CAROCRAFT (PTY) LTD: 88 KV OR 132KV POWER LINE FOR THE CONNECTION OF THE CAROCRAFT SOLAR PARK TO THE ESKOM BOPHIRIMA SUBSTATION, NALEDI LOCAL MUNICIPALITY, BOPHIRIMA DISTRICT MUNICIPALITY, NORTH WEST PROVINCE

Archaeological Impact Assessment

Prepared for: Carocraft (Pty) Ltd
Document version 3.0 (Final)
Compiled by N. Kruger

May 2014

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ARCHAEOLOGICAL IMPACT ASSESSMENT (AIA) FOR THE PROPOSED 88 KV OR 132KV POWER LINE FOR THE CONNECTION OF THE CAROCRAFT SOLAR PARK TO THE ESKOM BOPHIRIMA SUBSTATION, NALEDI LOCAL MUNICIPALITY, BOPHIRIMA DISTRICT MUNICIPALITY, NORTH WEST PROVINCE

May 2014

Document Version 3 (Final)

Conducted on behalf of:

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DECLARATION

I, Nelius Le Roux Kruger, declare that –

- I act as the independent specialist;
- I am conducting any work and activity relating to the proposed Carocraft Power Line Project in an objective manner, even if this results in views and findings that are not favourable to the client;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have the required expertise in conducting the specialist report and I will comply with legislation, including the relevant Heritage Legislation (National Heritage Resources Act no. 25 of 1999, Human Tissue Act 65 of 1983 as amended, Removal of Graves and Dead Bodies Ordinance no. 7 of 1925, Excavations Ordinance no. 12 of 1980), the Minimum Standards: Archaeological and Palaeontological Components of Impact Assessment (SAHRA and the CRM section of ASAPA), 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.

_____

SIGNATURE OF SPECIALIST

Company: Africa Geo-Environmental Services Gauteng (Pty) Ltd.

Date: 6 May 2014

EXECUTIVE SUMMARY

This report details the results of an Archaeological Impact Assessment (AIA) study on Portions of the Farms Weltevrede 681IN, Glencairn 724 IN, Brandwagt 728 IN, Woodhouse 729 IN, Cleef 678 IN, Welgelegen 677IN and Bernauw 674IN, subject to an Environmental Basic Assessment (BA) process for the proposed Carocraft Power Line Project, Naledi Local Municipality, Bophirima District Municipality, North West Province. The report includes background information on the area's archaeology, its representation in southern Africa, and the history of the larger area under investigation, survey methodology and results as well as heritage legislation and conservation policies. A copy of the report will be supplied to the South African Heritage Resources Agency (SAHRA) and recommendations contained in this document will be reviewed.

A number of archaeological and historical studies have been conducted in the Vryburg area and many of these studies infer a varied and rich heritage landscape. However, the landscape directly surrounding the properties under study seems to have been sparsely populated by humans in the past, possibly as a result of the general scarcity of sustainable water sources as well as the absence of hills or outcrops for shelter. Four area of archaeological potential were located during the AIA survey of the corridors identified for the Carocraft power line, extending over approximately 12km in total**.**

Stone Age:

A single Earlier Stone Age cleaver (**Site AGES-WH729-SA01**: **S26.98320 E24.78847)** was located near the ESKOM Woodhouse Substation on the farm Woodhouse towards the south-western offset of the proposed power line corridor. No other diagnostic stone tools or debris were identified in the area and the site is of low scientific value due to the low lithic density and the general loss of context for the artefact. Any impact possibly emanating from the development, on the resource is expected to be low. No further action is thus recommended for the management of the heritage resource.

Iron Age (Farmer Period):

A number of collapsed rough stone structures, resembling small circular stone enclosures were documented along the proposed power line route on the farm Brandwagt (**Site AGES-BW728-IA01: S26.97404 E24.81211)**. The structures, which possibly date to the Later Iron Age Farmer Period, are of medium-low significance due to the poor preservation of the structures, the general absence of associated material culture and the general disturbed and altered state of the immediate surroundings, implying a loss of context for the sites. The impact on the resources by the proposed activity is anticipated to be peripheral and permanent but the significance of the impact on the resource is considered to be moderate to low. It is recommended that any activities pertaining to the construction of the power line in the area be monitored in order to closely control any possible impact on the sites. Should previously undetected heritage remains be exposed at any stage, construction activities should be aborted until such time that a qualified and registered CRM practitioner has assessed heritage resources and made recommendations on the management of such resources.

Historical/ Colonial Period:

The Brandwagt farmstead which is currently in use, as well as possible Historical Period farmstead structures such as an old barn occur on the farm Brandwacht in the general vicinity of the proposed power line corridor (**Site AGES-BW728-HP01: S26.97261 E24.81512).** The possible Historical Period structures at the farmstead are of medium significance since the site might yield information on the regional expansion of Colonial farming and architectural developments in the area. The impact on the resources by the proposed activity is anticipated to be peripheral but the significance of the impact on the resource is considered to be moderate to low and it is recommended that any activities pertaining to the development in the area be monitored in order to avoid any

possible impact on previously undetected heritage remains in the area. Should the structures be directly impacted by development activities, destruction permit from the relevant heritage resources authority (SAHRA) should be obtained.

Graves / Other features:

A small elongated stone feature (**Site AGES-WH729-FT01: S26.98394 E24.78895)** was located near the ESKOM Woodhouse Substation on the farm Woodhouse, towards the south-western offset of the proposed power line corridor**.** The function and context of the feature is not known but it could, in all probability be attributed to geo-technical investigations by means of trial pit excavations that were recently conducted in this area. However, cognisance should be taken of the fact that the structure might be an informal burial site, based on its general appearance. It is thus recommended that this area be closely monitored in order to avoid the destruction of a potentially sensitive heritage resource. It should be noted that, should human remains be discovered at any stage of the development along the proposed corridor route, these should be reported to the Heritage Specialist and relevant authorities (SAHRA) and development activities should be suspended until the site has been inspected by the Specialist. The Specialist will advise on further management actions and possible relocation of human remains in accordance with the Human Tissue Act (Act 65 of 1983 as amended), the Removal of Graves and Dead Bodies Ordinance (Ordinance no. 7 of 1925), the National Heritage Resources Act (Act no. 25 of 1999) and any local and regional provisions, laws and by-laws pertaining to human remains. A full social consultation process should occur in conjunction with the mitigation of cemeteries and burials.

Heritage resources have been documented in the proposed Carocraft Power Line Project footprint areas. From a culture resources management perspective, no lasting impact on heritage resources is foreseen, provided that the heritage component be closely monitored by the ECO during the construction process in order to avoid the destruction of existing, and previously undetected heritage remains. Should any previously undetected heritage remains be uncovered, the archaeologist should be alerted immediately. In the opinion of the author of this Archaeological Impact Assessment Report, the proposed Carocraft Power Line Project may proceed subject to recommendations contained in this assessment, endorsed by the relevant Heritage Resources authorities.

A Palaeontological Impact Assessment should be considered where bedrock is to be impacted on and, should fossil remains such as fossil fish, reptiles or vitrified wood be exposed during construction, these objects should be carefully safeguarded and the relevant heritage resources authority (SAHRA) should be notified immediately so that the appropriate action can be taken by a professional palaeontologist. It is essential that cognisance be taken of the larger archaeological landscape of the area in order to avoid the destruction of previously undetected heritage sites. Here, care should be taken around rock faces and outcrops in the larger landscape, as rock art is known to occur on these outcrops. Water sources such as salt pans, drainage lines and rivers should also be regarded as potentially sensitive in terms of possible Stone Age deposits. The possible existence of Historical Period resources deriving from the area's more recent history should also be considered. Ultimately, it is essential that the archaeological and cultural heritage of the Northwest Province be respected.

NOTATIONS AND TERMS

Absolute dating:
Absolute dating provides specific dates or range of dates expressed in years.

Archaeology:
The study of the human past through its material remains.

Archaeological record:
The archaeological record minimally includes all the material remains documented by archaeologists. More comprehensive definitions also include the record of culture history and everything written about the past by archaeologists.

Artefact:
Entities whose characteristics result or partially result from human activity. The shape and other characteristics of the artefact are not altered by removal of the surroundings in which they are discovered. In the southern African context examples of artefacts include potsherds, iron objects, stone tools, beads and hut remains.

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

^{14}C or radiocarbon dating:
The ^{14}C method determines the absolute age of organic material by studying the radioactivity of carbon. It is reliable for objects not older 70 000 years by means of isotopic enrichment. The method becomes increasingly inaccurate for samples younger than ±250 years.

Ceramic Facies:
In terms of the cultural representation of ceramics, a facies is denoted by a specific branch of a larger ceramic tradition. A number of ceramic facies thus constitute a ceramic tradition.

Ceramic Tradition:
In terms of the cultural representation of ceramics, a series of ceramic units constitutes as ceramic tradition.

Context:
An artefact's context usually consists of its immediate *matrix*, its *provenience* and its *association* with other artefacts. When found in *primary context*, the original artefact or structure was undisturbed by natural or human factors until excavation and if in *secondary context,* disturbance or displacement by later ecological action or human activities occurred.

Culture:
A contested term, "culture" could minimally be defined as the learned and shared things that people have, do and think.

Cultural Heritage Resource:
The broad generic term *Cultural Heritage Resources* refers to any physical and spiritual property associated with past and present human use or occupation of the environment, cultural activities and history. The term includes sites, structures, places, natural features and material of palaeontological, archaeological, historical, aesthetic, scientific, architectural, religious, symbolic or traditional importance to specific individuals or groups, traditional systems of cultural practice, belief or social interaction.

Cultural landscape:
A cultural landscape refers to a distinctive geographic area with cultural significance.

Cultural Resource Management (CRM):
A system of measures for safeguarding the archaeological heritage of a given area, generally applied within the framework of legislation designed to safeguard the past.

Ecofact:
Non artefactual material remains that has cultural relevance which provides information about past human activities. Examples would include remains or evidence of domesticated animals or plant species.

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 the other material covering and accompanying it.

Feature:
Non-portable artefacts, in other words artefacts that cannot be removed from their surroundings without destroying or altering their original form. Hearths, roads, and storage pits are examples of archaeological features

GIS:
Geographic Information Systems are computer software that allows layering of various types of data to produce complex maps; useful for predicting site location and for representing the analysis of collected data within sites and across regions.

Historical archaeology:
Primarily that aspect of archaeology which is complementary to history based on the study of written sources. In the South African context it concerns the recovery and interpretation of relics left in the ground in the course of Europe's discovery of South Africa, as well as the movements of the indigenous groups during, and after the "Great Scattering" of Bantu-speaking groups – known as the *mfecane* or *difaqane*.

Impact: A description of the effect of an aspect of the development on a specified component of the biophysical, social or economic environment within a defined time and space.

Iron Age:
Also known as "Farmer Period", the "Iron Age" is an archaeological term used to define a period associated with domesticated livestock and grains, metal working and ceramic manufacture.

Lithic:
Stone tools or waste from stone tool manufacturing found on archaeological sites.

Management / Management Actions:
Actions – including planning and design changes - that enhance benefits associated with a proposed development, or that avoid, mitigate, restore, rehabilitate or compensate for the negative impacts.

Matrix:
The material in which an artefact is situated (sediments such as sand, ashy soil, mud, water, etcetera). The matrix may be of natural origin or human-made.

Megalith:
A large stone, often found in association with others and forming an alignment or monument, such as large stone statues.

Midden:
Refuse that accumulates in a concentrated heap.

Microlith:
A small stone tool, typically knapped of flint or chert, usually about three centimetres long or less.

Monolith:
A geological feature such as a large rock, consisting of a single massive stone or rock, or a single piece of rock placed as, or within, a monument or site.

Oral Histories:
The historical narratives, stories and traditions passed from generation to generation by word of mouth.

