Agri Civils
Geo-Tech & Heritage

PHASE 1 HERITAGE IMPACT ASSESSMENT

for the Proposed Gatlimip PR Application on Reserve No. 12 15832 HU, Nongoma, KwaZulu-Natal Province

For:
Meridien Resources (Pty) Ltd

Project Ref:
Gatlimip PR

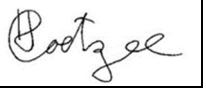
Date:
19/05/2023

Phase 1 Heritage Impact Assessment for the Proposed Gatlimip PR Application on Reserve No. 12 15832 HU, Nongoma, KwaZulu-Natal Province

Project Ref:	Gatlimip PR
Report No:	MR-1905231
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 Gatlimip PR Application 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
Tobias Coetzee	MA (Archaeology – UP)	tcoetzee.heritage@gmail.com	19/05/2023	

Executive Summary

The author was appointed by Meridien Resources (Pty) Ltd to undertake a Phase 1 Heritage Impact Assessment for the proposed Gatlimip Prospecting Right Application on a portion of the Remaining Extent of Portion 12 of the Farm Reserve No. 12 15832 HU near Nongoma in the KwaZulu-Natal Province. The aim of the study is to determine the scope of archaeological resources that could be impacted by the proposed prospecting activities at five demarcated sites (DH1 – DH5), and an access road.

The environment of the demarcated study area is generally associated with very dense vegetation and previously cultivated areas. Four sites were noted on historical aerial imagery and on topographical maps, three additional sites were observed during the survey, while the location of one site was provided by Meridien Resources (Pty) Ltd. These sites include one cemetery (B05), two grave sites (F01 & F02), a stone-walled enclosure dating to historical times (F01), and four areas potentially associated with historical infrastructure (B01 – B04). Since the identified sites do not intersect the demarcated prospecting locations, the sites are not at risk of being impacted by the proposed prospecting project. However, due to the sensitive nature of graves, it is recommended that no activity takes place within 50 m of the grave / cemetery sites. Although the proposed access road intersects as small portion of the 50 m cemetery buffer at Site B05, impact to the graves is not foreseen. This is due to the location of the proposed access road being based on an existing road and due to the fact that the access road will be used to transport prospecting equipment only.

Proposed prospecting site DH1 could not be accessed due to dense vegetation, therefore it is recommended that the Environmental Control Officer, as well as a member of the local community, inspect DH1 after access has been obtained and prior to any prospecting activity. No potential heritage sites were observed at sites DH2 – DH5 and the areas are therefore not considered to be sensitive from a heritage perspective.

Also, no access routes to the proposed prospecting locations exist and since the study area is associated with graves and past settlements, potential heritage resources may be impacted. Due the local community's in-depth knowledge of the study area, it is recommended that a member of the local community, as well as the Environmental Control Officer, accompany the prospecting team when clearing the way to each of the proposed prospecting sites in order to limit the potential impact to heritage resources.

Subject to adherence to the recommendations and approval by the South African Heritage Resources Agency, the proposed Gatlimip Prospecting Right Application on the demarcated portion of the Remaining Extent of Portion 12 of the Farm Reserve No. 12 15832 HU as per the indicated activity boundaries may continue. Should skeletal remains be exposed during the prospecting project, all activities must be suspended, and the relevant heritage resources authority must be contacted (See National Heritage and Resources Act, 1999 (Act No. 25 of 1999 section 36 (6))). Also, should culturally significant material be discovered during the course of the said development, all activities must be suspended pending further investigation by a qualified archaeologist.

List of Abbreviations

AIA – Archaeological Impact Assessment

CRM – Cultural Resource Management

DMR – Department of Mineral Resources

ECO – Environmental Control Officer

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

PR – Prospecting Right

MSA – Middle Stone Age

NHRA – National Heritage Resources Act

SAHRA – South African Heritage Resources Agency

ya – Years ago

NEMA Appendix 6

NEMA Specialist reports	
Item	**Section / Page No**
1. (1) A specialist report prepared in terms of these Regulations must contain—	
(a) details of-	
(i)the specialist who prepared the report; and	P2
(ii)the expertise of that specialist to compile a specialist report including a curriculum vitae;	P2
(b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	P2
(c) an indication of the scope of, and the purpose for which, the report was prepared;	1.1, 2.2
(cA) an indication of the quality and age of base data used for the specialist report;	2.1, 3
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	2
(d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	3
(e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	3
(f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	5, 7.1, P22 – P24
(g) an identification of any areas to be avoided, including buffers;	7.2, P44
(h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	P44
(i) a description of any assumptions made and any uncertainties or gaps in knowledge;	3.2
(j) a description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives on the environment or activities;	5 – 7
(k) any mitigation measures for inclusion in the EMPr;	7.2
(l) any conditions for inclusion in the environmental authorisation;	7.2
(m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	7.2, Appendix C
(n) a reasoned opinion—	
(i)[as to] whether the proposed activity, activities or portions thereof should be authorised	7.2
(iA) regarding the acceptability of the proposed activity or activities; and	7.2
(ii)if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;	7.2, Appendix C

NEMA Specialist reports	
Item	**Section / Page No**
(o)a description of any consultation process that was undertaken during the course of preparing the specialist report;	3.1.3
(p)a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	
(q)any other information requested by the competent authority.	Nothing received to date
(2) Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	Noted

Table of Contents

List of Figures

List of Tables

1. Project Background

1.1 Introduction

Meridien Resources (Pty) Ltd appointed Agri Civils Geotech & Heritage to undertake a Phase 1 Heritage Impact Assessment (HIA) for the proposed Gatlimip Prospecting Right (PR) Application on a portion of the Remaining Extent of Portion 12 of the Farm Reserve No. 12 15832 HU to the south of Nongoma in the KwaZulu-Natal Province (**Figure 1 & Table 1**). The purpose of this study is to examine the five proposed prospecting locations and proposed access road in order to determine if any archaeological resources of heritage value will be impacted by the proposed prospecting project, as well as to archaeologically contextualise the general study area. The aim of this report is to provide the developer with information regarding the potential location and sensitivity of heritage resources within the demarcated study area, as well as at the identified prospecting locations and along the proposed access road.

In the following report, the implications for the proposed Gatlimip PR Application regarding heritage resources are discussed. The prospecting project will consist of five localities demarcated for drilling, and one access road. 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 project.

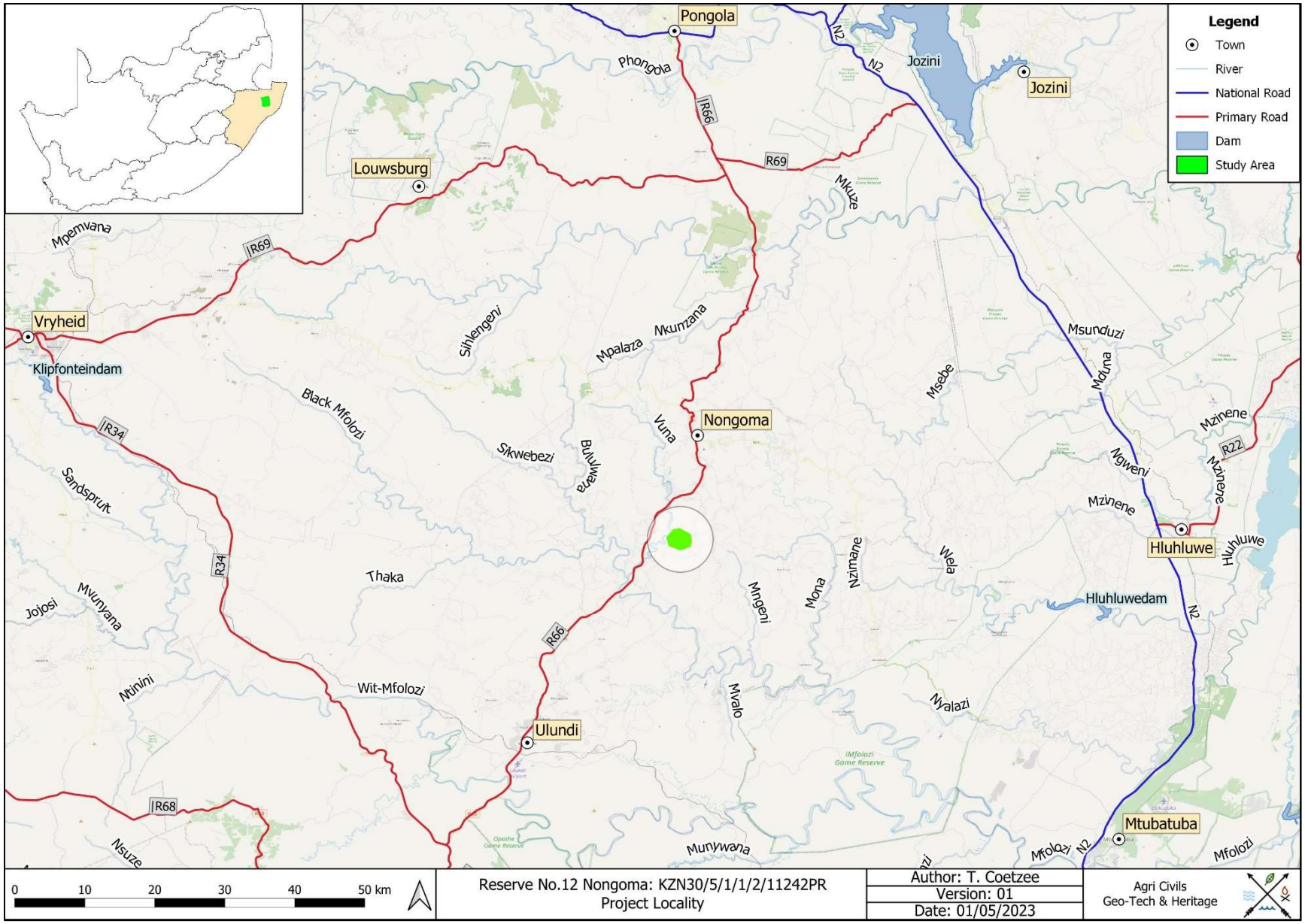


Figure 1: Regional and Provincial location of the study area.

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 Environmental Impact Assessment (EIA) 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 (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 Member of the Executive Council (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 Gatlimip PR Application project area is situated to the south of Nongoma. The proposed prospecting locations are listed in **Table 1**.

Table 1: Properties & Coordinates.

Prospecting Site	Farm Portion	Parent Farm	Lat	Lon	Map Reference (1:50 000)	Study Area Extent
DH1	RE/12	Reserve No 12 15832 HU	-28.032169	31.629694	2831 BA	204 Ha
DH2	RE/12	Reserve No 12 15832 HU	-28.035111	31.627500	2831 BA	
DH3	RE/12	Reserve No 12 15832 HU	-28.028436	31.625361	2831 BA	
DH4	RE/12	Reserve No 12 15832 HU	-28.028625	31.622092	2831 BA	
DH5	RE/12	Reserve No 12 15832 HU	-28.032900	31.622111	2831 BA	
Access Road	RE/12	Reserve No 12 15832 HU	-28.035983	31.633162	2831 BA	529 m

Nongoma is located roughly 13 km to the north of the project area, while Ulundi is located 33 km to the southwest and Louwsburg 53 km to the northwest. The study area falls within the Nongoma Local Municipality and the Zululand District Municipality in the KwaZulu-Natal Province. The R66 primary road runs in a north-south direction approximately 3 km to the west of the study area.

In terms of vegetation, the study area falls within the Savanna Biome, which is typically associated with summer rainfall regions. According to the vegetation classification by Mucina & Rutherfords (2006), the western and majority of the study area is classified as Zululand Lowveld, while the remaining eastern section is classified as Northern Zululand Sourveld.

Zululand Lowveld is found in the KwaZulu-Natal and Mpumalanga Provinces, as well as in Eswatini. This vegetation unit is distributed from around Big Bend south to Mkuze, Hluhluwe, and Ulundi to just north of the Ongoye Forest. In terms of conservation, Zululand Lowveld is considered to be vulnerable with a conservation target of 19%. About 11% is statutorily conserved in the Hluhluwe-iMfolozi Park and the Phongolapoort Nature

Reserve, while another 1% is conserved in the private Masibekela Wetland. Cultivation transformed about 26% of the vegetation unit and erosion varies between low and high (Mucina & Rutherfords 2006).

Northern Zululand Sourveld is found in the KwaZulu-Natal Province and in Eswatini. This vegetation unit is distributed from the Lusthof area in Eswatini southwards with scattered patches in northern Zululand in the surrounds of Hlomohlomo, east of Louwsburg, Nongoma, and the vicinity of Ulundi. It also occurs at the highest altitudes in the Hluhluwe-iMfolozi Park. In terms of conservation, Northern Zululand Sourveld is considered to be vulnerable with a conservation target of 19%. About 4% is statutorily conserved in the Hluhluwe-iMfolozi Park and in the Ithala Game Reserve. Cultivation and plantations transformed about 22% of the vegetation unit and erosion varies between moderate and high (Mucina & Rutherfords 2006).

The average elevation for Zululand Lowveld varies between 50 and 450 Metres Above Sea Level (MASL), while the elevation for Northern Zululand Sourveld varies between 450 and 900 MASL. The average elevation of the project area is 405 MASL and is associated with mountainous terrain.

The study area falls within the summer rainfall region and the average annual rainfall is roughly 673 mm per year. The average maximum temperature for the study area is recorded during February when an average of 22.6 ºC is reached. The average minimum temperature is recorded during July when an average of 14.4 ºC is reached (Climate-data.org 02/05/2023).

The study area falls within the W22G Quaternary Catchment in the Pongola-Mtamvuna Water Management Area. The closest perennial river to the study area is the Vuna River that flows approximately 440 m to the west of the study area. A non-perennial offshoot, Mbokodeni, also intersects the north-western corner of the study area. The Hluhluwe Dam is located 52 km to the east.

