrated in **Figures 2 & 3**.

Table 1: Land parcels & coordinates.

No	Property	Portion	Map Reference (1:50 000)	Lat (y)	Lon (x)	Extent (ha)
1	Rietpan 1760	RE/1760	2728DB & 2729CA	-27.674099	28.999387	428.2
2	Uitkomst 1736	RE/1736	2728DB & 2729CA	-27.713866	29.016736	340.6
3	Uitval 1737	RE/1737	2728DB & 2729CA	-27.708725	28.999277	331.2
4	Uitval 1737	1/1737	2728DB	-27.703184	28.986236	38.5
5	Rooikop 1739	RE/1739	2728DB & 2729CA	-27.697827	29.008722	526.7
6	Goldia 960	RE/960	2729CA	-27.686606	29.017493	217.5
Total Extent						1882.6

Warden is located roughly 15 km to the south-southwest of the proposed prospecting area, while Reitz is located 61 km to the west and Vrede 32 km to the northeast. The study area falls within the Phumelela Local Municipality and the Thabo Mofutsanyane District Municipality within the Free State Province. The R103 secondary road runs in a north-south direction and intersects the western-most section of the demarcated study area.

In terms of vegetation, the study area falls within the Grassland Biome and Mesic Highveld Grassland Bioregion. On a local scale, the study area falls within the Eastern Free State Sandy Grassland vegetation unit (Mucina & Rutherford 2006).

Eastern Free State Sandy Grassland is found in the Free State Province, Lesotho and marginally in the KwaZulu-Natal Province. The vegetation unit stretches from Ladybrand in the West to the foothills of the Drakensberg and from the escarpment in the vicinity of Harrismith in the east to Mafeteng in the south. This type of vegetation is considered to be endangered and has a conservation target of 24%. Roughly 2% are statutorily conserved in the Qwaqwa and Golden Gate Highlands National Parks and in the Sterkfontein Dam Nature Reserve. Almost half of the vegetation unit has been transformed for cultivation and the building of dams. Erosion generally varies between very low, low, moderate and high (Mucina & Rutherford 2006).



According to Mucina & Rutherford (2006), the average elevation for Eastern Free State Sandy Grassland ranges from 1520 to 1800 Metres Above Sea Level (MASL), but reaches 2020 MASL in some places. The average elevation of the study area is 1670 MASL and generally slopes from the more elevated eastern and western sections to the lower middle section.

The study area falls within the summer rainfall region and the average annual rainfall is roughly 771 mm. The average annual temperature is 14.6 °C. The average summer temperature is 18.7 °C, while the winter temperature averages 7.9 °C (Climate-data.org accessed 03/06/2023).

The study area falls within in the C82E quaternary catchment of the Vaal Water Management Area. The Holspruit perennial river intersects the Remaining Extents of the Farms Goldia 960 and Rietpan 1760, while numerous non-perennial offshoots intersect the remaining farm portions. The Vaal Dam is located approximately 90 km to the northwest of the study area and the Sterkfontein Dam 74 km to the south.

Access to the demarcated study area appears to be through local roads turning from the R103 secondary road. The majority of the study area appears to consist of open veldt, while several currently / previously cultivated sections were noted as well. The land use of the undisturbed sections is unknown, but is likely to be utilised as pasture for cattle. The general surroundings appear to be associated with crop cultivation and farming related activities. Several buildings are also visible on the Remaining Extents of the farms Uitkomst 1736, Rooikop 1739, as well as on the Remaining Extent and Portion 1 of the Farm Uitval 1737.



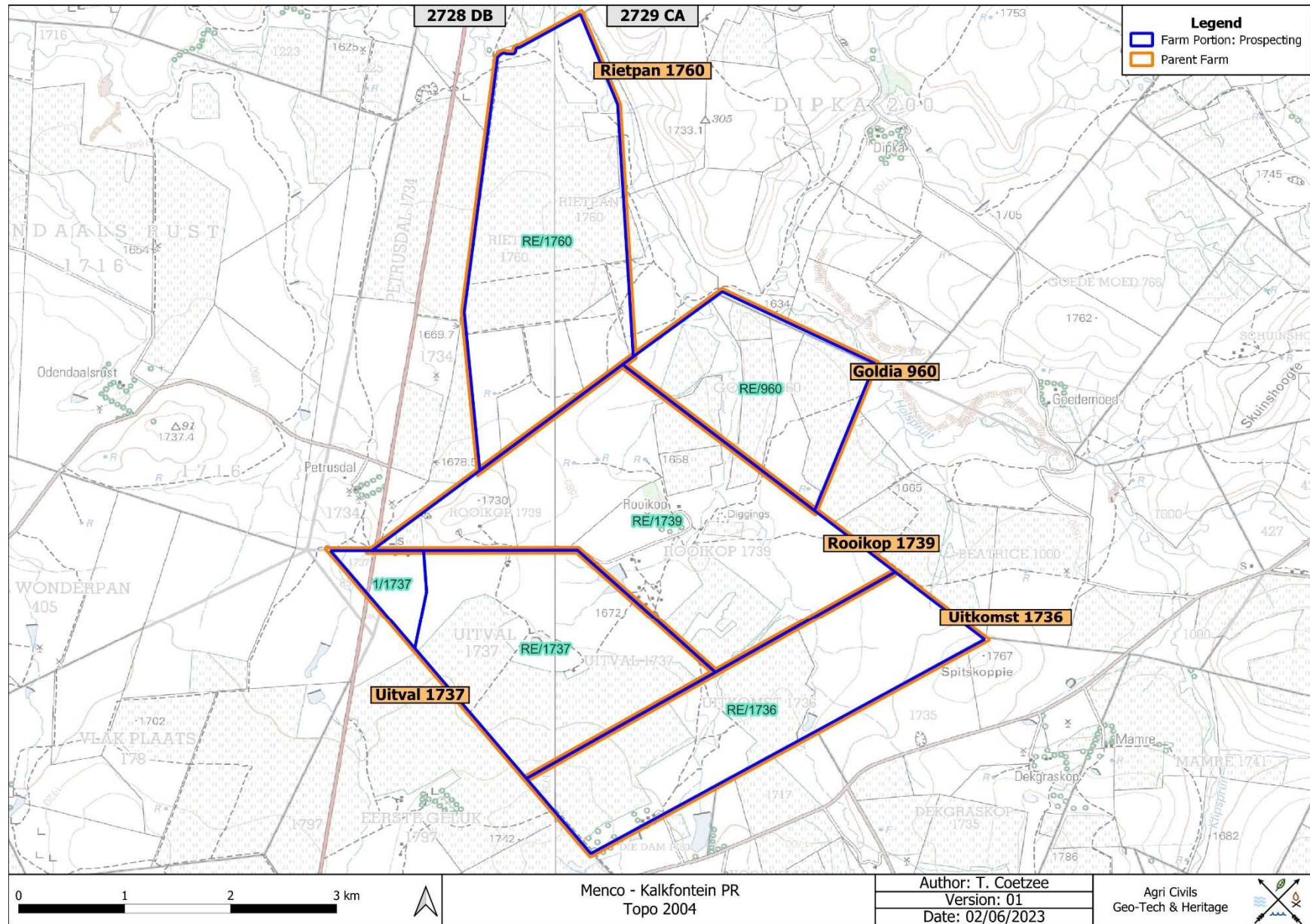


Figure 2: Segments of SA 1:50 000 2728 DB and 2729 CA indicating the area demarcated for prospecting.



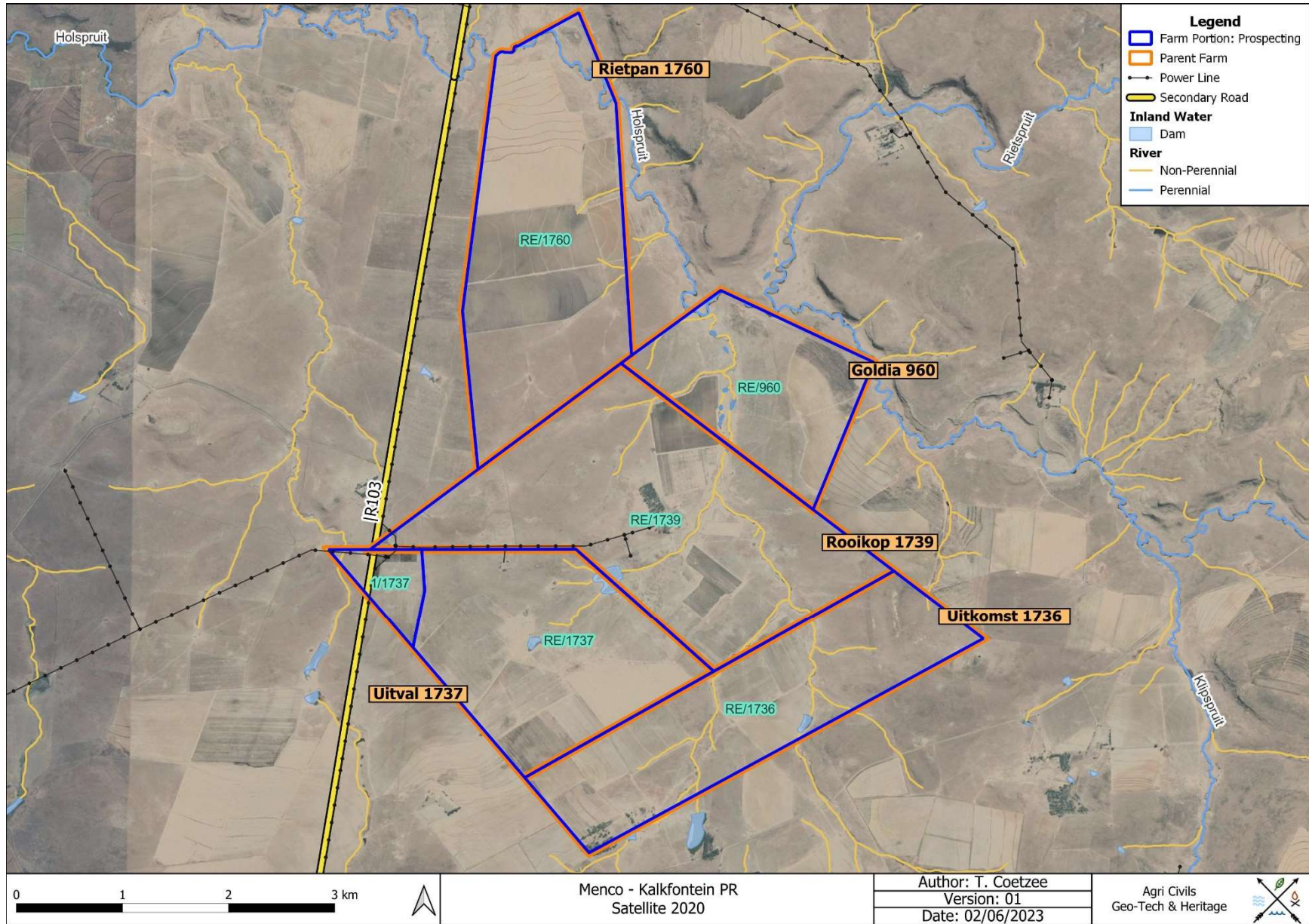


Figure 3: Proposed prospecting area portrayed on a 2020 satellite image.



2.2 Project Description

The prospecting right application for lime covers approximately 1882.6 ha and the preliminary drill site plan is illustrated by **Figure 4**. The following description of the planned activities was supplied by Menco (2023):

“Planned non-invasive activities

Phase 1 of the non-invasive prospecting work will take approximately four months and will compile the relevant data and observations from the historical survey work coupled with detailed mapping and ground magnetometer survey of the limestone units. The deliverables will be a detailed report and maps highlighting areas with the best potential for high grade limestone deposits.