Phase 1 CRM Assessment:
An Impact Assessment which identifies archaeological and heritage sites, assesses their significance and comments on the impact of a given development on the sites. Recommendations for site mitigation or conservation are also made during this phase.

Phase 2 CRM Study:
In-depth 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. Mitigation / Rescue involves planning the protection of significant sites or sampling through excavation or

collection (in terms of a permit) at sites that may be lost as a result of a given development.

Phase 3 CRM Measure:

A Heritage Site Management Plan (for heritage conservation), is required in rare cases where the site is so important that development will not be allowed and sometimes developers are encouraged to enhance the value of the sites retained on their properties with appropriate interpretive material or displays.

Prehistoric archaeology:

That aspect of archaeology which concerns itself with the development of humans and their culture before the invention of writing. In South Africa, prehistoric archaeology comprises the study of the Early Stone Age, the Middle Stone Age and the greater part of the Later Stone Age and the Iron Age.

Probabilistic Sampling:

A sampling strategy that is not biased by any person's judgment or opinion. Also known as statistical sampling, it includes systematic, random and stratified sampling strategies.

Provenience

Provenience is the three-dimensional (horizontal and vertical) position in which artefacts are found. Fundamental to ascertaining the provenience of an artefact is *association,* the co-occurrence of an artefact with other archaeological remains; and *superposition,* the principle whereby artefacts in lower levels of a matrix were deposited before the artefacts found in the layers above them, and are therefore older.

Random Sampling:

A probabilistic sampling strategy whereby randomly selected sample blocks in an area are surveyed. These are fixed by drawing coordinates of the sample blocks from a table of random numbers.

Relative dating:

The process whereby the relative antiquity of sites and objects are determined by putting them in sequential order but not assigning specific dates.

Remote Sensing:

The small or large-scale acquisition of information of an object or phenomenon, by the use of either recording or real-time sensing device(s) that is not in physical or intimate contact with the object (such as by way of aircraft, spacecraft or satellite). Here, ground-based geophysical methods such as Ground Penetrating Radar and Magnetometry are often used for archaeological imaging.

Rock Art Research:

Rock art can be "decoded" in order to inform about cultural attributes of prehistoric societies, such as dress-code, hunting and food gathering, social behaviour, religious practice, gender issues and political issues.

Scoping Assessment:

The process of determining the spatial and temporal boundaries (i.e. extent) and key issues to be addressed in an impact assessment. The main purpose is to focus the impact assessment on a manageable number of important questions on which decision making is expected to focus and to ensure that only key issues and reasonable alternatives are examined. The outcome of the scoping process is a Scoping Report that includes issues raised during the scoping process, appropriate responses and, where required, terms of reference for specialist involvement.

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 (Archaeological):

A distinct spatial clustering of artefacts, features, structures, and organic and environmental remains, as the residue of human activity. These include surface sites, caves and rock shelters, larger open-air sites, sealed sites (deposits) and river deposits. Common functions of archaeological sites include living or habitation sites, kill sites, ceremonial sites, burial sites, trading, quarry, and art sites,

Slag:

The material residue of smelting processes from metalworking.

Stone Age:
An archaeological term used to define a period of stone tool use and manufacture.

Stratigraphy:
This principle examines and describes the observable layers of sediments and the arrangement of strata in deposits

Stratified Sampling:
A probabilistic sampling strategy whereby a study area is divided into appropriate zones – often based on the probable location of archaeological areas, after which each zone is sampled at random.

Systematic Sampling:
A probabilistic sampling strategy whereby a grid of sample blocks is set up over the survey area and each of these blocks is equally spaced and searched.

Tradition:
Artefact types, assemblages of tools, architectural styles, economic practices or art styles that last longer than a phase and even a horizon are describe by the term *tradition*. A common example of this is the early Iron Age tradition of Southern Africa that originated ± 200 AD and came to an end at about 900 AD.

Trigger: A particular characteristic of either the receiving environment or the proposed project which indicates that there is likely to be an *issue* and/or potentially significant *impact* associated with that proposed development that may require specialist input. Legal requirements of existing and future legislation may also trigger the need for specialist involvement.

Tuyère:
A ceramic blow-tube used in the process of iron smelting / reduction.

LIST OF ABBREVIATIONS

Abbreviation	Description
AGES	Africa Geo Environmental Services Gauteng Pty Ltd
ASAPA	Association for South African Professional Archaeologists
AIA	Archaeological Impact Assessment
BP	Before Present
BCE	Before Common Era
CRM	Culture Resources Management
EIA	Early Iron Age (also Early Farmer Period)
EIA	Environmental Impact Assessment
EFP	Early Farmer Period (also Early Iron Age)
ESA	Earlier Stone Age
GIS	Geographic Information Systems
HIA	Heritage Impact Assessment
ICOMOS	International Council on Monuments and Sites
K2/Map	K2/Mapungubwe Period
LFP	Later Farmer Period (also Later Iron Age)
LIA	Later Iron Age (also Later Farmer Period)
LSA	Later Stone Age
MIA	Middle Iron Age (also Early later Farmer Period)
MRA	Mining Right Area
MSA	Middle Stone Age
NHRA	National Heritage Resources Act No.25 of 1999, Section 35
PFS	Pre-Feasibility Study
PHRA	Provincial Heritage Resources Authorities
SAFA	Society for Africanist Archaeologists
SAHRA	South African Heritage Resources Association
YCE	Years before Common Era (Present)

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1 BACKGROUND

1.1 Scope and Motivation

AGES Gauteng was commissioned by Carocraft (Pty) Ltd for an Archaeological Impact Assessment (AIA) study of Portions of the Farms Weltevrede 681IN, Glencairn 724 IN, Brandwagt 728 IN, Woodhouse 729 IN, Cleef 678 IN, Welgelegen 677IN and Bernauw 674IN, subject to an Environmental Basic Assessment (BA) process for the proposed Carocraft Power Line Project, Naledi Local Municipality, Bophirima District Municipality, North West Province. The rationale of this AIA is to determine the presence of heritage resources such as archaeological and historical sites and features, graves and places of religious and cultural significance in previously unstudied areas; to consider the impact of the proposed project on such heritage resources, and to submit appropriate recommendations with regard to the cultural resources management measures that may be required at affected sites / features.

1.2 Project Direction

AGES's expertise ensures that all projects be conducted to the highest international ethical and professional standards. As archaeological specialist for AGES, Mr Neels Kruger acted as field director for the project; responsible for the assimilation of all information, the compilation of the final consolidated AIA report and recommendations in terms of heritage resources on the demarcated project areas. Mr Kruger is an accredited archaeologist and Culture Resources Management (CRM) practitioner with the Association of South African Professional Archaeologists (ASAPA), a member of the Society for Africanist Archaeologists (SAFA) and the Pan African Archaeological Association (PAA) as well as a Master's Degree candidate in archaeology at the University of Pretoria.

1.3 Project Brief

In view of the growing electricity demand and in an effort to use renewable energy resources, Carocraft (Pty) Ltd is assessing the feasibility of a new 88 kV or 132 kV Power Line to connect the Carocraft renewable energy generation facility (Photovoltaic Solar Facility) to the Eskom grid.

The proposed 88 kV or 132 kV power line will connect the Carocraft Solar Park to the planned Eskom Bophirima substation, 11 km west of the planned location of the Solar Park (see Figure 1-1).

The new 88 kV or 132 kV power line will be approximately 11.5 km long and will run parallel to the existing Eskom "Delareyville Municipality – Vryburg 1" 88 kV power line.

The proposed 88 kV or 132kV power line may run over the following properties:

- **Remainder Portion of the Farm Weltevrede 681 In**
- **Portion 1 of the Farm Glencairn 724 In**
- **Portion 2 of the Farm Glencairn 724 In**
- **Portion 8 of the Farm Brandwagt 728 In**
- **Portion 11 of the Farm Brandwagt 728 In**
- **Portion 12 of the Farm Brandwagt 728 In**
- **Remainder Portion of the Farm Woodhouse 729 In**
- **Portion 4 of the Farm Cleef 678 In**
- **Remainder Portion of the Farm Cleef 678 In**
- **Portion 2 of the Farm Welgelegen 677 In**

- **Remainder Portion of the Farm Welgelegen 677 In**
- **Portion 17 of the Farm Bernauw 674 In**
- **Portion 18 of the Farm Bernauw 674 In**
- **Portion 26 of the Farm Bernauw 674 In**
- **Portion 32 of the Farm Bernauw 674 In**
- **Portion 54 of the Farm Bernauw 674 In**
- **Portion 56 of the Farm Bernauw 674 In**

These properties are located in the Naledi Local Municipality, Bophirima District Municipality, North West Province.

The power line will consist of a series of steel and/or wood towers / structures supporting the electrical cables and a communication cable, to be installed approximately 200 - 260 m apart. The proposed structures will be between 18 m and 25 m high and the basement of each tower will have a footprint of approximately 2.5 m^2.

The power line servitude will be 36 m wide (18 m from each side of the center line); the alignment will be assessment within the proposed corridor routes. An access road may be constructed within the power line servitude, for the construction and maintenance activities.

The final section of the power line may be underground (underground cables).

The proposed power line may be built and/or operates by Carocraft and/or Eskom. The construction may also entail interventions on the Eskom grid according to Eskom requirements.

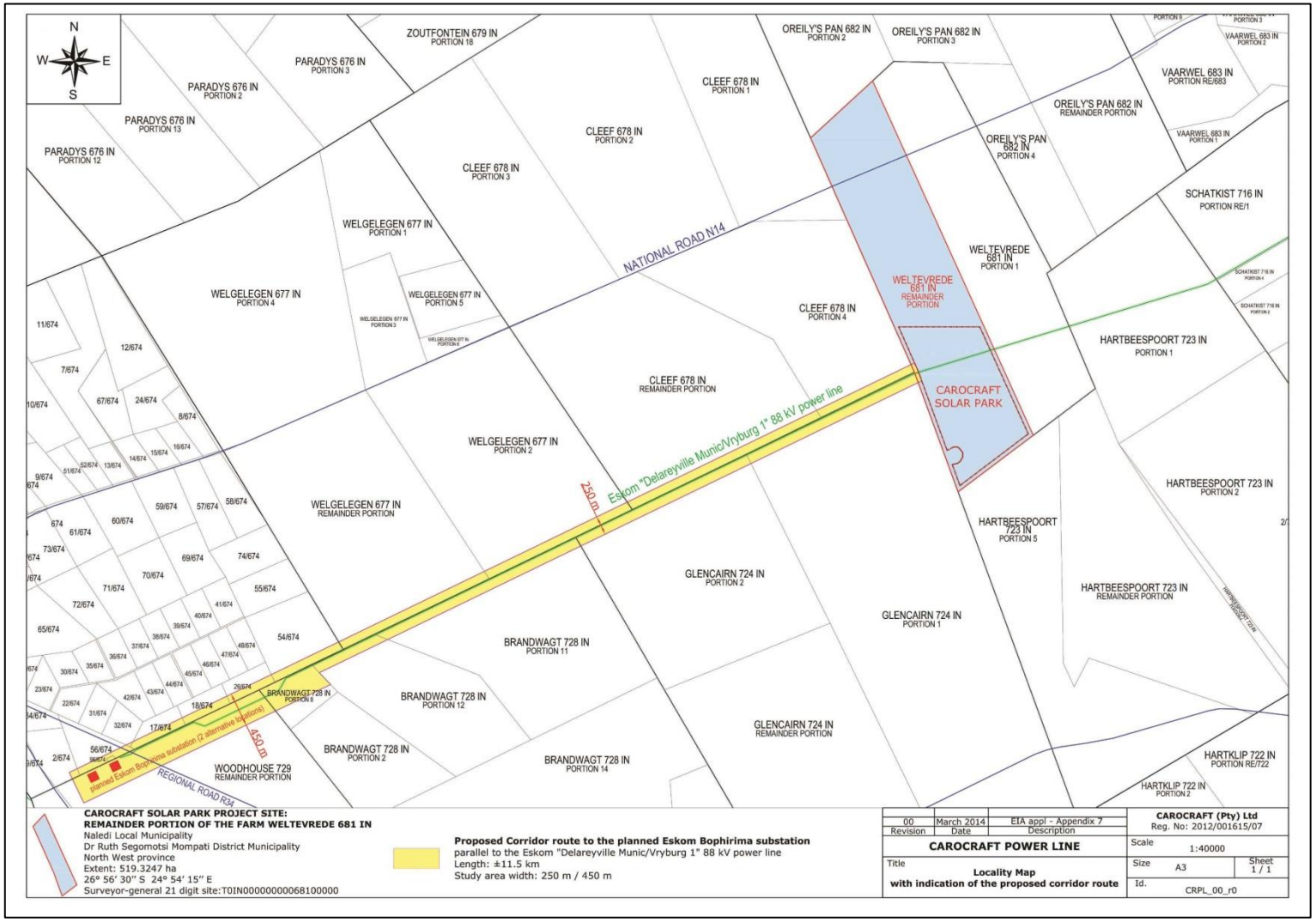

Figure 1-1: Map representation of the proposed corridor and infrastructure components for the Carocraft Power Line Development.