When the surrounding environment is considered, the region is associated with villages and patches of cultivated areas. Access to the study area is via a local road turning from a tertiary road to the east (**Figures 2 & 3**). Locally, the demarcated study area and impact areas are associated with very dense vegetation on mountainous terrain, as well as a few previously cultivated areas that are now severely overgrown. The area is generally used as pastureland for cattle. In terms of the five proposed prospecting localities, only one site (DH5) is located on previously cultivated land.

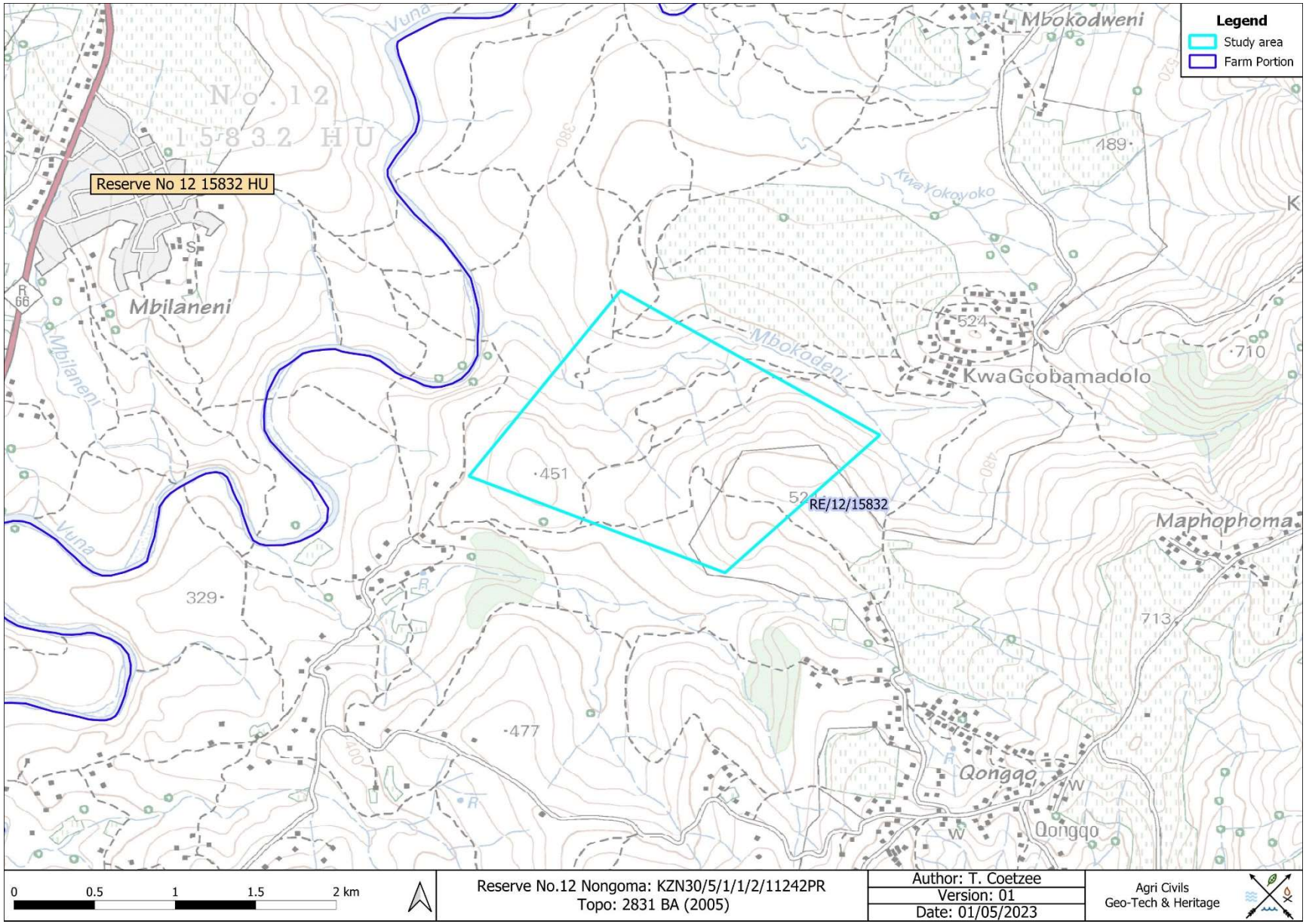


Figure 2: Segment of SA 1: 50 000 2831 BA indicating the study area.

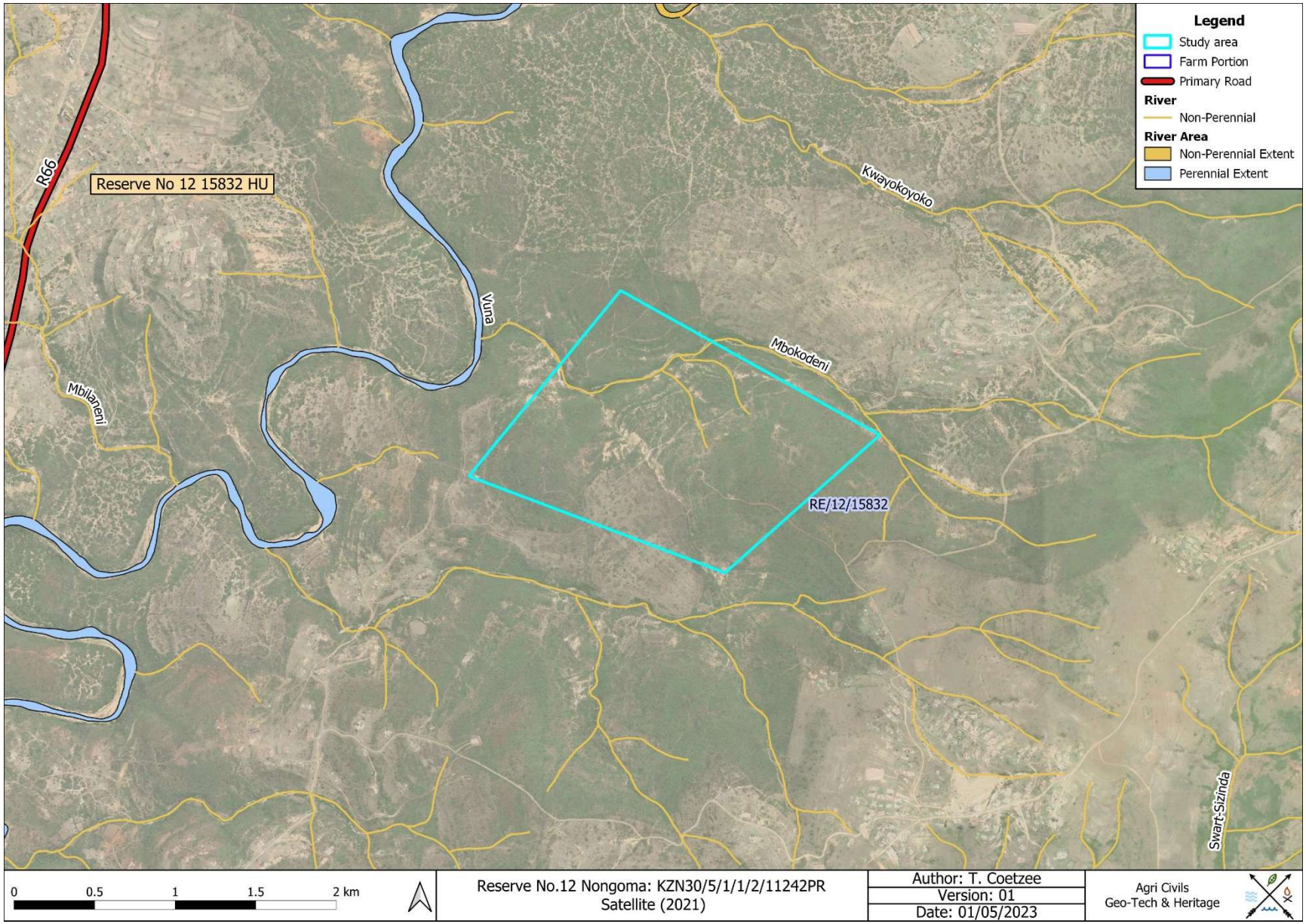


Figure 3: Study area portrayed on a 2021 satellite image.

2.2 Project Description

The prospecting right application for coal covers 204 ha and an access road of 529 m (**Figure 4**). For the prospecting phase, however, five sites will be selected for geotechnical drilling: DH1 – 5. The full extent of the drill sites will also be demarcated and no drilling will be done outside of the boundary. An existing dirt road will be used as an access road, but will likely be upgraded to allow the transport of equipment.

3. Methodology

Archaeological reconnaissance of the study area was conducted during April 2023 through an unsystematic pedestrian survey of the demarcated prospecting sites and access road (**Figure 4**). Seven members of the local community accompanied the author on the survey and significantly aided in contextualising the study area. General site conditions were recorded via photographic record (**Figures 7 – 14**). Also, the proposed study area was inspected on Google Earth, historical topographical maps, and historical aerial imagery in order to identify potential heritage remains (**Appendix A**). The historical topographical maps dating to 1966, 1991, and 2005, as well as the historical aerial images dating to 1937, 1954, 1956, 1960, 1963, 1970, 1991, and 2005, proved useful in terms of providing an indication of potential heritage sites and past land uses associated with the study area. Four potential sites were identified on historical topographical maps and aerial images, while the location of one site was provided by Meridien Resources (Pty) Ltd. An additional three sites were also identified and recorded during the site visit (**Table 2 & Figure 4**). The type of sites is shown in **Figure 5** and the age and status in **Figure 6**. The total area inspected was approximately 204 Ha and 529 m for the proposed access road. Since heritage resources are often associated with perennial and non-perennial rivers, the rivers and streams located within close proximity of the study area were buffered by a distance of 500 m, indicating a potentially sensitive area (**Figure 4**). Also, the areas that appear to have been disturbed by cultivation were plotted using topographical maps and historical aerial imagery, indicating areas considered to be less sensitive from a heritage perspective.

The reconnaissance of the area under investigation served a twofold purpose:

- To obtain an indication of heritage material found in the general area as well as to identify or locate archaeological sites on the areas demarcated for prospecting. This was done in order to establish a heritage context and to supplement background information that would benefit developers through identifying areas that are sensitive from a heritage perspective.

- All archaeological and historical events have spatial definitions in addition to their cultural and chronological context. Where applicable, spatial recording of these definitions were done by means of a handheld Global Positioning System (GPS) during the site visit, as well as by plotting the boundaries from aerial imagery and topographical maps.

Table 2: Site coordinates & description.

Name	Off. Name	Latitude	Longitude	Description	Age	Current Status	Estimated Extent	ID Source	Land Parcel	Intersecting Proposed Prospecting Site
B01	2831BA-B01	-28.030842	31.614975	Building 1954	Historical	Unknown	1.4 Ha	Aerial 1954	RE/12/15832	No
B02	2831BA-B02	-28.033080	31.616951	Building 1954	Historical	Unknown	1.2 Ha	Aerial 1954	RE/12/15832	No
B03	2831BA-B03	-28.033466	31.619345	Building 1954	Historical	Unknown	0.9 Ha	Aerial 1954	RE/12/15832	No
B04	2831BA-B04	-28.036626	31.626687	Building 1954	Historical	Unknown	1.3 Ha	Aerial 1954	RE/12/15832	No
B05	2831BA-B05	-28.035190	31.633289	Cemetery	Historical	Intact	0.5 Ha	Provided	RE/12/15832	No
F01	2831BA-F01	-25.694610	27.291473	Stone-walled Enclosure	Historical	Dilapidated	Ø 3 m	Field	RE/12/15832	No
F02	2831BA-F02	-28.034872	31.626387	Grave	Historical	Intact	12 m²	Field	RE/12/15832	No
F03	2831BA-F03	-28.034729	31.626084	Grave	Historical	Intact	12 m²	Field	RE/12/15832	No

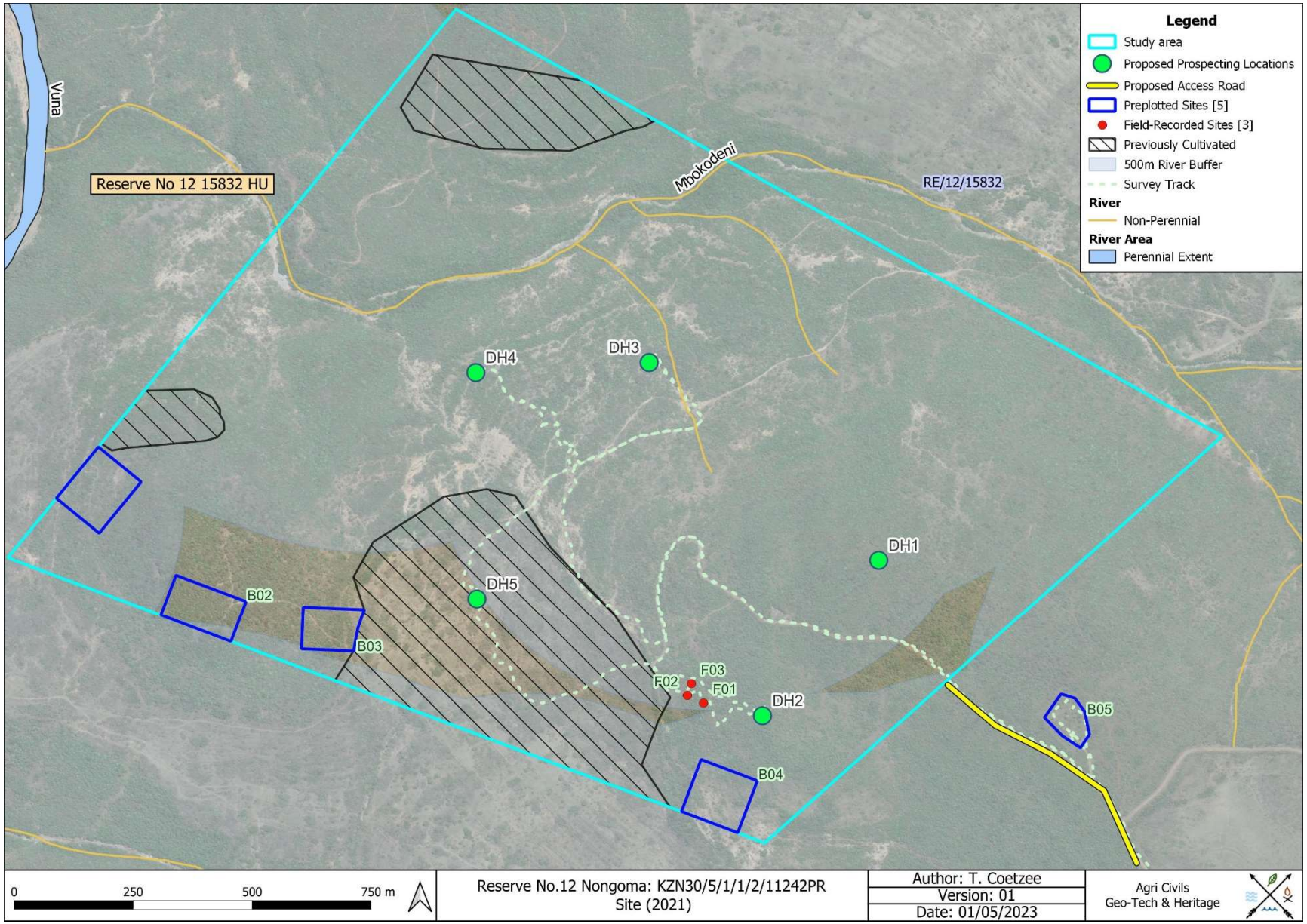


Figure 4: Study area with survey track portrayed on a 2021 satellite image.