Phase 5 of the non-invasive prospecting will consist of off-site metallurgical test work, at MINTEK or similar facility. This work will investigate the crushing and grinding equipment required to produce a pulp of 80% less than 45µm. The reactivity of the pulp with sulphuric acid will also be tested to ascertain the suitability of the material for acid neutralisation. A suitably sized and representative sample for the metallurgical test work will be obtained from compositing all the borehole intersections.

Phase 6 of the non-invasive prospecting will be developing a preliminary economic assessment to be further discussed.

Planned invasive activities

Phase 2 of the invasive prospecting will initially consist of surface limestone sampling on a regular grid over areas that have been defined as limestone bearing outcrop at the surface. The samples will have to be taken from the surface and in some instances pitting to penetrate the wind-blown sand that is common in this area. This may involve digging a small shallow hole (<2m deep) to sample the limestone bedrock. The hole will be rehabilitated immediately after the sample is taken. The sample lines will be traversed by foot so no new tracks will be formed by the field vehicles. The samples will be analysed for their calcium carbonate content. The data will be interpreted and an anomaly map developed of the most prospective areas.

It should be clearly noted that each step or phase of the prospecting activities depends on encouraging results from the previous step.”



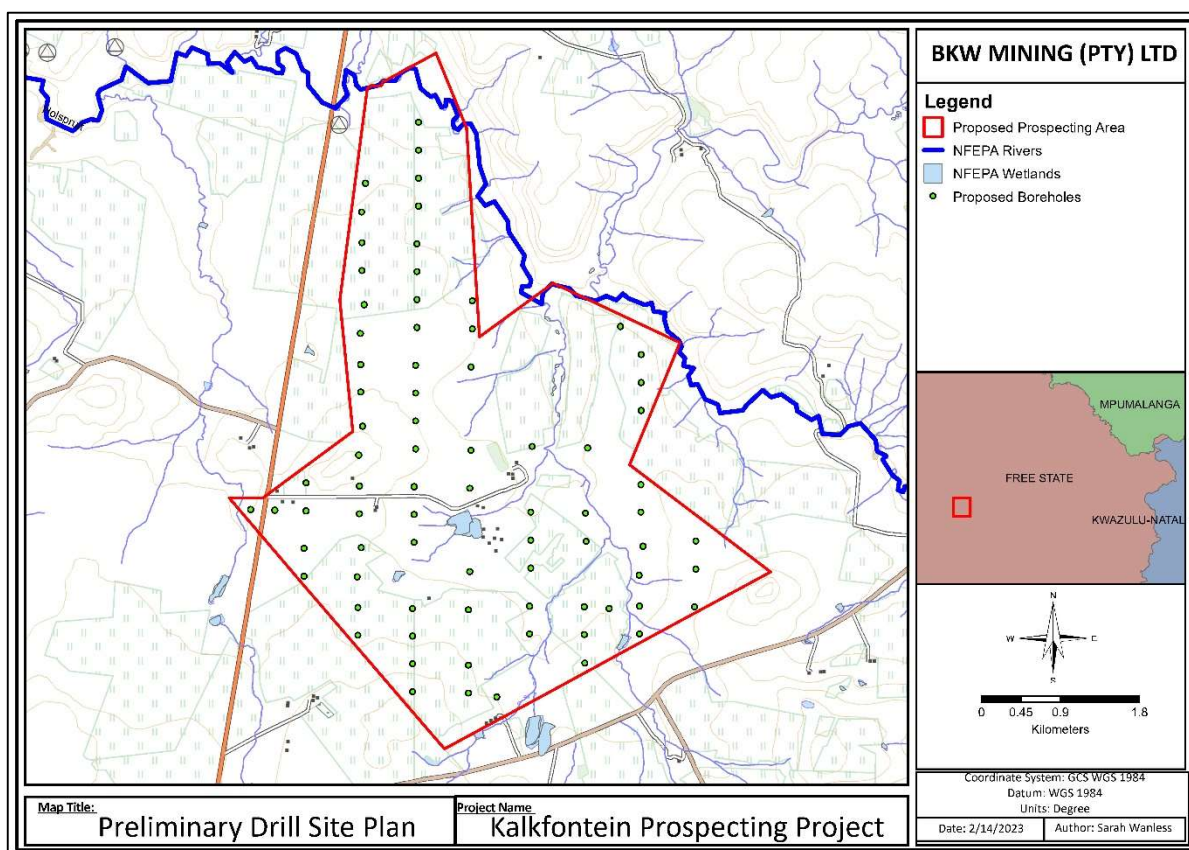


Figure 4: Preliminary Drill Site Plan (Provided by Menco 2023).

3. Methodology

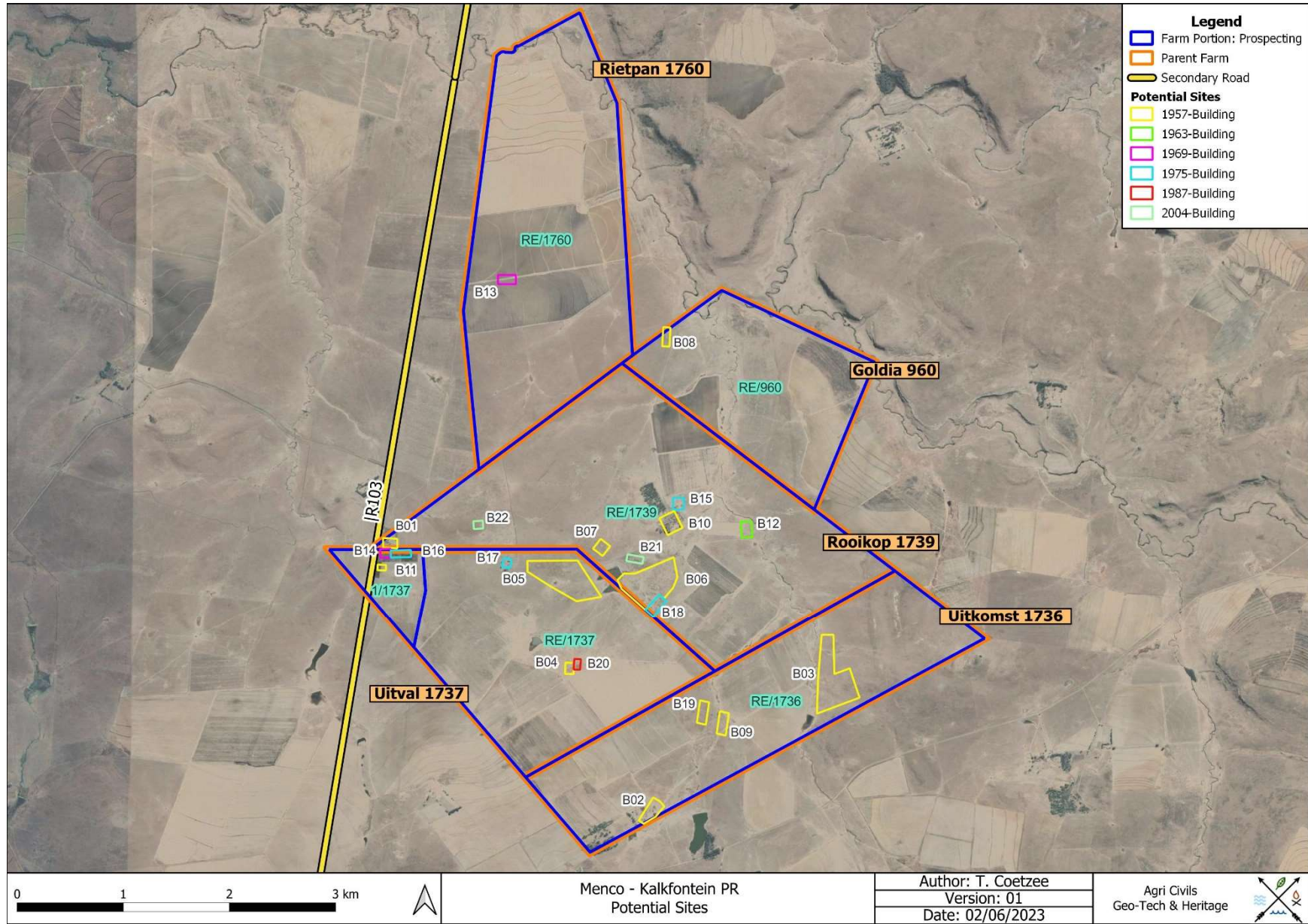
Archaeological reconnaissance of the study area was conducted by means of inspecting historical aerial imagery and topographical maps in order to identify potential heritage remains (**Appendix A**). The historical topographical datasets dating to 1969, 1971, 1978, 1987, and 2004, as well as the historical aerial images dating to 1957, 1963, 1975, and 1991, proved useful in terms of providing an indication of potential heritage sites and past land uses associated with the study area. Twenty-two (22) potential sites were observed within the demarcated boundary using these data sources (**Table 2 & Figure 5**). It should be noted that the prefixes '2728DB' and '2729CA' are not used when referring to the site names due to the length of the names, but are recorded as such in **Tables 2 & 7**. Based on contemporary satellite imagery, 10 of the sites (B03, B05, B07 – B09, B11 – B13, B19, B20) appear to have been demolished since no surface remains are visible (**Figures 6**), while some surface remains are visible at three of the sites (B04, B14, B22) and intact buildings at nine of the sites (B01, B02, B06, B10, B15 – B18, B21). The total area inspected was 1882.6 ha. Since heritage resources are often associated with water sources such as perennial and non-perennial rivers/streams, these water sources were buffered by a distance of 500 m, indicating a potentially sensitive area (**Figure 18**). The areas previously/currently associated with cultivated land were traced and plotted as shown on topographical maps, indicating disturbed areas that are less sensitive from a heritage perspective (**Figure 18**).



Table 2: Potential Sites.

Site No	Type	Parent Farm	Farm Portion	Current Status	Age	Estimated Extent (ha)	Lat (y)	Lon (x)
2728DB-B01	Building	Rooikop 1739	RE/1739	Intact Building	Historical	1.1	-27.699794	28.986190
2729CA-B02	Building	Uitkomst 1736	RE/1736	Intact Building	Historical	2.4	-27.722505	29.008322
2729CA-B03	Building	Uitkomst 1736	RE/1736	No Visible Remains	Historical	14.2	-27.711418	29.023672
2729CA-B04	Building	Uitval 1737	RE/1737	Surface Remains	Historical	0.7	-27.710457	29.001363
2729CA-B05	Building	Uitval 1737	RE/1737	No Visible Remains	Historical	14.2	-27.702765	29.000970
2729CA-B06	Building	Rooikop 1739	RE/1739	Intact Building	Historical	13.4	-27.703163	29.008188
2729CA-B07	Building	Rooikop 1739	RE/1739	No Visible Remains	Historical	1.2	-27.700155	29.004084
2729CA-B08	Building	Goldia 960	RE/960	No Visible Remains	Historical	1.1	-27.682318	29.009560
2729CA-B09	Building	Uitkomst 1736	RE/1736	No Visible Remains	Historical	1.6	-27.715107	29.014339
2729CA-B10	Building	Rooikop 1739	RE/1739	Intact Building	Historical	2.4	-27.698088	29.009949
2728DB-B11	Building	Uitval 1737	1/1737	No Visible Remains	Historical	0.4	-27.701861	28.985474
2729CA-B12	Building	Rooikop 1739	RE/1739	No Visible Remains	Historical	1.3	-27.698631	29.016356
2728DB-B13	Building	Rietpan 1760	RE/1760	No Visible Remains	Potentially Historical	1.3	-27.677462	28.996070
2728DB-B14	Building	Uitval 1737	1/1737	Surface Remains	Potentially Historical	0.7	-27.700657	28.985790
2729CA-B15	Building	Rooikop 1739	RE/1739	Intact Building	Contemporary	1.0	-27.696448	29.010586
2728DB-B16	Building	Uitval 1737	1/1737	Intact Building	Contemporary	1.1	-27.700694	28.987092
2728DB-B17	Building	Uitval 1737	RE/1737	Intact Building	Contemporary	0.6	-27.701477	28.996063
2729CA-B18	Building	Rooikop 1739	RE/1739	Intact Building	Contemporary	1.6	-27.705113	29.008684
2729CA-B19	Building	Uitkomst 1736	RE/1736	No Visible Remains	Historical	1.6	-27.714187	29.012661
2729CA-B20	Building	Uitval 1737	RE/1737	No Visible Remains	Contemporary	0.5	-27.710114	29.002017
2729CA-B21	Building	Rooikop 1739	RE/1739	Intact Building	Contemporary	0.9	-27.701140	29.006908
2728DB-B22	Building	Rooikop 1739	RE/1739	Surface Remains	Contemporary	0.6	-27.698240	28.993644