1.4 Terms of Reference

Heritage specialist input into the Environmental Impact Assessment (EIA) process is essential to ensure that through the management of change, developments still conserve our heritage resources. Heritage specialist input in EIA processes can play a positive role in the development process by enriching an understanding of the past and its contribution to the present. It is also a legal requirement for certain development categories which may have an impact on heritage resources (Refer to Section 1.5.2.).

Thus, EIAs should always include an assessment of Heritage Resources. The heritage component of the EIA is provided for in the **National Environmental Management Act, (Act 107 of 1998)** and endorsed by section 38 of the **National Heritage Resources Act (NHRA - Act 25 of 1999)**. In addition, the NHRA protects all structures and features older than 60 years (see Section 34 of the Act), archaeological sites and material (see Section 35 of the Act) and graves as well as burial sites (see Section 36 of the Act). The objective of this legislation is to enable and to facilitate developers to employ measures to limit the potentially negative effects that the development could have on heritage resources.

Based hereon, this project functioned according to the following **terms of reference for** heritage specialist input**:**

- *Provide a detailed description of all archaeological artefacts, structures (including graves) and settlements which may be affected, if any.*
- *Assess the nature and degree of significance of such resources within the area.*
- *Establish heritage informants/constraints to guide the development process through establishing thresholds of impact significance.*
- *Assess any possible impact on the archaeological and historical remains within the area emanating from the proposed development activities.*
- *Propose possible heritage management measures provided that such action is necessitated by the development.*
- *Liaise and consult with the South African Heritage Resources Agency (SAHRA)).*

1.5 CRM: Legislation, Conservation and Heritage Management

The broad generic term *Cultural Heritage Resources* refers to any physical and spiritual property associated with past and present human use or occupation of the environment, cultural activities and history. The term includes sites, structures, places, natural features and material of palaeontological, archaeological, historical, aesthetic, scientific, architectural, religious, symbolic or traditional importance to specific individuals or groups, traditional systems of cultural practice, belief or social interaction.

1.5.1 Legislation regarding archaeology and heritage sites

The South African Heritage Resources Agency (SAHRA) and their provincial offices aim to conserve and control the management, research, alteration and destruction of cultural resources of South Africa. It is therefore vitally important to adhere to heritage resource legislation at all times.

a. National Heritage Resources Act No 25 of 1999, section 35

According to the National Heritage Resources Act of 1999 a historical site is any identifiable building or part thereof, marker, milestone, gravestone, landmark or tell older than 60 years. This clause is commonly known as

the "60-years clause". Buildings are amongst 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 Iron Age settlements. "Tell" refers to the evidence of human existence which is no longer above ground level, such as building foundations and buried remains of settlements (including artefacts).

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
- 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 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 agency-

(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) any excavation equipment, or any equipment which assists in the detection or recovery of metals (36. [3] 1999:60)."

b. Human Tissue Act of 1983 and Ordinance on the Removal of Graves and Dead Bodies of 1925

Graves 60 years or older are heritage resources and fall under the jurisdiction of both the National Heritage Resources Act and the Human Tissues Act of 1983. However, graves younger than 60 years are specifically protected by the Human Tissues Act (Act 65 of 1983) and the Ordinance on the Removal of Graves and Dead Bodies (Ordinance 7 of 1925) as well as any local and regional provisions, laws and by-laws. Such burial places also fall under the jurisdiction of the National Department of Health and the Provincial Health Departments. Approval for the exhumation and re-burial must be obtained from the relevant Provincial MEC as well as the relevant Local Authorities.

1.5.2 Background to HIA and AIA Studies

South Africa's unique and non-renewable archaeological and palaeontological heritage sites are 'generally' protected in terms of the National Heritage Resources Act (Act No 25 of 1999, section 35) and may not be disturbed at all without a permit from the relevant heritage resources authority. Heritage sites are frequently threatened by development projects and both the environmental and heritage legislation require impact assessments (HIAs & AIAs) that identify all heritage resources in areas to be developed. Particularly, these assessments are required to make recommendations for protection or mitigation of the impact of the sites. HIAs and AIAs should be done by qualified professionals with adequate knowledge to (a) identify all heritage resources including archaeological and palaeontological sites that might occur in areas to be developed and (b) make recommendations for protection or mitigation of the impact on the sites.

The National Heritage Resources Act (Act No. 25 of 1999, section 38) provides guidelines for Cultural Resources Management and prospective developments:

"38. *(1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as:*

(a) the construction of a road, wall, powerline, 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 5 000 m^2 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 10 000 m^2 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."

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)."

Consequently, section 35 of the Act requires Heritage Impact Assessments (HIAs) or Archaeological Impact Assessments (AIAs) to be done for such developments in order for all heritage resources, that is, all places or objects of aesthetic, architectural, historic, scientific, social, spiritual, linguistic or technological value or significance to be protected. Thus any assessment should make provision for the protection of all these heritage components, including archaeology, shipwrecks, battlefields, graves, and structures older than 60 years, living heritage, historical settlements, landscapes, geological sites, palaeontological sites and objects.

2 REGIONAL CONTEXT

2.1 Area Location

The study area subject to the Carocraft Power Line development is located across portions of farms Weltevrede 681IN, Glencairn 724 IN, Brandwagt 728 IN, Woodhouse 729 IN, Cleef 678 IN, Welgelegen 677IN and Bernauw 674IN, generally at **S26.97461 E24.81114 (1:50 000 Map Reference 2624DD).** The farms are situated approximately 7km east of the town of Vrybuyrg in the Naledi Local Municipality, Bophirima District Municipality of the North West Province.

The N14 national route passes north of the study area and the proposed power line route crosses the R34 provincial road towards the south-west. The region lies approximately 200km north of the Northern Cape town of Kmberley (see Figure 2-1).

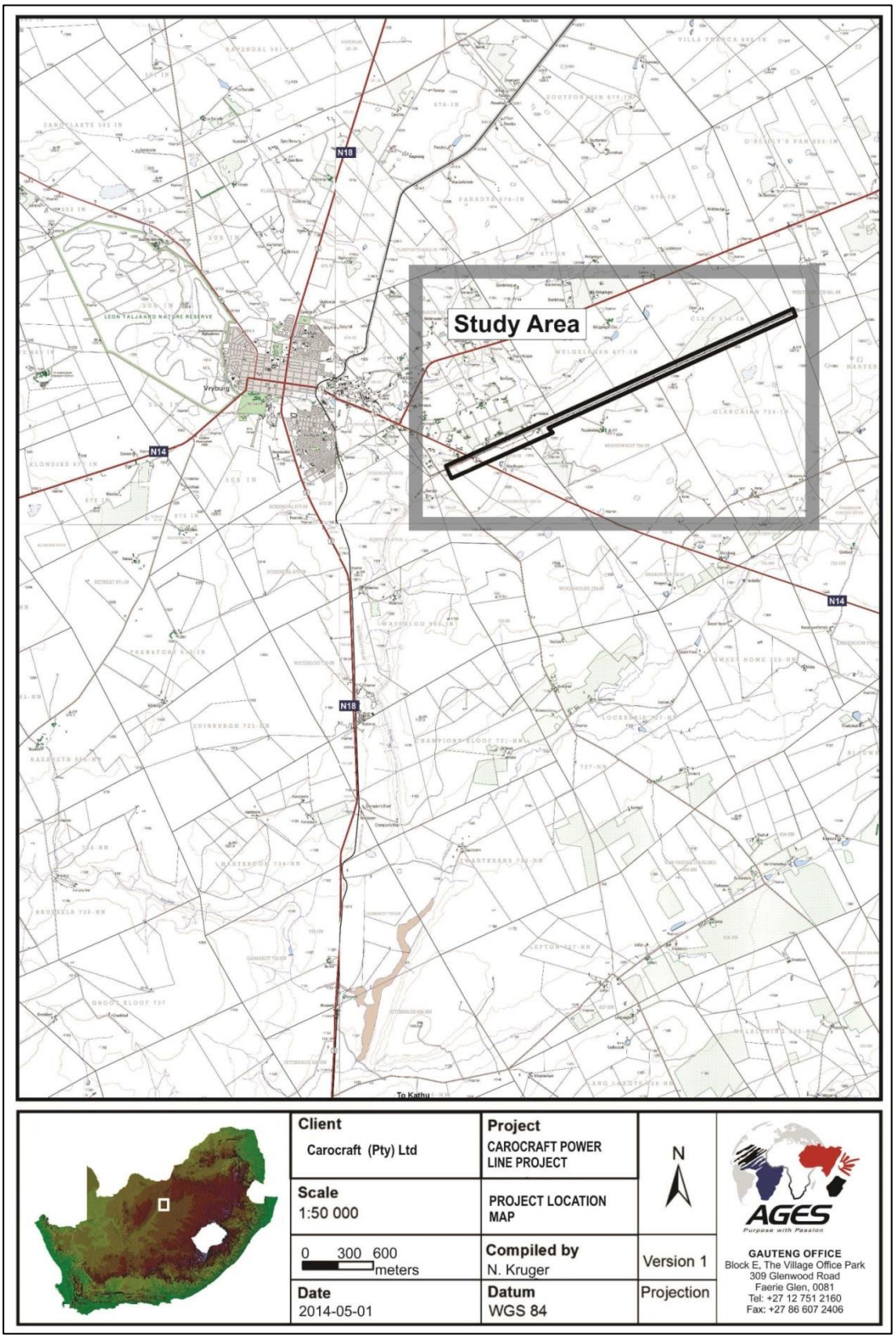

Figure 2-1: 1:50 000 Map representation of the location of the Carocraft Power Line Development location (2624DD). The proposed route corridor for the power line is indicated in black and the suggested locations for the new ESKOM Bohirima Substation are indicated in red.

2.2 Area Description: Receiving Environment[1]

The development site lies within the Savanna biome which is the largest biome in Southern Africa. It is characterized by a grassy ground layer and a distinct upper layer of woody plants (trees and shrubs). The environmental factors delimiting the biome are complex and include altitude, rainfall, geology and soil types, with rainfall being the major delimiting factor. Fire and grazing also keep the grassy layer dominant. The most recent classification of the area by Mucina & Rutherford shows that the site is classified as Ghaap Plateau Vaalbosveld.