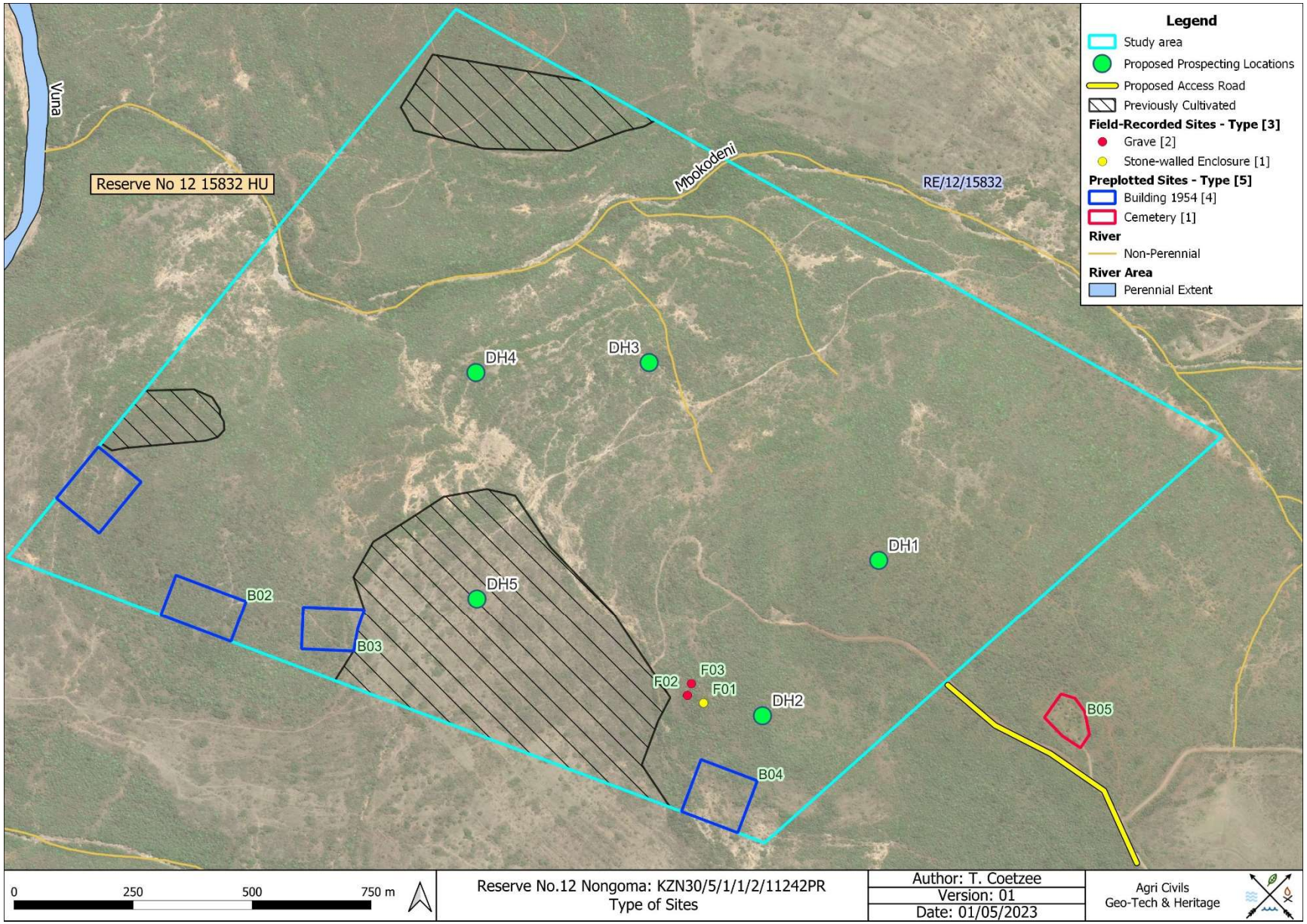


Figure 5: Type of sites portrayed on a 2021 satellite image.

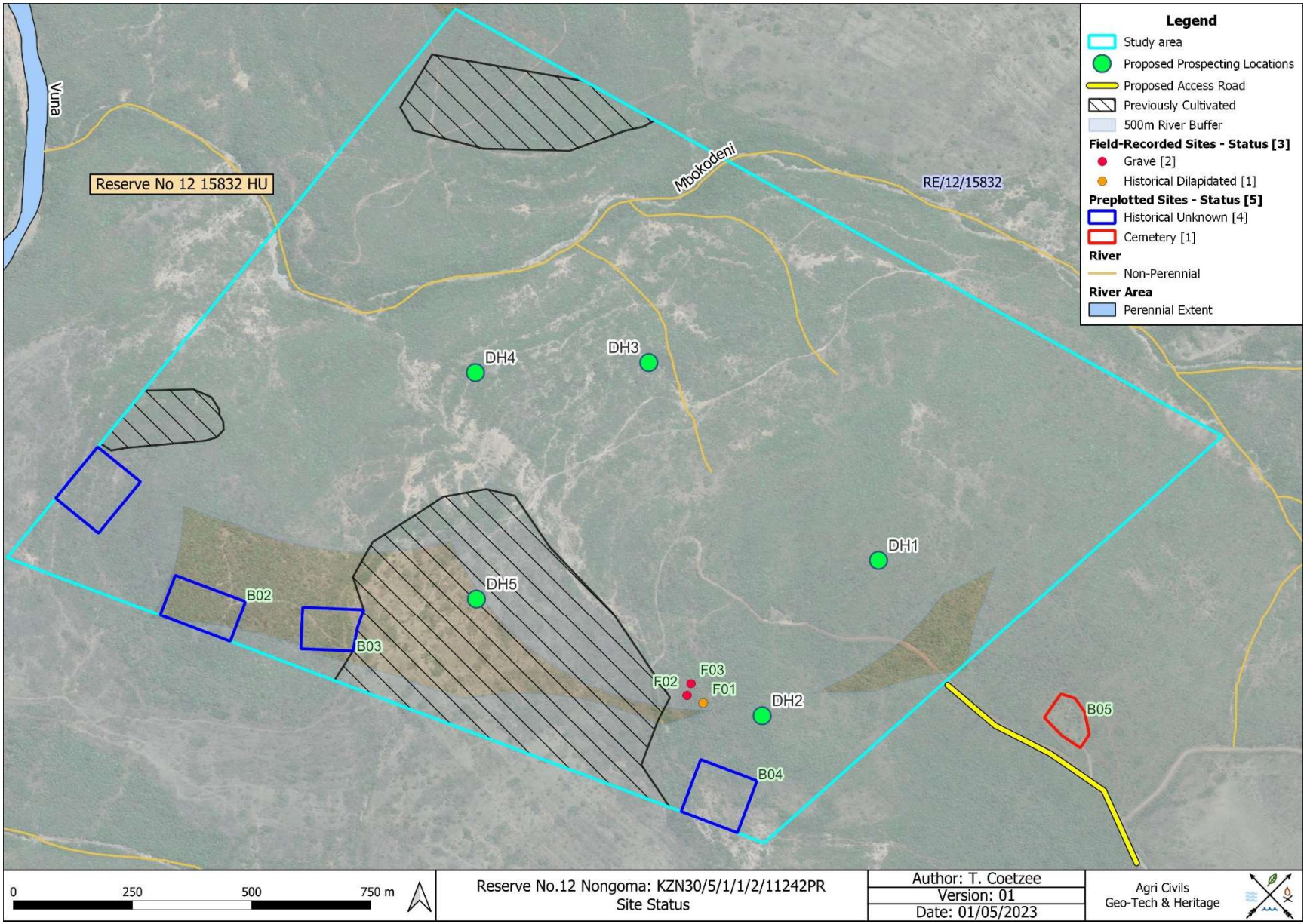


Figure 6: Site status and age portrayed on a 2021 satellite image.

Figure 7: Proposed prospecting site DH2.

Figure 8: Proposed prospecting site DH3

Figure 9: Proposed prospecting site DH4

Figure 10: Proposed prospecting site DH5

Figure 11: Proposed access road in a western direction.

Figure 12: Proposed access road in an eastern direction.

Figure 13: Dense vegetation associated with previously cultivated areas.

Figure 14: General view of the study area.

3.1 Sources of information

At all times during the survey, standard archaeological procedures for the observation of heritage resources were followed. As most archaeological material occur in single or multiple stratified layers beneath the soil surface, special attention was paid to disturbances; both man-made such as roads and clearings, and those made by natural agents such as burrowing animals and erosion. Locations associated with archaeological material remains, as well as general environmental conditions, were recorded by means of a Garmin Oregon 750 GPS and were photographed with a Samsung A71 mobile phone. A literature study, which incorporated previous work done in the region, was conducted in order to place the study area into context from a heritage perspective.

3.1.1 Previous Heritage Studies

Ward 15 Phenyane to Obazweni Gravel Road, Nongoma

A Heritage Impact Assessment was conducted by Active Heritage (Prins 2014) for the proposed gravel road between Phenyane and Obazweni in Ward 15, Nongoma. The study recorded no heritage sites, but noted that the general area is rich in archaeological and historical sites. The Phenyane to Obazweni Gravel Road is located approximately 13 km north-northwest of the proposed Gatlimip PR project area.

Mbhekamuzi Pedestrian Bridge near Ulundi

A Heritage Impact Assessment was conducted by Active Heritage (Prins 2017) for the proposed Mbhekamuzi Pedestrian Bridge near Ulundi. The study recorded no heritage sites, but noted that the general area is rich in archaeological and historical sites. The study area is located approximately 16 km southwest of the proposed Gatlimip PR project area.

Usuthu Dam

A heritage survey for the proposed Usuthu Dam approximately 6 km to the west of the proposed Gatlimip PR project area was conducted by Umlabo Archaeological Surveys and Heritage Management (Anderson 2018). The study did not record any archaeological sites and noted that the geological formations in the valley are not conducive for rock shelters and overhangs, except above the 400 m contours. However, several Middle Stone Age (MSA) and Later Stone Age (LSA) stone tools in a secondary deposit were noted throughout the study area and at various contour lines (Anderson 2018).

3.1.2 Historical topographical maps & aerial images

1937 Aerial Image

The earliest aerial image of the study area dates to 1937 (**Appendix A: Figure 31**) and shows one cultivated area, while the remainder of the study area appears undisturbed. Several footpaths are also noted.

1954 Aerial Image

The 1954 aerial image (**Appendix A: Figure 32**) shows two additional cultivated areas, as well as four areas along the southern border that are potentially associated with buildings.

1956 Aerial Image

The 1956 aerial image (**Appendix A: Figure 33**) shows the same detail as the 1954 aerial image (**Appendix A: Figure 32**).

1960 Aerial Image

The 1960 aerial image (**Appendix A: Figure 34**) shows the same detail as the 1956 aerial image (**Appendix A: Figure 33**).

1963 Aerial Image

The 1963 aerial image (**Appendix A: Figure 35**) shows the same detail as the 1960 aerial image (**Appendix A: Figure 34**).

1966 Topographical Map

The earliest topographical map of the study area dates to 1966 (**Appendix A: Figure 36**). The map shows a study area generally associated with undisturbed land and a few footpaths. Two of the three cultivated sections are indicated, as well as a hut at each of the previously identified building sites.

1970 Aerial Image

The aerial image dating to 1970 (**Appendix A: Figure 37**) shows a general increase in tree cover, while two of the previously cultivated areas appear to be no longer cultivated. Also, the buildings located at Sites B01 & B02 are no longer visible.

1991 Aerial Image

The majority of study area appears to be covered by very dense tree cover and no buildings are visible at any of the previously identified sites (**Appendix A: Figure 38**). One of the cultivated areas, however, still appears to be cultivated.

1991 Topographical Map

The 1991 topographical map (**Appendix A: Figure 39**) still indicates two of the cultivated fields, as well as a building at each of the previously identified building sites.

2005 Aerial Image

The 2005 aerial image (**Appendix A: Figure 40**) shows a densely vegetated study aera, several footpaths, and disused cultivated fields. Buildings are also no longer visible at any of the identified building sites.

2005 Topographical Map

The 2005 topographical map (**Appendix A: Figure 41**) shows a study area absent of buildings and cultivated land.

3.1.3 Personal Communication

Personal communication with the community members listed below yielded valuable information (**Figure 15**):

- Sakhile Ntshangase
- Sihle Ntshangase
- Neliswa Ntshangase

- Senzo Ntshangase
- Simo Ntshangase
- Smiso Ntombela
- Fisokuhle Mhlophe

The listed community members accompanied the author and identified two grave sites, as well as a small stone-walled enclosure. Accordingly, their ancestors lived in the area to the south of the access road, but moved to the Qongqo village 2 km to the southeast. The reason being proximity to roads and transport opportunities. There is uncertainty about the date on which the move occurred, but it appears to have taken place between the 1950's and 1960's.