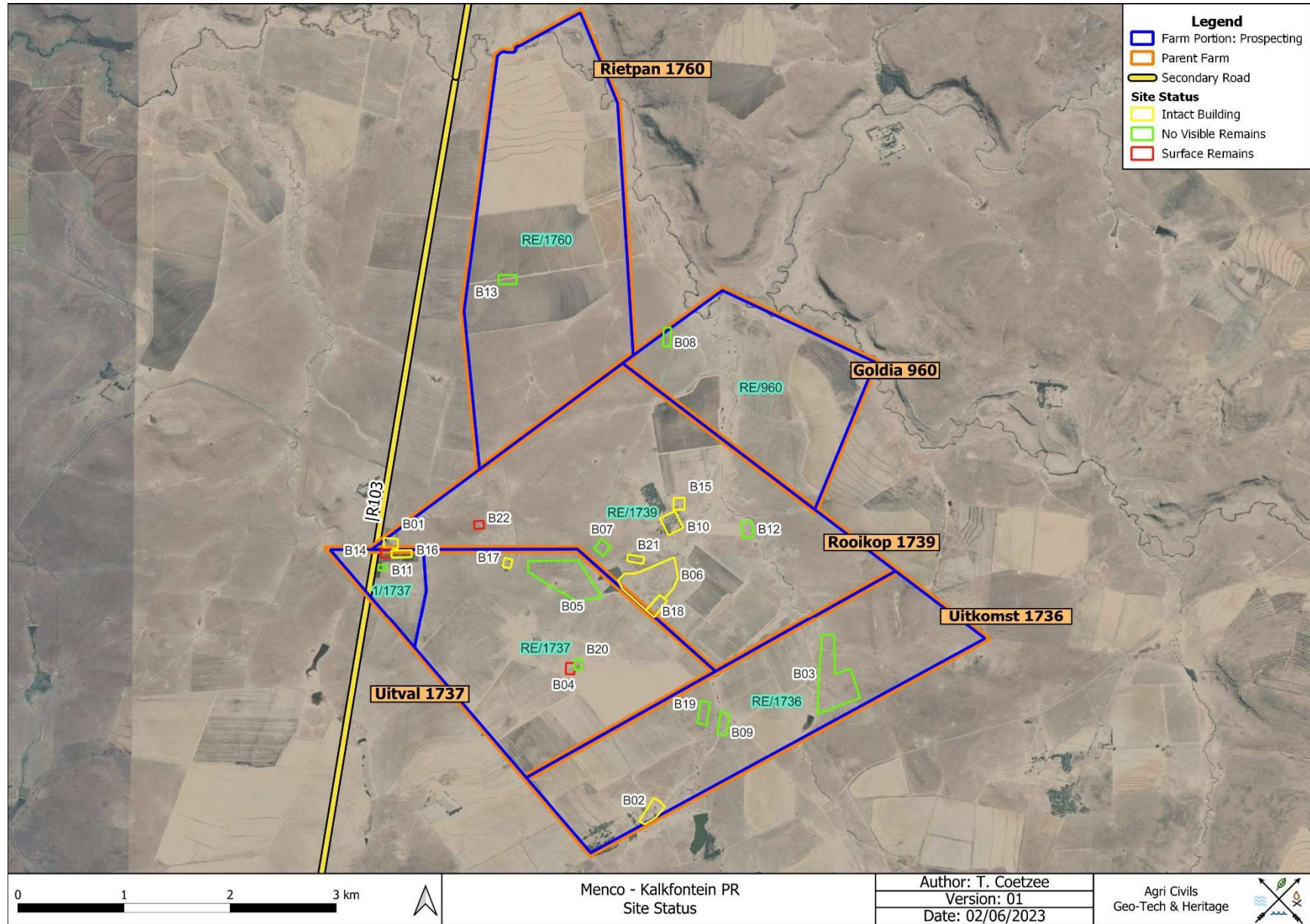


Figure 6: Site Status.



3.1 Limitations

Using historical topographical maps and historical aerial images for locating heritage resources have several shortcomings. Potential heritage remains, such as buildings, structures and graves/cemeteries, are not always indicated on topographical maps and are often omitted between different publications. Historical aerial imagery, on the other hand, might have a poor image resolution that renders potential heritage sites invisible. Inaccuracies during the georeferencing process may also lead to some heritage sites not being plotted, as well as dense vegetation obscuring heritage sites. Due to the small size of some heritage sites, such as Stone Age sites, small Iron Age features, rock art sites and burials, such sites are rarely visible on aerial imagery and are generally only detected during pedestrian surveys.

4. Archaeological Background

Southern African archaeology is broadly divided into the Early, Middle and Later Stone Ages; Early, Middle and Later Iron Ages; and Historical or Colonial Periods. This section of the report provides a general background to archaeology in South Africa.

4.1 The Stone Age

The earliest stone tool industry, the Oldowan, was developed by early human ancestors which were the earliest members of the genus *Homo*, such as *Homo habilis*, around 2.6 million years ago. It comprises tools such as cobble cores and pebble choppers (Toth & Schick 2007). Archaeologists suggest these stone tools are the earliest direct evidence for culture in southern Africa (Clarke & Kuman 2000). The advent of culture indicates the advent of more cognitively modern hominins (Mitchell 2002: 56, 57).

The Acheulean industry completely replaced the Oldowan industry. The Acheulian industry was first developed by *Homo ergaster* between 1.8 to 1.65 million years ago and lasted until around 300 000 years ago. Archaeological evidence from this period is also found at Swartkrans, Kromdraai and Sterkfontein. The most typical tools of the ESA (Early Stone Age) are handaxes, cleavers, choppers and spheroids. Although hominins seemingly used handaxes often, scholars disagree about their use. There are no indications of hafting, and some artefacts are far too large for it. Hominins likely used choppers and scrapers for skinning and butchering scavenged animals and often obtained sharp ended sticks for digging up edible roots. Presumably, early humans used wooden spears as early as 5 million years ago to hunt small animals.

Middle Stone Age (MSA) artefacts started appearing about 250 000 years ago and replaced the larger Early Stone Age bifaces, handaxes and cleavers with smaller flake industries consisting of scrapers, points and blades. These artefacts roughly fall in the 40-100 mm size range and were, in some cases, attached to handles, indicating a significant technical advance. The first *Homo sapiens* species also emerged during this period. Associated sites are Klasies River Mouth, Blombos Cave and Border Cave (Deacon & Deacon 1999).



Although the transition from the Middle Stone Age to the Later Stone Age (LSA) did not occur simultaneously across the whole of southern Africa, the Later Stone Age ranges from about 20 000 to 2000 years ago. Stone tools from this period are generally smaller, but were used to do the same job as those from previous periods; only in a different, more efficient way. The Later Stone Age is associated with: rock art, smaller stone tools (microliths), bows and arrows, bored stones, grooved stones, polished bone tools, earthenware pottery and beads. Examples of Later Stone Age sites are Nelson Bay Cave, Rose Cottage Cave and Boomplaas Cave (Deacon & Deacon 1999). These artefacts are often associated with rocky outcrops or water sources.

4.2 The Iron Age & Historical Period

The Early Iron Age marks the movement of farming communities into South Africa in the first millennium AD, or around 2500 years ago (Mitchell 2002:259, 260). These groups were agro-pastoralist communities that settled in the vicinity of water in order to provide subsistence for their cattle and crops. Archaeological evidence from Early Iron Age sites is mostly artefacts in the form of ceramic assemblages. The origins and archaeological identities of this period are largely based upon ceramic typologies. Some scholars classify Early Iron Age ceramic traditions into different “streams” or “trends” in pot types and decoration, which emerged over time in southern Africa. These “streams” are identified as the Kwale Branch (east), the Nkope Branch (central) and the Kalundu Branch (west). Early Iron Age ceramics typically display features such as large and prominent inverted rims, large neck areas and fine elaborate decorations. This period continued until the end of the first millennium AD (Mitchell 2002; Huffman 2007). Some well-known Early Iron Age sites include the Lydenburg Heads in Mpumalanga, Happy Rest in the Limpopo Province and Mzonjani in Kwa-Zulu Natal.

The Middle Iron Age roughly stretches from AD 900 to 1300 and marks the origins of the Zimbabwe culture. During this period cattle herding appeared to play an increasingly important role in society. However, it was proved that cattle remained an important source of wealth throughout the Iron Age. An important shift in the Iron Age of southern Africa took place in the Shashe-Limpopo basin during this period, namely the development of class distinction and sacred leadership. The Zimbabwe culture can be divided into three periods based on certain capitals. Mapungubwe, the first period, dates from AD 1220 to 1300, Great Zimbabwe from AD 1300 to 1450, and Khami from AD 1450 to 1820 (Huffman 2007: 361, 362).

The Late Iron Age (LIA) roughly dates from AD 1300 to 1840. It is generally accepted that Great Zimbabwe replaced Mapungubwe. Some characteristics include a greater focus on economic growth and the increased importance of trade. Specialisation in terms of natural resources also started to play a role, as can be seen from the distribution of iron slag which tend to occur only in certain localities compared to a wide distribution during earlier times. It was also during the Late Iron Age that different areas of South Africa were populated, such as the interior of KwaZulu Natal, the Free State, the Gauteng Highveld and the Transkei. Another characteristic is the increased use of stone as building material. Some artefacts associated with this period are knife-blades, hoes, adzes, awls, other metal objects as well as bone tools and grinding stones.



The Historical period mainly deals with Europe's discovery, settlement and impact on southern Africa. Some topics covered by the Historical period include Dutch settlement in the Western Cape, early mission stations, Voortrekker routes and the Anglo Boer War. This time period also saw the compilation of early maps by missionaries, explorers, military personnel, etc.

4.2.1 Warden Archaeo-History

According to Harding (1951 a,b) and Maggs (1976), the larger region is associated with a high number of stone-walled LIA settlements and rock shelters containing paintings and stone tool assemblages.

Maggs (1976) suggests that the region is characterised by a significant increase of LIA settlements after 1640 AD that points toward the southerly expansion of Sotho-Tswana peoples into the north-eastern Free State. The settlements occur to the south and east, but appear not to extend further than the Vet River and the Drakensberg Escarpment. The type of stone-walled structures found in the vicinity of Warden is classified as Type V settlements (Maggs 1976).

Rock paintings have been recorded in the Warden area on the Farm Goedgegeven 164, as well as further southwest toward Bethlehem where paintings were found together with LSA artefacts on the Farms Saulspoord and Trekpad (Palaeo Field Services 2018).

5. Sources of Information

Sources consulted include an inspection of historical aerial images and historical topographical maps, previous heritage studies conducted in the general area, and the South African Heritage Resources Information System (SAHRIS) database.

