HERITAGE IMPACT ASSESSMENT

(REQUIRED UNDER SECTION 38(8) OF THE NHRA (No. 25 OF 1999) AND THE KZN HERITAGE ACT

FOR THE PROPOSED ROOSBOOM TOWNSHIP, LADYSMITH AREA, KWA ZULU NATAL PROVINCE

Type of development:

Township

Client:

Eco Assessments Ecological & Environmental Consultants

Client info:

Mark Custers

E – mail: mark@ecoassessments.co.za

Developer: TBC

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HCAC - Heritage Consultants

Private Bag X 1049

Suite 34

Modimolle

0510

Tel: 082 373 8491

Fax: 086 691 6461

E-Mail: jaco.heritage@gmail.com

Report Author:

Mr. J. van der Walt

Project Reference:

HCAC Project number 21

Report date:

November 2019

APPROVAL PAGE

Project Name	Roosboom Township
Report Title	Heritage Impact Assessment Roosboom Township
Authority Reference Number	TBC
Report Status	Final Report
Applicant Name	TBC

	Name	Qualifications and Certifications	Date
Archaeologist	Jaco van der Walt	MA Archaeology ASAPA #159	May 2019
Archival Specialist	Liesl Bester	BHCS Honours	May 2019
Archaeologist	Ruan van der Merwe	BA Hons Archaeology	May 2019

DOCUMENT PROGRESS

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Amendments on Document

Date	Report Reference Number	Description of Amendment

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REPORT OUTLINE

Appendix 6 of the GNR 326 EIA Regulations published on 7 April 2017 provides the requirements for specialist reports undertaken as part of the environmental authorisation process. In line with this, Table 1 provides an overview of Appendix 6 together with information on how these requirements have been met.

Table 1. Specialist Report Requirements.

Requirement from Appendix 6 of GN 326 EIA Regulation 2017	Chapter
(a) Details of - (i) the specialist who prepared the report; and (ii) the expertise of that specialist to compile a specialist report including a curriculum vitae	Section a Section 12
(b) Declaration that the specialist is independent in a form as may be specified by the competent authority	*Declaration of Independence*
(c) Indication of the scope of, and the purpose for which, the report was prepared	Section 1
(cA)an indication of the quality and age of base data used for the specialist report	Section 3.4 and 7.1.
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	9
(d) Duration, Date and season of the site investigation and the relevance of the season to the outcome of the assessment	Section 3.4
(e) Description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used	Section 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 alternative;	Section 8 and 9
(g) Identification of any areas to be avoided, including buffers	Section 8 and 9
(h) Map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers	Section 8
(I) Description of any assumptions made and any uncertainties or gaps in knowledge	Section 3.7
(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;	Section 9
(k) Mitigation measures for inclusion in the EMPr	Section 9
(I) Conditions for inclusion in the environmental authorisation	Section 9
(m) Monitoring requirements for inclusion in the EMPr or environmental authorisation	Section 9
(n) Reasoned opinion - (i) as to whether the proposed activity, activities or portions thereof should be authorised; (iA) regarding the acceptability of the proposed activity or activities; and (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	Section 9.2
(o) Description of any consultation process that was undertaken during the course of preparing the specialist report	Section 6
(p) A summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Refer to EIA report
(q) Any other information requested by the competent authority	Section 10

Executive Summary

Eco Assessments Ecological & Environmental Consultants were appointed to conduct an Environmental Assessment for the proposed Roosboom Township, Ladysmith area, Kwa Zulu Natal Province. HCAC was subsequently appointed to conduct a Heritage Impact Assessment to determine the presence of cultural heritage sites and the impact of the proposed development on these non-renewable resources. The study area was assessed both on desktop level and by a field survey. The field survey was conducted as a non-intrusive pedestrian survey to cover the extent of the study area as the development lay out was not available at the time of the survey. The proposed development is envisaged to comprise 1000 residential units as well as subsidiary land uses that include creches, primary school, religious centres and business. The township will also include Public Open Space areas and Public Roads on an area measuring approximately 83 hectares.

The background study highlighted that the general area under investigation has a wealth of heritage sites dating from the Stone Age to the recent past (e.g.,Vinnicombe, 1976, Klein 1977, Huffman 2007, Anderson 2015 a and b). During the survey of the study area, several features were recorded.
Key findings of the study are:

- Demolished ruins of several structures were recorded. The structures' potential to contribute to aesthetic, historic, scientific and social aspects are low, but sites like these are known to contain unmarked graves, usually of stillborn babies. In which case the sites would be of high social significance;
- Two isolated find spots were recorded consisting of a broken lower grinder and an undecorated ceramic sherd. No other features were found in associated and these features are therefor of no heritage significance;
- An independent paleontological assessment was conducted by Prof Marion Bamford (2019) that concluded as far as the palaeontology is concerned the project can proceed based on the implementation of a fossil chance finds procedure (Bamford 2019);
- A number of locations were identified across the survey area interpreted as grave sites. Some of these features are only marked by stone packed cairns and the possibility exists that not all of these could be graves but is handled as such until it is proven otherwise;
- The area is characterised by informal grazing and rural township developments. The proposed development will not impact negatively on significant cultural landscapes or viewscapes as the development is in line with the surrounding land use. During the Public Participation process conducted for this project, no heritage concerns were raised.

The proposed project will impact directly on heritage resources with the highest impact being on grave sites. Three alternative lay outs were assessed and if the recommendations in this report are adhered to all the alternatives are acceptable from a heritage point view with the Draft Final lay out being the preferred option.
To mitigate the impact of the proposed project on the recorded heritage resources the following recommendations apply as a condition of authorisation (part of the EMPr) and based on approval from AMAFA.

- Confirmation of grave sites in the study area through a social consultation process that addresses the issue of unmarked graves associated with structures as well as stone cairns currently interpreted as possible graves;
- Graves located in future and known graves should ideally be retained *in situ* in open spaces;
- Implementation of a chance find procedure for the project as outlined in Section 9.1;
- Demolishment of built environment features, especially site R5 and surrounds will require an assessment by a conservation architect and a demolition permit from AMAFA.
- A Site development plan should be compiled for the development;
- Site specific recommendations should also be adhered to (Table 6 and 7).

Declaration of Independence

Specialist Name	Jaco van der Walt
Declaration of Independence	I declare, as a specialist appointed in terms of the National Environmental Management Act (Act No 108 of 1998) and the associated 2014 Environmental Impact Assessment (EIA) Regulations, that I: • I act as the independent specialist in this application; • I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant; • I declare that there are no circumstances that may compromise my objectivity in performing such work; • I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity; • I will comply with the Act, Regulations and all other applicable legislation; • I have no, 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 form are true and correct; and • I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.
Signature	
Date	18/11/2019

a) Expertise of the specialist

Jaco van der Walt has been practising as a CRM archaeologist for 15 years. He obtained an MA degree in Archaeology from the University of the Witwatersrand focussing on the Iron Age in 2012 and is a PhD candidate at the University of Johannesburg focusing on Stone Age Archaeology with specific interest in the Middle Stone Age (MSA) and Later Stone Age (LSA). Jaco is an accredited member of ASAPA (#159) and have conducted more than 500 impact assessments in Limpopo, Mpumalanga, North West, Free State, Gauteng, KZN as well as he Northern and Eastern Cape Provinces in South Africa.

Jaco has worked on various international projects in Zimbabwe, Botswana, Mozambique, Lesotho, DRC Zambia and Tanzania. Through this he has a sound understanding of the IFC Performance Standard requirements, with specific reference to Performance Standard 8 – Cultural Heritage.

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ABBREVIATIONS

AIA: Archaeological Impact Assessment
ASAPA: Association of South African Professional Archaeologists
BGG Burial Ground and Graves
BIA: Basic Impact Assessment
CFPs: Chance Find Procedures
CMP: Conservation Management Plan
CRR: Comments and Response Report
CRM: Cultural Resource Management
DEA: Department of Environmental Affairs
EA: Environmental Authorisation
EAP: Environmental Assessment Practitioner
ECO: Environmental Control Officer
EIA: Environmental Impact Assessment*
EIA: Early Iron Age*
EIA Practitioner: Environmental Impact Assessment Practitioner
EMP: Environmental Management Programme
ESA: Early Stone Age
ESIA: Environmental and Social Impact Assessment
GIS Geographical Information System
GPS: Global Positioning System
GRP Grave Relocation Plan
HIA: Heritage Impact Assessment
LIA: Late Iron Age
LSA: Late Stone Age
MEC: Member of the Executive Council
MIA: Middle Iron Age
MPRDA: Mineral and Petroleum Resources Development Act
MSA: Middle Stone Age
NEMA National Environmental Management Act, 1998 (Act No. 107 of 1998)
NHRA National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NID Notification of Intent to Develop
NoK Next-of-Kin
PRHA: Provincial Heritage Resource Agency
SADC: Southern African Development Community
SAHRA: South African Heritage Resources Agency

**Although EIA refers to both Environmental Impact Assessment and the Early Iron Age both are internationally accepted abbreviations and must be read and interpreted in the context it is used.*

GLOSSARY

Archaeological site (remains of human activity over 100 years old)
Early Stone Age (~ 2.6 million to 250 000 years ago)
Middle Stone Age (~ 250 000 to 40-25 000 years ago)
Later Stone Age (~ 40-25 000, to recently, 100 years ago)
The Iron Age (~ AD 400 to 1840)
Historic (~ AD 1840 to 1950)
Historic building (over 60 years old)

1 Introduction and Terms of Reference:

Heritage Contracts and Archaeological Consulting CC (**HCAC)** has been contracted by Eco Assessments Ecological & Environmental Consultants to conduct a heritage impact assessment of the proposed Roosboom Township, Kwa Zulu Natal (Figure 1 -3). The report forms part of the Environmental Impact Assessment Report (EIA) and Environmental Management Programme Report (EMPR) for the development.

The aim of the study is to survey the proposed development footprint to identify cultural heritage sites, document, and assess their importance within local, provincial and national context. It serves to assess the impact of the proposed project on non-renewable heritage resources, and to submit appropriate recommendations with regard to the responsible cultural resources management measures that might be required to assist the developer in managing the discovered heritage resources in a responsible manner. It is also conducted to protect, preserve, and develop such resources within the framework provided by the National Heritage Resources Act of 1999 (Act No 25 of 1999). The report outlines the approach and methodology utilized before and during the survey, which includes: Phase 1, review of relevant literature; Phase 2, the physical surveying of the area on foot and by vehicle; Phase 3, reporting the outcome of the study.

During the survey, graves, structures and ruins were recorded within the development footprint. General site conditions and features on sites were recorded by means of photographs, GPS locations, and site descriptions. Possible impacts were identified and mitigation measures are proposed in the following report. SAHRA as a commenting authority under section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) require all environmental documents, complied in support of an Environmental Authorisation application as defined by NEMA EIA Regulations section 40 (1) and (2), to be submitted to SAHRA. As such the Basic Assessment report and its appendices must be submitted to the case as well as the EMPr, once it's completed by the Environmental Assessment Practitioner (EAP).

1.1 Terms of Reference

Field study
Conduct a field study to: (a) locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest; b) record GPS points of sites/areas identified as significant areas; c) determine the levels of significance of the various types of heritage resources affected by the proposed development.

Reporting
Report on the identification of anticipated and cumulative impacts the operational units of the proposed project activity may have on the identified heritage resources for all 3 phases of the project; i.e., construction, operation and decommissioning phases. Consider alternatives, should any significant sites be impacted adversely by the proposed project. Ensure that all studies and results comply with the relevant legislation, SAHRA minimum standards and the code of ethics and guidelines of ASAPA.
To assist the developer in managing the discovered heritage resources in a responsible manner, and to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act of 1999 (Act No 25 of 1999).

Table 2: Project Description

Locality	The Roosboom study area is situated about 12 km SW of Ladysmith and comprises approximately 83 hectares.
Magisterial District	Uthukela District Municipality
1: 50 000 map sheet number	2829DA
Central co-ordinate of the development	28°39'31.01"S 29°43'17.53"E

Table 3: Infrastructure and project activities

Type of development	Township Development with associated infrastructure
Project size	83 hectares
Project Components	The proposed development is envisaged to comprise the following land uses: • ± 1000 residential units; • Subsidiary land uses that include creches, primary school, religious centres and business; • Public Open Space areas; • Public Roads

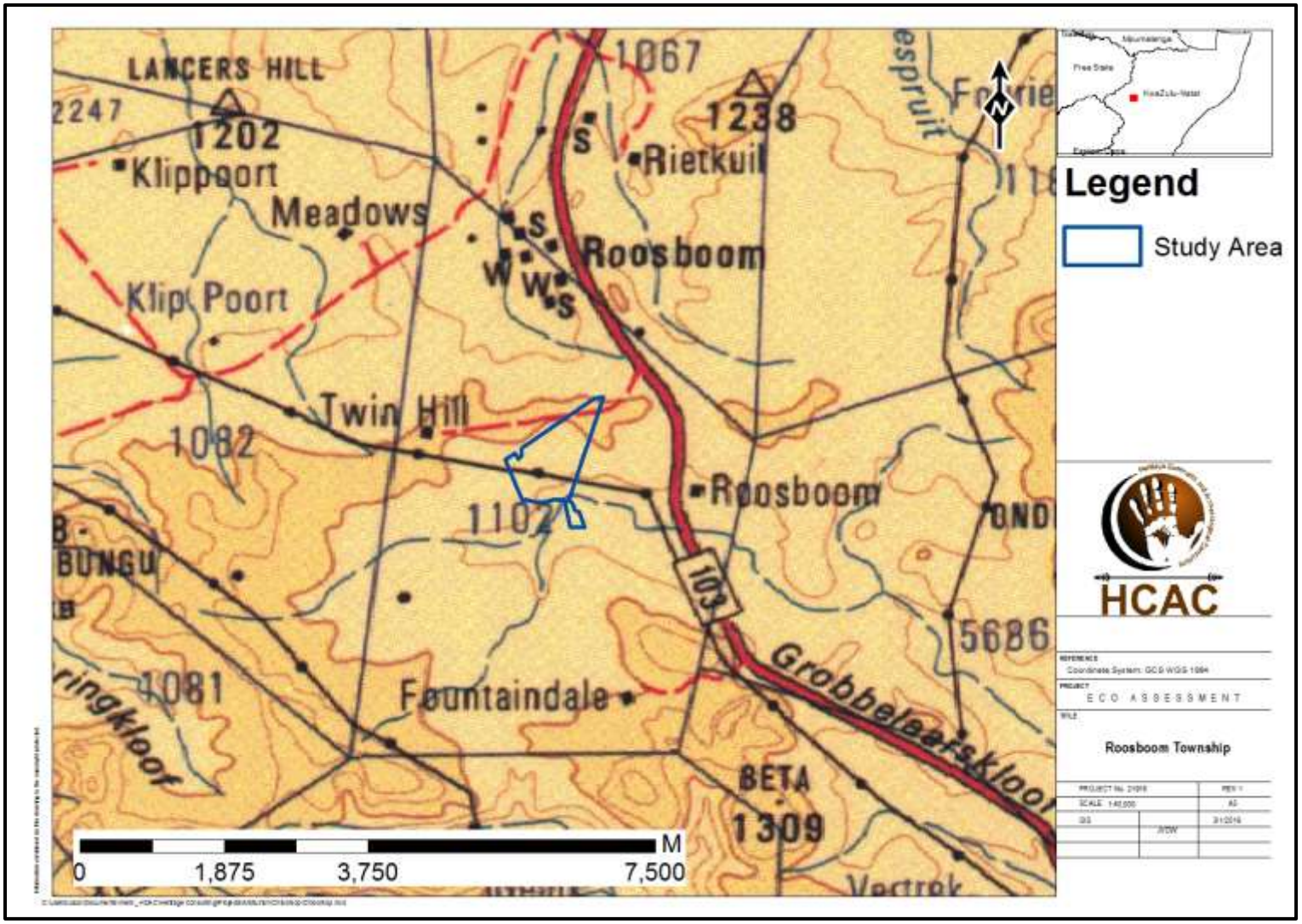

Figure 1. Provincial locality map (1: 250 000 topographical map)