Figure 15: Members of the local community assisting with the survey.

3.2 Limitations

The majority of the study area is associated with extremely dense vegetation that prohibited free movement and visibility (**Figures 16 – 17**). As a result, one of the proposed prospecting locations (DH1), as well as the four identified building sites (B01 – B04) could not be accessed. Time constraints due to slow movement through the dense vegetation further hampered the study. The proposed prospecting locations, however, do not intersect the identified heritage sites.

Figure 16: Dense vegetation prohibiting access to proposed prospecting site DH1.

Figure 17: Dense vegetation associated with the majority of the study area.

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 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 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 Nongoma Archaeo-History

Research conducted by Penner (1970), Hall (1980), Feely (1980) and Anderson (1988) revealed a rich and diverse archaeological record, especially in the Hluhluwe-Umfolozi Nature Reserve that is located approximately 23 km to the southeast of the proposed Gatlimip PR project area (Prins 2014).

The sites recorded in the Hluhluwe-Umfolozi Nature Reserve include Early, Middle and Later Stone Age sites, as well as rock art sites. The Six ESA sites were located mostly in dongas and close to water with little in-situ material. Fifty-nine MSA sites were also recorded in the reserve, the most of which are open-air sites occurring not within archaeological context. Thirty-five LSA sites were recorded as well. The majority of these sites occur in open-air context, while a few are associated with small shelters and caves. The eleven Zululand rock art sites that were recorded are not as well-known as the Drakensberg sites and differ in style. According to Prins (2014), these sites are likely to be older than the Drakensberg rock art sites.

Archaeological sites outside of the Hluhluwe-Umfolozi Nature Reserve include two ESA sites approximately 4 km southwest of Nongoma, a MSA site directly adjacent to Nongoma, and LSA sites in the greater Zululand, but not close to Nongoma. An Iron Age engraving has also been recorded in the greater area (Prins 2014).

According to Prins (2014), an initial wave of Early Iron Age people settled along the inland sand dunes around 1700 years ago. The sandy but humus rich soils would have ensured good crops. The pottery style characteristic of these early agro-pastoralists is known as Matola. These people exploited wild plant and animal resources of the forest and adjacent seashore. Communities likely consisted of small groups slash-and-burn cultivators.

Another wave of Iron Age people entered the area around 1500 years ago. The pottery styles associated with these people are classified as Msuluzi (AD 500 – 700), Ndondondwane (AD 700 – 800) and Ntshekane (AD 800 – 900). The archaeological sites dating to this period generally occur in the Tugela River Basin below the 1000 m contour (Prins 2014).

The development of the Zulu state of King Shaka in the early 1800's is also closely related to the Nongoma and Ulundi areas. The emaKhosini valley (Valley of the Kings), as well as the military capital of King Dingane, is located close to Ulundi. Some of the archaeological sites associated with Zwide, the Ndwandwe leader who initially opposed King Shaka, is located further to the north and closer to the study area (Prins 2014).

The general area is also known for historical sites dating to the Anglo-Zulu War of 1879. The majority of these sites are located closer to Ulundi. However, King Cetswayo's Gqikazi settlement is located closer to Nongoma. The more recent colonial history of the area deals with early English ivory traders at Port Natal (Durban) around 1820, followed by the Voortrekkers moving into the area around 1834. A short-lived Boer republic, Natalia, was established to the south of the Tugela River. By 1845, however, Natal became a British colony and in 1879, Zululand was invaded by British forces. The area was annexed soon after (Prins 2014).

5. Archaeological and Historical Remains

5.1 Stone Age Remains

A few stone tools dating to the LSA were located in the study area (**Figures 18 & 19**). These stone tools were observed in erosion gullies and therefore do not occur within archaeological context. Also, no concentrations were observed. **Figures 20 – 22** below are examples of stone tools often associated with the Early, Middle and Later Stone Age of southern Africa. Similar such stone tools might be located within the study area.

The archaeological survey conducted by Anderson (2018) recorded several MSA and LSA stone tools associated with a secondary context.

Figure 18: LSA tools located within the study area.

Figure 19: Reverse side of LSA tools.

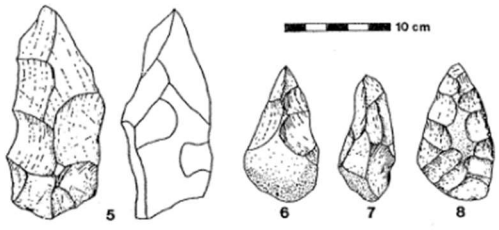


Figure 20: ESA artefacts (Volman 1984).

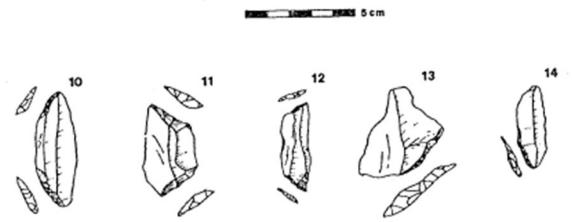


Figure 21: MSA artefacts (Volman 1984).

Figure 22: LSA scrapers (Klein 1984).

5.2 Iron Age Farmer Remains

No Iron Age Farmer remains were located within the demarcated study area.

The heritage studies conducted by Prins (2014, 2017) and Anderson (2018) also did not record any Iron Age sites.

5.3 Historical Remains

Four sites dating to the Historic Period were noted on historical aerial imagery and topographical maps, while one additional site was located during the survey (**Table 3**).

Sites B01 – B04 are located along the southern boundary of the demarcated study area and do not intersect any of the proposed prospecting localities. The sites were identified as buildings on the 1954 aerial image (**Appendix A: Figure 32**). Two of the buildings (B03 & B04) remain visible on subsequent aerial images, except on the 1991 and 2005 aerial images (**Appendix A: Figures 38 & 40**), while the other two buildings (B01 & B02) are no longer visible on the 1970 aerial image (**Appendix A: Figure 37**). The last topographical map to indicate the buildings dates to 1991 (**Appendix A: Figure 39**). It should be kept in mind that due to the dense vegetation obscuring much of the study area, the sites might not be visible on the 1970 and 1991 aerial images. It is therefore likely that the buildings were constructed between 1937 and 1954 (**Appendix A: Figures 31 & 32**), and were demolished between 1991 and 2005 (**Appendix A: Figures 39 & 41**). These sites could not be accessed during the site inspection, but do not intersect the proposed prospecting sites.

Site F01 was identified during the survey as a stone-walled enclosure with a diameter of approximately 3 m and a height of about 70 cm. The site is located near the south-eastern corner of the study area and west of proposed prosecting site DH2. According to members of the local community, their ancestors used the stone-walled enclosure to keep pigs. Accordingly, the ancestors of the local community members who accompanied the author on the survey settled in the immediate vicinity, but abandoned the settlement and moved up-hill and closer to

existing roads. **Figure 23** indicates the stone-walled enclosure. Due to the dense vegetation cover, however, no settlement remains were observed.

The heritage studies conducted by Prins (2014, 2017) and Anderson (2018) did not record any historical sites.

Table 3: Historical Sites.

Name	Type	Source	Year / Age	Surface Indications
B01	Building	Aerial	1954	Unknown
B02	Building	Aerial	1954	Unknown
B03	Building	Aerial	1954	Unknown
B04	Building	Aerial	1954	Unknown
F01	Stone-walled enclosure	Field	Historical	Stone-walled enclosure

Figure 23: Stone-walled enclosure at site F01.

5.4 Contemporary Remains

No potential sites dating to contemporary times were observed on historical aerial imagery, topographical maps, or during the pedestrian survey.

The heritage studies conducted by Prins (2014, 2017) and Anderson (2018) did not record any sites dating to contemporary times.

5.5 Graves/Burial Sites

The location of one cemetery was provided by Meridien Resources (Pty) Ltd and two sites associated with graves were identified by the local community during the pedestrian survey (**Table 4**).

Cemetery B05 is a large cemetery of which the location was provided. The cemetery is not fenced-off and is located approximately 192 m east of the demarcated study area (**Figures 24 – 26**). The graves are oriented in an east-west direction and the majority of the surface features are characterised by stacked stones, while some are associated with formal surface decorations. It should be noted that the cemetery is severely overgrown and although roughly 10 graves were noted, several additional graves may exist. According to the local community, the cemetery is still in use, but the age of the earliest graves is unknown. Inscriptions are also very limited.

Sites F02 and F03 were identified by the local community, are located close to each other and approximately 37 m northwest of the stone-walled enclosure at Site F01. Both sites are extremely overgrown, are not fenced-off, consist of stacked stones oriented in a n east-west direction and are not associated with any inscriptions or grave goods. Site F02 consists of approximately two graves and Site F03 of approximately four graves (**Figures 27 – 29**). Accordingly, the burial sites belong to the local community's ancestors who settled in the immediate vicinity.

The heritage studies conducted by Prins (2014, 2017) and Anderson (2018) did not record any burial sites.

Table 4: Graves/Burial Sites/Cemeteries.

Name	Type	Source	Year/Age	Current Status	No of graves
B05	Cemetery	Provided	Historical	Intact	10+
F02	Graves	Field	Historical	Intact	±2
F03	Graves	Field	Historical	Intact	±4

Figure 24: Graves and the local community at cemetery B05.

Figure 25: Informal graves at cemetery B05.

Figure 26: Dense vegetation at cemetery B05.

Figure 27: Two informal graves at Site F02.

Figure 28: Four informal graves at Site F03.

Figure 29: Dense vegetation at Site F03.

6. 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 NHRA (Act No. 25 of 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.

6.1 Field Ratings

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

Table 5: 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

Table 6: Individual site ratings.

Site / Survey Point Name	Type	Rating	Field Rating/Grade	Significance	Recommendation
2831BA-B01	Building	General Protection B	4 B	Medium	Record site
2831BA-B02	Building	General Protection B	4 B	Medium	Record site
2831BA-B03	Building	General Protection B	4 B	Medium	Record site
2831BA-B04	Building	General Protection B	4 B	Medium	Record site
2831BA-B05	Cemetery	Local	Grade 3 A	High	Mitigation not advised
2831BA-F01	Stone-walled enclosure	General Protection B	4 B	Medium	Record site
2831BA-F02	Graves	Local	Grade 3 A	High	Mitigation not advised
2831BA-F03	Graves	Local	Grade 3 A	High	Mitigation not advised

7. Statement of Significance & Recommendations

7.1 Statement of Significance

The study area: The Proposed Gatlimip PR Application

Some of the areas within the demarcated impact area are considered to be significant from a heritage perspective. The significance of the proposed area and the observed sites are discussed here.

The general region is associated with a rich and diverse archaeological record inclusive of ESA, MSA, LSA, Iron Age and historical sites. On a local scale, the project area is associated with scattered Stone Age material, historical infrastructure and graves / cemeteries. The demarcated study area is largely located within 500 m of rivers/streams, a zone that is generally associated with a higher heritage site probability. Three areas, however, have been disturbed by cultivated land that significantly lowers the sensitivity in terms of heritage resources. These areas are preferred for the proposed prospecting activities since archaeological sites are more likely to occur in the undisturbed areas (**Figure 30)**. It should be noted that four of the five proposed prospecting sites (DH1 – DH4) fall within the 500 m river buffer zone, while the fifth (DH5) falls within previously cultivated land and is therefore considered to be less sensitive from a heritage perspective.

Proposed prospecting site DH1 could not be accessed and the sensitivity of the site is therefore unknown. Although no surface remains were observed at the remaining proposed prospecting sites (DH1 – DH4) and access road, and due to no potential heritage sites being shown on historical aerial imagery and topographical maps, the demarcated prospecting sites and access road are not considered to be sensitive from a heritage perspective. However, due the existence of past settlements and graves, accessing the demarcated prospecting sites might impact heritage resources. All access routes to the individual prospecting sites are therefore considered to be potentially sensitive from a heritage perspective. Also, since the proposed access road to the study area, as indicated by **Figure 30**, is located on an existing road, and since the project will only entail prospecting activities, it is unlikely that cemetery B05 will be impacted by the proposed project.

Historical Sites

Five sites associated with historical infrastructure were recorded: B01 – B04 & F01. Four of these sites (B01 – B04) could not be accessed, but do not intersect the proposed prospecting localities. Since these sites are likely to exceed 60 years of age, potential remains might be protected by the NHRA (Act No. 25 of 1999). Another site, F01, consists of a stone-walled enclosure potentially exceeding 60 years of age. This site does not intersect any of the proposed prospecting sites, but is likely to be protected by the NHRA (Act No. 25 of 1999).

Graves / Cemeteries

One cemetery and two grave sites (F02 & F03) were recorded. The grave / cemetery sites do not intersect the proposed prospecting locations and are therefore unlikely to be impacted by the proposed prospecting project. All three sites appear to exceed 60 years of age and are therefore protected by the Human Tissues Act (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, 1999 (Act No. 25 of 1999). All grave / cemetery sites are considered to be significant and sensitive from a heritage perspective.