5.1 Historical Aerial Imagery and Topographical Maps

Historical images and topographical maps dating to 1957, 1963, 1969, 1971, 1975, 1978, 1987, 1991, and 2004 (**Appendix A**) were used to determine the location and relative age of the structures and buildings associated with the demarcated portions (**Table 3**), as well as to establish historical land uses associated with the demarcated area.

Table 3 indicates the identified sites, the date of the aerial images and topographical maps on which the sites are visible, as well as the date range during which the sites were constructed and demolished. Twenty-two building sites were identified. Thirteen of the sites date to historical times, two potentially to historical times, and seven to contemporary times. Also, nine sites appear to be associated with intact buildings, three with some form of surface



indication, while no surface remains were noted at 10 of the sites. Potential sites were identified on all the demarcated farm portions.



Table 3: Site age & type as identified on historical aerial images and topographical maps.

Site No	1957 Aerial	1963 Aerial	1969 Topo	1971 Topo	1975 Aerial	1978 Topo	1987 Topo	1991 Aerial	2004 Topo	2020 Satellite	Constructed	Demolished
B01	Building	Building	Building	N/A	Building	Building	N/A	Building	Building	Intact Building	<=1957	N/A
B02	Building	Building	N/A	Building	Building	N/A	Building	Building	Building	Intact Building	<=1957	N/A
B03	Building	Building	N/A	Building	Building	N/A	Building	None	None	No Visible Remains	<=1957	1987-1991
B04	Building	Building	N/A	Building	Building	N/A	Building	Building	Building	Surface Remains	<=1957	>=2004
B05	Building	Building	N/A	Building	Building	N/A	Building	None	None	No Visible Remains	<=1957	1987-1991
B06	Building	Building	N/A	Building	Building	N/A	Building	Building	Building	Intact Building	<=1957	N/A
B07	Building	Building	N/A	Building	None	N/A	Building	None	None	No Visible Remains	<=1957	1987-1991
B08	Building	Building	N/A	Building	Building	N/A	Building	None	None	No Visible Remains	<=1957	1987-1991
B09	Building	None	N/A	None	None	N/A	None	None	None	No Visible Remains	<=1957	1957-1963
B10	Building	Building	N/A	Building	Building	N/A	Building	Building	Building	Intact Building	<=1957	N/A
B11	Building	None	None	N/A	None	None	N/A	None	None	No Visible Remains	<=1957	1957-1963
B12	None	Building	N/A	Building	Building	N/A	Building	Building	None	No Visible Remains	1957-1963	1991-2004
B13	None	None	Building	N/A	None	None	N/A	None	None	No Visible Remains	1963-1969	1969-1971
B14	None	None	Building	N/A	Building	Building	N/A	Building	None	Surface Remains	1963-1969	1991-2004
B15	None	None	N/A	None	Building	N/A	Building	Building	Building	Intact Building	1971-1975	N/A
B16	None	None	None	N/A	Building	None	N/A	Building	Building	Intact Building	1971-1975	N/A
B17	None	None	None	N/A	Building	None	N/A	Building	Building	Intact Building	1971-1975	N/A
B18	None	None	N/A	None	None	N/A	None	Building	Building	Intact Building	1971-1975	N/A
B19	Building	None	N/A	None	None	N/A	Building	None	None	No Visible Remains	<=1957	1957-1963
B20	None	None	N/A	None	Building	N/A	Building	None	None	No Visible Remains	1975-1987	1987-1991
B21	None	None	N/A	None	None	None	N/A	None	Building	Intact Building	1987-1991	N/A
B22	None	None	None	N/A	Building	None	N/A	Building	Building	Surface Remains	1991-2004	>=1991



5.2 Previous Heritage Studies

Gravel quarries between Memel and Vrede

A Phase 1 Archaeological Impact Assessment was conducted by Rossouw (2008) for the development of eight gravel quarries along the R34 between Memel and Vrede in the Free State Province. The quarry sites are located roughly 66 km east of the proposed Kalkfontein Prospecting Project. It was noted that all the quarries that were investigated were located within igneous bedrock and that seven out of the eight quarries indicated no potential archaeological impact and were of low archaeological significance. One of the quarries, however, was characterised by an informally laid-out cluster of approximately 10 grave mounds. A grave relocation process was recommended due to the unstable nature of the exposed and easily erodible gravel mounds

Residential Development at De Brug 1020, Warden

A Phase 1 Archaeological and Cultural Heritage Assessment was conducted for the residential development on the Farm De Brug 1020 near Warden in the Free State Province by Cobus Dreyer (2006). No potential heritage remains were recorded. The housing development is located approximately 12 km to the south of the proposed Kalkfontein Prospecting Project (Dreyer 2006).

Township Extension, Warden

Palaeo Field Services (2013) conducted a Phase 1 Palaeontological and Archaeological Impact Assessment for a township extension at Warden in the Free State Province. The project area is located on the outskirts of Warden and about 13 km south of the proposed Kalkfontein Prospecting Project. The project area measured approximately 280 ha. During the assessment, one graveyard measuring 100 m² that consisted of nine unmarked graves was recorded. The graves consisted of two rectangular cement slabs and seven stone cairns. Although no additional heritage sites were observed, mention is made of Iron Age stone-walled enclosures in the general area.

Gravel Quarry, Warden

A Phase 1 HIA was compiled by Palaeo Field Services (2018) for a 5 ha gravel quarry on the Farm Johns Rust 1361 approximately 7 km west of the proposed Kalkfontein Prospecting Project. During the survey, a potentially historical rectangular stone-walled kraal and sheep-dip structure were recorded. It was recommended that the identified sites be fenced-off at a distance of 10 m. Mention is also made of rock shelters containing paintings and stone tool assemblages, as well as LIA stone-walled sites in the greater region.

5.3 SAHRIS Database

The databases containing the declared and graded heritage sites were exported from SAHRIS on 08/06/2023 and were plotted on the site map in order to determine the presence of previously recorded sites within the project area. Accordingly, no graded heritage sites intersect the demarcated study area, while the nearest declared heritage sites to the demarcated project area are the Nederduitse Gereformeerde Church in Warden



approximately 15 km to the north, and the All Saints Anglican Church in Vrede roughly 30 km to the north-northeast.

5.4 Ceramics associated with the study area

According to Huffman (2007), ceramics that can be expected in the study area include the following from the Urewe Tradition:

- Makgwareng facies of the Blackburn branch with an estimated date range of AD 1700 to 1820

5.5 Examples of Heritage Sites

Figures 7 – 17 are examples of heritage sites often encountered. Iron Age and Stone Age sites are often associated with water sources, rocky outcrops and hills and should be avoided by the proposed prospecting activities.

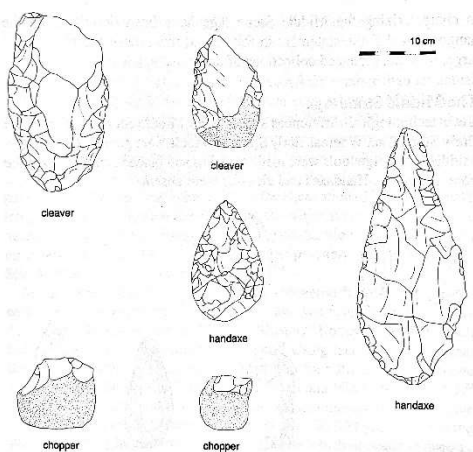


Figure 7: ESA artefacts (Mazel 1989).

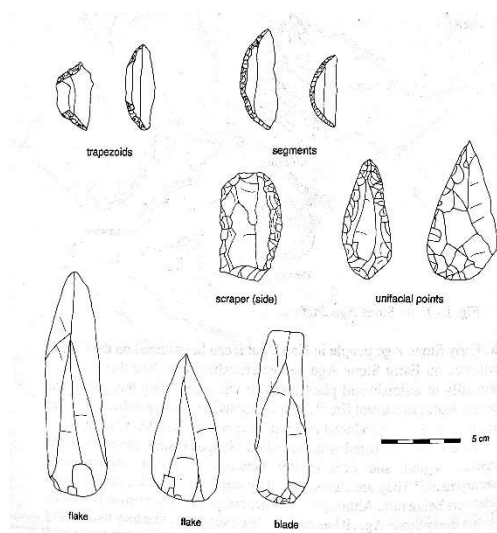


Figure 8: MSA artefacts (Mazel 1989).



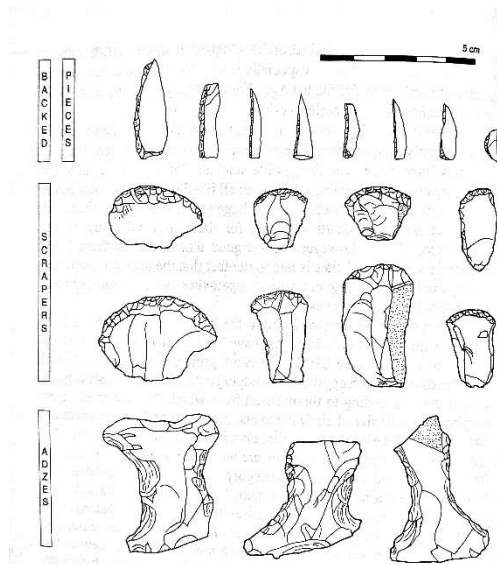


Figure 9: LSA artefacts (Mazel 1989).



Figure 10: Example of undecorated Iron Age potsherds.



Figure 11: Example of a decorated Iron Age potsherd.





Figure 12: Example of dilapidated linear walling.



Figure 13: Example of a stone-walled Iron Age site.



Figure 14 : Example of a broken lower grinding stone dating to the LIA.





Figure 15: Example of a dilapidated stone-walled site dating to the LIA.



Figure 16: Example of a historical building.



Figure 17: Example of a potential informal grave.



6. Archaeological and Historical Remains

This section serves as an indication of heritage material associated with the study area based on previous research, as well as historical aerial images and topographical maps.

6.1 Stone Age Remains

The heritage study conducted by Palaeo Field Services (2018) mentions the presence of rock paintings on the Farm Goedgegeven 164 near Warden, as well as in the Bethlehem area where paintings were found together with LSA artefacts on the Farms Saulspoor and Trekpad. Accordingly, the region is associated with rock shelters containing paintings and stone tool assemblages. Since such sites are often associated with water sources, Stone Age material is more likely to be encountered within the 500 m river buffer zone of the study area.

6.2 Iron Age Farmer Remains

Stone-walled sites are often detectable on satellite and aerial imagery. However, no such sites were noted on aerial and satellite imagery. It should also be noted that stone-walled sites might be obscured by dense vegetation and poor preservation and are therefore more likely to be located in the undisturbed sections of the study area. Since the heritage study conducted by Palaeo Field Services (2018) noted the presence of large numbers of stone-walled enclosures in the region, it is likely that such sites might be associated with the study area.

6.3 Historical Remains

Fifteen sites associated with buildings were identified on historical aerial imagery and topographical maps (**Table 4**). Twelve of the sites were constructed before or during 1957, one site was constructed between 1957 and 1963, while two sites were constructed between 1963 and 1969, therefore potentially dating to the Historic Period. Four of the historical sites are still associated with intact buildings, nine sites are not associated with any visible surface remains, and two sites are characterised by some form of surface indication. It should be kept in mind that the sites still associated with surface remains might have been demolished and replaced by more recent infrastructure. One such case is Site B19. Infrastructure is visible on the 1957 aerial image (**Appendix A: Figure 19**) and on the 1987 topographical map only (**Appendix A: Figure 23**). This suggests that the building was constructed before or during 1957 and was demolished between 1957 and 1963. New buildings were then constructed between 1978 and 1987, which were again demolished before 1991. Also, the nine sites where no surface remains were noted might be associated with subsurface cultural remains and could therefore be sensitive from a heritage perspective.