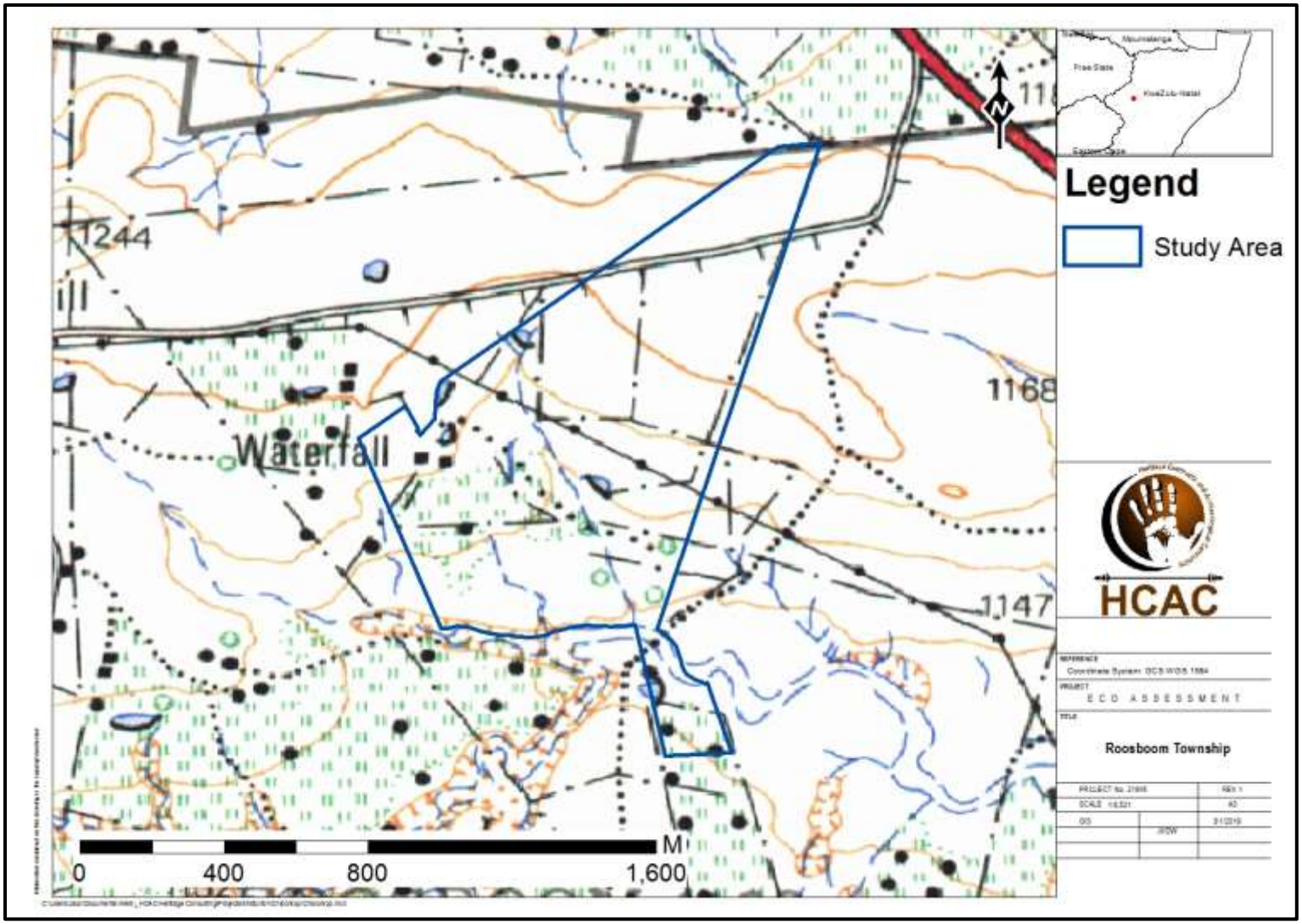

Figure 2: Regional locality map (1:50 000 topographical map).

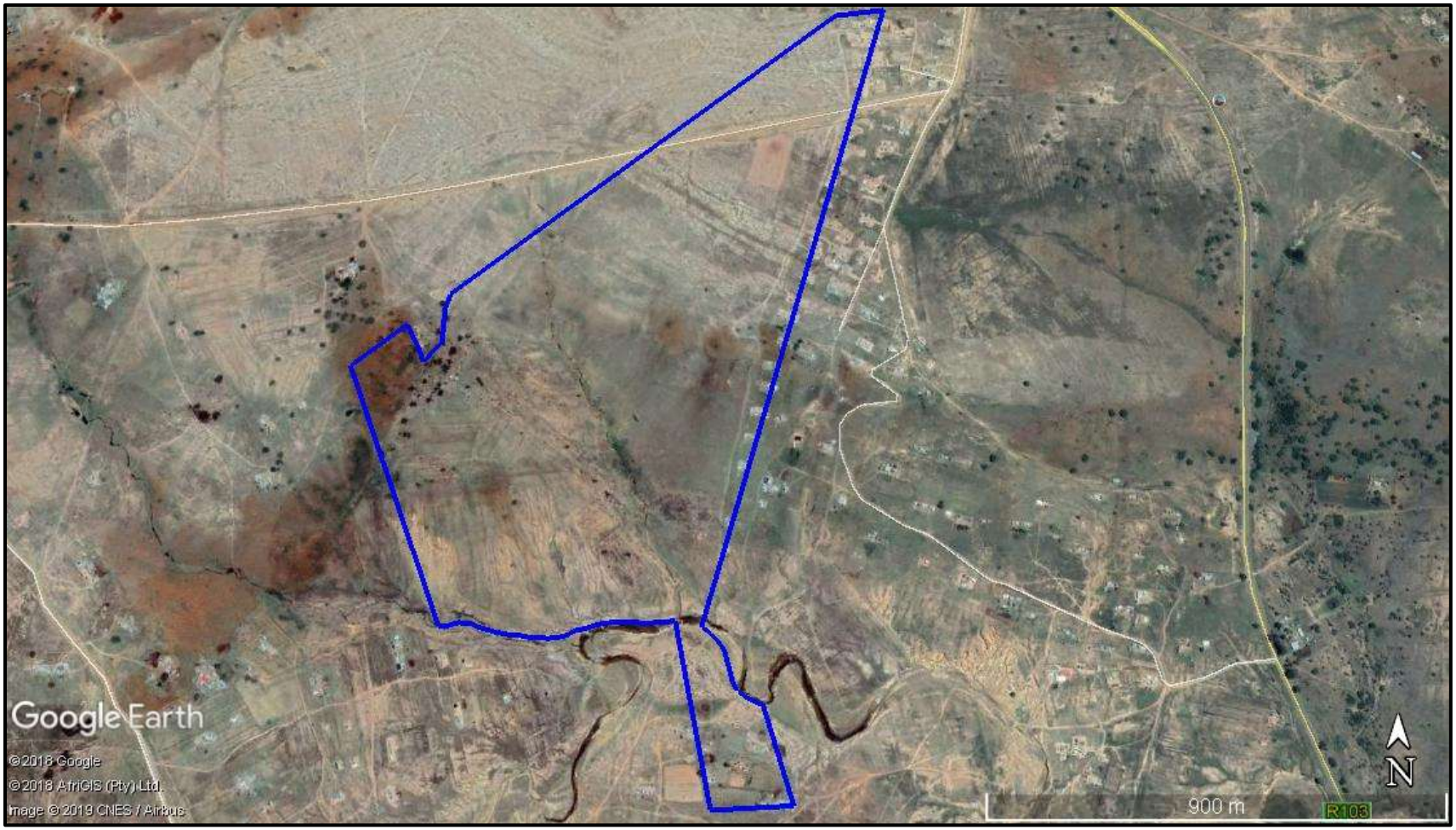

Figure 3. Satellite image of the study area in blue (Google Earth 2018).

2 Legislative Requirements

The HIA, as a specialist sub-section of the EIA, is required under the following legislation:

- National Heritage Resources Act (NHRA), Act No. 25 of 1999)
- National Environmental Management Act (NEMA), Act No. 107 of 1998 - Section 23(2)(b)
- Mineral and Petroleum Resources Development Act (MPRDA), Act No. 28 of 2002 - Section 39(3)(b)(iii)
- The Kwazulu-Natal Heritage Act, No. 4 of 2008

A Phase 1 HIA is a pre-requisite for development in South Africa as prescribed by SAHRA and stipulated by legislation. The overall purpose of heritage specialist input is to:

- Identify any heritage resources, which may be affected;
- Assess the nature and degree of significance of such resources;
- Establish heritage informants/constraints to guide the development process through establishing thresholds of impact significance;
- Assess the negative and positive impact of the development on these resources; and
- Make recommendations for the appropriate heritage management of these impacts.

The HIA should be submitted, as part of the impact assessment report or EMPr, to the PHRA if established in the province or to SAHRA. SAHRA will ultimately be responsible for the professional evaluation of Phase 1 AIA reports upon which review comments will be issued. 'Best practice' requires Phase 1 AIA reports and additional development information, as per the impact assessment report and/or EMPr, to be submitted in duplicate to SAHRA after completion of the study. SAHRA accepts Phase 1 AIA reports authored by professional archaeologists, accredited with ASAPA or with a proven ability to do archaeological work.

Minimum accreditation requirements include an Honours degree in archaeology or related discipline and 3 years post-university CRM experience (field supervisor level). Minimum standards for reports, site documentation and descriptions are set by ASAPA in collaboration with SAHRA. ASAPA is based in South Africa, representing professional archaeology in the SADC region. ASAPA is primarily involved in the overseeing of ethical practice and standards regarding the archaeological profession. Membership is based on proposal and secondment by other professional members.

Phase 1 AIA's are primarily concerned with the location and identification of heritage sites situated within a proposed development area. Identified sites should be assessed according to their significance. Relevant conservation or Phase 2 mitigation recommendations should be made. Recommendations are subject to evaluation by SAHRA and AMAFA.

Conservation or Phase 2 mitigation recommendations, as approved by SAHRA, are to be used as guidelines in the developer's decision-making process.

Phase 2 archaeological projects are primarily based on salvage/mitigation excavations preceding development destruction or impact on a site. Phase 2 excavations can only be conducted with a permit, issued by SAHRA to the appointed archaeologist. Permit conditions are prescribed by SAHRA and includes (as minimum requirements) reporting back strategies to SAHRA and deposition of excavated material at an accredited repository.

In the event of a site conservation option being preferred by the developer, a site management plan, prepared by a professional archaeologist and approved by SAHRA, will suffice as minimum requirement.

After mitigation of a site, a destruction permit must be applied for with SAHRA by the applicant before development may proceed.

Human remains older than 60 years are protected by the National Heritage Resources Act, with reference to Section 36. Graves older than 60 years, but younger than 100 years fall under Section 36 of Act 25 of 1999 (National Heritage Resources Act), as well as the Human Tissues Act (Act 65 of 1983) and are the jurisdiction of SAHRA. The procedure for Consultation Regarding Burial Grounds and Graves (Section 36[5]) of Act 25 of 1999) is applicable to graves older than 60 years that are situated outside a formal cemetery administrated by a local authority. Graves in this age category, located inside a formal cemetery administrated by a local authority, require the same authorisation as set out for graves younger than 60 years, in addition to SAHRA authorisation. If the grave is not situated inside a formal cemetery, but is to be relocated to one, permission from the local authority is required and all regulations, laws and by-laws, set by the cemetery authority, must be adhered to.

Human remains that are less than 60 years old are protected under Section 2(1) of the Removal of Graves and Dead Bodies Ordinance (Ordinance No. 7 of 1925), as well as the Human Tissues Act (Act 65 of 1983) and are the jurisdiction of the National Department of Health and the relevant Provincial Department of Health and must be submitted for final approval to the office of the relevant Provincial Premier. This function is usually delegated to the Provincial MEC for Local Government and Planning; or in some cases, the MEC for Housing and Welfare. Authorisation for exhumation and reinternment must also be obtained from the relevant local or regional council where the grave is situated, as well as the relevant local or regional council to where the grave is being relocated. All local and regional provisions, laws and by-laws must also be adhered to. To handle and transport human remains, the institution conducting the relocation should be authorised under Section 24 of Act 65 of 1983 (Human Tissues Act).

3 METHODOLOGY

3.1 Literature Review

A brief survey of available literature was conducted to extract data and information on the area in question to provide general heritage context into which the development would be set. This literature search included published material, unpublished commercial reports and online material, including reports sourced from the South African Heritage Resources Information System (SAHRIS).

3.2 Genealogical Society and Google Earth Monuments

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where sites of heritage significance might be located; these locations were marked and visited during the field work phase. The database of the Genealogical Society was consulted to collect data on any known graves in the area.

3.3 Public Consultation and Stakeholder Engagement:

Stakeholder engagement is a key component of any BAR process, it involves stakeholders interested in, or affected by the proposed development. Stakeholders are provided with an opportunity to raise issues of concern (for the purposes of this report only heritage related issues will be included). The aim of the public consultation process was to capture and address any issues raised by community members and other stakeholders during key stakeholder and public meetings. The process involved:

- Placement of advertisements and site notices
- Stakeholder notification (through the dissemination of information and meeting invitations);
- Stakeholder meetings undertaken with I&APs;
- Authority Consultation
- The compilation of a Basic Assessment Report (BAR).

Please refer to section 6 for more detail.

3.4 Site Investigation

Conduct a field study to: a) systematically survey the proposed project area to locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest; b) record GPS points of sites/areas identified as significant areas; c) determine the levels of significance of the various types of heritage resources recorded in the project area.

Table 4: Site Investigation Details

	Site Investigation
Date	28 March 2019
Season	Summer – Vegetation growth is high hindering visibility of heritage features. In the southern section no access was gained to residential stands. The impact area was sufficiently covered (Figure 4) to adequately record the presence of heritage resources.

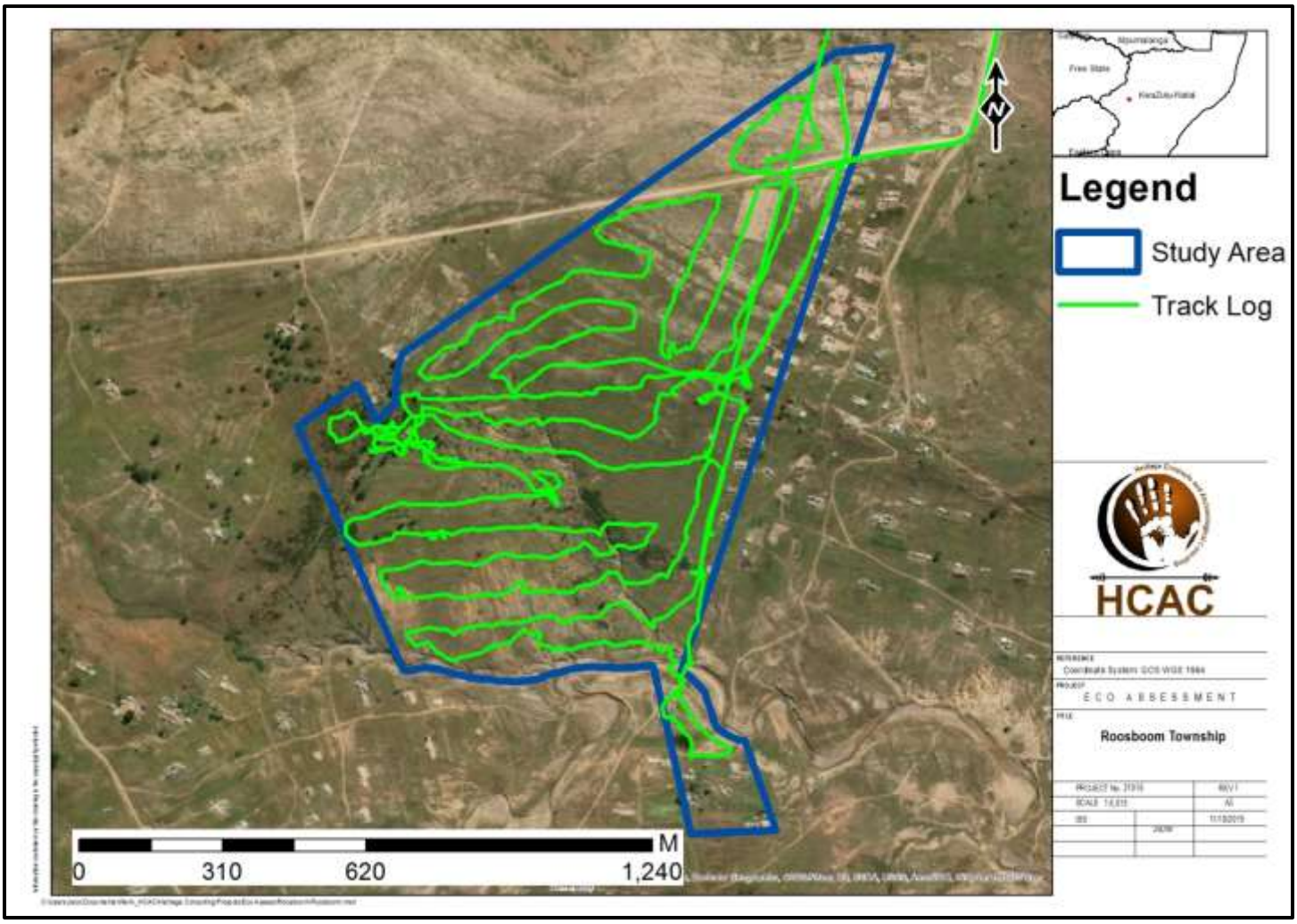

Figure 4: Track logs of the survey in green.