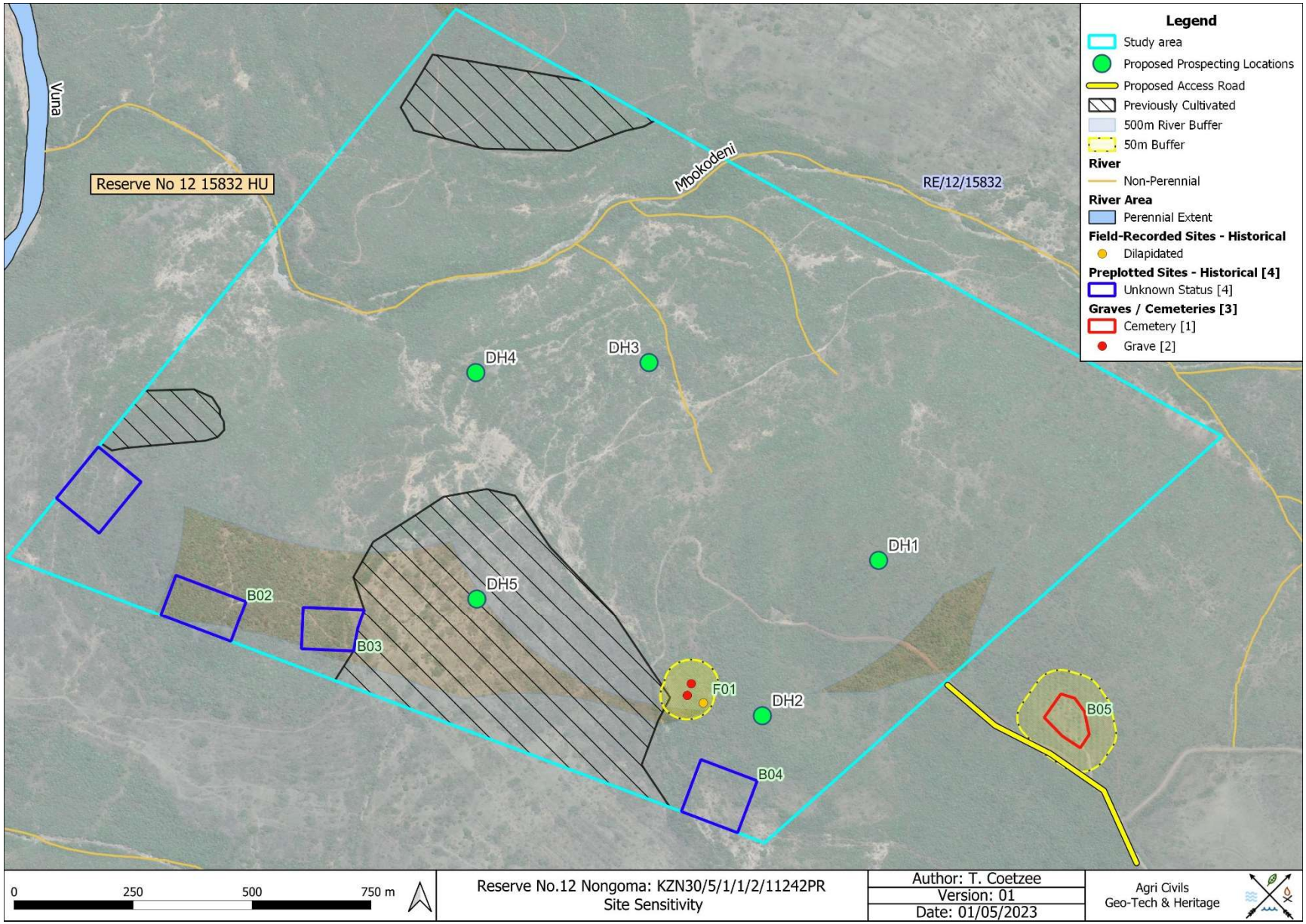


Figure 30: Study area and sensitive areas portrayed on a 2021 satellite image.

7.2 Recommendations

The following recommendations are made in terms with the National Heritage Resources Act, 1999 (Act No. 25 of 1999) in order to avoid the destruction of heritage remains associated with the areas demarcated for prospecting:

Sites intersecting the proposed impact areas

- No potential heritage sites were located at proposed prospecting sites DH1 – DH4 and no potential heritage sites were located along the proposed access road. These locations are therefore not considered to be sensitive from a heritage perspective and prospecting may continue at these locations.

- Proposed prospecting location DH1 could not be accessed and might be sensitive from a heritage perspective. However, no potential sites were noted on historical aerial imagery and topographical maps and according to the local community, no graves or past settlements occur in the immediate surroundings of proposed prospecting site DH1. Site DH1 is therefore unlikely to be sensitive from a heritage perspective. However, it is recommended that the Environmental Control Officer (ECO), as well as a member of the local community, inspect DH1 after access has been obtained and prior to any prospecting activity.

- No access routes to the proposed prospecting locations exist and since the study area is associated with graves and past settlements, potential heritage resources may be impacted. Due the local community's in-depth knowledge of the study area, it is recommended that a member of the local community, as well as the ECO, accompany the prospecting team when clearing the way to each of the proposed prospecting sites in order to limit/prevent impact to heritage resources.

Sites that intersect the study area, but not the proposed impact area

- Historical Sites B01 – B04 could be associated with infrastructure exceeding 60 years of age may therefore be protected by the NHRA, 1999 (Act No. 25 of 1999). However, these sites could not be accessed, but fall outside of the proposed impact areas. Therefore, no impact is foreseen and no further action is required.

- Stone-walled site F01 forms part of the local community's previous settlement, is likely to exceed 60 years of age and might be protected by the NHRA, 1999 (Act No. 25 of 1999). Due to the nearby presence of graves and potential historical infrastructure obscured by dense vegetation, the area is considered to be sensitive from a heritage perspective and should be avoided when clearing an access road to proposed prospecting site DH2. However, no potential heritage resources were observed at proposed prospecting site DH2 and the site is therefore not considered to be sensitive from a heritage perspective.

- Grave sites F02 and F03 are significant and sensitive from a heritage perspective, but are unlikely to be impacted by the proposed prospecting project. Since the graves are likely to exceed 60 years of age, the Human Tissues Act (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, 1999 (Act No. 25 of 1999) apply. It is recommended that no activity take place within 50 m of the graves.

Sites that do not intersect the study area

- Cemetery B05 is significant and sensitive from a heritage perspective, but is located outside of the demarcated study area. Although the proposed access road, based on an existing road, falls just within the 50 m buffer zone of the cemetery, the cemetery is unlikely to be impacted by the proposed prospecting project since the access road will only be used to transport prospecting equipment. Since the graves are likely to exceed 60 years of age, the Human Tissues Act (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, 1999 (Act No. 25 of 1999) apply. Except for the small section of existing road intersecting the 50 m buffer, it is recommended that no additional activities take place within the buffer zone.

General

- The above recommendations are based on the specific project extent and planned activities as indicated by the figures of this report. Should the proposed project/impact areas be altered to include additional areas, a qualified archaeologist must amend the HIA accordingly.

- Should uncertainty regarding the presence of heritage remains exist, or if heritage resources are discovered by chance, it is advised that the potential site be avoided and that a qualified archaeologist be contacted as soon as possible.

- Since archaeological artefacts generally occur below surface, the possibility exists that culturally significant material may be exposed during the proposed prospecting project, in which case all activities must be suspended pending further archaeological investigations by a qualified archaeologist. Also, should skeletal remains be exposed during the prospecting project, 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 continue at the demarcated sites, subject to the abovementioned conditions, recommendations, and approval by the South African Heritage Resources Agency.

8. Conclusion

The proposed Gatlimip PR Application will consist of five prospecting locations and an access road. The project area is associated with a combination of stone tools in secondary context, a stone-walled enclosure, potential historical infrastructure, graves and a cemetery, some of which are protected by legislation. Should the recommendations made in this study be adhered to and with the approval of the South African Heritage Resources Agency, the proposed Gatlimip PR Application may proceed.

9. 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 selvage 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.

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Toth, N. & Schick, K. 2007. *Handbook of paleoanthropology*. Berlin: Springer.

Volman, T. P. 1984. Early Prehistory of southern Africa. In: Klein, R. G. (ed.) Southern African prehistory and paleoenvironments. Rotterdam: Balkema.

Human Tissue Act No. 65 of 1983, Government Gazette, Cape Town

National Heritage Resource Act No.25 of 1999, Government Gazette, Cape Town

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

Appendix A: Historical Aerial Imagery & Topographical Maps

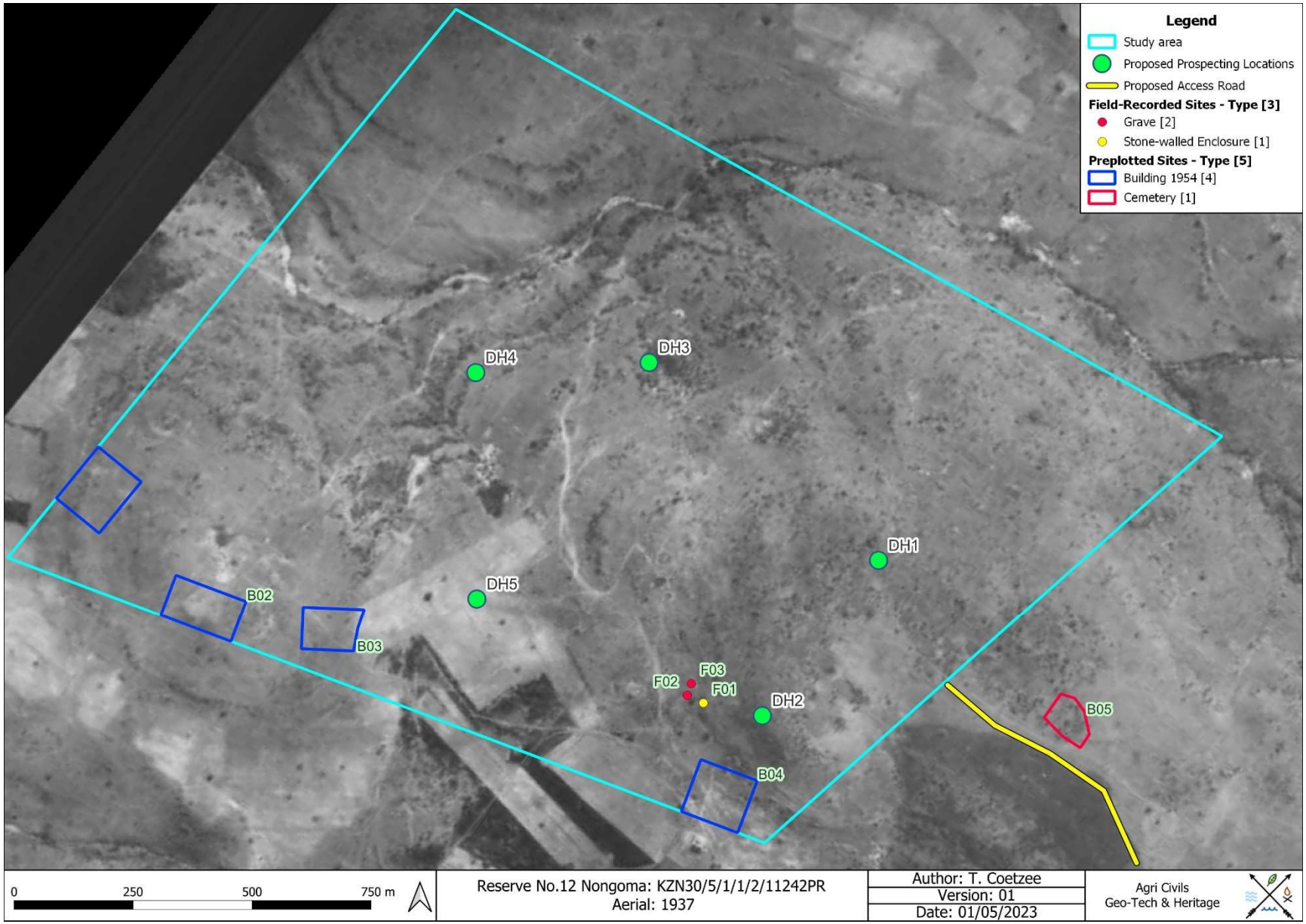

Figure 31: Study area superimposed on a 1937 aerial image.

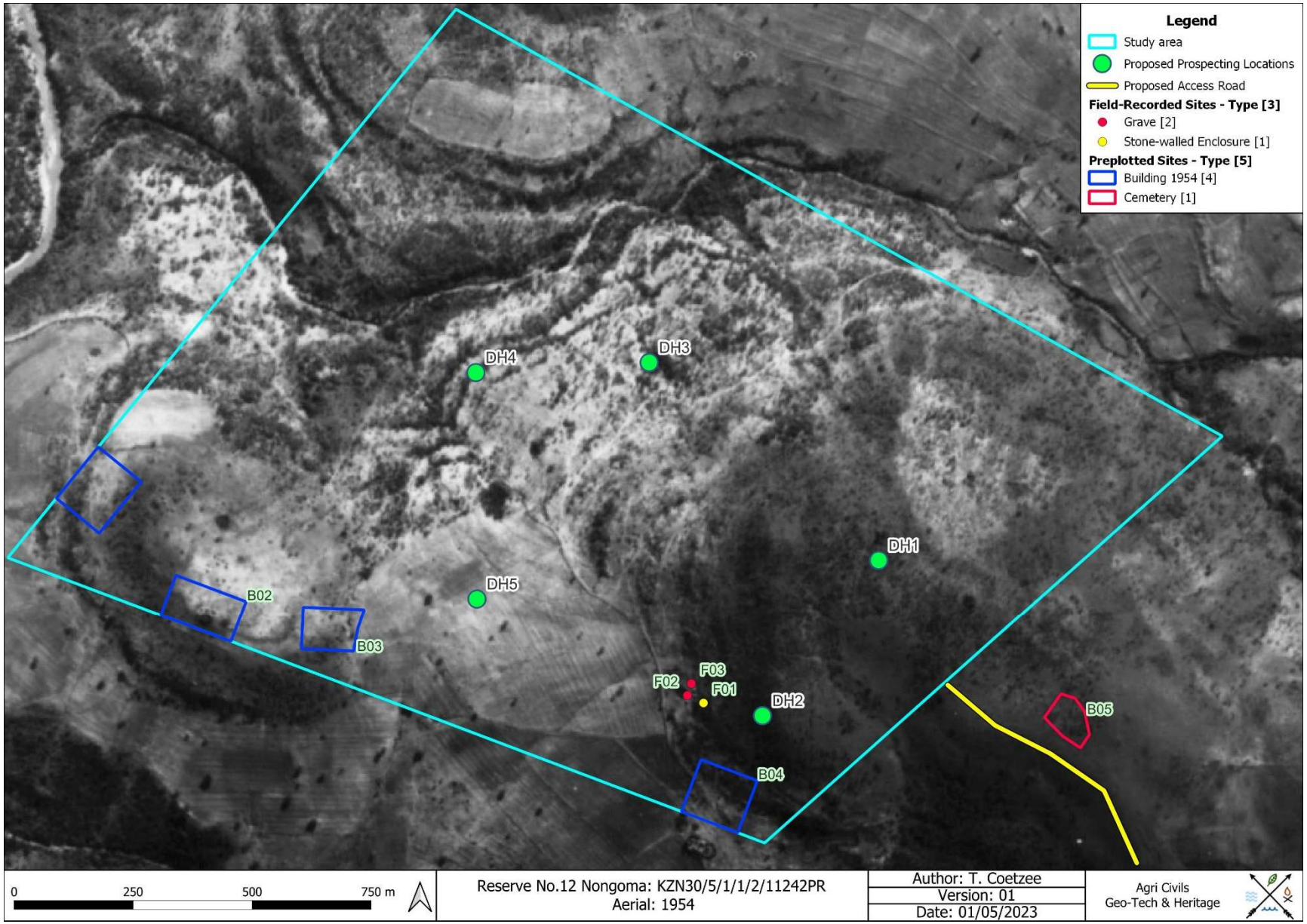

Figure 32: Study area superimposed on a 1954 aerial image.