The heritage study conducted by Palaeo Field Services (2018) recorded a rectangular stone-walled kraal and a sheep-dip structure that might date to the Historic Period.



Table 4: Historical Sites.

Site No	Dataset date & site type	Current Status	Age	Farm Portion	Lat (y)	Lon (x)
B01	1957-Building	Intact Building	Historical	RE/1739	-27.699794	28.986190
B02	1957-Building	Intact Building	Historical	RE/1736	-27.722505	29.008322
B03	1957-Building	No Visible Remains	Historical	RE/1736	-27.711418	29.023672
B04	1957-Building	Surface Remains	Historical	RE/1737	-27.710457	29.001363
B05	1957-Building	No Visible Remains	Historical	RE/1737	-27.702765	29.000970
B06	1957-Building	Intact Building	Historical	RE/1739	-27.703163	29.008188
B07	1957-Building	No Visible Remains	Historical	RE/1739	-27.700155	29.004084
B08	1957-Building	No Visible Remains	Historical	RE/960	-27.682318	29.009560
B09	1957-Building	No Visible Remains	Historical	RE/1736	-27.715107	29.014339
B10	1957-Building	Intact Building	Historical	RE/1739	-27.698088	29.009949
B11	1957-Building	No Visible Remains	Historical	1/1737	-27.701861	28.985474
B12	1963-Building	No Visible Remains	Historical	RE/1739	-27.698631	29.016356
B13	1969-Building	No Visible Remains	Potentially Historical	RE/1760	-27.677462	28.996070
B14	1969-Building	Surface Remains	Potentially Historical	1/1737	-27.700657	28.985790
B19	1957-Building	No Visible Remains	Historical	RE/1736	-27.714187	29.012661

6.4 Contemporary Remains

Evidence from satellite and aerial imagery, as well as topographical maps, indicate the presence of seven areas associated with modern infrastructure (**Table 5**). These buildings and structures were constructed after 1963. One of these sites appears not to be associated with surface remains, five sites are associated with intact buildings, while one site is associated with some form of surface remains. The seven identified sites do not exceed 60 years of age and are therefore unlikely to be sensitive from a heritage perspective.

The heritage studies conducted by Palaeo Field Services (2013, 2018), Dreyer (2006) and Rossouw (2008) did not record significant contemporary sites.

Table 5: Contemporary Sites.

Site No	Dataset date & site type	Current Status	Age	Farm Portion	Lat (y)	Lon (x)
B15	1975-Building	Intact Building	Contemporary	RE/1739	-27.696448	29.010586
B16	1975-Building	Intact Building	Contemporary	1/1737	-27.700694	28.987092
B17	1975-Building	Intact Building	Contemporary	RE/1737	-27.701477	28.996063
B18	1975-Building	Intact Building	Contemporary	RE/1739	-27.705113	29.008684
B20	1987-Building	No Visible Remains	Contemporary	RE/1737	-27.710114	29.002017
B21	1991-Building	Intact Building	Contemporary	RE/1739	-27.701140	29.006908
B22	2004-Building	Surface Remains	Contemporary	RE/1739	-27.698240	28.993644

6.5 Graves

No graves were noted on the historical aerial images or on the historical topographical maps. Such sites are rarely visible on aerial imagery and are not always indicated on topographical maps. Burial sites are also often associated with historical farm- and homesteads and the possibility therefore exists that graves may be associated with the study area.



The heritage studies conducted by Rossouw (2008) and Palaeo Field Services (2018) mention the presence of cemeteries.

7. Evaluation

The significance of an archaeological site is based on the amount of deposit, the integrity of the context, the kind of deposit and the potential to help answer present research questions. Historical structures are defined by Section 34 of the National Heritage Resources Act, 1999, while other historical and cultural significant sites, places and features, are generally determined by community preferences.

A fundamental aspect in the conservation of a heritage resource relates to whether the sustainable social and economic benefits of a proposed development outweigh the conservation issues at stake. There are many aspects that must be taken into consideration when determining significance, such as rarity, national significance, scientific importance, cultural and religious significance, and not least, community preferences. When, for whatever reason the protection of a heritage site is not deemed necessary or practical, its research potential must be assessed and if appropriate mitigated in order to gain data / information which would otherwise be lost. Such sites must be adequately recorded and sampled before being destroyed.

7.1 Field Ratings

All sites should include a field rating in order to comply with section 38 of the National Heritage Resources Act (Act No. 25 of 1999). The field rating and classification in this report are prescribed by SAHRA.

Table 6: Prescribed Field Ratings

Rating	Field Rating/Grade	Significance	Recommendation
National	Grade 1		National site
Provincial	Grade 2		Provincial site
Local	Grade 3 A	High	Mitigation not advised
Local	Grade 3 B	High	Part of site should be retained
General protection A	4 A	High/Medium	Mitigate site
General Protection B	4 B	Medium	Record site
General Protection C	4 C	Low	No recording necessary

*These site ratings can only be assigned following a Phase 1 AIA.



8. Statement of Significance & Recommendations

8.1 Statement of Significance

The study area: Kalkfontein Prospecting Project

As can be seen from previous research conducted in the area, the general study area appears to be sensitive from a heritage perspective and sites are likely to include graves, stone-walling, kraals, settlements, Late Iron Age settlements, rock art, shelters, and Stone Age sites. Since heritage sites, such as burial sites, are not always clearly identifiable due to disturbed/removed surface features, care must be exercised when prospecting.

Figure 18 indicates historical and potentially historical sites, as well as a 500 m buffer area around water sources. The 500 m buffer area is considered to be potentially sensitive from a heritage perspective since archaeological sites are often located within this zone. Areas previously/currently associated with cultivated fields are indicated as well. These areas are considered to be less sensitive from a heritage perspective due to the areas being disturbed. The least sensitive areas would therefore be areas that are located more than 500 m from a water source, fall within previously/currently cultivated fields and are not located within close proximity of potential heritage sites or contemporary infrastructure. Apart from the identified potential sites, undisturbed areas falling outside of the previously/currently cultivated areas are considered to be the most sensitive areas from a heritage perspective. The possibility also exists that culturally sensitive sites, such as burial sites, might have been created after some of the cultivated fields fell into disuse, meaning that burial sites might be located on disturbed areas as well.

The 15 sites listed in **Table 7** are associated with intact and demolished historical and potentially historical infrastructure that might exceed 60 years of age. The sites associated with surface remains are considered to be sensitive from a heritage perspective, while the sites where no surface remains are visible are considered to be potentially sensitive. It should be noted that Site B19 is initially indicated on historical aerial imagery and is visible on a later historical topographical map, but is omitted from all other sources. This suggests that the initial building was demolished and replaced by more recent infrastructure, that was eventually demolished as well. Therefore, the site is considered to be potentially sensitive. Due to the listed sites potentially exceeding 60 years of age, the sites might be protected under the NHRA (Act No. 25 of 1999). The remaining seven sites are of contemporary origin and are unlikely to be sensitive or significant from a heritage perspective. Any grave will be considered to be sensitive and significant from a heritage perspective as the Human Tissues Act (Act No. 65 of 1983) and Ordinance on the Removal of Graves and Dead Bodies (Ordinance 7 of 1925), as well as the National Heritage Resources Act (Act No. 25 of 1999) could apply.



Table 7: Sensitive Sites.

Site No	Type	Farm Portion	Lat (y)	Lon (x)	Current Status	Age	Sensitivity
2728DB-B01	Building	RE/1739	-27.699794	28.986190	Intact Building	Historical	Sensitive
2729CA-B02	Building	RE/1736	-27.722505	29.008322	Intact Building	Historical	Sensitive
2729CA-B03	Building	RE/1736	-27.711418	29.023672	No Visible Remains	Historical	Potentially Sensitive
2729CA-B04	Building	RE/1737	-27.710457	29.001363	Surface Remains	Historical	Sensitive
2729CA-B05	Building	RE/1737	-27.702765	29.000970	No Visible Remains	Historical	Potentially Sensitive
2729CA-B06	Building	RE/1739	-27.703163	29.008188	Intact Building	Historical	Sensitive
2729CA-B07	Building	RE/1739	-27.700155	29.004084	No Visible Remains	Historical	Potentially Sensitive
2729CA-B08	Building	RE/960	-27.682318	29.009560	No Visible Remains	Historical	Potentially Sensitive
2729CA-B09	Building	RE/1736	-27.715107	29.014339	No Visible Remains	Historical	Potentially Sensitive
2729CA-B10	Building	RE/1739	-27.698088	29.009949	Intact Building	Historical	Sensitive
2728DB-B11	Building	1/1737	-27.701861	28.985474	No Visible Remains	Historical	Potentially Sensitive
2729CA-B12	Building	RE/1739	-27.698631	29.016356	No Visible Remains	Historical	Potentially Sensitive
2728DB-B13	Building	RE/1760	-27.677462	28.996070	No Visible Remains	Potentially Historical	Potentially Sensitive
2728DB-B14	Building	1/1737	-27.700657	28.985790	Surface Remains	Potentially Historical	Sensitive
2729CA-B19	Building	RE/1736	-27.714187	29.012661	No Visible Remains	Historical	Potentially Sensitive



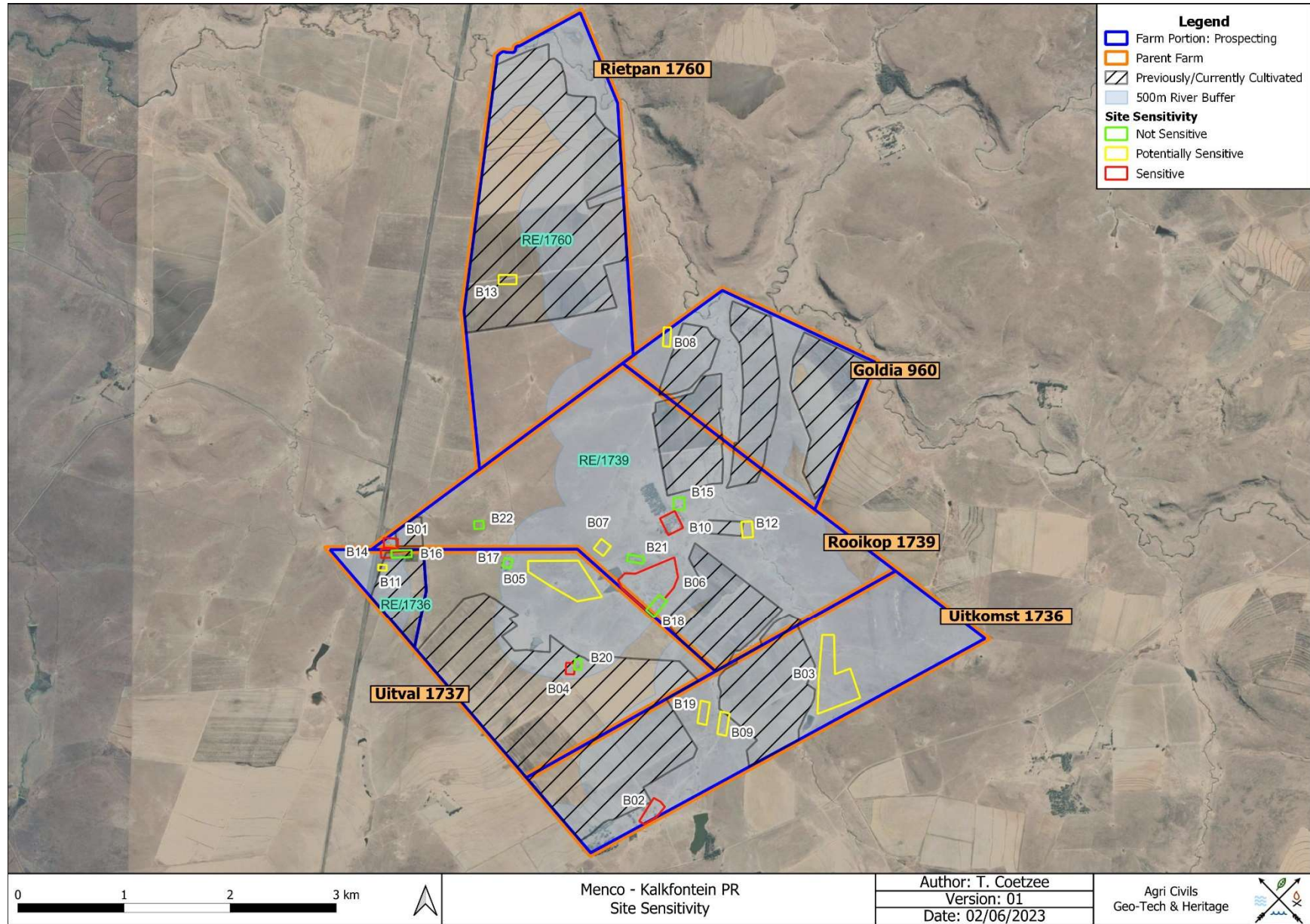


Figure 18: Site Sensitivity.