The landscape features of the Ghaap Plateau Vaalbosveld vegetation type are a flat plateau with well-developed shrub layer dominated by *Tarchonanthus camphoratus* underlied by surface limestone and dolomite. The conservation status of the Ghaap Plateau Vaalbosveld is Least Threatened with none conserved in statutory reserves and only 1% transformed (Mucina & Rutherford, 2006). This vegetation type covers most of the Ghaap Plateau, and is found on different types of soils, such as calcareous tufa, dark brown to red sands and acid gravels, all underlain by dolomite.

Figure 2-2: General surroundings on a portion of the farm Brandwagt along the footprint area for in the Carocraft Power Line at the time of the field survey (April 2014).

2.3 Site Description

The proposed power line connection will cover footprint areas across approximately 12km. The properties subject to the proposed project occur on fairly flat terrain but the north-eastern portion of the study area towards the proposed Carocraft Solar Farm is slightly contoured. Vegetation in the study area range from moderate to dense surface cover but large portions of the servitude of the existing Eskom "Delareyville Municipality – Vryburg 1" 88 kV power line, which demarcates the site survey focus area, have been altered and disturbed as a result of the existing power line. The current land-use along the proposed power line corridors is mainly grazing by livestock and game, with a small area utilized for crop cultivation. Neighbouring farms are being used for livestock grazing and game farming. The major land use of the study area as classified by the Environmental Potential Atlas of South Africa (2000) is vacant / unspecified land. There are no significant landscape features in the corridor footprint except for a small wetland system on the farm Brandwagt and a number of small pans along the route.

[1] See Henning, B. 2014. **AN ENVIRONMENTAL REPORT ON THE ECOLOGY (FLORA AND FAUNA) FOR THE PROPOSEDCAROCRAFT POWER LINE DEVELOPMNET, NORTHWEST PROVINCE**

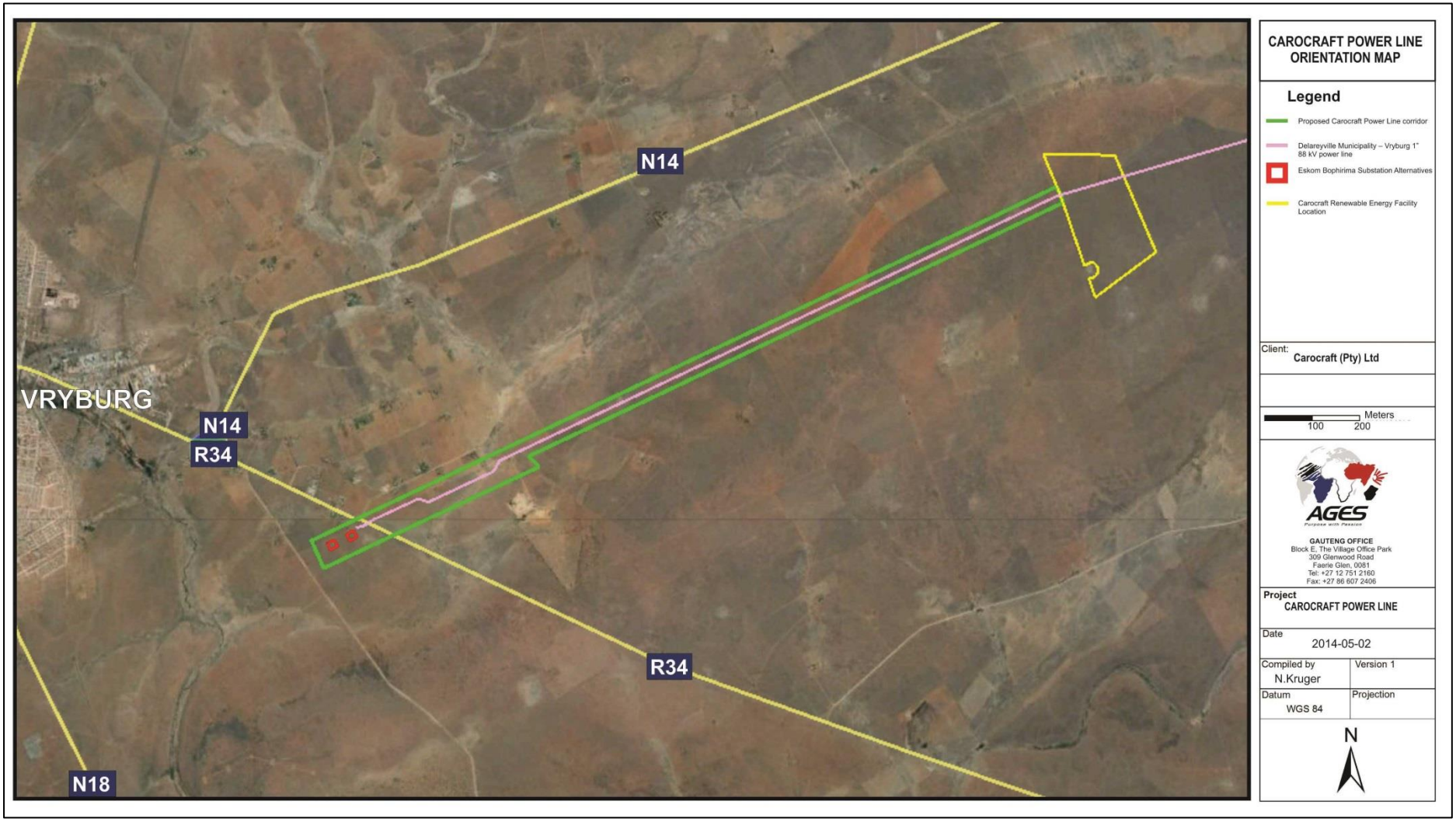

Figure 2-3: Aerial imagery providing a regional context for the proposed Carocraft Power Line Development.

3 METHOD OF ENQUIRY

3.1 Sources of Information

Data from detailed desktop, aerial and field studies were employed in order to sample surface areas systematically and to ensure a high probability of heritage site recording.

3.1.1 Desktop Study

A desktop study was prepared in order to contextualize the proposed project within a larger historical milieu. The study focused on relevant previous studies, archaeological and archival sources, aerial photographs, historical maps and local histories, all pertaining to the Vryburg area and the larger landscape of this section of the Northwest Province.

3.1.2 Aerial Representations and Survey

Aerial photography is often employed to locate and study archaeological sites, particularly where larger scale area surveys are performed. This method was applied to great success in the pedestrian survey for the project where contour lines of elevations, depressions, variation in vegetation, soil marks and landmarks were examined. Specific attention was given to shadow sites (shadows of walls or earthworks which are visible early or late in the day), crop mark sites (crop mark sites are visible because disturbances beneath crops cause variations in their height, vigour and type) and soil marks (e.g. differently coloured or textured soil (soil marks) might indicate ploughed-out burial mounds). Attention was also given to moisture differences, as prolonged dampening of soil as a result of precipitation frequently occurs over walls or embankments. By superimposing high frequency aerial photographs with images generated with Google Earth, potential sensitive areas were subsequently identified, geo-referenced and transferred to a handheld GPS device. In addition, based on existing knowledge of the local heritage landscape, the corridor was divided into smaller survey zones centred around areas of higher site catchment probability (where human activity was likely to occur in prehistoric and historic times e.g. around water sources, near soils fit for agriculture, on ridges). These survey zones were then transferred to a handheld GPS device. These areas served as referenced points from where further vehicular and pedestrian surveys were carried out.

3.1.3 Field Survey

Archaeological survey implies the systematic procedure of the identification of archaeological sites. An archaeological survey of the footprint areas proposed for the Carocraft Power Line was conducted in April 2014. The site survey encompassed a systematic site inspection in accordance with standard archaeological practice by which heritage resources are observed and documented. In order to sample surface areas systematically and to ensure a high probability of site recording the entire corridor route was systematically surveyed on foot, GPS reference points were visited and random spot checks were made (see detail in previous section). The site survey commenced along the south-western offset of the power line corridor on the farm Woodhouse, and proceeded north-east across the R34 towards site of the planned Carocraft Solar facility on the farm Weltevrede. Using a Garmin E-trex Legend GPS objects and structures of archaeological / heritage value were recorded and photographed with a Canon 450D Digital camera. Real time aerial orientation, by means of a mobile Google Earth application was also employed to investigate possible disturbed areas during the survey.

As most archaeological material occur in single or multiple stratified layers beneath the soil surface, special attention was given to disturbances, both man-made such as roads and clearings, as well as those made by natural agents such as burrowing animals and erosion.

3.1.4 General Public Liaison

Correspondence with employees from ESKOM provided information on possible locations of heritage resources and brief commentaries on the recent history of the farm area.

3.2 Limitations

3.2.1 Access

All farms subject to this study are accessed via a servitude road that follows the existing "Delareyville Municipality – Vryburg 1" 88 kV power line. This road connects to the R34 regional road and smaller regional routes. Access control is applied to the farm portions relevant to this assessment but no restrictions were encountered during the site visit as the author of this report was accompanied by an ESKOM employee and access was granted by all property owners.

3.2.2 Visibility

The surrounding vegetation in the study area is mostly comprised out of mixed grasslands and scattered trees with the occurrence of semi-arid succulents in places. The south-western portion of the study area is covered in moderately dense Thornveld vegetation and visibility proved to be a constraint in certain areas. Dense vegetation across other parts of the study area also proved to be a constraint. As such, the general visibility at the time of the initial AIA survey (April 2014) was moderate to low due to surface vegetation and obstruction (see Figures 3-1 to 3-7). In single cases during the survey sub-surface inspection was possible. Where applied, this revealed no archaeological deposits.

Figure 3-1: View of the study area at the far south-western offset of the proposed power line corridor on the farm Woodhouse.

Figure 3-2: View of the study area near the ESKOM Woodhouse Substation on the farm Woodhouse .

Figure 3-3 View of the study area on a northern portion of the farm Brandwagt.

Figure 3-4: View of the study area along the existing ESKOM power line and regional road on the farm Glencairn. Note deep red sands.

Figure 3-5: View of the study area along the existing ESKOM power line on the farm Glencairn.

Figure 3-6: View of disturbed and degrade surface cover towards the proposed Carocraft Solar facility site, looking east towards the site.

Figure 3-7: View of crop fields and cultivated land along the proposed corridor on the farm Cleef.

3.2.3 Limitations and Constraints

The pedestrian site survey for the Carocraft Power Line Project AIA primarily focused around areas tentatively identified as sensitive and of high heritage probability (i.e. those noted during the aerial survey) as well as areas of high human settlement catchment. The following constraints were encountered:

- **Survey Time and Extent:** Survey time proved to be a minor constraint due to the relatively large linear extent of the corridor footprint areas. Therefore, pedestrian site surveys focused around areas tentatively identified as sensitive (i.e. along drainage lines and those noted during the aerial survey) during aerial surveys.

- **Visibility:** Visibility constrained site identification in undisturbed areas with denser surface cover, as well as portions where vegetation is more pristine.

Thus, even though it might be assumed that survey findings are representative of the heritage landscape of the project area for the Carocraft Power Line, it should be stated that the possibility exists that individual sites could be missed due to the localised nature of some heritage remains as well as the possible presence of sub-surface archaeology. Therefore, maintaining due cognisance of the integrity and accuracy of the archaeological survey, it should be stated that the heritage resources identified during the study do not necessarily represent all the heritage resources present in the project area. The subterranean nature of some archaeological sites, dense vegetation cover and visibility constraints sometimes distort heritage representations and any additional heritage resources located during consequent development phases must be reported to the Heritage Resources Authority or an archaeological specialist.

3.3 Impact Assessment

For consistency among specialists, the impact assessment ratings for this report in Section 6 were done using the Plomp[2] impact assessment matrix scale supplied by AGES. Each heritage receptor in the study area is given an impact assessment. A cumulative assessment for the proposed project is also included.