3.5 Site Significance and Field Rating

Section 3 of the NHRA distinguishes nine criteria for places and objects to qualify as 'part of the national estate' if they have cultural significance or other special value. These criteria are:

- Its importance in/to the community, or pattern of South Africa's history;
- Its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
- Its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
- Its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
- Its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
- Its importance in demonstrating a high degree of creative or technical achievement at a particular period;
- Its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
- Its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa;
- Sites of significance relating to the history of slavery in South Africa.

The presence and distribution of heritage resources define a 'heritage landscape'. In this landscape, every site is relevant. In addition, because heritage resources are non-renewable, heritage surveys need to investigate an entire project area, or a representative sample, depending on the nature of the project. In the case of the proposed project the local extent of its impact necessitates a representative sample and only the footprint of the areas demarcated for development were surveyed. In all initial investigations, however, the specialists are responsible only for the identification of resources visible on the surface. This section describes the evaluation criteria used for determining the significance of archaeological and heritage sites. The following criteria were used to establish site significance with cognisance of Section 3 of the NHRA:

- The unique nature of a site;
- The integrity of the archaeological/cultural heritage deposits;
- The wider historic, archaeological and geographic context of the site;
- The location of the site in relation to other similar sites or features;
- The depth of the archaeological deposit (when it can be determined/is known);
- The preservation condition of the sites; and
- Potential to answer present research questions.

In addition to this criteria field ratings prescribed by SAHRA (2006), and acknowledged by ASAPA for the SADC region, were used for the purpose of this report. The recommendations for each site should be read in conjunction with section 10 of this report.

FIELD RATING	***GRADE***	***SIGNIFICANCE***	***RECOMMENDED MITIGATION***
National Significance (NS)	Grade 1	-	Conservation; national site nomination
Provincial Significance (PS)	Grade 2	-	Conservation; provincial site nomination
Local Significance (LS)	Grade 3A	High significance	Conservation; mitigation not advised
Local Significance (LS)	Grade 3B	High significance	Mitigation (part of site should be retained)
Generally Protected A (GP. A)	-	High/medium significance	Mitigation before destruction
Generally Protected B (GP. B)	-	Medium significance	Recording before destruction
Generally Protected C (GP.C)	-	Low significance	Destruction

3.6 Impact Assessment Methodology

The criteria below are used to establish the impact rating on sites:

- The **nature**, which shall include a description of what causes the effect, what will be affected and how it will be affected.
- The **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional, and a value between 1 and 5 will be assigned as appropriate (with 1 being low and 5 being high):
- The **duration**, wherein it will be indicated whether:
  - the lifetime of the impact will be of a very short duration (0-1 years), assigned a score of 1;
  - the lifetime of the impact will be of a short duration (2-5 years), assigned a score of 2;
  - medium-term (5-15 years), assigned a score of 3;
  - long term (> 15 years), assigned a score of 4; or
  - permanent, assigned a score of 5;
  - The **magnitude**, quantified on a scale from 0-10 where; 0 is small and will have no effect on the environment, 2 is minor and will not result in an impact on processes, 4 is low and will cause a slight impact on processes, 6 is moderate and will result in processes continuing but in a modified way, 8 is high (processes are altered to the extent that they temporarily cease), and 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
  - The **probability of occurrence**, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale of 1-5 where; 1 is very improbable (probably will not happen), 2 is improbable (some possibility, but low likelihood), 3 is probable (distinct possibility), 4 is highly probable (most likely) and 5 is definite (impact will occur regardless of any prevention measures).
  - The **significance**, which shall be determined through a synthesis of the characteristics described above and can be assessed as low, medium or high; and
  - the **status**, which will be described as either positive, negative or neutral.
  - the degree to which the impact can be reversed.
  - the degree to which the impact may cause irreplaceable loss of resources.
  - the *degree* to which the impact can be mitigated.

The **significance** is calculated by combining the criteria in the following formula:

S=(E+D+M) P

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

The **significance weightings** for each potential impact are as follows:

- < 30 points: Low (i.e., where this impact would not have a direct influence on the decision to develop in the area),
- 30-60 points: Medium (i.e., where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- 60 points: High (i.e., where the impact must have an influence on the decision process to develop in the area).

3.7 Limitations and Constraints of the study

The authors acknowledge that the brief literature review is not exhaustive on the literature of the area. Due to the subsurface nature of archaeological artefacts, the possibility exists that some features or artefacts may not have been discovered/recorded during the survey. The survey was hampered by dense vegetation. Also the possible occurrence of graves and other cultural material not recorded cannot be excluded. Similarly, the depth of the deposit of heritage sites cannot be accurately determined due its subsurface nature. This report only dealt with the footprint area of the proposed development and consisted of non-intrusive surface surveys. It is possible that new information could come to light in future, which might change the results of this Impact Assessment.

4 Description of Socio Economic Environmental

According to StatsSA and to Census 2011, Emnambithi-Ladysmith Local Municipality has a total population of 237 437 people of whom 91,8% are black African, 1,0% are coloured, 2,7% are white, and 4,4% are Indian/Asian. The other population groups make up the remaining 0,2%.

Of those aged 20 years and older, 4,6% have completed primary school, 33,2% have some secondary education, 30,9% have completed matric, and 9,0% have some form of higher education, while 8,1% of those aged 20 years and older have no form of schooling.

72 249 people are economically active (employed or unemployed but looking for work), and of these, 34,0% are unemployed. Of the 39 523 economically active youth (15 – 35 years) in the area, 43,4% are unemployed.

5 Description of the Physical Environment:

The study area falls within the bioregion described by Mucina *et al* (2006) as Sub-Escarpment Grassland with the vegetation described as KwaZulu-Natal Dry Highland Grassland. Land use in the impact area is characterized by townships and informal grazing and most of the original vegetation types remain (Figure 5 & 6). The study area is characterised by sandy to loamy soils and in terms of the lithology of the area, greenish- to bluish-grey and greyish-red mudstone, siltstone and subordinate sandstone. The Southern section of the survey area has been extensively eroded to the point where gullies have formed, some of which are approximately 10m deep (Figure 7 & 8).

Figure 5. Grasslands characteristic of the study area.

Figure 6. Grasslands characteristic of the study area.

Figure 7. Erosion in the southern portion of the study area.

Figure 8. Erosion in the southern portion of the study area.

6 Results of Public Consultation and Stakeholder Engagement:

6.1.1 Stakeholder Identification

Adjacent landowners and the public at large were informed of the proposed activity as part of the EIA process. Site notices and advertisements notifying interested and affected parties were placed at strategic points and in local newspapers as part of the process. In addition, the authors contacted the local ward councillor Mr Edwin Dladla to confirm the location of heritage sites in the area.

7 Literature / Background Study

7.1 Literature Review

Few CRM studies have been conducted in the immediate study area; the following reports have been consulted in this report:

Table 5. CRM studies consulted for this project.

Author	Year	Project	Findings
Anderson, G.	2015a	HIA Ladysmith Bulkwater Pipeline: Spionkop To Ladysmith	Stone Age, Iron Age and Anglo Boer War Sites as well as Graves
Anderson, G.	2015b	HIA Lombard's Kop Bulk Water Pipeline, Kwazulu-Natal	Graves, Historical Sites and Anglo Boer War Sites.

Information obtained from several archaeological databases show a high occurrence of heritage sites in the larger area (Figure 9), including heritage resources such as:

- Middle and Late Stone Age sites;
- Rock art sites
- Iron Age stone walled sites related to the rich Zulu heritage of the area
- Places associated with oral traditions and living heritage;
- Grave sites.
- Battlefield sites

It should be noted that although these sites help to contextualise the study area none of the known sites will be directly impacted on by the development.

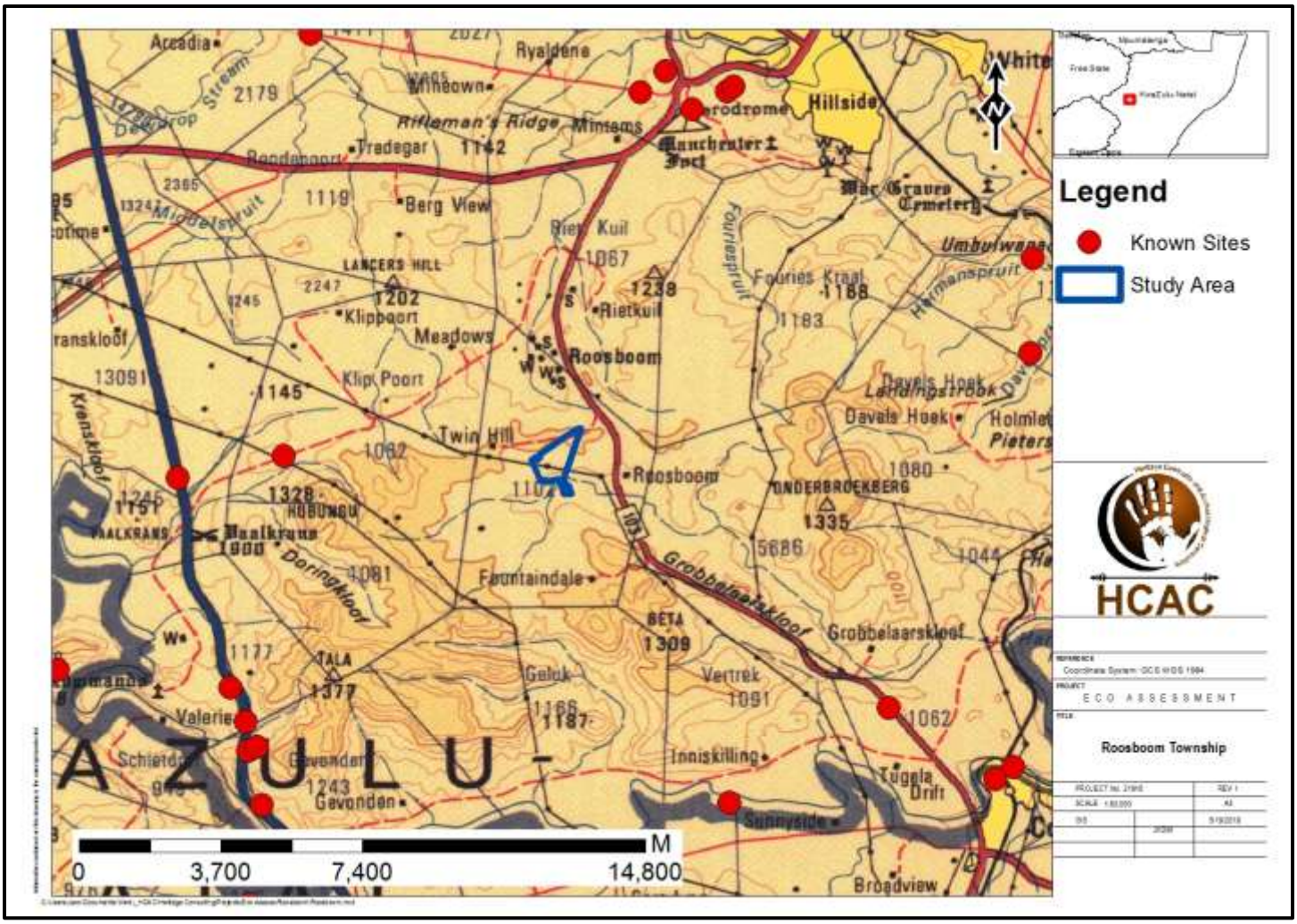

Figure 9. Known sites in relation to the study area.

7.1.1 Genealogical Society and Google Earth Monuments

No known grave sites are indicated in the study area.

7.2 General History of the area

7.2.1 Archaeology of the area

The archaeology of KwaZulu-Natal can be divided in three main periods namely the Stone Age, Iron Age and Historical period.

Stone Age

South Africa has a long and complex Stone Age sequence of more than 2 million years. The broad sequence includes the Later Stone Age, the Middle Stone Age and the Earlier Stone Age. Each of these phases contains sub-phases or industrial complexes, and within these we can expect regional variation regarding characteristics and time ranges. For Cultural Resources Management (CRM) purposes it is often only expected/ possible to identify the presence of the three main phases.

Yet sometimes the recognition of cultural groups, affinities or trends in technology and/or subsistence practices, as represented by the sub-phases or industrial complexes, is achievable (Lombard 2011). The three main phases can be divided as follows;

- Later Stone Age; associated with Khoi and San societies and their immediate predecessors. - Recently to ~30 thousand years ago.
- Middle Stone Age; associated with Homo sapiens and archaic modern human -. 30-300 thousand years ago.
- Earlier Stone Age; associated with early Homo groups such as Homo habilis and Homo erectus. - 400 000-> 2 million years ago.

The LSA is well represented in KwaZulu-Natal with an abundance of rock art, like the rock paintings at Giants Castle and Kamberg in the Drakensburg Mountains (Vinnicombe, 1976). Rock art sites have been also been documented in the areas around Estcourt, Mooi River and Dundee. Several caves in KZN contain significant archaeological deposits like the well-known MSA site of Sibudu Cave on the coast of KwaZulu-Natal, which shows evidence for early forms of cognitive human behavioural patterns (Wadley, 2005). Another well-known cave called Border Cave is situated some 40 kilometres to the north east of the study area at the Ingodini Border Cave Museum Complex. The site was first investigated by Raymond Dart in 1934; here excavations exposed a thick deposit of archaeological material dating from the Iron Age overlaying MSA artefacts. Later excavations, by Beaumont in the early 1970's, revealed a complete MSA sequence succeeded by Early and Later Iron Age deposits (Klein 1977).

Iron Age and historical period

Bantu-speaking people moved into Eastern and Southern Africa about 2,000 years ago (Mitchell, 2002). These people cultivated sorghum and millets, herded cattle and small stock and manufactured iron tools and copper ornaments. Because metalworking represents a new technology, archaeologists call this period the Iron Age. Characteristic ceramic styles help archaeologists to separate the sites into different groups and time periods. The Iron Age as a whole represents the spread of Bantu speaking people and includes both the Pre-Historic and Historic periods. It can be divided into three distinct periods:

- The Early Iron Age: Most of the first millennium AD.
- The Middle Iron Age: 10th to 13th centuries AD.
- The Late Iron Age: 14th century to colonial period.

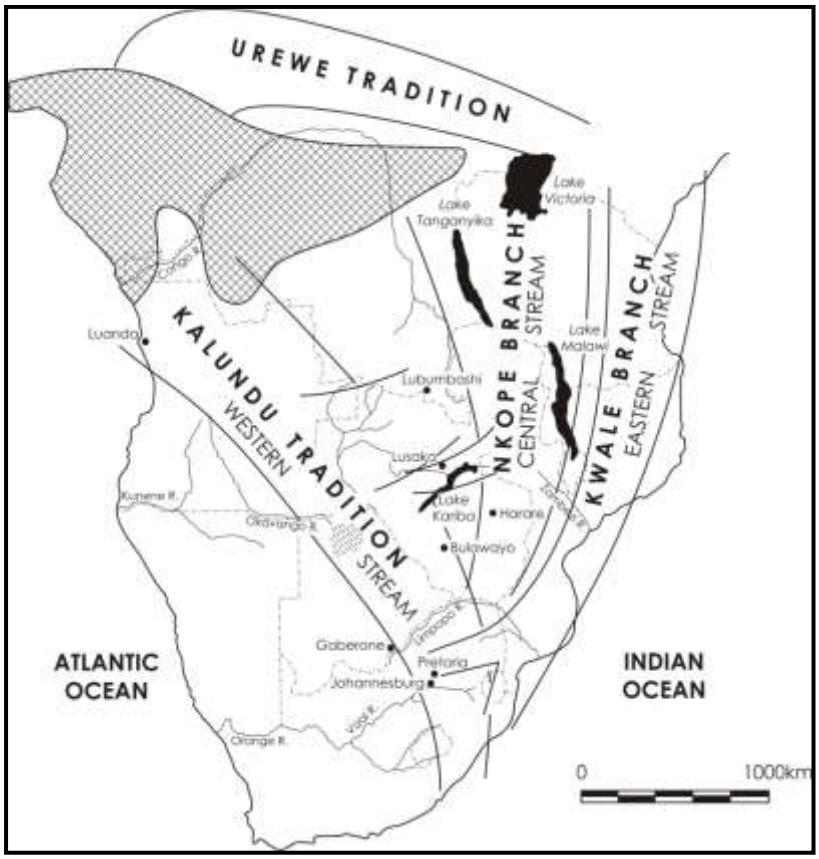

Figure 10: Movement of Bantu speaking farmers (Huffman 2007).