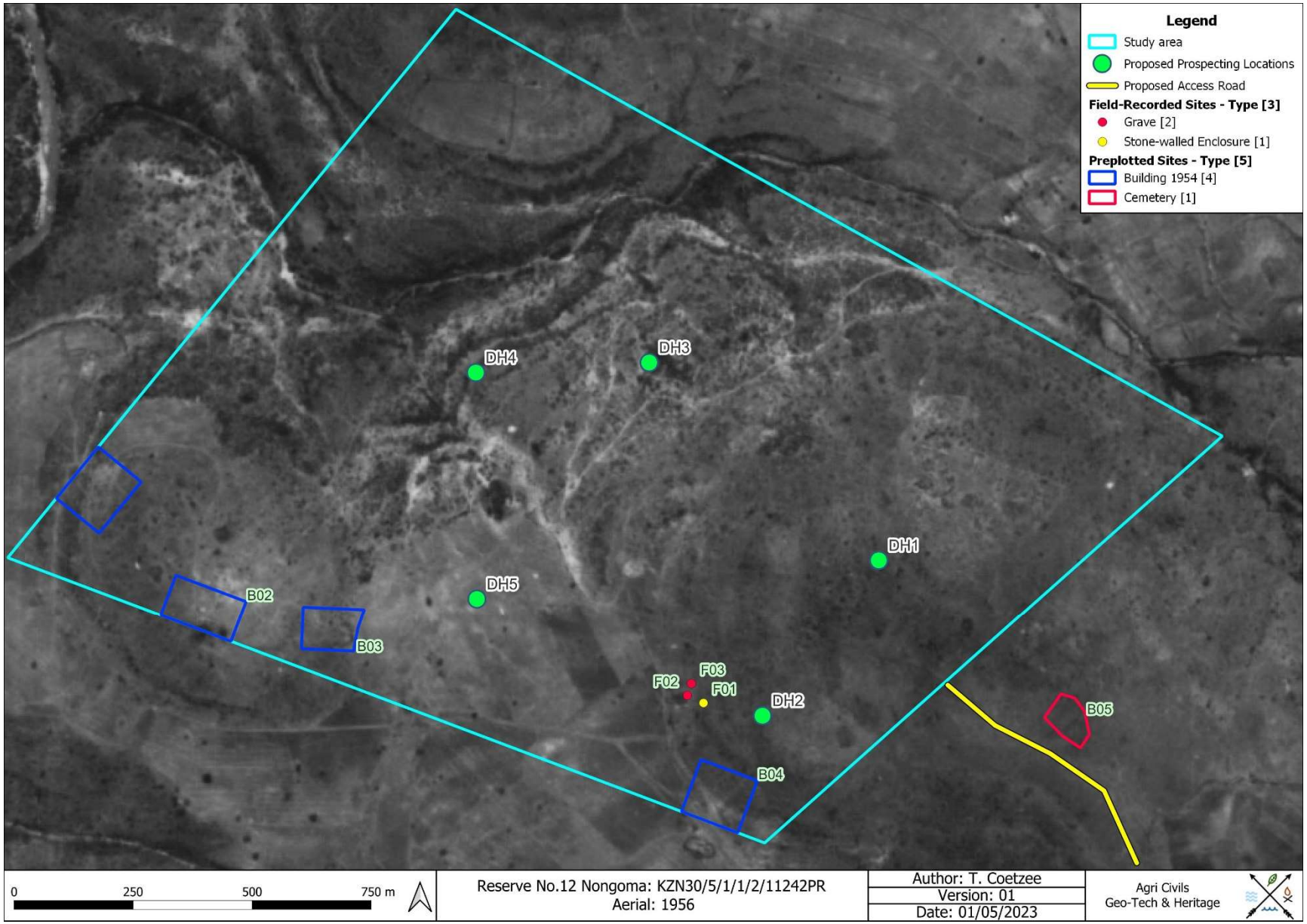

Figure 33: Study area superimposed on a 1956 aerial image.

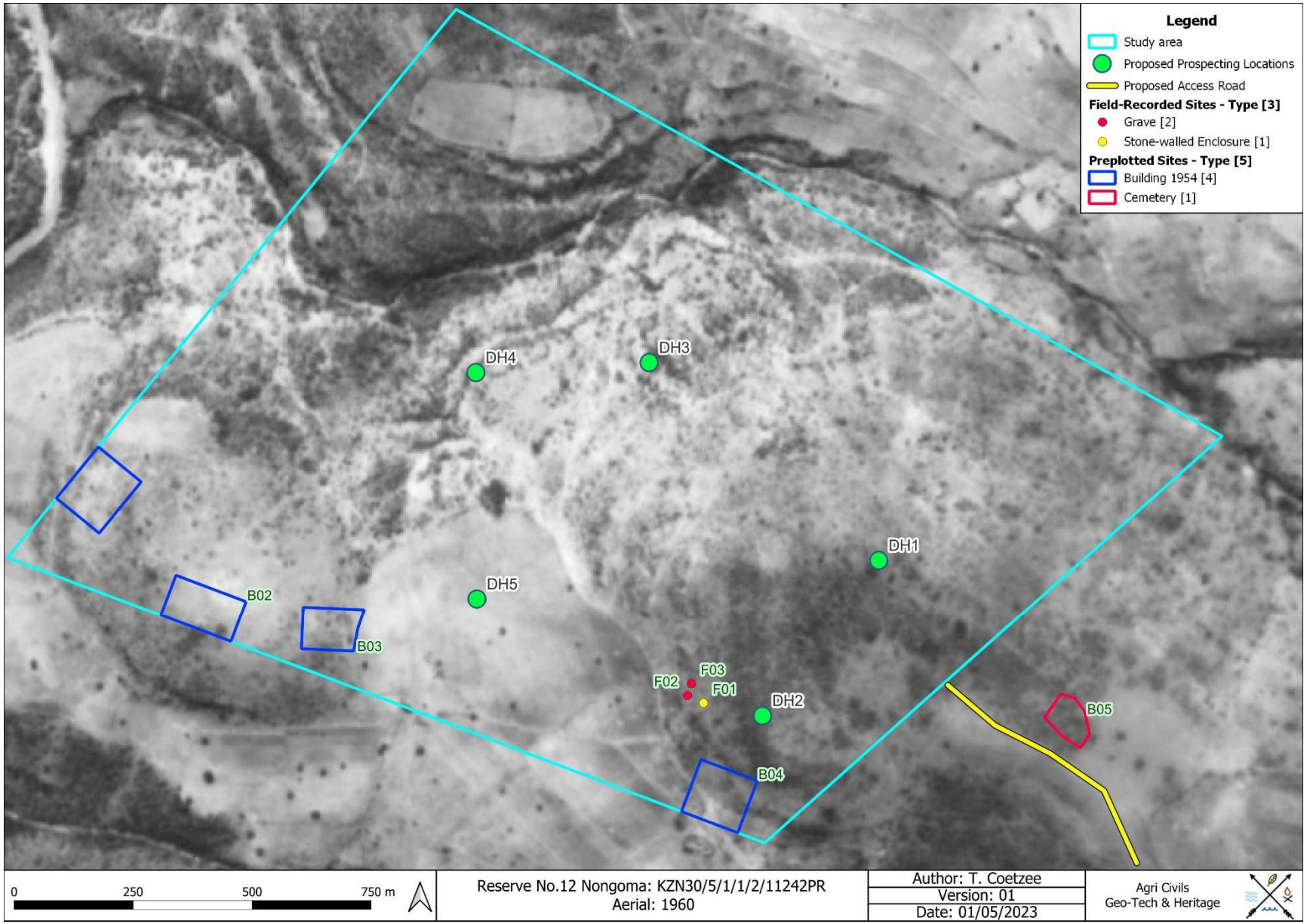

Figure 34: Study area superimposed on a 1960 aerial image.

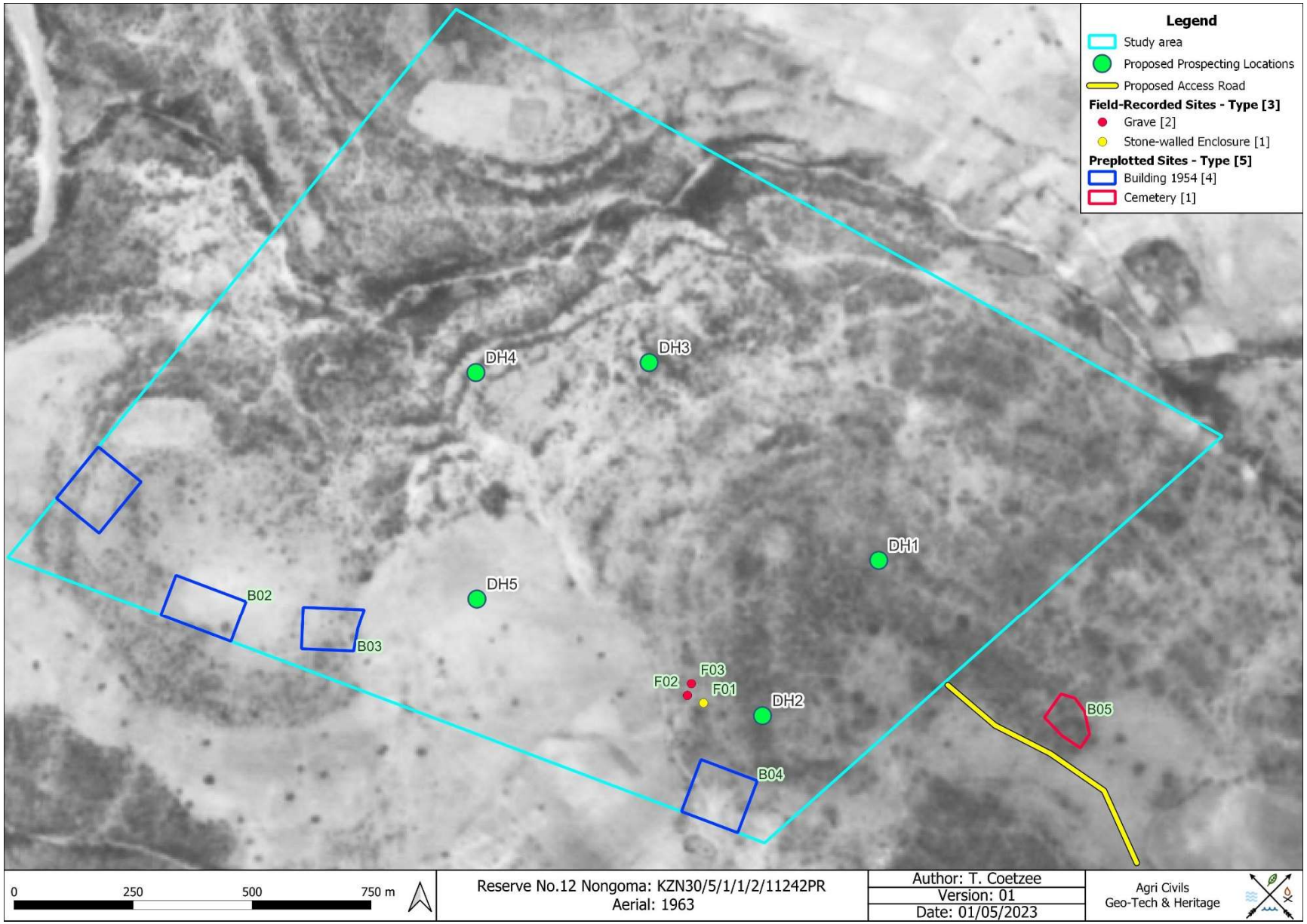

Figure 35: Study area superimposed on a 1963 aerial image.