8.2 Recommendations

The following recommendations are made in order to avoid the destruction of heritage remains within the area demarcated for prospecting:

- The nine historical and potentially historical sites (B03, B05, B07 – B09, B11 – B13, B19) that appear not to be associated with surface remains, might be associated with subsurface culturally significant material. The possibility also exists that historical surface remains exceeding 60 years of age are present, but are not detectable on aerial imagery. Therefore, it is recommended that the demarcated areas be avoided by the proposed prospecting activities. Should this not be possible, a qualified archaeologist should first inspect the sites in order to determine the potential presence of heritage remains.
- Sites B01, B02, B06, and B10 appear to be associated with intact infrastructure likely to exceed 60 years of age. Therefore, it is recommended that the demarcated areas be avoided by the proposed prospecting activities. Should this not be possible, a qualified archaeologist should first inspect the sites in order to determine the significance of the sites.
- Sites B04 and B14 appear to be associated with historical surface remains likely to exceed 60 years of age. Therefore, it is recommended that the demarcated areas be avoided by the proposed prospecting activities. Should this not be possible, a qualified archaeologist should first inspect the sites in order to determine the significance of the sites.
- The buildings and structures associated with sites B15 – B18 and B20 – B21 appear not to exceed 60 years of age and are unlikely to be significant or sensitive from a heritage perspective. However, should impact to the sites be unavoidable, it is recommended that a qualified archaeologist inspect the sites prior to any impact.
- The 500 m buffer zone surrounding the perennial and non-perennial rivers is potentially sensitive from a heritage perspective. Although the previously/currently cultivated areas that intersect the 500 m buffer zone are disturbed, the potential for subsurface cultural material still exists and care should be exercised when prospecting.
- The least sensitive areas are areas falling outside of the 500 m river buffer zone, within previously/currently cultivated fields and not within close proximity of potential heritage sites, contemporary infrastructure and shelters. These areas should therefore be considered when selecting prospecting sites.



- Should uncertainty regarding the presence of heritage remains exist, or of heritage sites are discovered by chance, it is advised that the potential site be avoided and that a qualified archaeologist be contacted. Alternatively, once the prospecting localities have been finalised, a qualified archaeologist can inspect the proposed sites and provide recommendations that will aid the protection of heritage resources.
- Prospecting should not take place in the vicinity of stone cairns, potential burial sites, stone-walling, building ruins or any other heritage material or structures.
- Should the prospecting outcome result in further development or construction, a full Phase 1 Archaeological Impact Assessment must be conducted on the affected area if triggered. Also, a full Phase 1 AIA must be conducted should the cumulative impact of the proposed prospecting exceed 0.5 ha.
- Since archaeological artefacts generally occur below surface, the possibility exists that culturally significant material may be exposed during the prospecting phase, in which case all activities must be suspended pending further archaeological investigations by a qualified archaeologist. Also, should skeletal remains be exposed, all activities must be suspended and the relevant heritage resources authority must be contacted (See National Heritage Resources Act, 25 of 1999 section 36 (6)).
- From a heritage point of view, prospecting may proceed on the demarcated portions, subject to the abovementioned conditions and recommendations.

9. Conclusion

The proposed Kalkfontein Prospecting Project that consists of the prospecting of lime on the Remaining Extents of the Farms Goldia 960, Rietpan 1760, Rooikop 1739, Uitkomst 1736 and the Remaining Extent and Portion 1 of the Farm Uitval 1737 covers approximately 1882.6 ha. The general area is characterised by open grassland and sections of cultivated / previously cultivated land. The Archaeological Desktop Study examined the area using a combination of historical aerial imagery, historical topographical maps, contemporary satellite imagery, as well as written sources and previous heritage studies conducted in the area. Fifteen historical and potentially historical sites, as well as seven areas associated with contemporary infrastructure were noted. These areas should be avoided by the proposed prospecting activities. Since the region is associated with Stone Age, Iron Age and Historical sites, the general area is considered to be sensitive.

Should the recommendations made in this study be adhered to, the proposed Kalkfontein Prospecting Project may proceed.



10. Addendum: Terminology

Archaeology:

The study of the human past through its material remains.

Artefact:

Any portable object used, modified, or made by humans; e.g. pottery and metal objects.

Assemblage:

A group of artefacts occurring together at a particular time and place, and representing the sum of human activities.

Context:

An artefact's context usually consist of its immediate *matrix* (the material surrounding it e.g. gravel, clay or sand), its *provenience* (horizontal and vertical position within the matrix), and its *association* with other artefacts (occurrence together with other archaeological remains, usually in the same matrix).

Cultural Resource Management (CRM):

The safeguarding of the archaeological heritage through the protection of sites and through salvage archaeology (rescue archaeology), generally within the framework of legislation designed to safeguard the past.

Excavation:

The principal method of data acquisition in archaeology, involving the systematic uncovering of archaeological remains through the removal of the deposits of soil and other material covering and accompanying it.

Feature:

An irremovable artefact; e.g. hearths or architectural elements.

Ground Reconnaissance:

A collective name for a wide variety of methods for identifying individual archaeological sites, including consultation of documentary sources, place-name evidence, local folklore, and legend, but primarily actual fieldwork.

Matrix:

The physical material within which artefacts is embedded or supported, i.e. the material surrounding it e.g. gravel, clay or sand.

Phase 1 Assessments:

Scoping surveys to establish the presence of and to evaluate heritage resources in a given area.

Phase 2 Assessments:

In-depth culture resources management studies which could include major archaeological excavations, detailed site surveys and mapping / plans of sites, including historical / architectural structures and features. Alternatively, the sampling of sites by collecting material, small test pit excavations or auger sampling is required.

Sensitive:

Often refers to graves and burial sites although not necessarily a heritage place, as well as ideologically significant sites such as ritual / religious places. *Sensitive* may also refer to an entire landscape / area known for its significant heritage remains.



Site:

A distinct spatial clustering of artefacts, features, structures, and organic and environmental remains, as the residue of human activity.

Surface survey:

There are two kinds: (1) unsystematic and (2) systematic. The former involves field walking, i.e. scanning the ground along one's path and recording the location of artefacts and surface features. Systematic survey by comparison is less subjective and involves a grid system, such that the survey area is divided into sectors and these are walked ally, thus making the recording of finds more accurate.

11. References

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Removal of Graves and Dead Bodies Ordinance No. 7 of 1925, Government Gazette, Cape Town



Appendix A: Historical Aerial Imagery & Topographical Maps



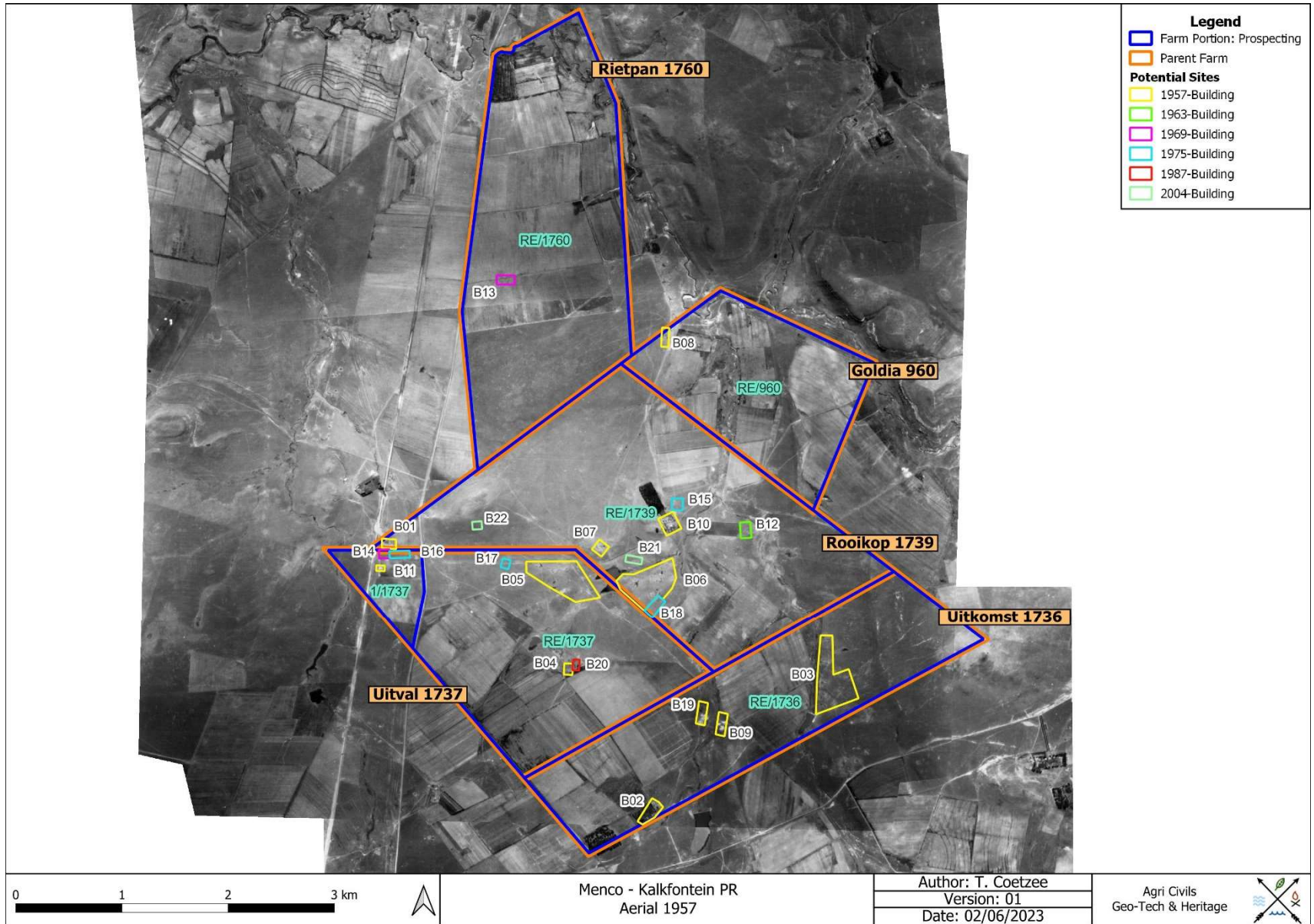


Figure 19: 1957 Aerial image of the study area.