The first 1,000 years is called the Early Iron Age. Early Iron Age people made a living by mixed farming. They had the technology to work metals like iron. Existing evidence dates the Iron Age in southern Africa to the first millennium AD (Huffman, 2007). The site of Mzonjani, 15 km from Durban, is the oldest known Iron Age site in KwaZulu-Natal, dating to the 3rd Millennium AD (Huffman, 2007).

The area that was occupied by the Nguni speaking group of the Eastern Bantu language stream is characterised by settlement patterns defined as the Central Cattle Pattern (CCP) (Huffman, 2007). The Nguni ceramic sequence consists of the *Blackburn* (AD 1050-1500), *Moor Park* (AD 1350-1700) and, *Nqabeni* (AD 1700-1850), although excavated pottery is seldom decorated and therefore complicates archaeological interpretation (Huffman 2007: 441, 443).

Blackburn pottery is on record along the north and south coasts of KwaZulu-Natal, often in shell middens (Huffman 2007: 443). The available radiocarbon dates place *Blackburn* between about AD 1100 and perhaps 1500.

The earliest known type of stonewalling that characterises this settlement pattern (CCP) in the region is the Moor Park site, which dates from the 14th to 16th Centuries AD (Huffman, 2007). This type of stonewalling can be found in defensive positions on hilltops in the Midlands of KZN (Huffman, 2007). Archaeologists have concluded that the function of these structures was to serve mainly as defensive purposes (Huffman, 2007). Archaeologically, the Natal area was occupied by the Zulu people by AD 1050 (Huffman, 2007).

In the late 1400's, a Nguni group under the leadership of Dlamini settled in the Delagoa Bay area. By the late 1700's, the Dlamini clan moved into land settling on the banks of the Pongola River where it cuts through the Lebombo Mountains. An attempt was also made to occupy the area between the Pongola River and Magudu Hills (at that stage the area was under Ndwandwe rule), but they had to retreat back across the Pongola River (Bonner 2002; Fourie 2013).

Serious rivalry between the Ndwandwe under Zwide and the Ngwane (Swazi) under Sobhuza created a period of unrest and confrontation in the early 1800's. An attempt from Zwide to annex the grain fields on the south side of the Pongola River almost destroyed the Ngwane. These successive Ndwandwe attacks lead to the fleeing of the Ngwane to the far north (Bonner, 2002).

The Late Iron Age economy was based on agriculture and livestock. Both components were inextricably linked to cultural practices and even contributed to the evolution of other institutions. In the Nguni groups, economic activities were divided along gender lines; men were closely associated with cattle and women with farming. It is believed that maize was introduced to northern KwaZulu-Natal via the Delagoa Bay trade network and the crop soon became widely cultivated. According to oral tradition, the Mthethwa first produced maize in the late 18th century (Huffman 2007: 453, 457).

Along with cattle and trade beads, (both used as currency for bride wealth); metal objects also became markers of wealth, status and power. Iron and copper ornaments (bangles, neck-and earrings) were worn to indicate social position and were also used in trade (Wylie 2006: 58, 59). Other metal artefacts which may appear in the archaeological record are iron spear points and hoes used for agriculture (very few have been found in context). It is interesting that the deliberate burial of numerous metal objects (mostly spearheads and hoes) seems to have been a common practice in Late Iron Age KwaZulu-Natal (Maggs 1991). This phenomenon is probably connected to the period of instability leading up to the Mfecane.

The Difaqane (Sotho), or Mfekane/Imfecane ("the crushing" in Nguni) was a time of bloody upheavals in Natal and on the Highveld, which occurred around the early 1820's until the late 1830's (Berg 1999: 109-115). It came about in response to heightened competition for land and trade, and caused population groups like gun-carrying Griquas and Shaka's Zulus to attack other tribes (Berg 1999: 14; 116-119). In KwaZulu-Natal, this commenced in the early 1800's when the amaZulu were still under Senzangakona (Omer-Cooper, 1993).

The Mthethwa confederacy also arose in the 18th century as a consolidation of clans that formed part of the greater northern Nguni-speaking cultural group in southern Africa. Their ruling lineage (the Nyambose) originally settled between the Mfolozi and Mhlatuse rivers (Wylie 2006: 49).

Indian Ocean trade contributed to changes in the socio-political structures of many groups, including that of the Mthethwa: imported beads became part of bride-wealth/lobola currency, increased demand for meat and grain from east coast ships necessitated more control of agricultural labour, cattle-raids etc., and even influenced the evolution of the amabutho (age-set regiments) system. Ivory, hides, slaves, grain, and metal hoes were exchanged for incoming commodities such as beads and cloth (Mitchell & Whitelaw 2005: 228; Huffman 2007: 77-80). It was amid the ensuing power struggles between politically complex chiefdoms that the Mthethwa, Ndwandwe in the north and the Qwabe in the south emerged as prominent role-players.

Interestingly both Colenso and Ladysmith were home to important battle sites during the Anglo Boer War (1899 – 1902).

7.2.2 Cultural Landscape

The site under investigation is located to the south of Roosboom Township, about 10 kilometres south west of Ladysmith in KwaZulu-Natal Province.

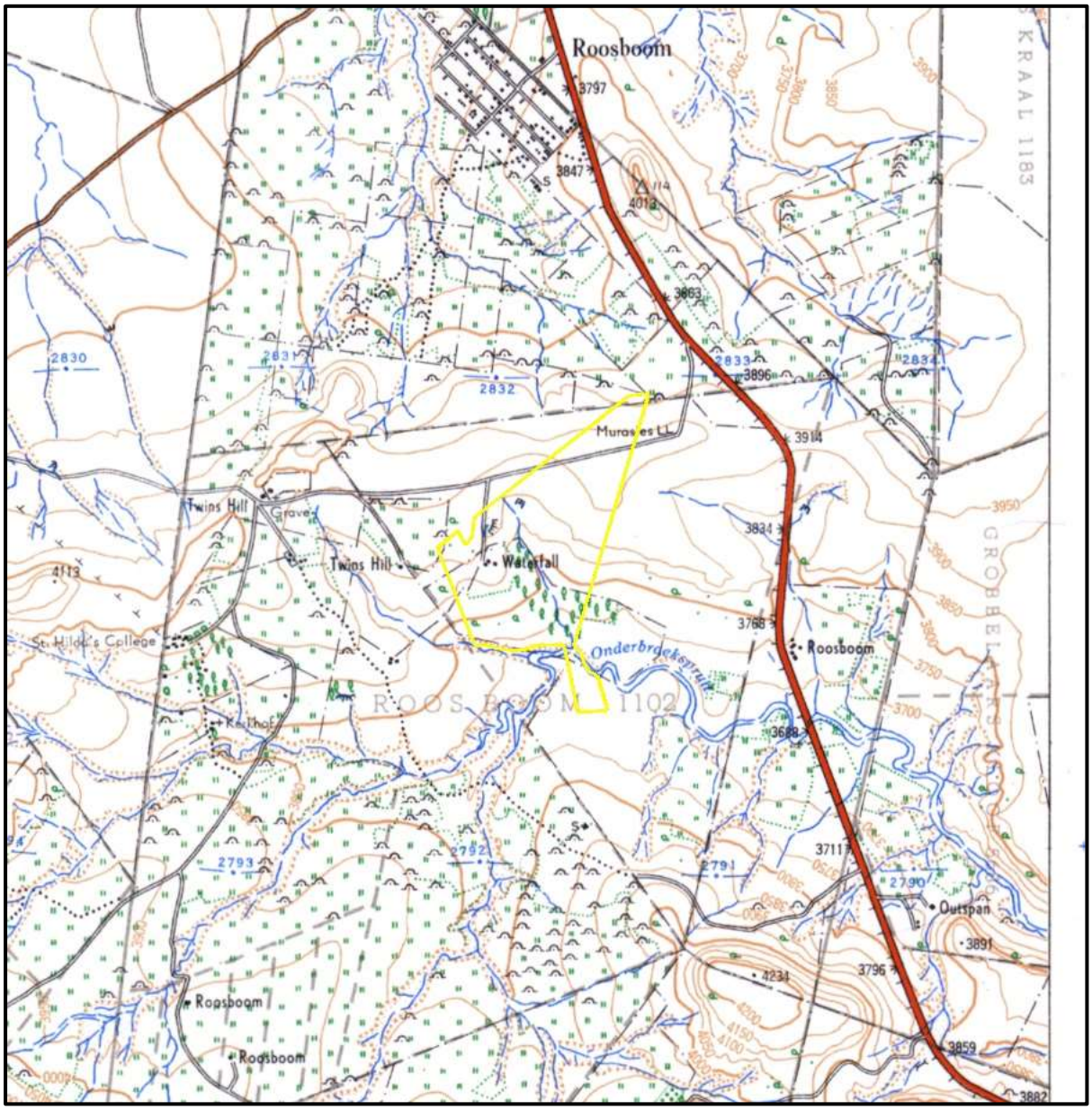

Figure 11. 1954 Topographical map of the site under investigation. The approximate study area is indicated with a yellow border. The Onderbroekspruit can be seen in the southern part of the property, and trees grew along one of its northern tributary that went through the site. Developments included two minor roads that went through the northern part of the study area, an anti-erosion wall and three buildings. (Topographical Map 1954)

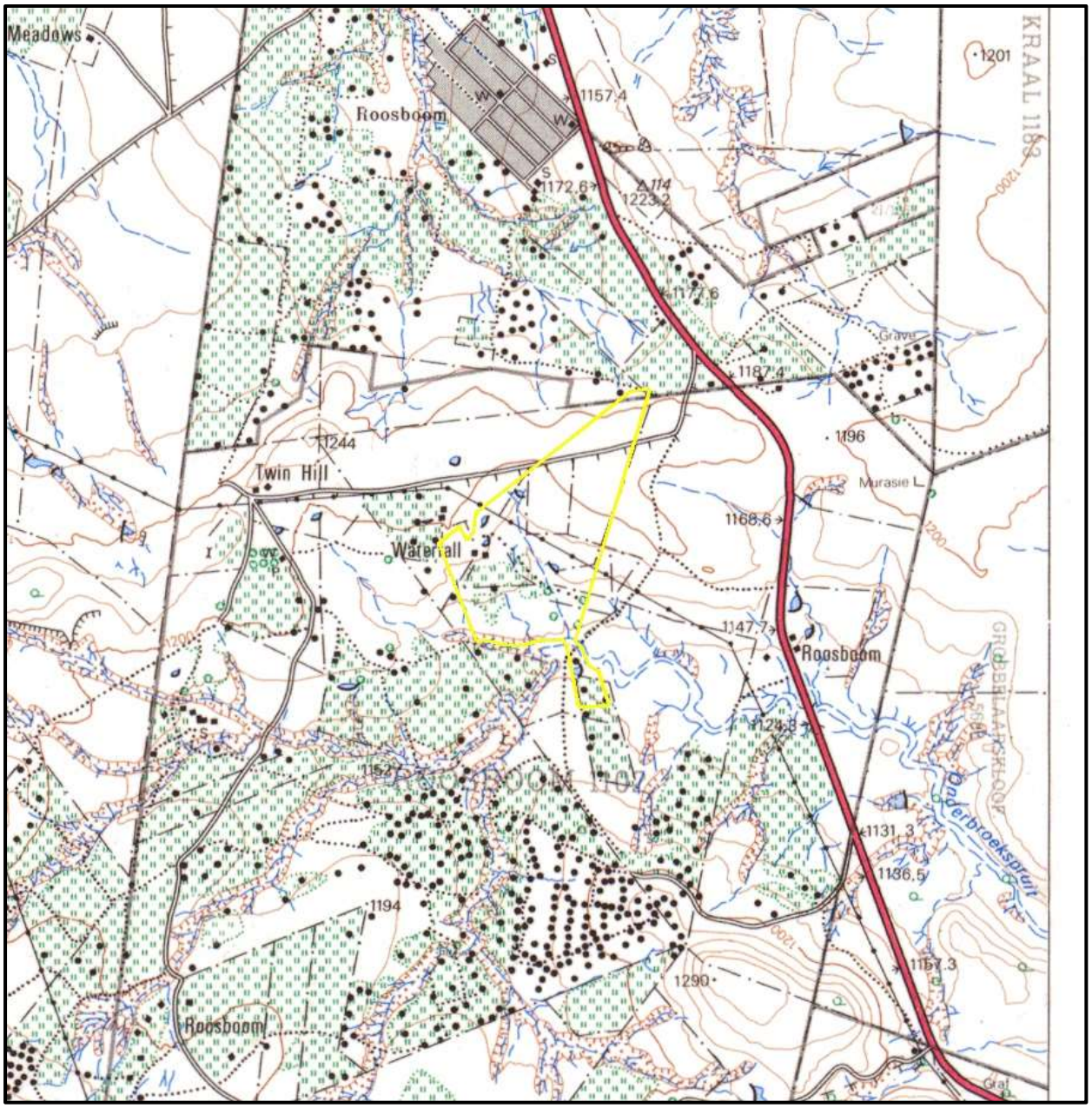

Figure 12. 1992 Topographical map of the site under investigation. The approximate study area is indicated with a yellow border. A stream can be seen in the southern part of the study area, and some of its tributaries went through the site. Developments included a minor road that went through the northern part of the study area, a track / footpath, a power line, five small dams, two sections of cultivated land and six buildings (note that the dots represent huts, whereas the black squares represent European buildings). (Topographical Map 1992)

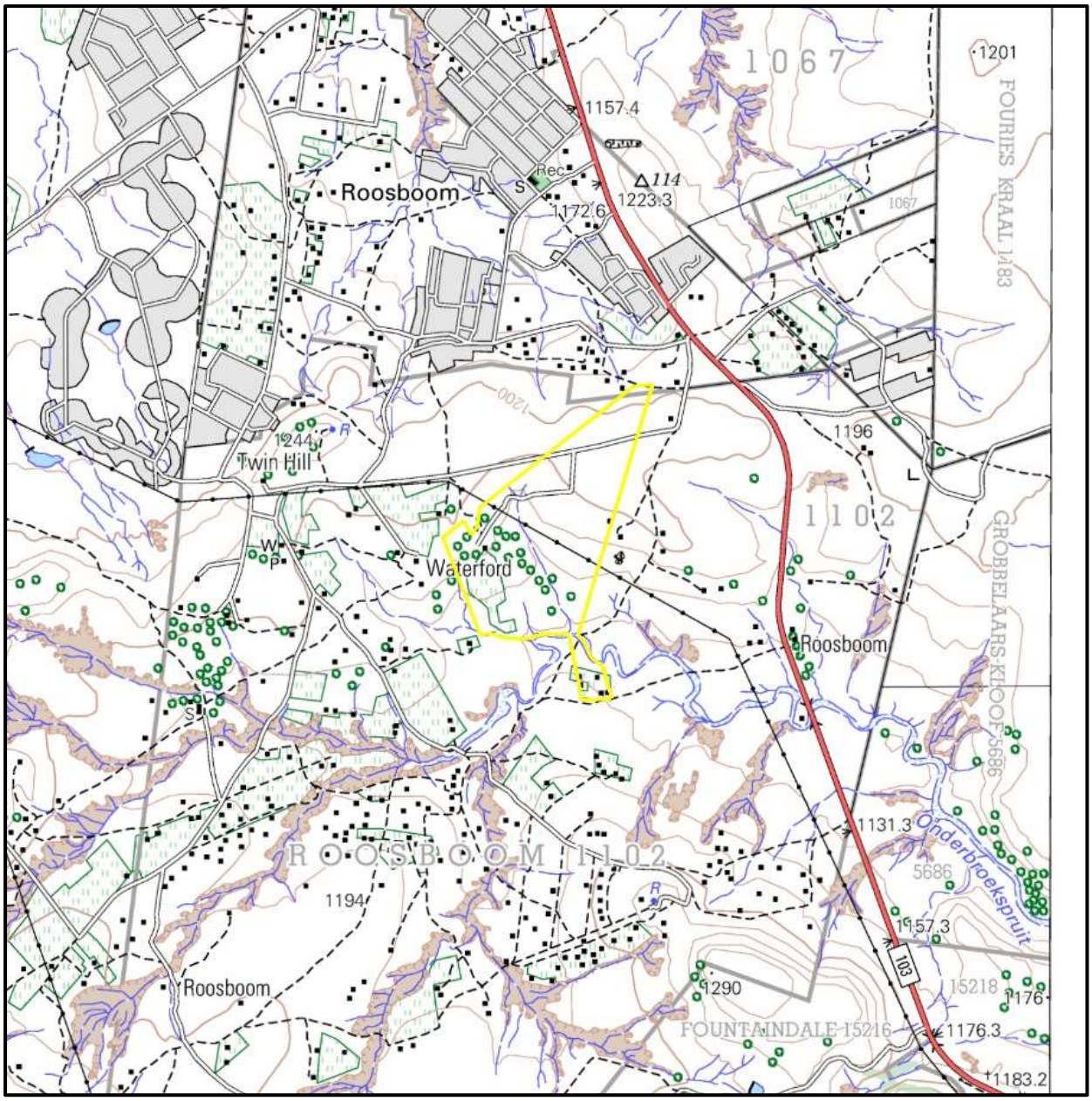

Figure 13. 2000 Topographical map of the site under investigation. The approximate study area is indicated with a yellow border. A stream can be seen in the southern part of the study area, and some of its tributaries went through the site. Developments included two minor roads that went through the northern part of the study area, a power line, two sections of cultivated land and about eight buildings. (Topographical Map 2000)

Figure 14. 2018 Google Earth image showing the study area in relation to Roosboom, Klip Poort, Ladysmith, Colenso and other sites. (Google Earth 2018)

8 Findings of the Survey

The study area forms part of a relatively young township and the area is mainly used for the grazing of goats and cattle and signs of overgrazing can be seen. The Southern portion of the study area has been extensively eroded to the point where gullies have formed, some of which are approximately 10m deep. The study area consists mostly of open grasslands with a small stream running from north to south of the study area. The stream is relatively small towards the north, however due to erosion it becomes a deep gully towards the south where it joins a small river.