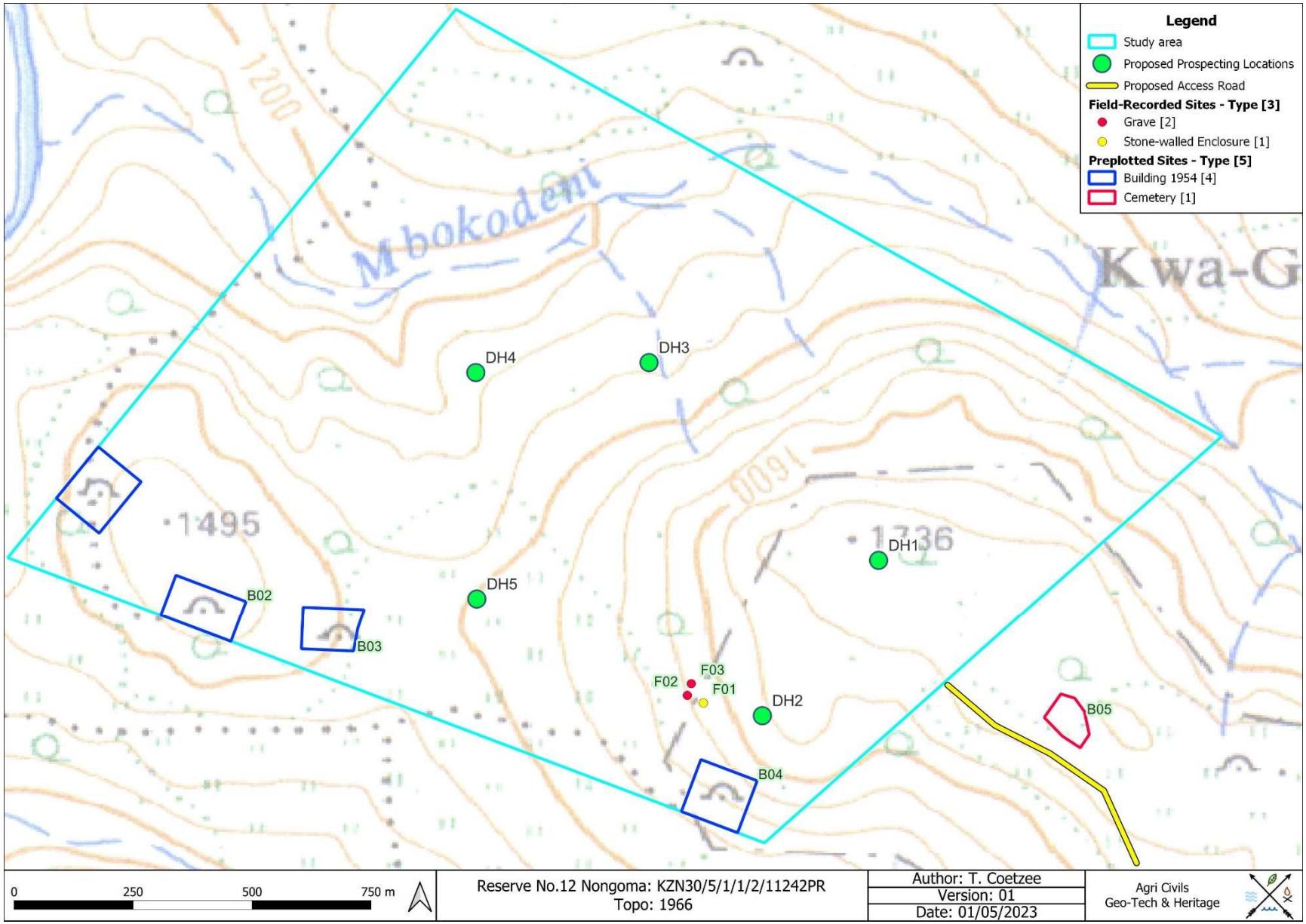

Figure 36: Study area superimposed on a 1966 topographical map.

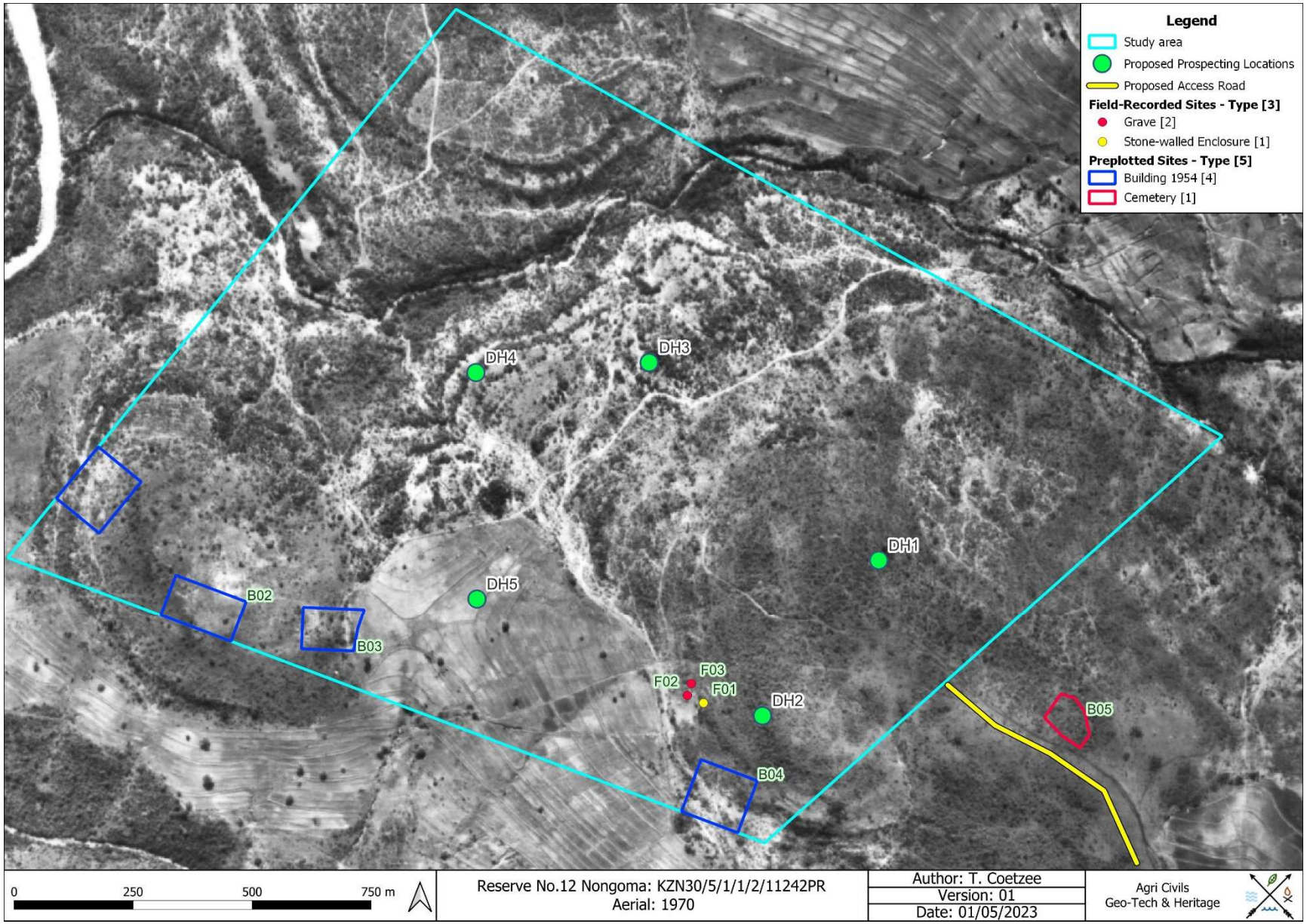

Figure 37: Study area superimposed on a 1970 aerial image.

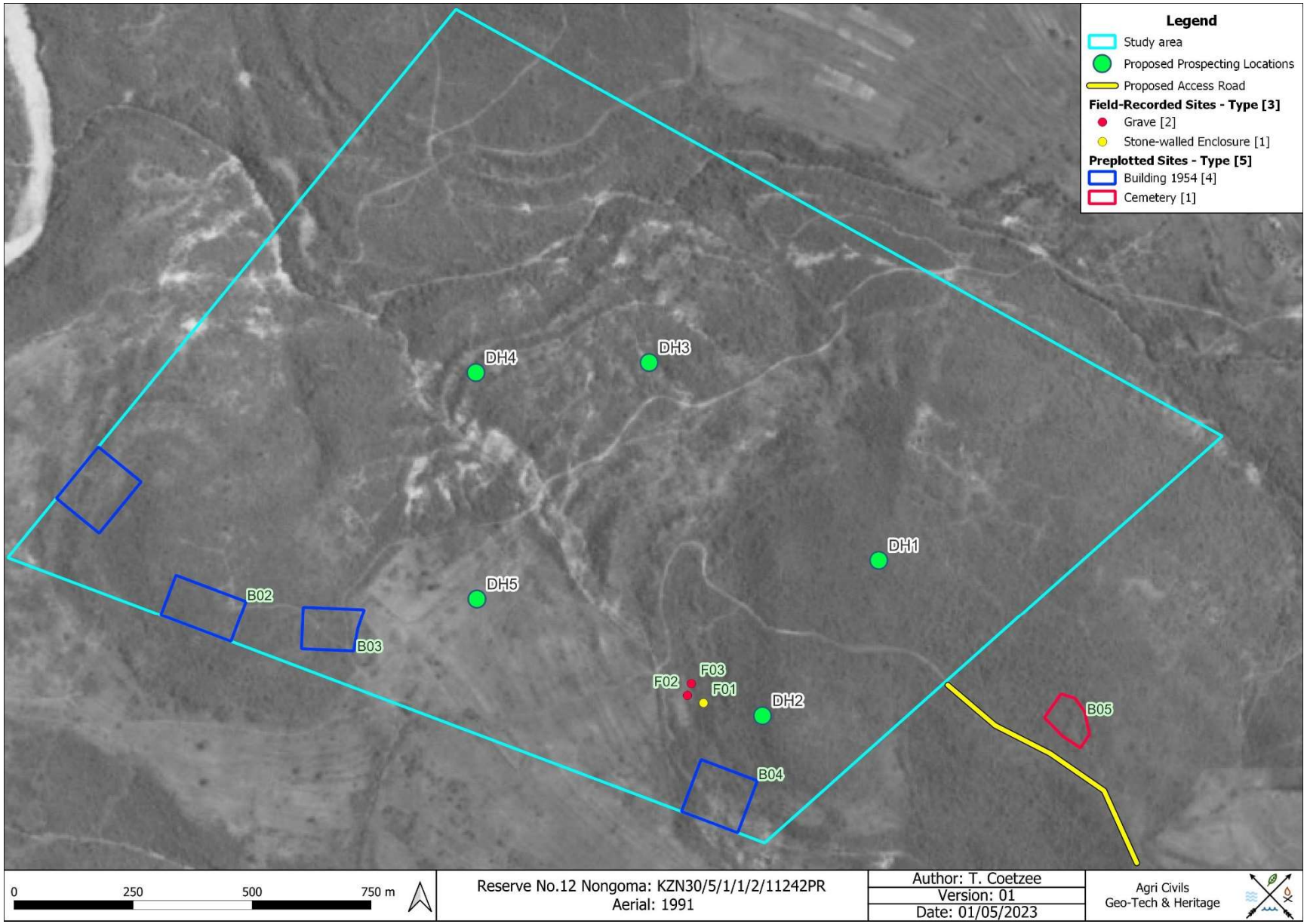

Figure 38: Study area superimposed on a 1991 aerial image.

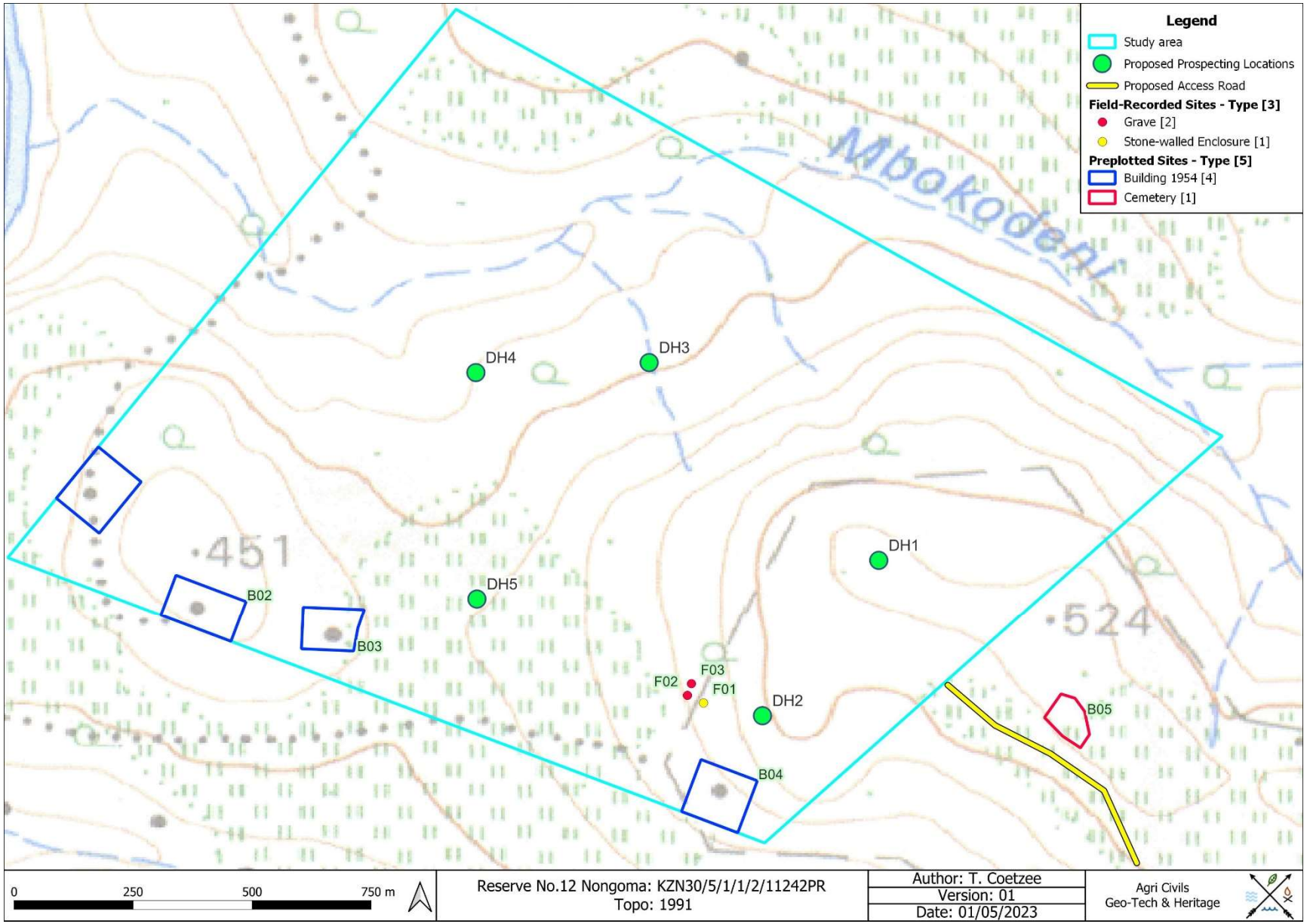

Figure 39: Study area superimposed on a 1991 topographical map.