4 RESULTS: ARCHAEOLOGICAL SURVEY

The heritage resources identified in the Carocraft Power Line study area were arbitrarily coded according to the names of farms on which sites were located, e.g. AGES-WH729-SAxx (AGES Woodhouse 729 Stone Age Site) and AGES-BW728-IAxx (AGES Brandwagt 728 Iron Age Site).

4.1 The Stone Age

A single Stone Age occurrence was identified near the ESKOM Woodhouse Substation on the farm Woodhouse 729. It is likely that further Stone Age occurrences will be present in the landscape, specifically along drainage lines and water sources.

- **Site AGES-WH729-SA01: Earlier Stone Age Occurrence**
  S26.98320 E24.78847

A single Earlier Stone Age (ESA) cleaver was documented near the south-western offset of the power line corridor on the farm Woodhouse. The highly weathered stone tool displays clear knapping scars and use-wear marks along its cutting edge. Even though no other lithics were identified in the surrounding areas, similar Stone Age occurrences occur frequently in this area along major drainage lines, river banks and around water pans (see Section 5.2). Typologically, the artefact can tentatively attribute to the Earlier Stone Age when compared to similar recorded assemblages in the area and the larger landscape (e.g. Beaumont & Morris 1990). The site is of limited significance due to the general loss of artefact context and the low density of formal tools.

[2] Plomp, H.,2004

Figure 4-1: A large ESA stone cleaver from Site AGES-WH729-SA01. Note knapping scars along the cutting edge.

Figure 4-2: **View of general surroundings at Site AGES-WH729-SA01**.

4.2 The Iron Age Farmer Period

A number of collapsed rough stone structures, resembling small circular stone enclosures were documented along the proposed power line route on the farm Brandwagt.

- **Site AGES-BW728-IA01: Iron Age period enclosures**
  S26.97404 E24.81211

At least 5 small circular stone structures were documented along the proposed power line route on the farm Brandwagt, directly north of a small drainage line. The structures range in size, with the smallest approximately 2m in diameter and the largest more or less 5m in diameter. The structures, which were possibly Later Iron Age Farmer Period enclosures, occur in a landscape which has seen rapid change and alteration in the past 15 years, where agricultural activities, flooding and erosion, and the development of the ESKOM power line seem to have heavily impacted on the surroundings (see aerial imagery of the area in Figure 4-6). As such, the structures are poorly preserved and associated material culture is absent from the site. One might therefore assume that much of the context of the structures has been lost and the local significance of the sites is limited. However, the sites might prove to be significance in terms of its regional representation in the Iron Age farmer period landscape of the area.

Figure 4-3: View of an overgrown stone wall section at Site AGES-BW728-IA01.

Figure 4-4: View of an overgrown and collapsed stone wall section at Site AGES-BW728-IA01.

Figure 4-5: Aerial view of circular stone wall structures (indicated by black arrows) at Site AGES-BW728-IA01.

Figure 4-6: A series of aerial imagery of general surroundings at Site AGES-BW728-IA01 (dating to 2001, 2006 and 2012) which indicates changes over time in the landscape as a result of natural and man-made factors.

4.3 Historical / Colonial Period and recent times

Vryburg is surrounded by farming communities and Historical and Colonial Period houses, farmer's quarters and other related infrastructure occur across the landscape around the study area.

- **Site AGES- BW728-HP01: Historical Period Structures**
  S26.97261 E24.81512

The current Brandwagt farmstead, farm buildings and related structures occur in the general vicinity of the power line corridor. A small farmhouse, built in contemporary style is still in use but a number of other structures, including an old barn structure seem to have been deserted. The barn seems to be of older age based on surface artefacts such as glass, metal, enamel, plastic and wood, and it might be inferred that site date to the original occupation of the farm towards the beginning of the 20th century. The barn and other associated structures of presumed older age are of medium significance since the sites might yield an understanding of architectural developments and Colonial farming expansion in the area.

Figure 4-7: A Historical Period barn structure at the Brandwagt farmstead,

4.4 Graves / Other Features

- **Site AGES-WH729-FT01: Stone feature, possible burial**
  S26.98394 E24.78895

An elongated stone structure, measuring approximately 1.5m x 0.5m in size, occurs near the ESKOM Woodhouse Substation on the farm Woodhouse, towards the south-western offset of the proposed power line corridor. No associated material culture was observed near the structure. The function and context of the feature is not known but the feature can, in all probability be attributed to geo-technical investigations by means of trial pit excavations that were recently conducted in this area. This is motivated by the fact that the Geo-technical Report for this work indicates an excavated trial pit located in the direct surroundings of the feature. However, cognisance should be taken of the fact that the structure might be an informal burial site, based on its general appearance.

Figure 4-8: An elongated stone feature (indicated by shaded oval) at Site AGES-WH729-FT01.

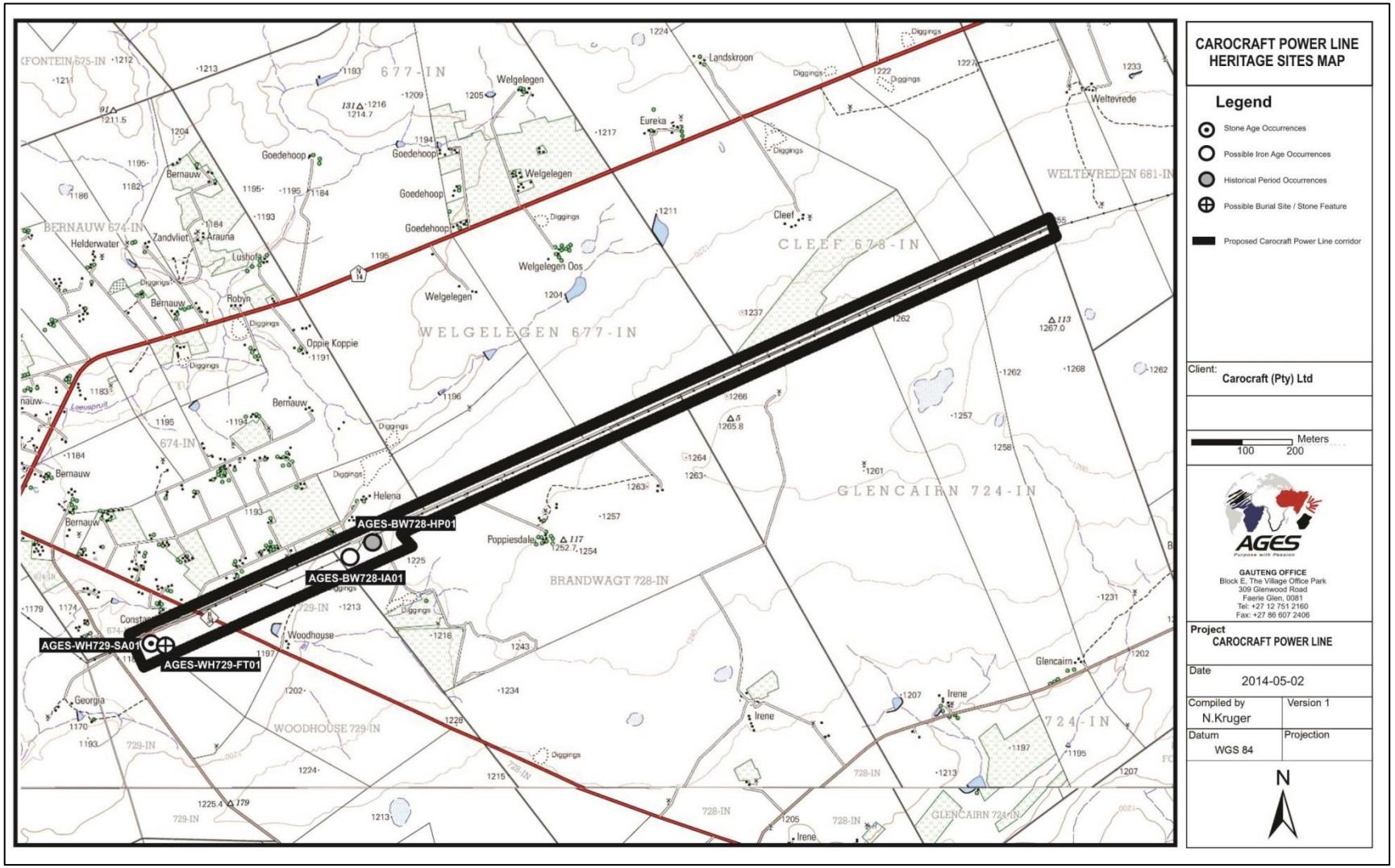

Figure 4-9: Map indicating the location of the heritage sensitive area and site discussed in the text.

5 ARCHAEO-HISTORICAL CONTEXT

5.1 The archaeology of Southern Africa

Archaeology in southern Africa is typically divided into three temporal and thematic frames of study namely the **Stone Age**, the **Iron Age** or **Farmer Period** and the **Historical / Colonial Period**. The following table provides a concise outline of the chronological sequence of periods, events, cultural groups and material expressions in Southern African pre-history and history.

Table 1 Chronological Periods across southern Africa

Period	Epoch	Associated cultural groups	Typical Material Expressions
Early Stone Age 2.5m – 250 000 YCE	Pleistocene	Early Hominins: *Australopithecines* *Homo habilis* *Homo erectus*	Typically large stone tools such as hand axes, choppers and cleavers.
Middle Stone Age 250 000 – 25 000 YCE	Pleistocene	First *Homo sapiens* species	Typically smaller stone tools such as scrapers, blades and points.
Late Stone Age 20 000 BC – present	Pleistocene / Holocene	*Homo sapiens sapiens* including San people	Typically small to minute stone tools such as arrow heads, points and bladelets.
Early Iron Age / Early Farmer Period 300 – 900 AD	Holocene	First Bantu-speaking groups	Typically distinct ceramics, bead ware, iron objects, grinding stones.
Middle Iron Age (Mapungubwe / K2) / early Later Farmer Period 900 – 1350 AD	Holocene	Bantu-speaking groups, ancestors of present-day groups	Typically distinct ceramics, bead ware and iron / gold / copper objects, trade goods and grinding stones.
Late Iron Age / Later Farmer Period 1400 AD -1850 AD	Holocene	Various Bantu-speaking groups including Venda, Thonga, Sotho-Tswana and Zulu	Distinct ceramics, grinding stones, iron objects, trade objects, remains of iron smelting activities including iron smelting furnace, iron slag and residue as well as iron ore.
Historical / Colonial Period ±1850 AD – present	Holocene	Various Bantu-speaking groups as well as European farmers, settlers and explorers	Remains of historical structures e.g. homesteads, missionary schools etc. as well as, glass, porcelain, metal and ceramics.

5.1.1 The Stone Ages

- **The Earlier Stone Age (ESA)**

Earlier Stone Age deposits typically occur on the flood-plains of perennial rivers and may date to between 2 million and 250 000 years ago. These ESA open sites sometimes contain stone tool scatters and manufacturing debris ranging from pebble tool choppers to core tools such as handaxes and cleavers. These stone tools were made by the earliest hominins. These groups seldom actively hunted and relied heavily on the opportunistic scavenging of meat from carnivore fill sites.

- **The Middle Stone Age (MSA)**

The majority of Middle Stone Age (MSA) sites occur on flood plains and sometimes in caves and rock shelters. Sites usually consist of large concentrations of knapped stone flakes such as scrapers, points and blades and associated manufacturing debris. Tools may have been hafted but organic materials, such as those used in hafting, seldom remain preserved in the archaeological record. Limited drive-hunting activities are also associated with the MSA.

- **The Later Stone Age (LSA)**

Sites dating to the Later Stone Age (LSA) are better preserved in rock shelters, although open sites with scatters of mainly stone tools can occur. Well-protected deposits in shelters allow for stable conditions that result in the preservation of organic materials such as wood, bone, hearths, ostrich eggshell beads and even bedding material. By using San (Bushman) ethnographic data a better understanding of this period is possible. South African rock art is also associated with the LSA.