Features noted during the survey including isolated undecorated ceramics and features relating to the built environment such as fence posts were recorded as Find spots and recorded with the pre-fix F and numerically numbered. These find spots are of no heritage significance apart from mentioning them in this report. Significant tangible heritage features such as burial sites and structures were recoded as sites with the pre-fix “R’ for Roosboom and also numerically numbered. In addition to the graves recorded during this study, graves were noted by the surveyor and these locations are also included in this report. A number of locations were identified across the survey area interpreted as grave sites. Some of these features are only marked by stone packed cairns and the possibility exists that not all of these could be graves but is handled as such until it is proven otherwise. The area is characterised by the foundations of demolished structures. The structures’ potential to contribute to aesthetic, historic, scientific and social aspects are low, but sites like these are known to contain unmarked graves, usually of stillborn babies. In which case the sites would be of high social significance;

A total of 34 features were recorded (Figure 15) including 13 find spots (Table 6) and 21 sites (Table 7). Figure 15 indicates sites of low, medium and high significance. The features recorded are briefly discussed in the following section.

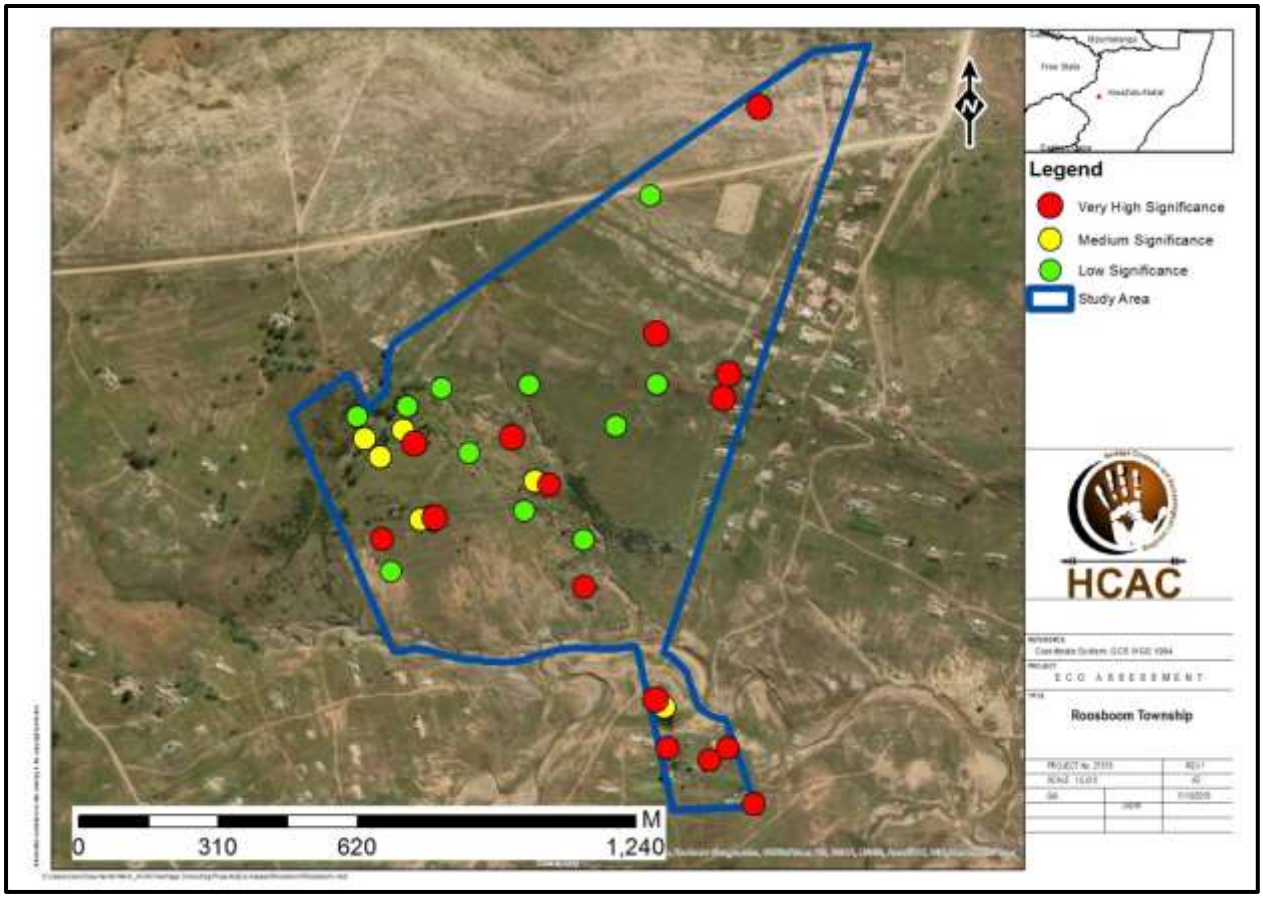

Figure 15. Sensitivity of recorded features in the study area.

Table 6. Find Spots recorded during the survey

Site Number	Description	Longitude	Latitude	Significance	Impact	Recommendations
F1	Ceramic shard	29° 43' 03.9107" E	28° 39' 41.3386" S	Low significance	Direct	No action required
F2	Stone fence post	29° 43' 17.7923" E	28° 39' 39.0707" S	Low significance	Direct	No action required
F3	Start of 350 m long collapsed stone wall	29° 43' 13.5192" E	28° 39' 36.9720" S	Low significance	Direct	No action required
F4	Large broken lower grind stone.	29° 43' 06.9529" E	28° 39' 37.7315" S	Low significance	Direct	No action required
F5	Continuation of 350m long collapsed stone wall	29° 43' 06.8627" E	28° 39' 37.3357" S	Low significance	Direct	No action required
F6	Stone fence post	29° 43' 09.5377" E	28° 39' 32.8140" S	Low significance	Direct	No action required
F7	Possible terraced area with loosely packed stone walling	29° 43' 01.4556" E	28° 39' 30.1933" S	Low significance	Direct	No action required
F8	Stone fence post	29° 43' 13.8611" E	28° 39' 27.9108" S	Low significance	Direct	No action required
F9	Stone fence post	29° 43' 07.5289" E	28° 39' 28.1375" S	Low significance	Direct	No action required
F10	Old water dam/reservoir.	29° 43' 05.0555" E	28° 39' 29.4371" S	Low significance	Direct	No action required
F11	Stone fence post	29° 43' 20.1432" E	28° 39' 30.8520" S	Low significance	Direct	No action required
F12	Old path or road	29° 43' 23.1167" E	28° 39' 27.8460" S	Low significance	Direct	No action required
F13	Old farm road entrance with stone fence posts and aloes.	29° 43' 22.6019" E	28° 39' 14.2631" S	Low significance	Direct	No action required

Table 7. Heritage Features recorded during the survey

Site number	Description	Longitude	Latitude	Significance	Impact	Recommendation
R1	Possible hut foundation	29° 43' 23.6459" E	28° 39' 51.1020" S	Medium Significance	Direct	The presence of graves should be confirmed through social consultation and the site should be monitored during construction.
R2	Small area of collapsed	29° 43' 06.0673" E	28° 39' 37.6127" S	Medium Significance	Direct	The presence of graves should be confirmed through social consultation and the site should be monitored during construction.

	stone walling forming a square.					
R3	Multiple stone foundations. A stone fence post is also close to this point.	29° 43' 14.3041" E	28° 39' 34.8661" S	Medium Significance	Direct	The presence of graves should be confirmed through social consultation and the site should be monitored during construction.
R4	Possible foundation only visible through google earth historical view.	29° 43' 03.1430" E	28° 39' 33.0980" S,	Medium Significance	Direct	The presence of graves should be confirmed through social consultation and the site should be monitored during construction.
R5	Large foundation remains and a rectangular stone ruin.	29° 43' 04.8035" E	28° 39' 31.1580" S	Medium Significance	Direct	The presence of graves should be confirmed through social consultation and the site should be monitored during construction.
R6	Partial section of what seems to be an old canal build with stone.	29° 43' 02.0099" E	28° 39' 31.8025" S	Medium Significance	Direct	The presence of graves should be confirmed through social consultation and the site should be monitored during construction.
R7	Possible Graves	29° 43' 28.2397" E	28° 39' 27.1369" S	High Social significance	Direct	Confirmation from community members should be obtained on whether these features are graves. If confirmed - Graves should be retained *in situ* with a recommended buffer zone of 20 m incorporated into open public spaces. Family members should have access to the graves.
R8	Large rectangular stone wall enclosure	29° 43' 27.8508" E	28° 39' 28.8792" S	High Social significance	Direct	Confirmation from community members should be obtained on whether these features are graves. If confirmed - Graves should be retained in situ with a recommended buffer zone of 20 m incorporated into open public spaces. Family members should have access to graves
R9	Graves	29° 43' 22.9872" E	28° 39' 50.5836" S	High Social significance	Direct	Confirmation from community members should be obtained on whether these features are graves. If confirmed - Graves should be retained in situ with a recommended buffer zone of 20 m incorporated into open public spaces. Family members should have access to graves
R10	Graves	29° 43' 07.0573" E	28° 39' 37.4832" S	High Social significance	Direct	Confirmation from community members should be obtained on whether these features are graves. If confirmed - Graves should be

						retained in situ with a recommended buffer zone of 20 m incorporated into open public spaces. Family members should have access to graves
R11	Graves	29° 43' 05.6207" E	28° 39' 32.1299" S	High Social significance	Direct	Graves should be retained in situ with a recommended buffer zone of 20 m incorporated into open public spaces. Family members should have access to the graves.
R12	Graves	29° 43' 12.6731" E	28° 39' 31.7089" S	High Social significance	Direct	Confirmation from community members should be obtained on whether these features are graves. If confirmed - Graves should be retained in situ with a recommended buffer zone of 20 m incorporated into open public spaces. Family members should have access to graves
R13	Graves	29° 43' 23.0412" E	28° 39' 24.2208" S	High Social significance	Direct	Confirmation from community members should be obtained on whether these features are graves. If confirmed - Graves should be retained in situ with a recommended buffer zone of 20 m incorporated into open public spaces. Family members should have access to graves
R14	Graves	29° 43' 30.4896" E	28° 39' 07.8696" S	High Social significance	Direct	Confirmation from community members should be obtained on whether these features are graves. If confirmed - Graves should be retained in situ with a recommended buffer zone of 20 m incorporated into open public spaces. Family members should have access to graves
R15	Graves	29° 43' 03.2812" E	28° 39' 39.0225" S	High Social significance	Direct	Confirmation from community members should be obtained on whether these features are graves. If confirmed - Graves should be retained in situ with a recommended buffer zone of 20 m incorporated into open public spaces. Family members should have access to graves
R16	Graves	29° 43' 15.3009" E	28° 39' 35.0831" S	High Social significance	Direct	Confirmation from community members should be obtained on whether these features are graves. If confirmed - Graves should be retained in situ with a recommended buffer zone of 20 m incorporated into open public spaces. Family members should have access to graves
R17	Graves	29° 43' 17.8487" E	28° 39' 42.4682" S	High Social significance	Direct	Confirmation from community members should be obtained on whether these features are graves. If confirmed - Graves should be retained in situ with a recommended buffer zone of 20 m incorporated into open public spaces. Family members should have access to graves
R18	Graves	29° 43' 28.1807" E	28° 39' 54.0772" S	High Social significance	Direct	Confirmation from community members should be obtained on whether these features are graves. If confirmed - Graves should be retained in situ with a recommended buffer zone of 20 m incorporated into open public spaces. Family members should have access to graves
R19	Graves	29° 43' 23.8533" E	28° 39' 54.1032" S	High Social significance	Direct	Confirmation from community members should be obtained on whether these features are graves. If confirmed - Graves should be retained in situ with a recommended buffer zone of 20 m incorporated into open public spaces. Family members should have access to graves

R20	Graves	29° 43' 26.8873" E	28° 39' 54.9504" S	High Social significance	Direct	Confirmation from community members should be obtained on whether these features are graves. If confirmed - Graves should be retained in situ with a recommended buffer zone of 20 m incorporated into open public spaces. Family members should have access to graves
R21	Graves	29° 43' 30.1004" E	28° 39' 58.1232" S	High Social significance	Direct	Confirmation from community members should be obtained on whether these features are graves. If confirmed - Graves should be retained in situ with a recommended buffer zone of 20 m incorporated into open public spaces. Family members should have access to graves

8.1 Built Environment (Section 34 of the NHRA)

Remnants of several demolished foundations (Figure 18 – 23) are spread over the study area. The structures' potential to contribute to aesthetic, historic, scientific and social aspects are low, but sites like these are known to contain unmarked graves, usually of stillborn babies. In which case the sites would be of high social significance and therefor the sites were given a medium heritage significance rating (Figure 16 and Table 8).