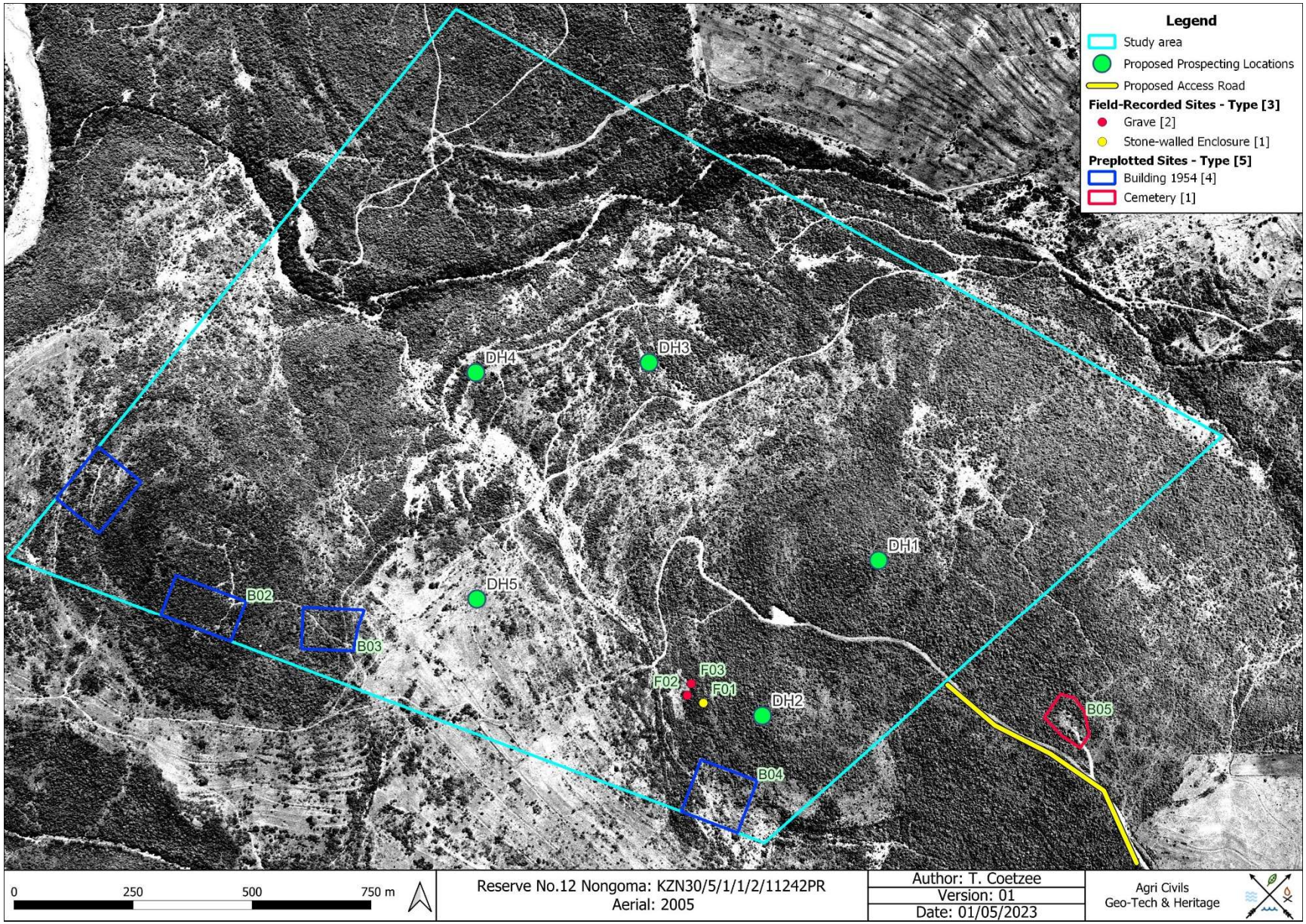

Figure 40: Study area superimposed on a 2005 aerial image.

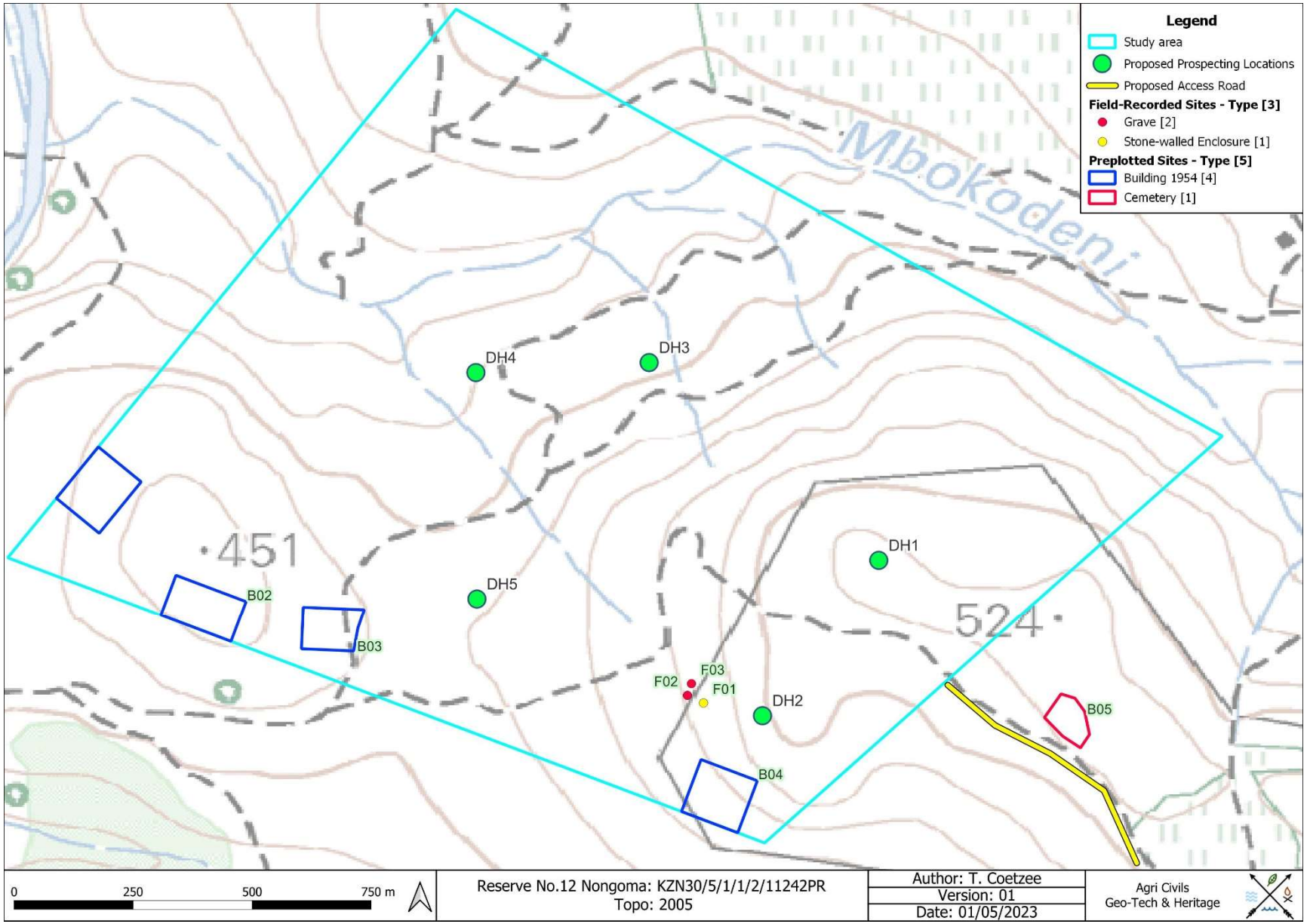

Figure 41: Study area superimposed on a 2005 topographical map.

Appendix B: NEMA Risk Assessment Methodology

1.1 RISK ASSESSMENT

The first stage of impact assessment is the identification of environmental activities, aspects and impacts. The receptors and resources are also identified, which allows for an understanding of the impact pathway and assessment of the sensitivity to change.

The purpose of the rating is to develop a clear understanding of influences and processes associated witheach impact. The values for the likelihood and consequence (severity, spatial scope and duration) of the impact are then used to determine whether mitigation is necessary.

1.1.1 Methodology used in Determining the Significance of Environmental impacts

The Environmental Impact Assessment (EIA) 2014 Regulations [as amended] promulgated in terms of Sections 24 (5), 24M and 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) [as amended] (NEMA), requires that all identified potential impacts associated with the project be assessedin terms of their overall potential significance on the natural, social and economic environments. The criteriaidentified in the EIA Regulations (2014) include the following:

- Nature of the impact;
- Extent of the impact;
- Duration of the impact
- Probability of the impact occurring;
- Degree to which impact can be reversed;
- Degree to which impact may cause irreplaceable loss of resources;
- Degree to which the impact can be mitigated; and
- Cumulative impacts.

The impact assessment methodology used to determine the significance of impacts prior and after mitigation is presented below

Extent of the impact		
The EXTENT of an impact is the physical extent/area of impact or influence.		
Score	**Extent**	**Description**
1	Footprint	The impacted area extends only as far as the actual footprint of the activity.
2	Site	The impact will affect the entire or substantial portion of the site/property.
3	Local	The impact could affect the area including neighbouring properties and transport routes.
4	Region	Impact could be widespread with regional implication.
5	National	Impact could have a widespread national level implication.

Duration of the impact		
The DURATION of an impact is the expected period of time the impact will have an effect.		
Score	**Duration**	**Description**
1	Short term	The impact is quickly reversible within a period of less than 2 y limited to the construction phase, or immediate upon the commenof floods.
2	Short to medium term	The impact will have a short term lifespan (2–5 years).
3	Medium term	The impact will have a medium term lifespan (6 – 10 years)
4	Long term	The impact will have a medium term lifespan (10 – 25 years)
5	Permanent	The impact will be permanent beyond the lifespan of the development

Intensity of the impact		
The INTENSITY of an impact is the expected amplitude of the impact.		
Score	**Intensity**	**Description**
1	Minor	The activity will only have a minor impact on the affected environment i a way that the natural processes or functions are not affected.
2	Low	The activity will have a low impact on the affected environment.
3	Medium	The activity will have a medium impact on the affected environment function and process continue, albeit in a modified way.
4	High	The activity will have a high impact on the affected environment which be disturbed to the extent where it temporarily or permanently ceases
5	Very High	The activity will have a very high impact on the affected environment may be disturbed to the extent where it temporarily or permanently ce

Reversibility of the impact

The REVERSIBILITY of an impact is the severity of the impact on the ecosystem structure

Score	Reversibility	Description
1	Completely reversible	The impact is reversible without any mitigation measures and manag measures
2	Nearly completely reversible	The impact is reversible without any significant mitigation management measures. Some time and resources required.
3	Partly reversible	The impact is only reversible with the implantation of mitigation management measures. Substantial time and resources required.
4	Nearly irreversible	The impact is can only marginally be reversed with the implantatio significant mitigation and management measures. Significant time resources required to ensure impact is on a controllable level.
5	Irreversible	The impact is irreversible.

Probability of the impact

The PROBABILITY of an impact is the severity of the impact on the ecosystem structure

Score	Probability	Description
1	Improbable	The possibility of the impact occurring is highly improbable (less than of impact occurring).
2	Low	The possibility of the impact occurring is very low, due either to circumstances, design or experience (5% to 30% of impact occurring
3	Medium	There is a possibility that the impact will occur to the extent that provis must be made therefore (30% to 60% of impact occurring).
4	High	There is a high possibility that the impact will occur to the extent t provision must be made therefore (60% to 90% of impact occurring).
5	Definite	The impact will definitely take place regardless of any prevention pla and there can only be relied on migratory actions or contingency plato contain the effect (90% to 100% of impact occurring).

Calculation of Impacts – Significance Rating of Impact

Significance is determined through a synthesis of the various impact characteristics and represents the combined effect of the Irreplaceability (Magnitude, Extent, Duration, and Intensity) multiplied by the Probability of the impact. The significance of an impact is rated according the scores a presented below:

Equation 1:

Significance = Irreplaceability (Reversibility + Intensity + Duration + Extent) X Probability

Significance Rating		
Score	**Significance**	**Colour Code**
1 to 20	Very low	
21 to 40	Low	
41 to 60	Medium	
61 to 80	High	
81 to 100	Very high	

Mitigation Efficiency	
Degree to which the impact can be mitigated: *The effect of mitigation measures on the impact and itsdegree of effectiveness:*	
Equation 2:	
Significance Rating = Significance x Mitigation Efficiency	
High	0,2
Medium to High	0,4
Medium	0,6
Low to Medium	0,8
Low	1,0

Confidence rating: *Level of certainty of the impact occurring.*

- **Certain**
- **Sure**
- **Unsure**

Cumulative impacts: *The effect the combination of past, present and "reasonably foreseeable" futureactions have on aspects.*

- Very Low cumulative impact
- Low cumulative impact
- Medium cumulative impact
- High cumulative impact

Appendix C: Monitoring – Heritage

Site	Impact	Applicable Phase	Action	Frequency	Responsible person
B01	None foreseen	Prospecting	N/A	N/A	N/A
B02	None foreseen	Prospecting	N/A	N/A	N/A
B03	None foreseen	Prospecting	N/A	N/A	N/A
B04	None foreseen	Prospecting	N/A	N/A	N/A
B05	None foreseen	Prospecting	No additional activities within 50 m	N/A	ECO
F01	None foreseen	Prospecting	Avoid area	N/A	ECO
F02	None foreseen	Prospecting	Avoid 50 m buffer zone	N/A	ECO
F03	None foreseen	Prospecting	Avoid 50 m buffer zone	N/A	ECO
Access roads to each prospecting location	Potential impact caused by road clearing	Prospecting	Monitor	While clearing	ECO, member from local community
Prospecting Site DH1	Potential impact to heritage resources	Prospecting	Monitor	While clearing	ECO, member from local community