5.1.2 The Iron Age Farmer Period

- **Early Iron Age (Early Farming Communities)**

The Early Iron Age (also Early Farmer Period) marks the movement of Bantu speaking farming communities into South Africa at around 200 A.D. These groups were agro-pastoralists that settled in the vicinity of water in order to provide subsistence for their cattle and crops. Artefact evidence from Early Farmer Period sites is mostly found in the form of ceramic assemblages and the origins and archaeological identities of this period are largely based upon ceramic typologies and sequences, where diagnostic pottery assemblages can be used to infer group identities and to trace movements across the landscape. Early Farmer Period ceramic traditions are classified by some scholars into different "streams" or trends in pot types and decoration that, over time emerged in southern Africa. These "streams" are identified as the Kwale Branch (east), the Nkope Branch (central) and the Kalundu Branch (west). More specifically, in the northern regions of South Africa at least three settlement phases have been distinguished for prehistoric Bantu-speaking agropastoralists. The first phase of the Early Iron Age, known as Happy Rest (named after the site where the ceramics were first identified), is representative of the Western Stream of migrations, and dates to AD 400 - AD 600. The second phase of Diamant is dated to AD 600 - AD 900 and was first recognized at the eponymous site of Diamant in the western Waterberg. The third phase, characterised by herringbone-decorated pottery of the Eiland tradition, is regarded as the final expression of the Early Iron Age (EIA) and occurs over large parts of the North West Province, Northern Province, Gauteng and Mpumalanga. This phase has been dated to about AD 900 - AD 1200. Early Farmer Period ceramics typically display features such as large and prominent inverted rims, large neck areas and fine elaborate decorations. The Early Iron Age continued up to the end of the first millennium AD.

- **Middle Iron Age / K2 Mapungubwe Period (early Later Farming Communities)**

The onset of the middle Iron Age dates back to ±900 AD, a period more commonly known as the Mapungubwe / K2 phase. These names refer to the well known archaeological sites that are today the pinnacle of South Africa's Iron Age heritage. The inhabitants of K2 and Mapungubwe, situated on the banks of the Limpopo, were agriculturalists and pastoralists and were engaged in extensive trade activities with local and foreign traders. Although the identity of this Bantu-speaking group remains a point of contestation, the Mapungubwe people were the first state-organized society southern Africa has known. A considerable amount of golden objects, ivory, beads (glass and gold), trade goods and clay figurines as well as large amounts of potsherds were found at these sites and also appear in sites dating back to this phase of the Iron Age. Ceramics of this tradition take the form of beakers with upright sides and decorations around the base (K2) and shallow-shouldered bowls with decorations as well as globular pots with long necks. (Mapungubwe). The site of Mapungubwe was deserted at around 1250 AD and this also marks the relative conclusion of this phase of the Iron Age.

- **Later Iron Age (Later Farming Communities)**

The late Iron Age of southern Africa marks the grouping of Bantu speaking groups into different cultural units. It also signals one of the most influential events of the second millennium AD in southern Africa, the difaqane. The difaqane (also known as "the scattering") brought about a dramatic and sudden ending to centuries of stable society in southern Africa. Reasons for this change was essentially the first penetration of the southern African

interior by Portuguese traders, military conquests by various Bantu speaking groups primarily the ambitious Zulu King Shaka and the beginning of industrial developments in South Africa. Different cultural groups were scattered over large areas of the interior. These groups conveyed with them their customs that in the archaeological record manifest in ceramics, beads and other artefacts. This means that distinct pottery typologies can be found in the different late Iron Age groups of South Africa.

- **Bantu Speaking Groups in the South African interior**

It should be noted that terms such as "Nguni", "Sotho", "Venda" and others refer to broad and comprehensive language groups that demonstrated similarities in their origins and language. It does not imply that these Nguni / Sotho groups were homogeneous and static; they rather moved through the landscape and influenced each other in continuous processes marked by cultural fluidity.

Ethnographers generally divide major Bantu-speaking groups of southern Africa into two broad linguistic groups, the Nguni and the Sotho with smaller subdivisions under these two main groups. Nguni groups were found in the eastern parts of the interior of South Africa and can be divided into the northern Nguni and the southern Nguni. The various Zulu and Swazi groups were generally associated with the northern Nguni whereas the southern Nguni comprised the Xhosa, Mpondo, Thembu and Mpondomise groups. The same geographically based divisions exist among Sotho groups where, under the western Sotho (or Tswana), groups such as the Rolong, Hurutshe, Kwena, Fokeng and Kgatla are found. The northern Sotho included the Pedi and amalgamation of smaller groups united to become the southern Sotho group or the Basutho. Other smaller language groups such as the Venda, Lemba and Tshonga Shangana transpired outside these major entities but as time progressed they were, however to lesser or greater extend influenced and absorbed by neighbouring groups.

5.1.3 Historical and Colonial Times and Recent History

The Historical period in southern Africa encompass the course of Europe's discovery of South Africa and the spreading of European settlements along the East Coast and subsequently into the interior. In addition, the formation stages of this period are marked by the large scale movements of various Bantu-speaking groups in the interior of South Africa, which profoundly influenced the course of European settlement. Finally, the final retreat of the San and Khoekhoen groups into their present-day living areas also occurred in the Historical period in southern Africa.

5.2 The larger Vryburg landscape: Specific Themes

The history of the Nortwest Province is reflected in a rich archaeological landscape, mostly dominated by Stone Age occurrences. Numerous sites, documenting Earlier, Middle and Later Stone Age habitation occur across the landscape, mostly in open air locales or in sediments alongside rivers or pans. In addition, a wealth of Later Stone Age rock art sites, most of which are in the form of rock engravings are to be found in the larger landscape. These sites occur on hilltops, slopes, rock outcrops and occasionally in river beds.. Most of our knowledge of the archaeology of the region is largely dependent on the work undertaken by Humphreys & Thackeray (1983) to the south of Kuruman, and on the Ghaap escarpment, as well as that of Beaumont (1990). Sites dating to the Iron Age occur in the north eastern part of the Northwest Province but environmental factors delegated that the spread of Iron Age farming westwards from the 17th century was constrained mainly to the area east of the Langeberg Mountains. However, evidence of an Iron Age presence as far as the Upington area in the eighteenth century occurs in this area. Moving into recent times, the archaeological record reflects the development of a rich colonial frontier, characterised by, amongst others, a complex industrial archaeological landscape such as mining developments at Kimberley, which herald the modern era in South African history. Finally, the Northwest Province saw a number of war conflicts, particularly the Anglo Boer War (or the South

African War) left behind the remnants of battlefields, skirmishes and concentration camps

5.2.1 Previous Heritage Studies

A large number of heritage studies have been conducted in the larger Taung and Vryburg areas. Most of these studies have emanated from Impact Assessment measures for EIA purposes commissioned by the private sector. These studies all point to a landscape of limited human ecology, probably the result of scarce water sources and the general absence of and hills or outcrops for shelter. Some of the studies include:

Birkholtz, P. 2011. Heritage Impact Assessment: Proposed Pering Mining Project, Located on the Farm Pering Mine 1023 HN, Reivilo, North West Province.

Dreyer, C. 2007. First Phase Archaeological and Cultural Heritage Assessment of the Proposed Garona-Mercury Transmission Power Line, Northern Cape, North-west Province & Free State.

Dreyer, C. 2007. First Phase Archaeological and Cultural Heritage Assessment of the Proposed Developments of a New Cemetery at Stella, North West Province.

Coetzee, F.P. 2008. Cultural Heritage Survey of the Proposed Kalplatz Mining Operations near Stella, North West Province.

Van Schalkwyk, J. 2011. Heritage impact assessment for the proposed development of photovoltaic power plants on five different locations in Northwest and Northern Cape Provinces.

Van Schalkwyk, J. 2012. Heritage impact assessment for the proposed development of photovoltaic power plants on four different locations in Northwest and Northern Cape Provinces.

Van Schalkwyk, J. 2012. Heritage impact assessment for the proposed development of a photovoltaic power plant on a portion of the farm Waterloo 992, Vryburg region, Northwest Province.

Van Schalkwyk, J. 2013. Heritage impact assessment for the proposed Vryburg-mookodi 132Kv Power Line Development, Northwest Province.

5.2.2 The Early and Middle stone Ages in the Northern Cape

The Taung area is significant in terms of early human development. In 1924, the fossilized skull of an early human infant was discovered by a quarry-worker in the nearby Buxton-limestone quarry. The fossil remains were described by Raymond Dart in 1925 as the type specimen of Australopithecus africanus. Later *in-situ* excavations were conducted under the direction of Phillip Tobias of the University of the Witwatersrand, and although they failed to find additional hominid specimens they did recover many important fossil baboons. The Taung Child, as the hominin fossil became known, is among the most important early human fossils ever discovered. It was the first hominid to be discovered in Africa, a species later named *Australopithecus africanus*.

Figure 5-1: The Taung child hominin fossil (left) excavated from the Buxton limestone quarry (right) at Taung. (http://southafricanpalaeocaves.files.wordpress.com/)

Stone Age sites are not randomly scattered within the landscape and they occur either near water sources or close to local sources of two highly-prized raw materials, specularite and jaspilite. As such, tools dating to all phases of the Stone Age are mostly found in the vicinity of larger watercourses, e.g. the Vaal River or the Harts River and near pans. More recent surveys have documented Acheullian industries and continuity between ESA and MSA lithic technologies in the same area. Excavations at other well-known sites in the wider region attest to further ESA and MSA occupation, some of which have yielded have yielded significant Stone Age assemblages that all inform on our general understanding of the technological sequences of the Stone Age in the Northern Cape and the Northwest (e.g. see Beaumont 2008, 2009; Morris 2006; Morris 2007; Dreyer 2007).

Further afield it is worth noting that a significant Stone Age site occurs in and around the town of Kathu, approximately 120km west of the study area. This site, known as Kathu Pan, is a shallow water pan about 30ha in extent. The site was extensively studied from 1974 to 1990 by Humpreys and Beaumont, amongst others. Kathu Pan is an extremely significant site as it represents the major industries of the Stone Age, more specifically two phases of the Earlier Stone Age, two phases of the Middle Stone Age, and more or less the entire Later Stone Age (Beaumont 1990). The site yielded large amounts of hand axes and faunal remains, including the concentrated remains of large mammal remains. More recently, research by Jayne Wilkins revealed a hoard of stone points, each between 4 and 9 centimeters long, that they think belonged to the earliest stone-tipped spears yet found. The stone points are the right shape and size for the job, and some have fractured tips that suggest they were used as weapons. Since stone points used on spears had been found only at sites that date back no more than 300 000 years, these discoveries in the 500 000-year-old deposits at Kathu is greatly significant. The abundance of Stone Age material at Kathu Pan can probably be attributed to the presence of a permanent water source at the pan.

Figure 5-2: Early Stone Age (Acheul) handaxe from the Kathu Pan site (http://www.museumsnc.co.za)

The landscape around the town of Kuruman is rich in archaeological material dating to Earlier and Middle Stone Ages. Sites such as Wonderwerk Cave, Kathu Pan and Kathu Townlands (see below) have yielded significant Stone Age assemblages that all inform on our general understanding of the technological sequences of the Stone Age in the Northern Cape (e.g. see Beaumont 2008; Morris 2006; Morris 2007; Dreyer 2007). In addition, a large amount of Middle and Later Stone Age sites have been documented across the landscape on calcrete lined pans and road cuttings.