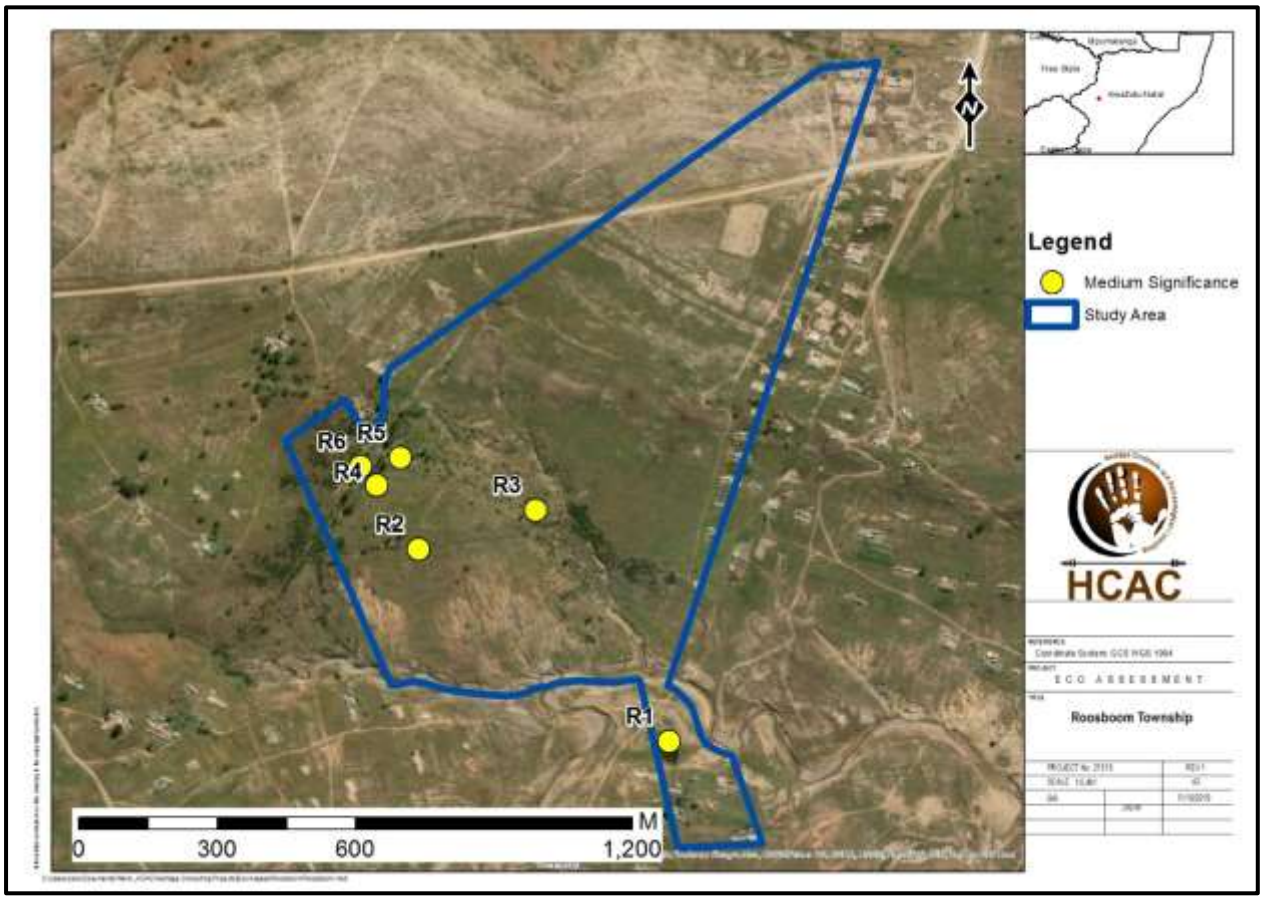

Figure 16. Site distribution map indicating built environment sites of medium significance.

The area surrounding feature R5 is the most prominent with a graveyard, extensive stone wall foundations and features such as stone fence posts in the Western section (indicated as a cluster of features on Figure 17). The features are degraded and there are modern modifications to some of the features. It seems that this cluster of sites was occupied over a long-time span and as recently as 2009 as the youngest grave within the graveyard is dated 2009. The exact age of this palimpset of features is unknown (Figure 11) but some of the associated graves date to 1897 and therefore the structures could be older than 60 years.

Numerous find spots were recorded (Figure 24 and Table 9) of low heritage significance consisting of stand-alone sandstone fence posts, agricultural terraces and linear stone walls demarcating boundaries (Figure 25 to 30).

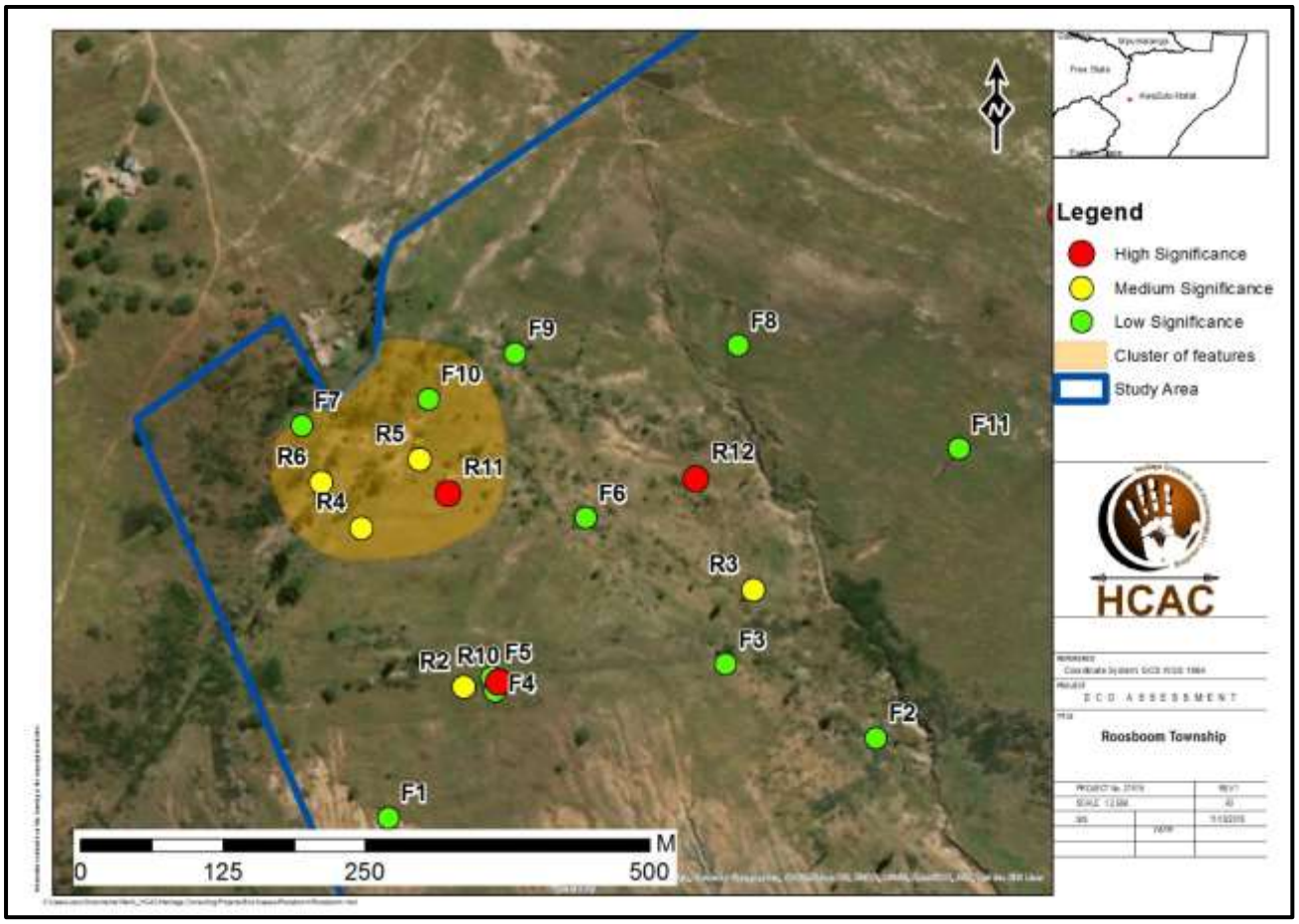

Figure 17. Cluster of heritage features highlighted in orange.

Table 8. Recorded features relating to the Built Environment.

Site Number	Description	Longitude	Latitude
R1	Foundation of small circular stone feature, possible hut. Half buried stones with grass growing from the centre.	29° 43' 23.6459" E	28° 39' 51.1020" S
R2	Small area of collapsed stone walling forming a square.	29° 43' 06.0673" E	28° 39' 37.6127" S
R3	Multiple stone foundations. A stone fence post is also close to this point.	29° 43' 14.3041" E	28° 39' 34.8661" S
R4	Rectangular foundation only visible through google earth historical view.	29° 43' 03.1430" E	28° 39' 33.0980" S,
R5	Large foundation remains and a rectangular stone ruin.	29° 43' 04.8035" E	28° 39' 31.1580" S

R6	Partial section of what seems to be an old canal build with stone.	29° 43' 02.0099" E	28° 39' 31.8025" S

Figure 18. Stone packed circular feature at R1.

Figure 19. Feature R2

Figure 20. Stone packed feature at R3.

Figure 21. Remains of a modern structure as seen on Google Earth (R4).

Figure 22. Stone built structure at R5.

Figure 23. Water canal at R6

Heritage Significance: Medium
Field Rating GP B

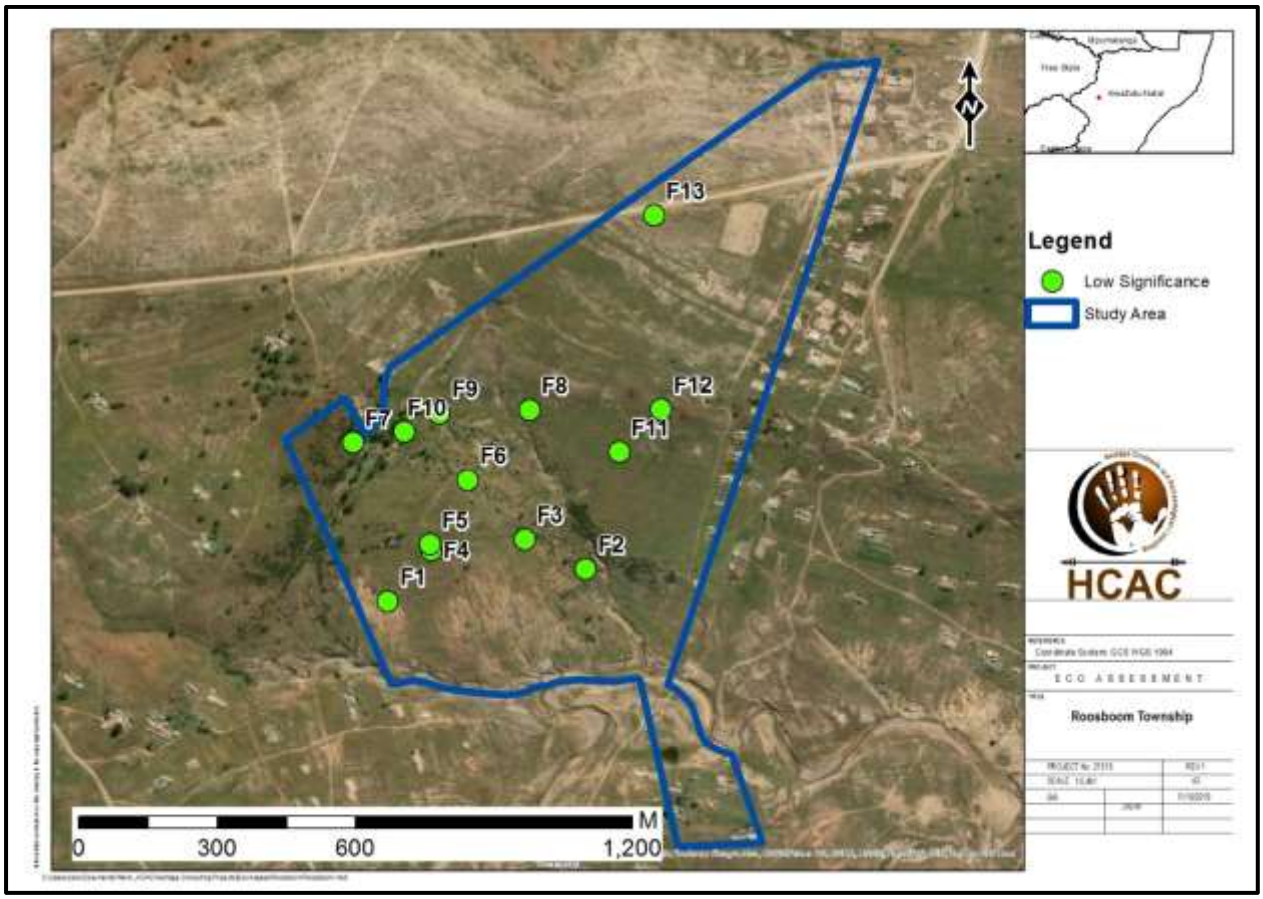

Figure 24. Heritage features of low significance.

Table 9. Find spots relating to the built environment.

Site Number	Longitude	Latitude	Description
F2	29° 43' 17.7923" E	28° 39' 39.0707" S	Stone fence post
F3	29° 43' 13.5192" E	28° 39' 36.9720" S	Start of 350 m long collapsed stone wall
F5	29° 43' 06.8627" E	28° 39' 37.3357" S	Continuation of 350m long collapsed stone wall
F6	29° 43' 09.5377" E	28° 39' 32.8140" S	Stone fence post
F7	29° 43' 01.4556" E	28° 39' 30.1933" S	Possible terraced area with loosely packed stone walling
F8	29° 43' 13.8611" E	28° 39' 27.9108" S	Stone fence post
F9	29° 43' 07.5289" E	28° 39' 28.1375" S	Stone fence post
F10	29° 43' 05.0555" E	28° 39' 29.4371" S	Old water dam/reservoir. The inside of the dam is built with packed stones. The dam is built on a slope with only the Eastern side built up. The natural slope of the hill forms the western edge of the dam.
F11	29° 43' 20.1432" E	28° 39' 30.8520" S	Stone fence post
F12	29° 43' 23.1167" E	28° 39' 27.8460" S	Old path or road
F13	29° 43' 22.6019" E	28° 39' 14.2631" S	Old farm road entrance with stone fence posts and aloes.

Figure 25. Stone Fence post at F1

Figure 26. 350 m wall at F3 and F5

Figure 27: Loosely packed stone walling at F7.

Figure 28: F10 – stone packed feature at dam

Figure 29. Old Road (F12).

Figure 30. Entrance to farm at F13.

Heritage Significance: Low
Field Rating: GP C

8.2 Archaeology and Palaeontology (Section 35 of the NHRA)

8.2.1 Archaeological resources

No significant archaeological sites or material was recorded during the survey. Therefore, no further mitigation prior to construction is recommended in terms of the archaeological component of Section 35 of the NHRA for the proposed development to proceed.

The lack of Iron Age sites in the study area is somewhat surprising as the general area is known to contain the remains of stone walled settlements. Two isolated find spots (Figure 24 and Table 10) consisting of an undecorated ceramic piece and a broken lower grinder are tentatively classified as Iron Age as similar artefacts can be found on sites from the recent past. The lack of Stone Age lithics in the area can be attributed to the local geology with lithology consist mostly of sandstone and resulting in the lack of raw material suitable for knapping.

Table 10. Iron Age find spots

Site number	Description	LONGITUDE	LATITUDE
F1	Large piece of ceramic found among eroded material from a small gully.	29° 43' 03.9107" E	28° 39' 41.3386" S
F4	Large broken lower grind stone.	29° 43' 06.9529" E	28° 39' 37.7315" S

Figure 31. Recorded Ceramic piece at F1

Figure 32.Broken grinder at F4.

8.2.2 Paleontological resources

An independent assessment was conducted by Prof Marion Bamford (2019). She concluded that the proposed site lies on the Late Permian Beaufort Group, Adelaide Subgroup, Normandien Formation (previously called the Estcourt Formation), sandstones, shales and mudstones. Although fossils have not been reported from this site, there is a small chance that typical late *Glossopteris* flora plants could occur in the sediments just below the surface. Surface exposures are likely to be very weathered. It is extremely unlikely that fossils would be preserved in the Quaternary sands and silcrete of the Masotcheni Formation (Bamford 2019)

8.3 Burial Grounds and Graves (Section 36 of the NHRA)

Multiple locations were identified across the survey area that might be graves or grave like features (Table 11 and Figure 33). Most prominent was the graveyard at R11. The youngest grave within the graveyard is dated 2009 and the oldest grave within the graveyard is marked by a marble gravestone and is dated 1897. The areas with grave locations are highly overgrown and accurate grave counts were not possible.