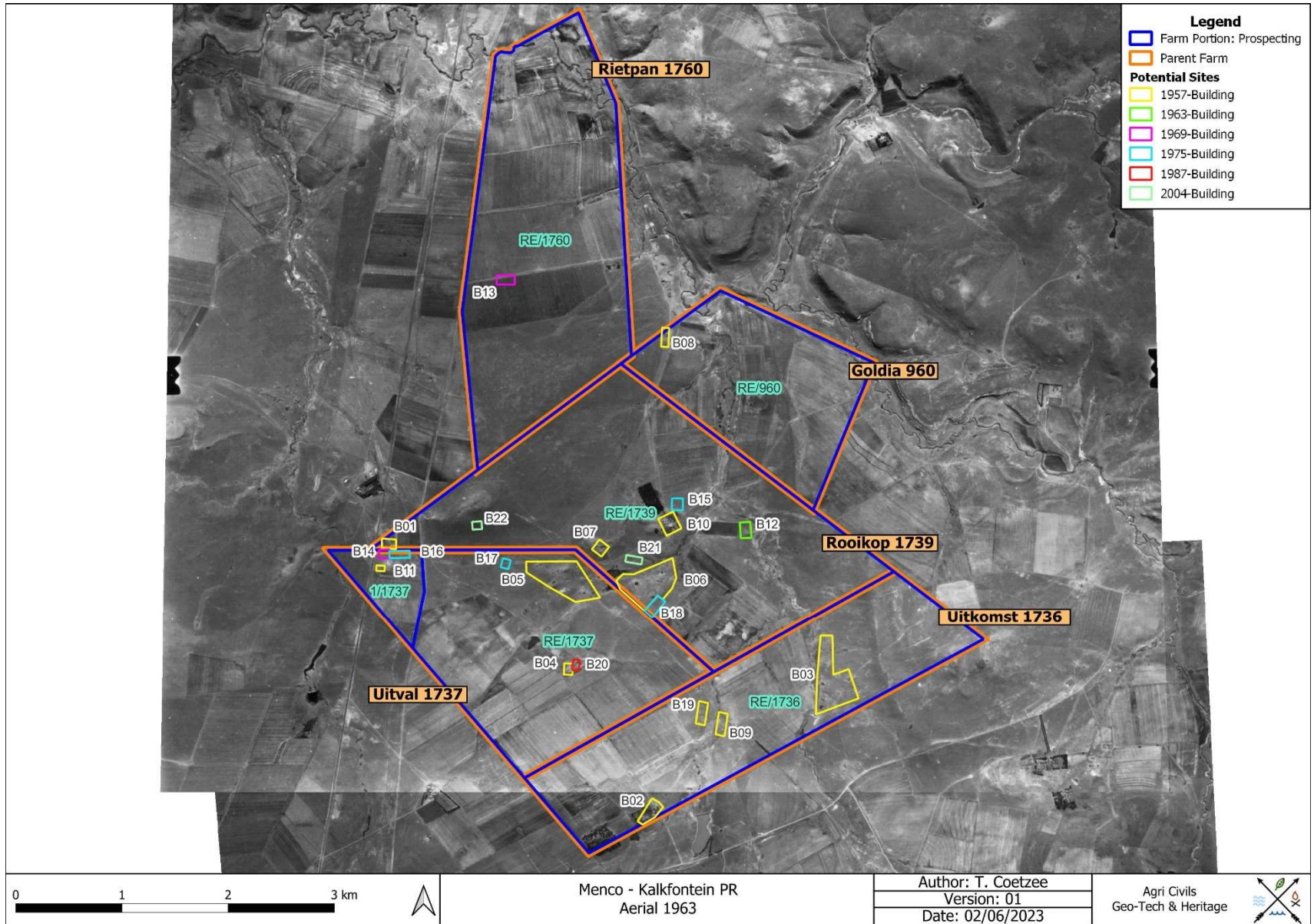


Figure 20: 1963 Aerial image of the study area.



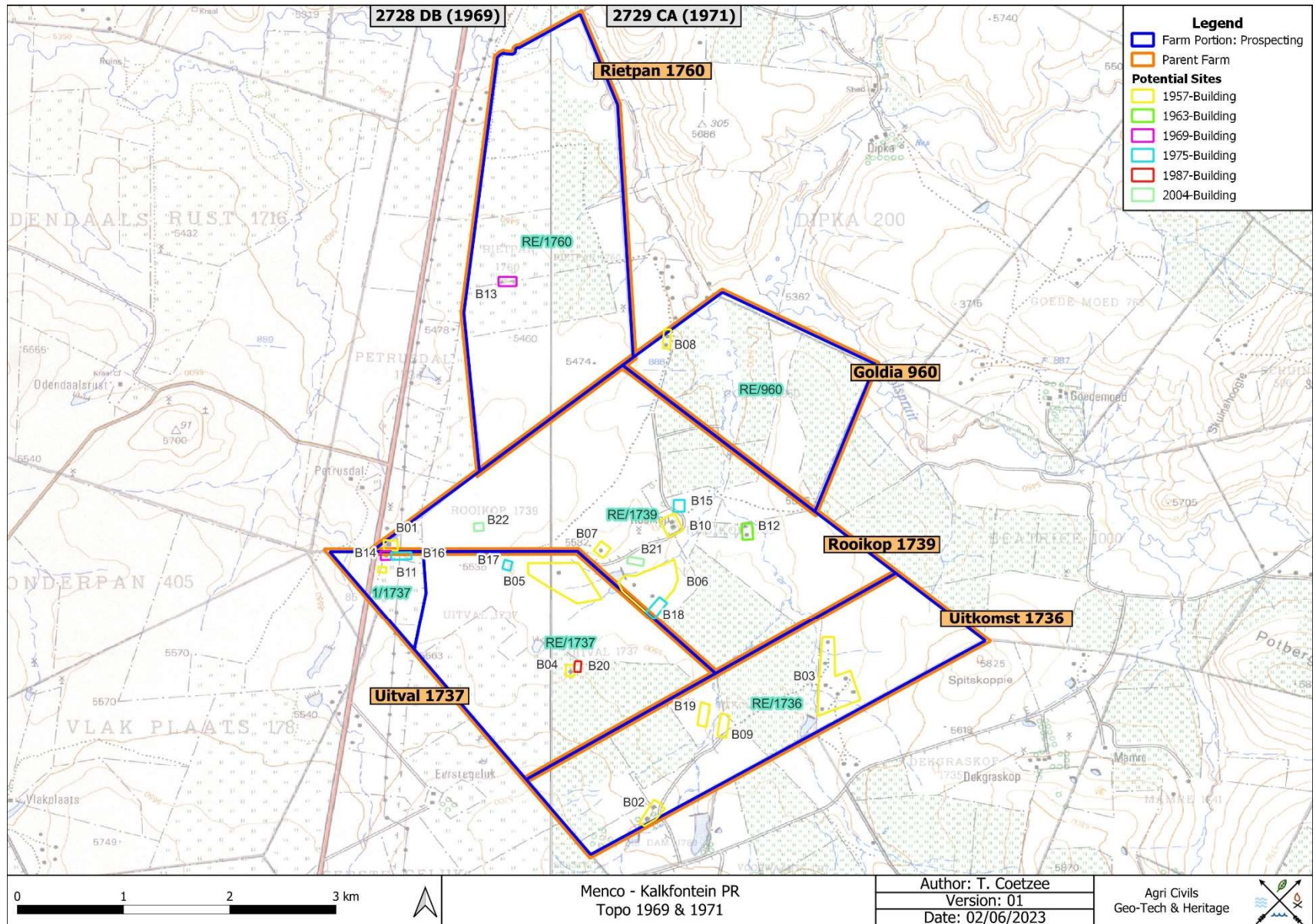


Figure 21: Segments of 1969 and 1971 1:50 000 2728 DB and 2729 CA indicating the study area.



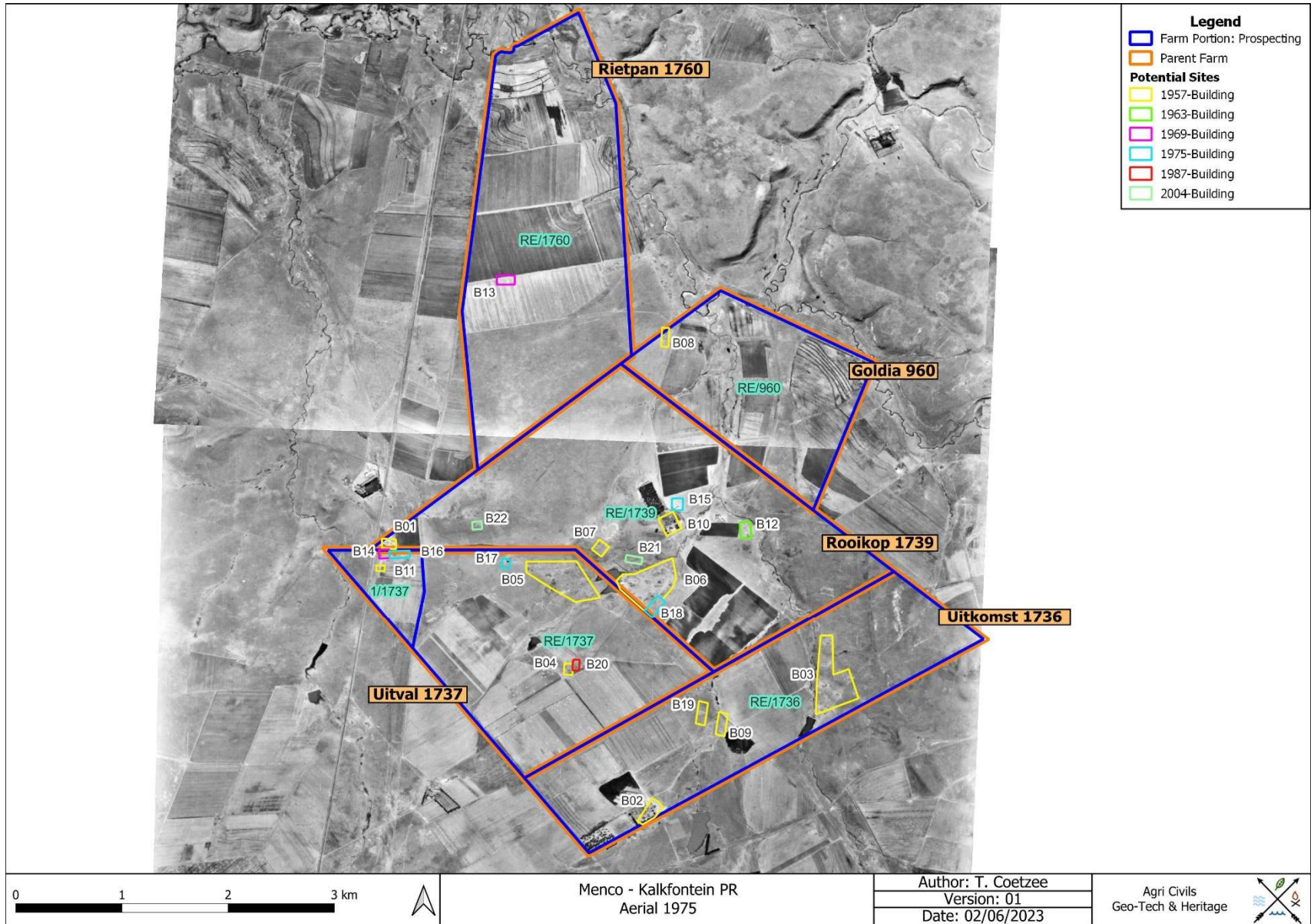


Figure 22: 1975 Aerial image of the study area.