5.2.3 Rock Markings

Rock engravings are mostly situated in the semi-arid plateau with most of these engravings situated at the Orange – Vaal basin, Karoo and Namibia. The upper Vaal, Limpopo basin and eastern Free State regions have a small quantity of rock engravings as well. Generally, rock paintings exist at cave areas and rock engravings at open surface areas. The Cape interior consists of a technical, formal and thematic variation between and within sites (Morris 1988). Two major techniques existed namely the incised and pecked engravings. Morris (1988) indicated technical and formal characteristics through space and a sharp contrast exists between engravings positioned north of the Orange River that are mostly pecked and those in the Karoo where scraping was mostly used. According to Morris (1988) hairline engravings occur at the North and the South, but they are rare at the Vryburg region. Finger painting techniques mostly occur at the Kuruman Hills, Asbestos Mountains, Ghaap Escarpment, Langeberg, Koranaberg ranges, scattered sites at the Karoo and the Kareeberge (Morris 1988). The development petroglyphs (i.e. carving or line drawing on rock) were associated with three different types of techniques, namely incised fine lines, pecked engravings and scraped engravings. According to Peter Beaumont the pecked and scraped engravings at the Upper Karoo are coeval (i.e. having the same age or date of origin) (Beaumont P B et al. 1989). Dating of rock art includes the use of carbonate fraction dating of ostrich eggshell pieces, dating of charcoal and ostrich eggshell at various rock art shelters. Unifacial points, double segments and thin – walled sherds may indicate the presence of the Khoikhoi at the Northern Cape during 2500 BP (years Before the Present) (Beaumont 1989). The LSA is further represented in the wider area by hunter-gatherer site at Thaba Sione to the west of Lichtenburg. The site has a lithic tool industry and 451 boulders engraved with imagery of animals, human figures and geometric shapes and is still used today as an ancestral site by the Zion

Christian Church (Ouzman 1995). Another engraving site can be found at Bosworth, a Provincial Heritage Site, near Klerksdorp. The more immediate region was historically occupied by Korana people who left evidence of their presence in the form of rock paintings, the greatest density being in the Harts River valley to the south of the study area (Ouzman 2005) where famous paintings occur just to the north of Schweizer-Reneke.

5.2.4 Iron Age / Farmer Period Sites

The beginnings of the Iron Age (Farmer Period) in southern Africa are associated with the arrival of a new Bantu speaking population group at around the third century AD. These newcomers introduced a new way of life into areas that were occupied by Later Stone Age hunter-gatherers and Khoekhoe herders. Distinctive features of the Iron Age are a settled village life, food production (agriculture and animal husbandry), metallurgy (the mining, smelting and working of iron, copper and gold) and the manufacture of pottery. Stone ruins indicate the occurrence of Iron Age settlements in the Northern Cape specifically at sites such as Dithakong where evidence exists that the Thlaping used to be settled in the Kuruman – Dithakong areas prior to 1800 (Humphreys 1976). Here, the assessment of the contact between the Stone Age, Iron Age and Colonial societies are significant in order to understand situations of contact and assimilation between societies. As an example, Trade occurred between local Thlaping Tswana people and the Khoikhoi communities. It means that the Tswana traded as far south as the Orange River at least the same time as the Europeans at the Cape (Humphreys 1976).

5.2.5 Later History: Historical archaeology and living heritage

As noted elsewhere, the landscape around the study area was scarcely populated in Historical times and it was only towards the early 19th century that missionaries, hunters and traders access the region. These pioneers were followed by Colonial farmers who negotiated with local chiefs for land, or occupied areas that were perceived to be vacant. In some areas short-lived Boer Republics were established. With the influx of farmers came the establishment of a number of small towns, some of which include Vryburg, Reivilo and Hartswater. The town of Vryburg was founded on September 20, 1882, when a site for a township was selected and named Endvogelfontein. The name “Vryburg” comes from the period in the 1882 when Vryburg was established as the capital of Republic of Stelleland, where the Republicans called themselves “Vryburgers” ("free citizens"). On November 15 the same year, the name was changed to Vryburg. In December that year, newly laid out plots were apportioned to the volunteers by means of a lottery and by February 1883 some 400 farms had been established. The farm Kankatjes was surveyed in 1890 as part of the larger farmland around Vryburg. During the Second Boer War, the British built a concentration camp here to house Boer women and children. The small town of Reivilo was laid out in 1917 and named Klein Boetsap. This was changed to Reivilo in 1927, which was an inversion of the name of the local minister, Rev. A J Olivier. The original church in town is a provincial heritage site. The town of Hartswater was laid out in 1948 to supply infrastructure for the construction and maintenance of the building and developing the Vaalharts irrigation scheme.

The Northern Cape was subjected to a resettlement program during the apartheid years. Tswana families were divided into the men who had to live in a compound and the women who were sent to a relocation centre (Hallett 1984). Between 1960 and 1962 it was estimated that an average of 834,000 people were affected by the Group Areas Act (Hallett 1984).

The majority of farms in the study area were proclaimed in the last decade of the 19th century.

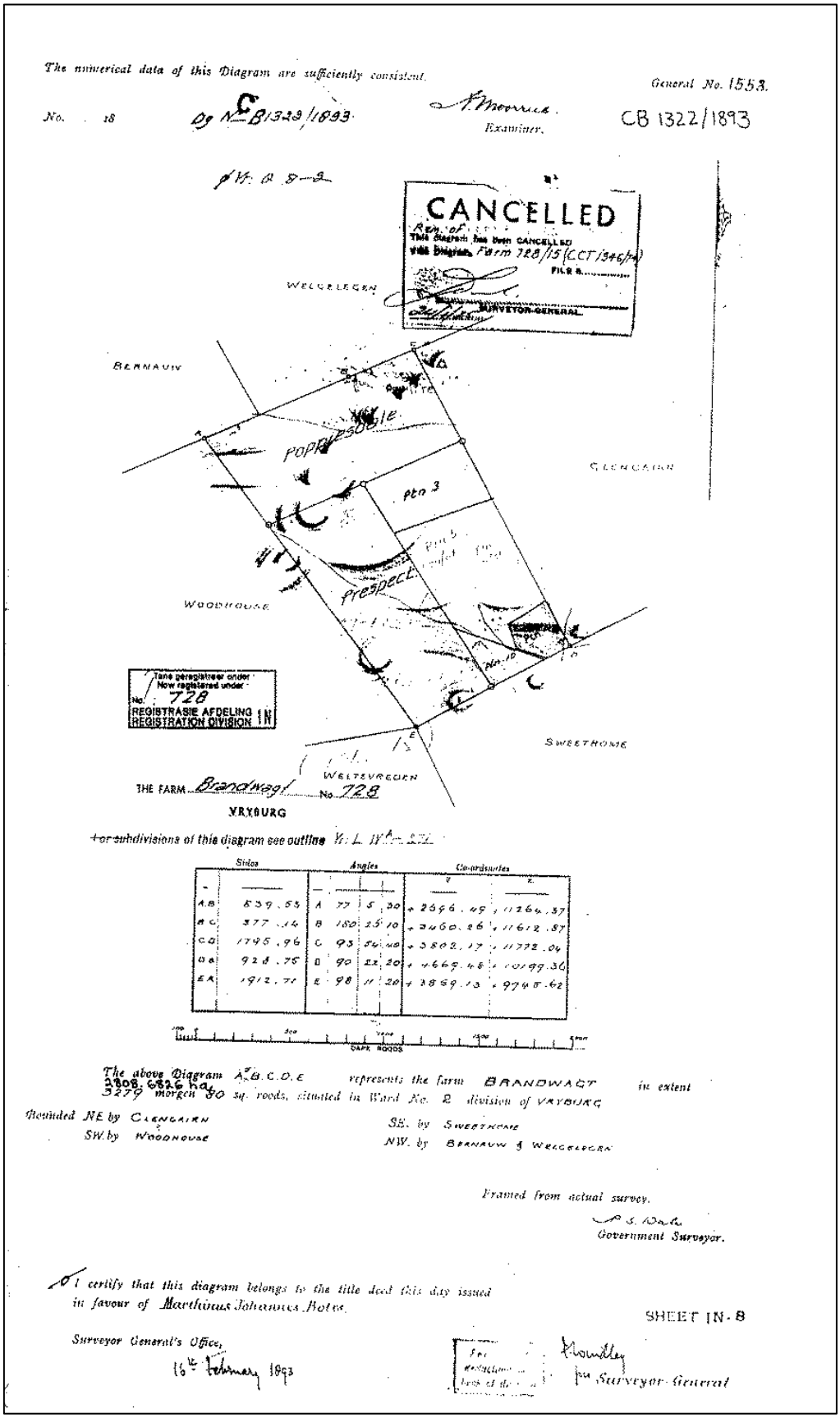

Figure 5-3: The original title deed for the farm Brandwagt c.1893.

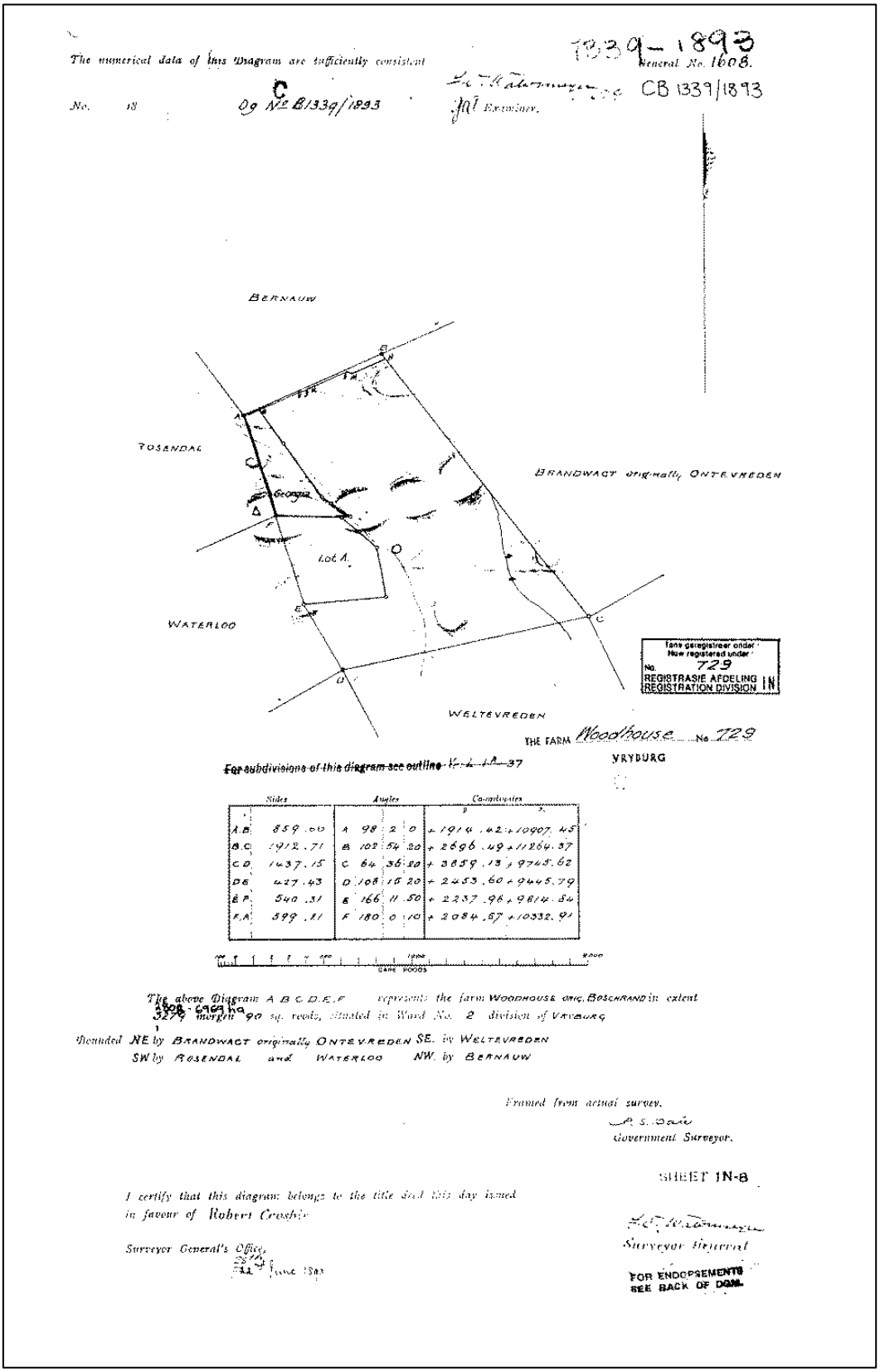

Figure 5-4: The original title deed for the farm Woodhouse c.1893.