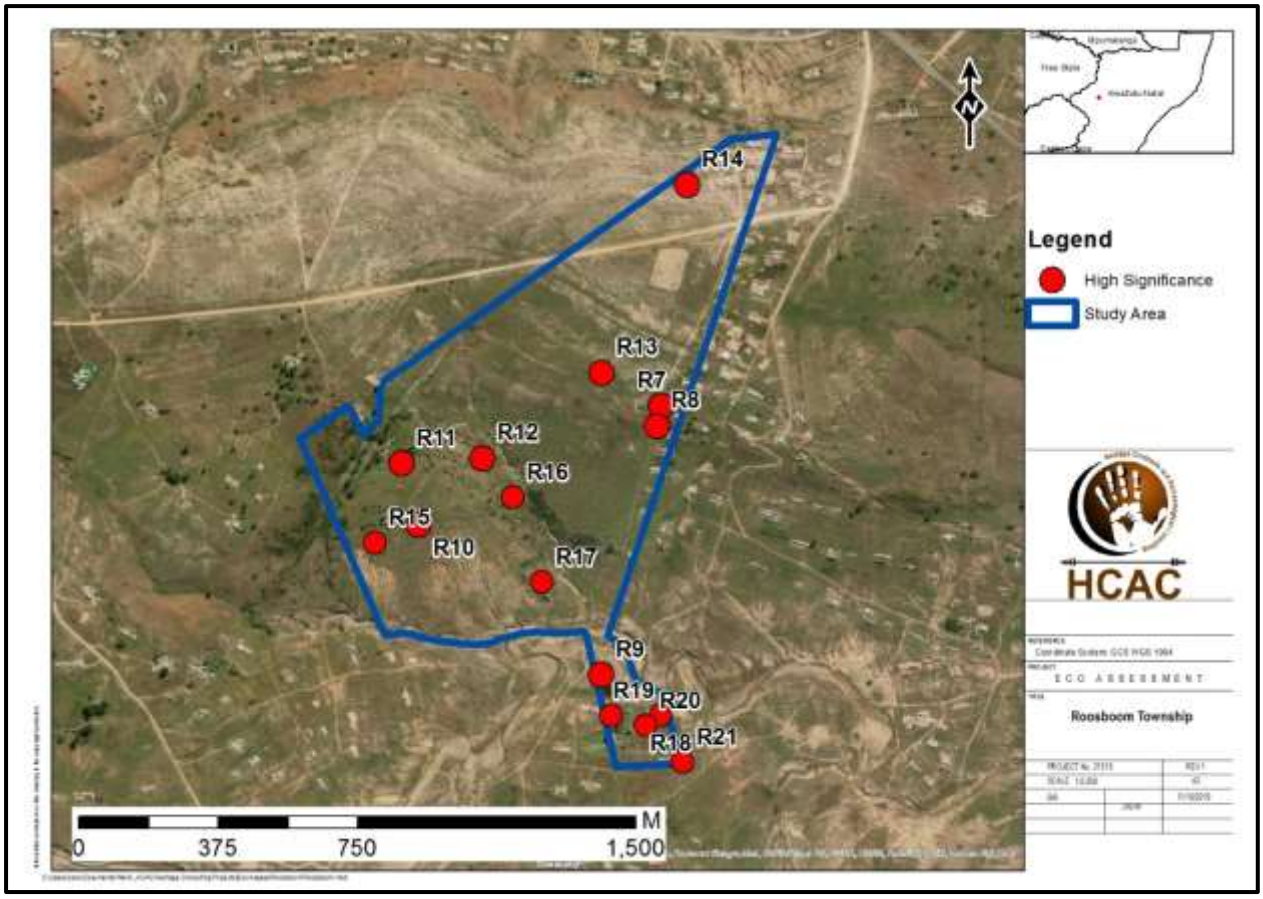

Figure 33. Features of high significance in the study area.

Table 11. Burial sites recorded during the survey

Site Number	Description	Longitude	Latitude
R7	Rectangular stone packed graves	29° 43' 28.2397" E	28° 39' 27.1369" S
R8	Closed off area next to existing homestead. Area is demarcated by rectangular stone wall and fenced in with barbed wire. The area is overgrown. Some stones could be seen in the grass. The site could contain graves, but this should be confirmed with the community	29° 43' 27.8508" E	28° 39' 28.8792" S
R9	Rectangular packed stone feature orientated E-W. Possible grave	29° 43' 22.9872" E	28° 39' 50.5836" S
R10	Rectangular packed stone feature. Possible grave.	29° 43' 07.0573" E	28° 39' 37.4832" S

R11	Graveyard containing approximately 10-12 graves. Oldest grave dates to 1897.	29° 43' 05.6207" E	28° 39' 32.1299" S
R12	Rectangular stone packed grave.	29° 43' 12.6731" E	28° 39' 31.7089" S
R13	Packed stone feature under large thorn tree. Although unlikely could be a possible grave associated with another packed stone feature (dwelling foundation) 10m away SW.	29° 43' 23.0412" E	28° 39' 24.2208" S
R14	Stone cairns underneath Sisal - Possible grave	29° 43' 30.4896" E	28° 39' 07.8696" S
R15	Graves recorded by surveyor	29° 43' 03.2812" E	28° 39' 39.0225" S
R16	Graves recorded by surveyor	29° 43' 15.3009" E	28° 39' 35.0831" S
R17	Graves recorded by surveyor	29° 43' 17.8487" E	28° 39' 42.4682" S
R18	Graves recorded by surveyor	29° 43' 28.1807" E	28° 39' 54.0772" S
R19	Graves recorded by surveyor	29° 43' 23.8533" E	28° 39' 54.1032" S
R20	Graves recorded by surveyor	29° 43' 26.8873" E	28° 39' 54.9504" S
R21	Graves recorded by surveyor	29° 43' 30.1004" E	28° 39' 58.1232" S

Figure 34. Stone packed grave at R9

Figure 35. Possible stone packed grave at R10

Figure 36. Walled cemetery R11.

Figure 37. Grave dressing at R11.

Figure 38. General site conditions R13

Figure 39. Possible stone packed grave R13

Figure 40. Possible stone packed grave at R14

Figure 41. General site conditions R14

Heritage Significance: High Social Significance
Field Rating: GP A

8.4 Cultural Landscapes, Intangible and Living Heritage.

Long term impact on the cultural landscape is considered to be negligible as the surrounding area consists of an area that has been subjected agricultural and road developments from prior to 1954 (Figure 11). Visual impacts to scenic routes and sense of place are also considered to be low due to the other developments in the area.

8.5 Battlefields and Concentration Camps

There are no battlefields or concentration camp sites in the study area, although (Figure 28) the following battles are indicated in the surrounding area dating to the Anglo Boer War (1899- 1902):

- uThukela
- Platrand
- Wagon Hill
- Vaalkrans Battlefields

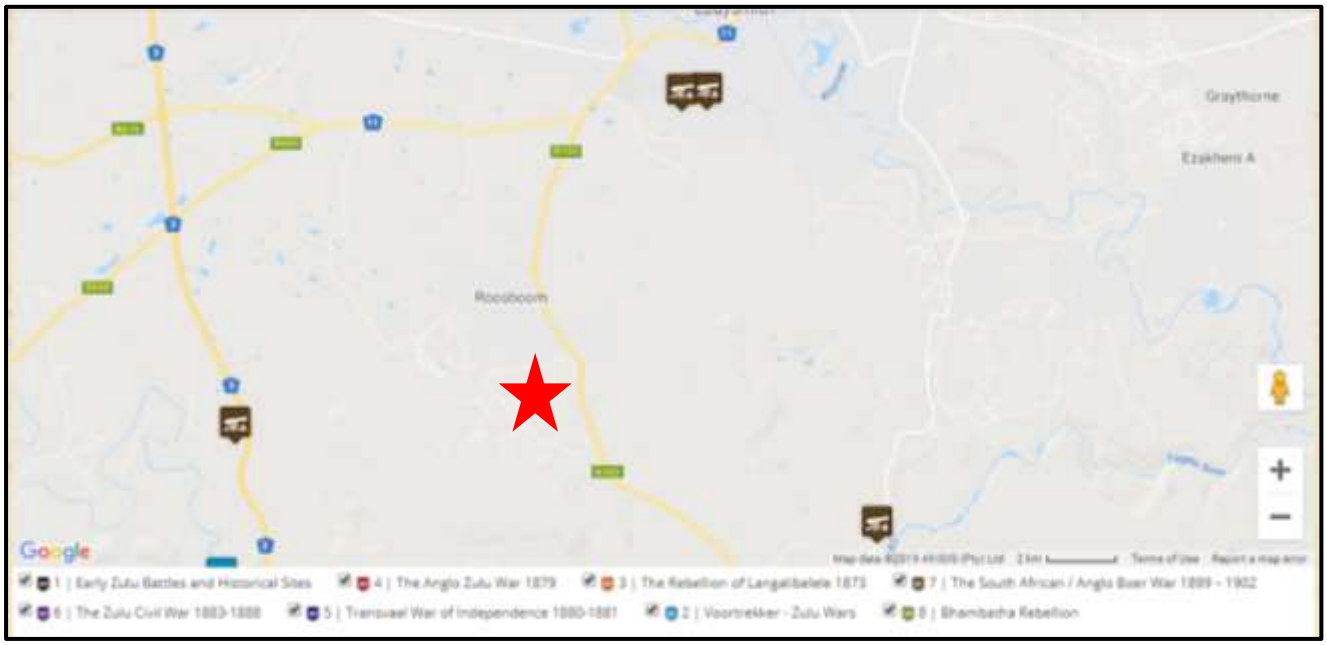

Figure 42. Battlefields indicated close to the study area marked by a red star (Battlefieldroute.co.za)

8.6 Potential Impact

Direct impacts to heritage resources would be in the construction phase and would be permanent and irreversible. The influx of people in the area will also impact on heritage resources that is preserved *in situ.* Cumulative impacts occur from the combination of effects of various impacts on heritage resources. The importance of identifying and assessing cumulative impacts is that the whole is greater than the sum of its parts. This and other projects in the area could have an indirect impact on the larger heritage landscape.

For the purposes of this assessment 3 alternative lay outs were considered

1. The initial layout (4A) included no knowledge of the Cultural Heritage Features (Figure 43)
2. The preferred layout (4B) similarly did not consider the cultural heritage properly and highlighted a number of sensitive areas (conflict areas) (Figure 44)

3.The Draft Final Layout (Nov19) accommodates the key (High areas) although there is still some overlap/conflict. This can either be accommodated by means of a Phase 2 application or the layout must be amended again to address the sensitivity. (Figure 45)

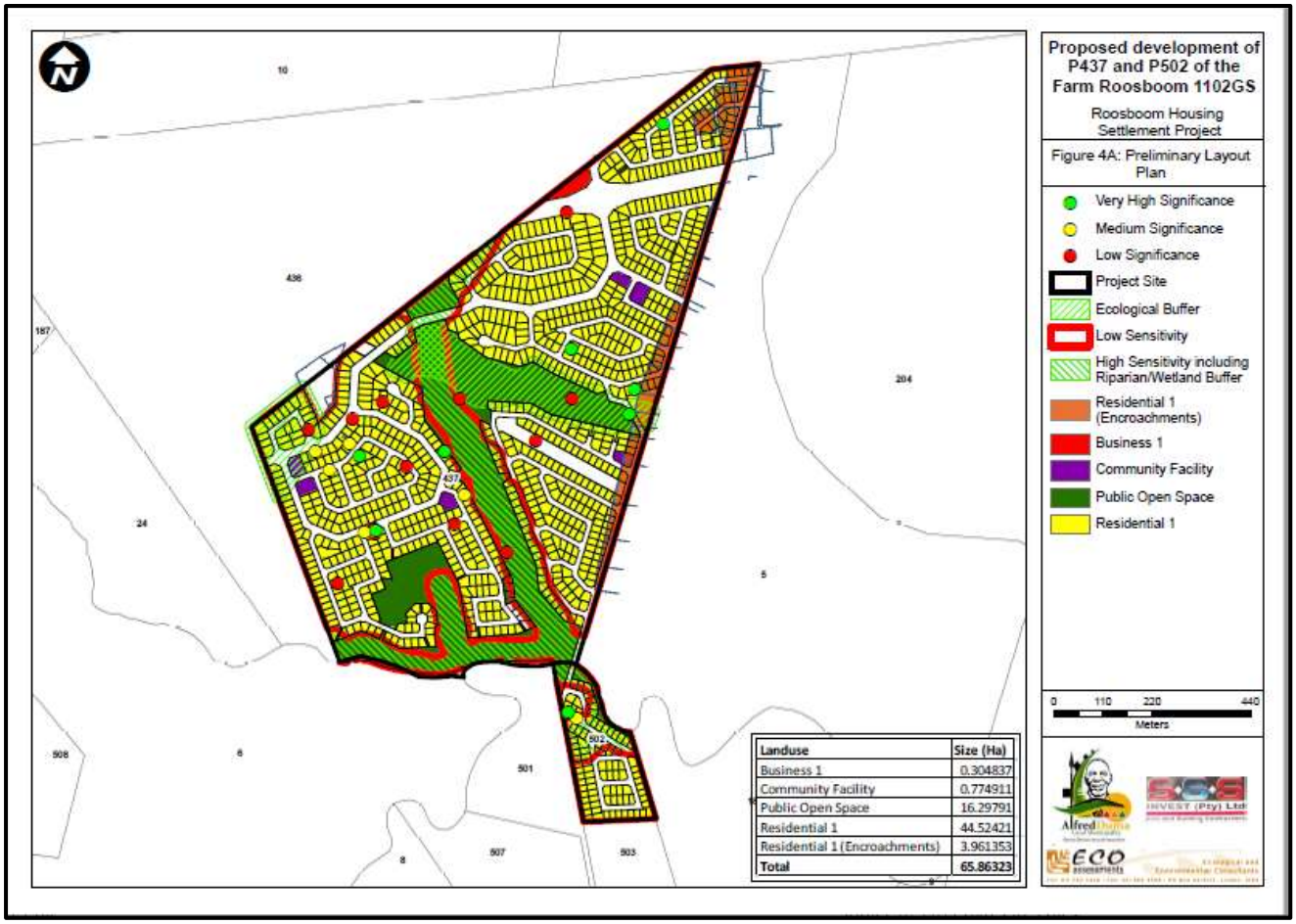

Figure 43. Initial Lay out as provided by the client.

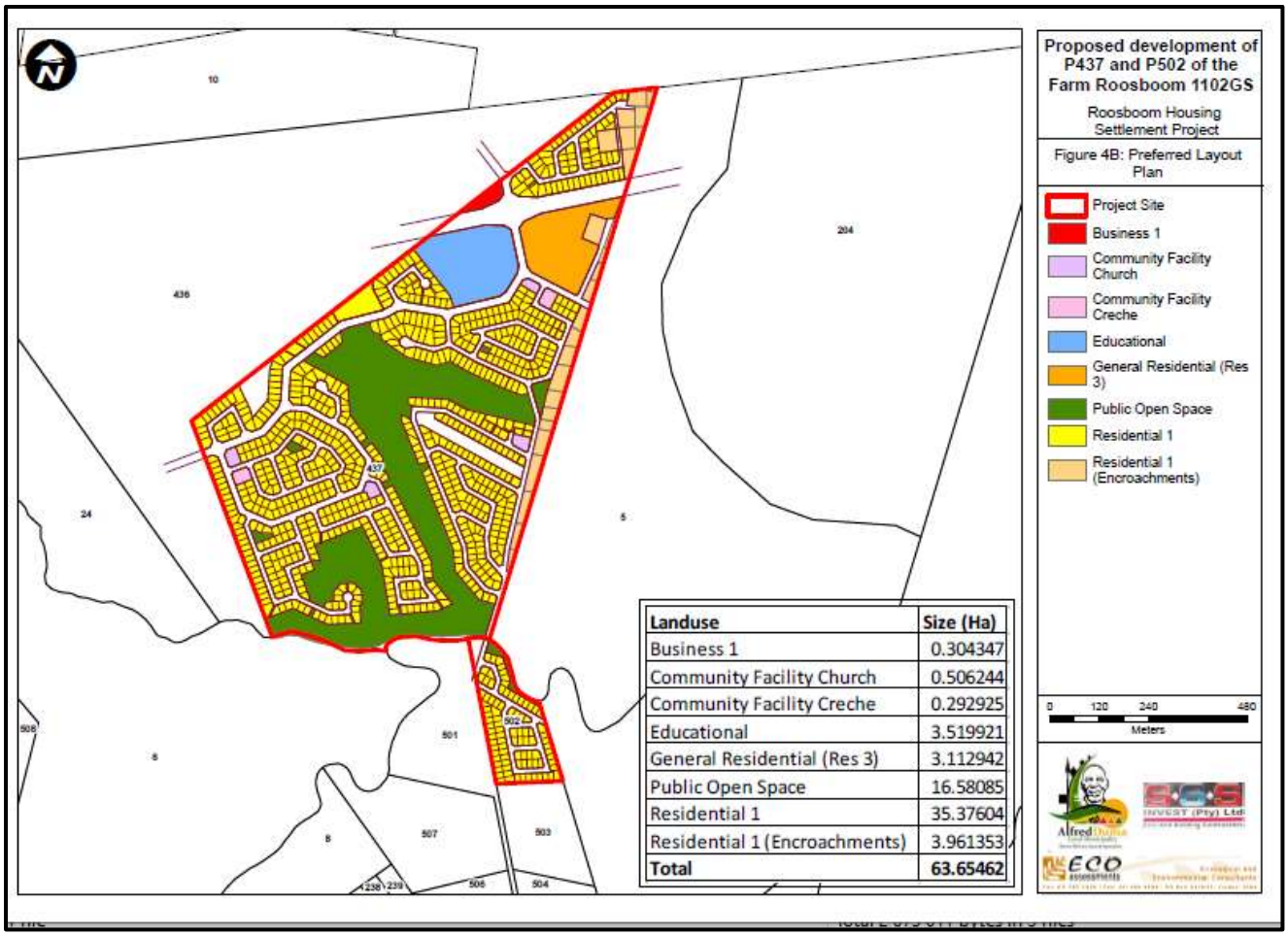

Figure 44. Preferred Lay out as provided by the client.