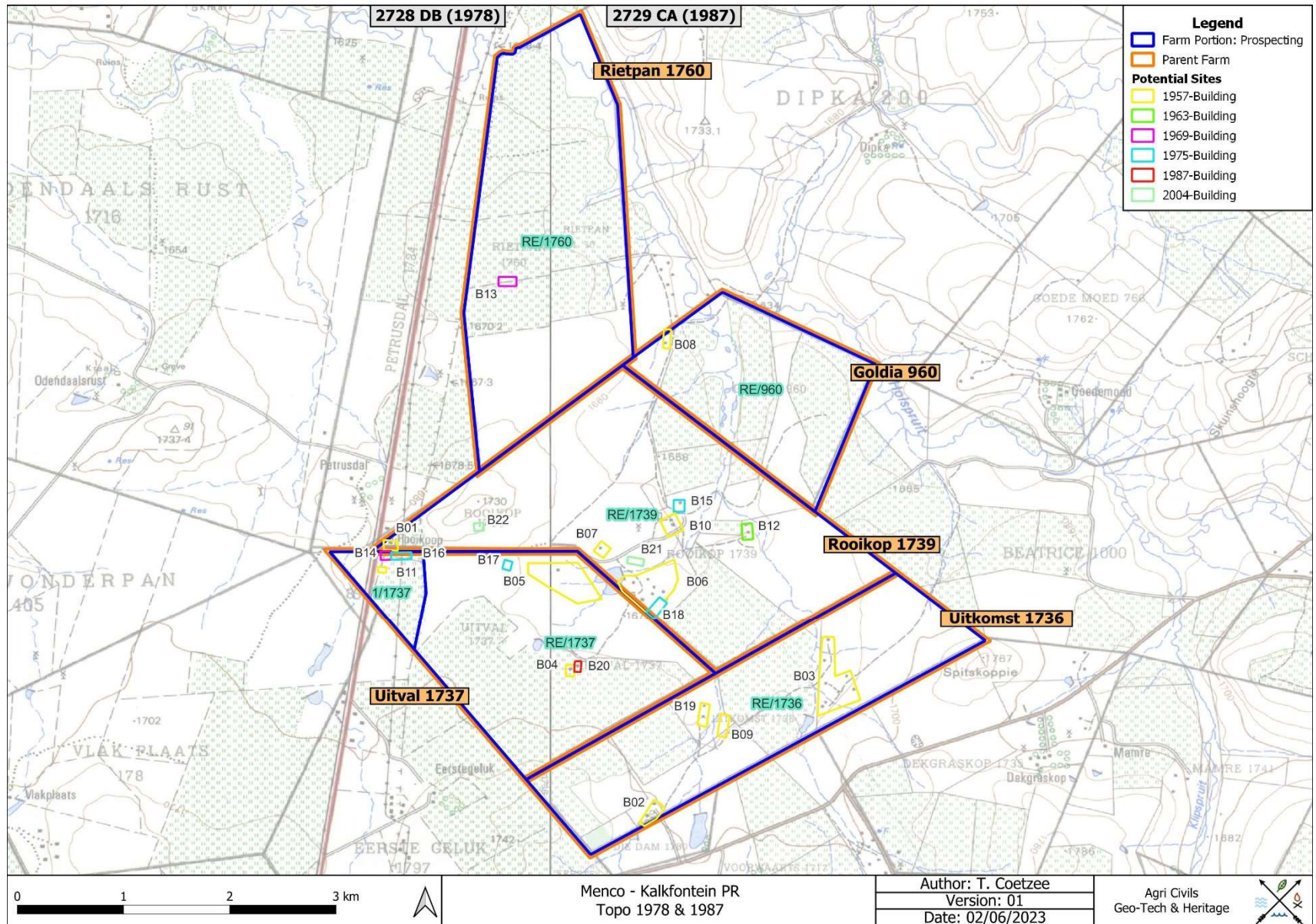


Figure 23: Segments of 1978 and 1987 1:50 000 2728 DB and 2729 CA indicating the study area.



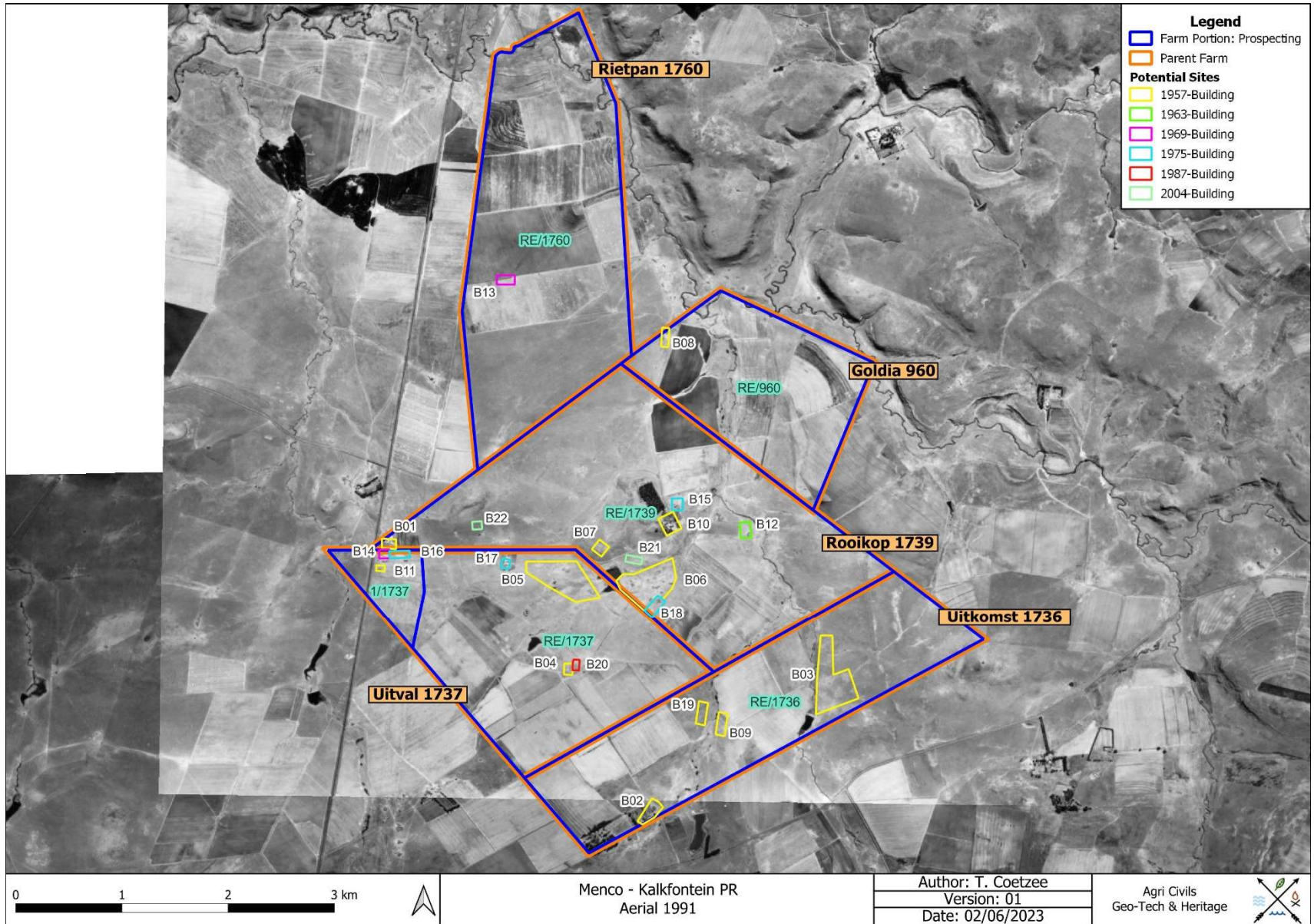


Figure 24: 1991 Aerial image of the study area.



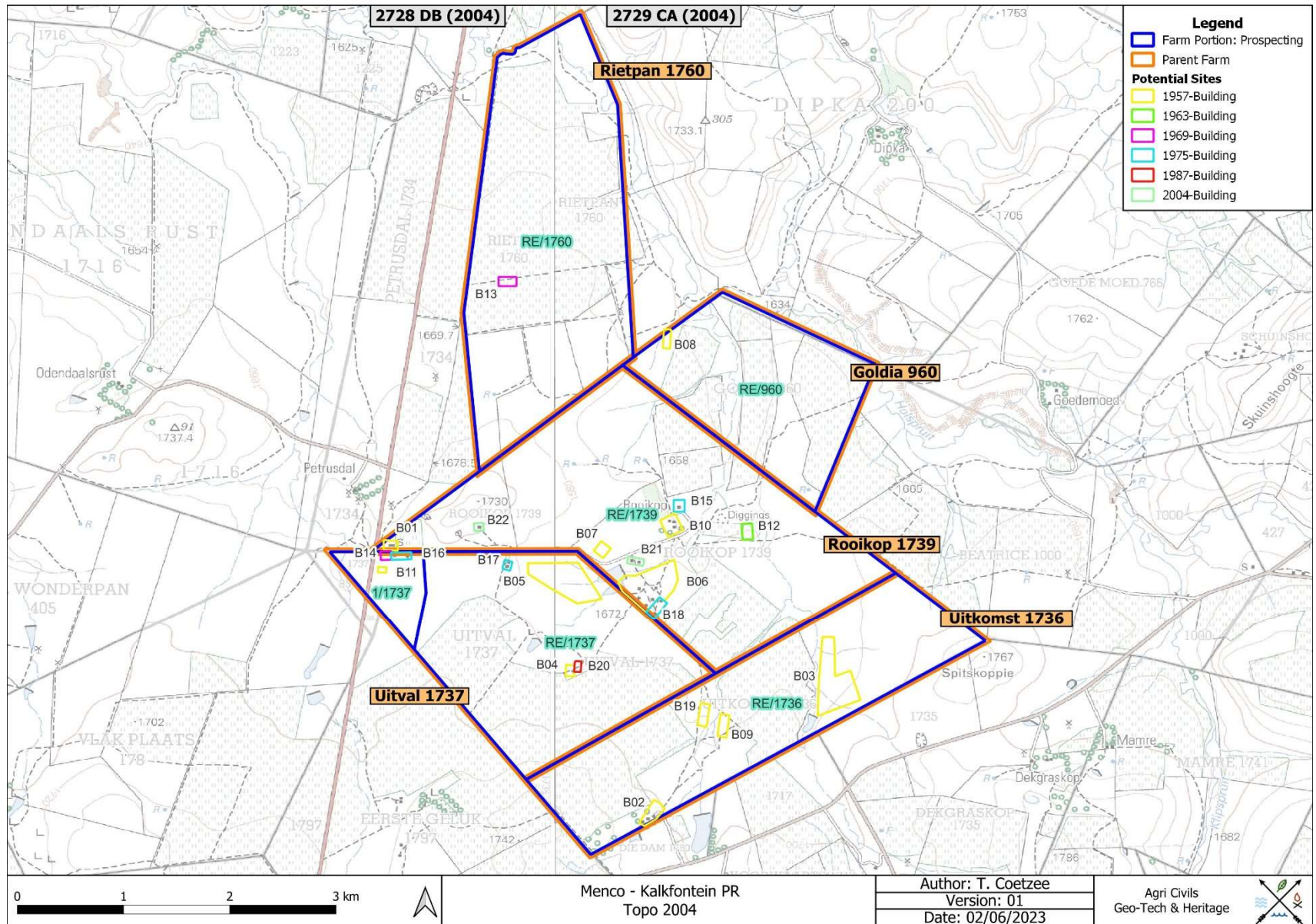


Figure 25: Segments of 2004 1:50 000 2728 DB & 2729 CA indicating the study area.