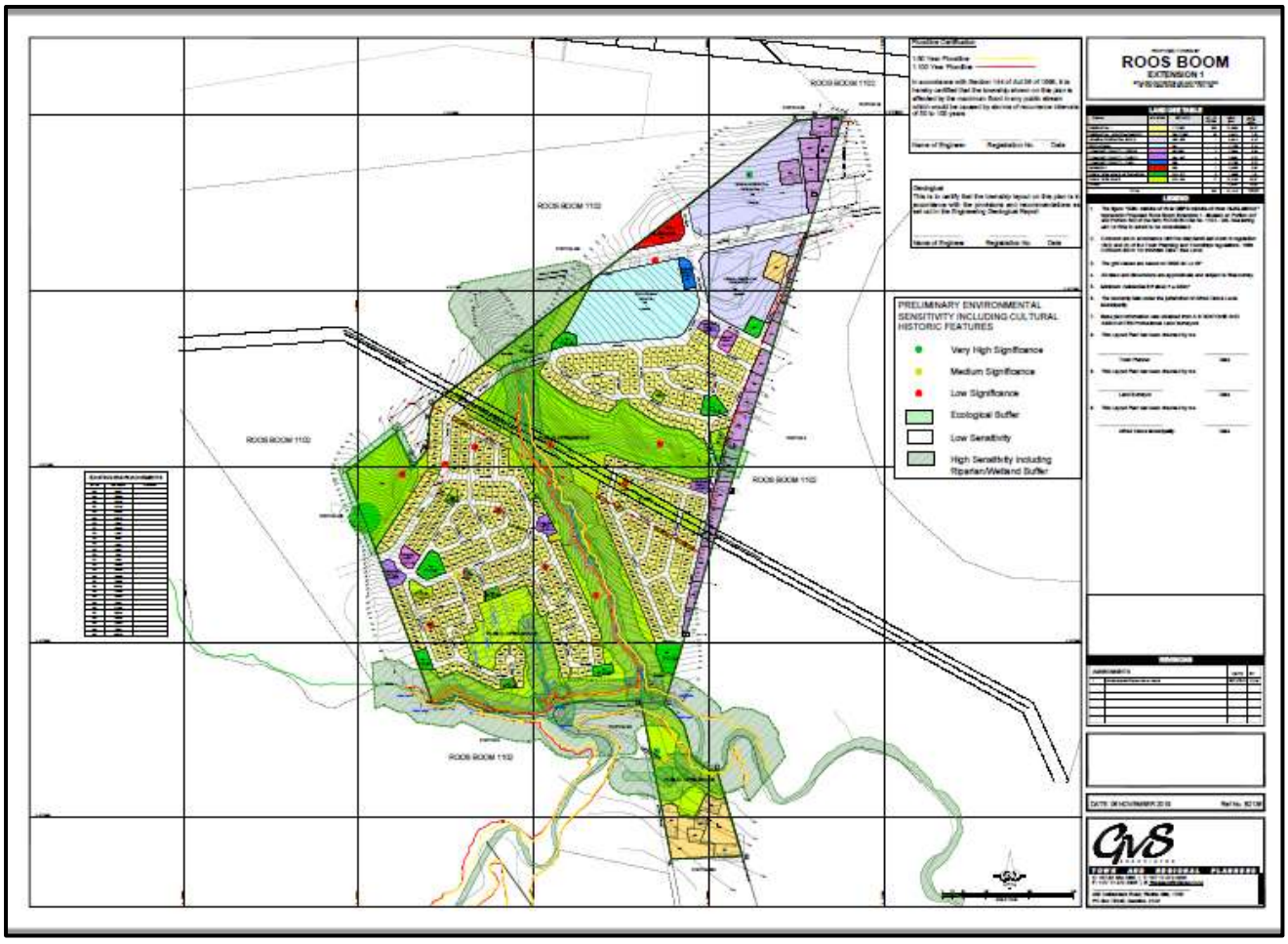

Figure 45. Final Draft lay out as provided by the client.

8.6.1 Pre-Construction phase:

It is assumed that the pre-construction phase involves the removal of topsoil and vegetation as well as the establishment of infrastructure needed for the construction phase. These activities can have a negative and irreversible impact on heritage sites. Impacts include destruction or partial destruction of non-renewable heritage resources.

8.6.2 Construction Phase

During this phase, the impacts and effects are similar in nature but more extensive than the pre-construction phase. These activities can have a negative and irreversible impact on heritage sites. Impacts include destruction or partial destruction of non-renewable heritage resources.

8.6.3 Operation Phase:

The additional influx of people can negatively impact on heritage resources during this phase.

Table 12. Impact Assessment table.

Nature: Activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological and paleontological material or objects.		
	Without mitigation	**With mitigation (Preservation/ excavation of site)**
Extent	Local (3)	Local (3)
Duration	Permanent (5)	Permanent (5)
Magnitude	Moderate (6)	Low (4)
Probability	Very Probable (4)	Not probable (2)
Significance	**56 (Medium)**	**24 (Low)**
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	No	Yes
Mitigation: • Confirmation of grave sites in the study area through a social consultation process that addresses the issue of unmarked graves associated with structures as well as stone cairns currently interpreted as possible graves; • Graves located in future and known graves should ideally be retained *in situ* in open spaces; • Implementation of a chance find procedure for the project as outlined in Section 9.1; • A Site development plan should be compiled for the development; • Site specific recommendations should also be adhered to		
Residual Impacts: Although surface sites can be avoided or mitigated, there is a chance that completely buried sites would still be impacted on but this cannot be quantified.		

9 Conclusion and recommendations

The background study highlighted that the general area under investigation has a wealth of heritage sites dating from the Stone Age to the recent past (e.g.,Vinnicombe, 1976, Klein 1977, Huffman 2007, Anderson 2015 a and b). During the survey of the study area, several features were recorded.

Features noted during the survey including isolated undecorated ceramics and features relating to the built environment such as fence posts were recorded as Find spots. These find spots are of no heritage significance apart from mentioning them in this report. Significant tangible heritage features such as burial sites and structures were recorded. A number of locations were identified across the survey area interpreted as grave sites. Some of these features are only marked by stone packed cairns and the possibility exists that not all of these could be graves but is handled as such until it is proven otherwise. The foundations of demolished structures of unknown age is found scattered over the area. The structures' potential to contribute to aesthetic, historic, scientific and social aspects are low, but sites like these are known to contain unmarked graves, usually of stillborn babies. In which case the sites would be of high social significance;

The proposed project will impact directly on heritage resources with the highest impact being on grave sites. Three alternative lay outs were assessed and if the recommendations in this report are adhered to all the alternatives are acceptable from a heritage point view with the Draft Final lay out being the preferred option.
To mitigate the impact of the proposed project on the recorded heritage resources the following recommendations apply as a condition of authorisation (part of the EMPr) and based on approval from AMAFA.

- Confirmation of grave sites in the study area through a social consultation process that addresses the issue of unmarked graves associated with structures as well as stone cairns currently interpreted as possible graves;
- Graves located in future and known graves should ideally be retained *in situ* in open spaces;
- Implementation of a chance find procedure for the project as outlined in Section 9.1;
- Demolishment of built environment features, especially site R5 and surrounds will require an assessment by a conservation architect and a demolition permit from AMAFA.
- A Site development plan should be compiled for the development;

Site specific recommendations should also be adhered to (Table 6 and 7).

9.1 Chance Find Procedures

Heritage resources

The possibility of the occurrence of subsurface finds cannot be excluded. Therefore, if during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped and a qualified archaeologist must be contacted for an assessment of the find and therefor chance find procedures should be put in place as part of the EMP. A short summary of chance find procedures is discussed below.

This procedure applies to the developer's permanent employees, its subsidiaries, contractors and subcontractors, and service providers. The aim of this procedure is to establish monitoring and reporting procedures to ensure compliance with this policy and its associated procedures. Construction crews must be properly inducted to ensure they are fully aware of the procedures regarding chance finds as discussed below.

- If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.
- It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find, and confirm the extent of the work stoppage in that area.
- The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA.

Fossil Chance find Procedure

Monitoring Programme for Palaeontology – to commence once the excavations for foundations, water and sewage pipes, electricity supply poles or roads begin.

1. The following procedure is only required if fossils are seen on the surface and when excavations commence.
2. When excavations begin the rocks and must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (plants, insects, wood, bone, coal) should be put aside in a suitably protected place. This way the building activities will not be interrupted.
3. Photographs of similar fossil plants must be provided to the developer to assist in recognizing the fossil plants in the shales and mudstones (for example see Figure 4, 5). This information will be built into the EMP's training and awareness plan and procedures.
4. Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
5. If there is any possible fossil material found by the developer/environmental officer/engineers then the qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.
6. Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.
7. If no good fossil material is recovered then the site inspections by the palaeontologist will not be necessary. Annual reports by the palaeontologist must be sent to SAHRA.
8. If no fossils are found and the excavations have finished then no further monitoring is required.

9.2 Reasoned Opinion

The impact of the proposed project on heritage resources is considered low and can be mitigated to an acceptable level and therefore we are of the opinion that the project can continue based on approval from SAHRA. Furthermore, the socio-economic benefits also outweigh the possible impacts of the development if the correct mitigation measures (i.e. chance find procedure) are implemented for the project.

9.3 Potential Risks

Potential risks to the proposed project are the occurrence of graves not recorded here and that subsurface cultural material/artefacts could be uncovered during earth works that could have cost implications and time delays. These risks can be mitigated to an acceptable level with monitoring and the implementation of a chance find procedure as outlined in Section 9.1.

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11 Appendices:

Curriculum Vitae of Specialist

Jaco van der Walt
Archaeologist

jaco.heritage@gmail.com
+27 82 373 8491
+27 86 691 6461

Education:

Particulars of degrees/diplomas and/or other qualifications:

Name of University or Institution:		University of Pretoria
Degree obtained	**:**	BA Heritage Tourism & Archaeology
Year of graduation	**:**	2001
Name of University or Institution:		University of the Witwatersrand
Degree obtained	**:**	BA Hons Archaeology
Year of graduation	**:**	2002
Name of University or Institution	**:**	University of the Witwatersrand
Degree Obtained	**:**	MA (Archaeology)
Year of Graduation	:	2012
Name of University or Institution	**:**	University of Johannesburg
Degree	**:**	PhD
Year	:	Currently Enrolled

EMPLOYMENT HISTORY:

2011 – Present:	**Owner – HCAC (Heritage Contracts and Archaeological Consulting CC)**.
2007 – 2010 :	**CRM Archaeologist,** Managed the Heritage Contracts Unit at the University of the Witwatersrand.
2005 - 2007:	**CRM Archaeologist**, Director of Matakoma Heritage Consultants
2004:	**Technical Assistant**, Department of Anatomy University of Pretoria
2003:	**Archaeologist**, Mapungubwe World Heritage Site
2001 - 2002:	**CRM Archaeologists,** For R & R Cultural Resource Consultants, Polokwane
2000:	**Museum Assistant**, Fort Klapperkop.

Countries of work experience include:

Republic of South Africa, Botswana, Zimbabwe, Mozambique, Tanzania, The Democratic Republic of the Congo, Lesotho and Zambia.

SELECTED PROJECTS INCLUDE:

Archaeological Impact Assessments (Phase 1)

Heritage Impact Assessment Proposed Discharge Of Treated Mine Water Via The Wonderfontein Spruit Receiving Water Body Specialist as part of team conducting an Archaeological Assessment for the Mmamabula mining project and power supply, Botswana

Archaeological Impact Assessment Mmamethlake Landfill

Archaeological Impact Assessment Libangeni Landfill

Linear Developments

Archaeological Impact Assessment Link Northern Waterline Project At The Suikerbosrand Nature Reserve

Archaeological Impact Assessment Medupi – Spitskop Power Line,

Archaeological Impact Assessment Nelspruit Road Development

Renewable Energy developments

Archaeological Impact Assessment Karoshoek Solar Project

Grave Relocation Projects

Relocation of graves and site monitoring at Chloorkop as well as permit application and liaison with local authorities and social processes with local stakeholders, Gauteng Province.

Relocation of the grave of Rifle Man Maritz as well as permit application and liaison with local authorities and social processes with local stakeholders, Ndumo, Kwa Zulu Natal.

Relocation of the Magolwane graves for the office of the premier, Kwa Zulu Natal

Relocation of the OSuthu Royal Graves office of the premier, Kwa Zulu Natal

Phase 2 Mitigation Projects

Field Director for the Archaeological Mitigation For Booysendal Platinum Mine, Steelpoort, Limpopo Province. Principle investigator Prof. T. Huffman

Monitoring of heritage sites affected by the ARUP Transnet Multipurpose Pipeline under directorship of Gavin Anderson.

Field Director for the Phase 2 mapping of a late Iron Age site located on the farm Kameelbult, Zeerust, North West Province. Under directorship of Prof T. Huffman.

Field Director for the Phase 2 surface sampling of Stone Age sites effected by the Medupi – Spitskop Power Line, Limpopo Province

Heritage management projects

Platreef Mitigation project – mitigation of heritage sites and compilation of conservation management plan.

MEMBERSHIP OF PROFESSIONAL ASSOCIATIONS:

- Association of Southern African Professional Archaeologists. Member number 159

  Accreditation:
  - Field Director Iron Age Archaeology
  - Field Supervisor Colonial Period Archaeology, Stone Age Archaeology and Grave Relocation
- Accredited CRM Archaeologist with SAHRA
- Accredited CRM Archaeologist with AMAFA
- Co-opted council member for the CRM Section of the Association of Southern African Association Professional Archaeologists (2011 – 2012)

PUBLICATIONS AND PRESENTATIONS

- A Culture Historical Interpretation, Aimed at Site Visitors, of the Exposed Eastern Profile of K8 on the Southern terrace at Mapungubwe.
  - J van der Walt, A Meyer, WC Nienaber
  - Poster presented at Faculty day, Faculty of Medicine University of Pretoria 2003
- 'n Reddingsondersoek na Anglo-Boereoorlog-ammunisie, gevind by Ifafi, Noordwes-Provinsie. South-African Journal for Cultural History 16(1) June 2002, with A. van Vollenhoven as co-writer.
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- A War Uncovered: Human Remains from Thabantšho Hill (South Africa), 10 May 1864.
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  - Paper read at the 12th Congress of the Pan-African Archaeological Association for Prehistory and Related Studies 2005
- Field Report on the mitigation measures conducted on the farm Bokfontein, Brits, North West Province .
  - J van der Walt, P Birkholtz, W. Fourie
  - Paper read at the Southern African Association of Archaeologists Biennial Conference 2007
- Field report on the mitigation measures employed at Early Farmer sites threatened by development in the Greater Sekhukhune area, Limpopo Province. J van der Walt
  - Paper read at the Southern African Association of Archaeologists Biennial Conference 2008
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    - Paper read at the Southern African Association of Archaeologists Biennial Conference 2011
- Bantu-Speaker Rock engravings in the Schoemanskloof Valley, Lydenburg District, Mpumalanga. J.P Celliers and J van der Walt
    - Paper read at the Southern African Association of Archaeologists Biennial Conference 2011
- Pleistocene hominin land use on the western trans-Vaal Highveld ecoregion, South Africa, Jaco van der Walt.
    - J van der Walt. Poster presented at SAFA, Toulouse, France. Biennial Conference 2016

REFERENCES:

1. Prof Marlize Lombard Senior Lecturer, University of Johannesburg, South Africa
   E-mail: mlombard@uj.ac.za
2. Prof TN Huffman Department of Archaeology Tel: (011) 717 6040
   University of the Witwatersrand
3. Alex Schoeman University of the Witwatersrand
   E-mail:Alex.Schoeman@wits.ac.za