6 RESULTS: STATEMENT OF SIGNIFICANCE AND IMPACT RATING

6.1 Heritage resources management and conservation

Archaeological sites, as previously defined in the National Heritage Resources Act (Act 25 of 1999) are places in the landscape where people have lived in the past – generally more than 60 years ago – and have left traces of their presence behind. In South Africa, archaeological sites include hominid fossil sites, places where people of the Earlier, Middle and Later Stone Age lived in open sites, river gravels, rock shelters and caves, Iron Age sites, graves, and a variety of historical sites and structures in rural areas, towns and cities. Palaeontological sites are those with fossil remains of plants and animals where people were not involved in the accumulation of the deposits. The basic principle of cultural heritage conservation is that archaeological and other heritage sites are valuable, scarce and *non-renewable.* Many such sites are unfortunately lost on a daily basis through development for housing, roads and infrastructure and once archaeological sites are damaged, they cannot be re-created as site integrity and authenticity is permanently lost. Archaeological sites have the potential to contribute to our understanding of the history of the region and of our country and continent. By preserving links with our past, we may not be able to revive lost cultural traditions, but it enables us to appreciate the role they have played in the history of our country.

6.2 Categories of significance

Rating the significance of archaeological sites, and consequently grading the potential impact on the resources is linked to the significance of the site itself. The significance of an archaeological site is based on the amount of deposit, the integrity of the context, the kind of deposit and the potential to help answer present research questions. Historical structures are defined by Section 34 of the National Heritage Resources Act, 1999, while other historical and cultural significant sites, places and features, are generally determined by community preferences. The guidelines as provided by the NHRA (Act No. 25 of 1999) in Section 3, with special reference to subsection 3 are used when determining the cultural significance or other special value of archaeological or historical sites. In addition, ICOMOS (the Australian Committee of the International Council on Monuments and Sites) highlights four cultural attributes, which are valuable to any given culture:

- *Aesthetic value:*

Aesthetic value includes aspects of sensory perception for which criteria can and should be stated. Such criteria include consideration of the form, scale, colour, texture and material of the fabric, the general atmosphere associated with the place and its uses and also the aesthetic values commonly assessed in the analysis of landscapes and townscape.

- *Historic value:*

Historic value encompasses the history of aesthetics, science and society and therefore to a large extent underlies all of the attributes discussed here. Usually a place has historical value because of some kind of influence by an event, person, phase or activity.

- *Scientific value:*

The scientific or research value of a place will depend upon the importance of the data involved, on its rarity, quality and on the degree to which the place may contribute further substantial information.

- *Social value:*

Social value includes the qualities for which a place has become a focus of spiritual, political, national or other cultural sentiment to a certain group.

It is important for heritage specialist input in the EIA process to take into account the heritage management structure set up by the NHR Act. It makes provision for a 3-tier system of management including the South Africa Heritage Resources Agency (SAHRA) at a national level, Provincial Heritage Resources Authorities (PHRAs) at a provincial and the local authority. The Act makes provision for two types or forms of protection of heritage resources; i.e. formally protected and generally protected sites:

Formally protected sites:

- Grade 1 or national heritage sites, which are managed by SAHRA
- Grade 2 or provincial heritage sites, which are managed by the provincial HRA.
- Grade 3 or local heritage sites.

Generally protected sites:

- Human burials older than 60 years.
- Archaeological and palaeontological sites.
- Shipwrecks and associated remains older than 70 years.
- Structures older than 60 years.

With reference to the evaluation of sites, the certainty of prediction is definite, unless stated otherwise and if the significance of the site is rated high, the significance of the impact will also result in a high rating. The same rule applies if the significance rating of the site is low. The significance of archaeological sites is generally ranked into the following categories.

Table 2: Heritage Site Significance Ratings

Significance	Rating Action
No significance: sites that do not require mitigation.	None
Low significance: sites, which may require mitigation.	2a. Recording and documentation (Phase 1) of site; no further action required 2b. Controlled sampling (shovel test pits, augering), mapping and documentation (Phase 2 investigation); permit required for sampling and destruction
Medium significance: sites, which require mitigation.	3. Excavation of representative sample, C14 dating, mapping and documentation (Phase 2 investigation); permit required for sampling and destruction [including 2a & 2b]
High significance: sites, where disturbance should be avoided.	4a. Nomination for listing on Heritage Register (National, Provincial or Local) (Phase 2 & 3 investigation); site management plan; permit required if utilised for education or tourism
High significance: Graves and burial places	4b. Locate demonstrable descendants through social consulting; obtain permits from applicable legislation, ordinances and regional by-laws; exhumation and reinterment [including 2a, 2b & 3]

Furthermore, the significance of archaeological sites was based on six main criteria:

- Site integrity (i.e. primary vs. secondary context),
- Amount of deposit, range of features (e.g., stonewalling, stone tools and enclosures),
- Density of scatter (dispersed scatter),
- Social value,
- Uniqueness, and
- Potential to answer current and future research questions.

A fundamental aspect in assessing the significance and protection status of a heritage resource is often whether or not the sustainable social and economic benefits of a proposed development outweigh the conservation issues at stake. When, for whatever reason the protection of a heritage site is not deemed necessary or practical, its research potential must be assessed and mitigated in order to gain data / information, which would otherwise be lost.

6.3 Potential Impacts and Significance Ratings[4]

The following section provides a background to the identification and assessment of possible impacts and alternatives, as well as a range of risk situations and scenarios commonly associated with heritage resources management. The section ultimately provides a guideline (Section 6.3.1, Section 6.3.2 & Section 6.3.3) for the rating of impacts and recommendation of management actions for the Carocraft Power Line Development Area.

6.3.1 General assessment of impacts on resources

Generally, the value and significance of archaeological and other heritage sites might be impacted on by any activity that would result immediately or in the future in the destruction, damage, excavation, alteration, removal or collection from its original position, any archaeological material or object (as indicated in the National Heritage Resources Act (No 25 of 1999)). Thus, the destructive impacts that are possible in terms of heritage resources would tend to be direct, once-off events occurring during the initial construction period. However, in the long run, the proximity of operations in any given area could result in secondary indirect impacts. The EIA process therefore specifies impact assessment criteria which can be utilised from the perspective of a heritage specialist study which elucidates the overall extent of impacts.

A. HERITAGE SPECIFIC DIRECT IMPACT ASSESSMENT

Nature of the impact

This is an assessment of the nature of the impact of the activity on a heritage resource, with some indication of its positive and/or negative effect/s. It is strongly informed by the statement of resource significance. In other words, the nature of the impact may be historical, aesthetic, social, scientific, linguistic or architectural, intrinsic, associational or contextual (visual or non-visual). In many cases, the nature of the impact will include more than one value.

Confidence

This should relate to the level of confidence that the specialist has in establishing the nature and degree of impacts. It relates to the level and reliability of information, the nature and degree of consultation with I&AP's and the dynamic of the broader socio-political context.

- High, where the information is comprehensive and accurate, where there has been a high degree of Consultation and the socio-political context is relatively stable.
- Medium, where the information is sufficient but is based mainly on secondary sources, where there has been a limited targeted consultation and socio-political context is fluid.
- Low, where the information is poor, a high degree of contestation is evident and there is a state of socio-political flux.

[4] Based on: W inter, S. & Baumann, N. 2005. *Guideline for involving heritage specialists in EIA processes: Edition 1.*

Impact Significance

The significance of impacts can be determined through a synthesis of the aspects produced in terms of the nature and degree of heritage significance and the nature, duration, intensity, extent, probability and confidence of impacts and can be described as:

- Low; where it would have a negligible effect on heritage and on the decision
- Medium, where it would have a moderate effect on heritage and should influence the decision.
- High, where it would have, or there would be a high risk of, a big effect on heritage. Impacts of high significance should have a major influence on the decision;
- Very high, where it would have, or there would be high risk of, an irreversible and possibly irreplaceable negative impact on heritage. Impacts of very high significance should be a central factor in decision-making.

B. ENVIRONMENTAL IMPACT ASSESSMENT (PLOMP 2004)

An impact can be defined as any change in the physical-chemical, biological, cultural and/or socio-economic environmental system that can be attributed to human activities related to alternatives under study for meeting a project need. The significance of the impacts will be determined through a synthesis of the criteria below (Plomp, 2004):

Probability

This should describe the likelihood of the impact actually occurring indicated as:

- Improbable, where the possibility of the impact to materialize is very low either because of design or historic experience;
- Probable, where there is a distinct possibility that the impact will occur;
- Highly probable, where it is most likely that the impact will occur; or
- Definite, where the impact will definitely occur regardless of any mitigation measures

Duration

The lifetime of the impact:

- Short term: The impact will either disappear with mitigation or will be mitigated through natural processes in a time span shorter than any of the phases.
- Medium term: The impact will last up to the end of the phases, where after it will be negated.
- Long term: The impact will last for the entire operational phase of the project but will be mitigated by direct human action or by natural processes thereafter.
- Permanent: Impact that will be non-transitory. Mitigation either by man or natural processes will not occur in such a way or in such a time span that the impact can be considered transient.

Of relevance to the duration of an impact are the following considerations:

- Reversibility of the impact; and
- Renewability of the heritage resource.

Scale / Extent

Here it should be indicated whether the impact will be experienced:

- On a site scale, i.e. extend only as far as the activity;
- Within the immediate context of a heritage resource;
- On a local scale, e.g. town or suburb
- On a metropolitan or regional scale; or
- On a national/international scale.

Magnitude / Severity

Here it should be established whether the impact should be indicated as:

- Low, where the impact affects the resource in such a way that its heritage value is not affected;
- Medium, where the affected resource is altered but its heritage value continues to exist albeit in a modified way;
- High, where heritage value is altered to the extent that it will temporarily or permanently be damaged or destroyed.

Significance (of the heritage resource)

This is a statement of the nature and degree of significance of the heritage resource being affected by the activity. From a heritage management perspective it is useful to distinguish between whether the significance is embedded in the physical fabric or in associations with events or persons or in the experience of a place; i.e. its visual and non-visual qualities. This statement is a primary informant to the nature and degree of significance of an impact and thus needs to be thoroughly considered. Consideration needs to be given to the significance of a heritage resource at different scales (i.e. site specific, local, regional, national or international) and the relationship between the heritage resource, its setting and its associations.

- Negligible: The impact is non-existent or unsubstantial and is of no or little importance to any stakeholder and can be ignored.
- Low: The impact is limited in extent, has low to medium intensity; whatever its probability of occurrence is, the impact will not have a material effect on the decision and is likely to require management intervention with increased costs.

  Moderate: The impact is of importance to one or more stakeholders, and its intensity will be medium or high; therefore, the impact may materially affect the decision, and management intervention will be required.

The impact could render development options controversial or the project unacceptable if it cannot be reduced to acceptable levels; and/or the cost of management intervention will be a significant factor in mitigation.

6.3.2 Direct impact rating

Direct or primary effects on heritage resources occur at the same time and in the same space as the activity, e.g. loss of historical fabric through demolition work. **Indirect effects or secondary effects** on heritage resources occur later in time or at a different place from the causal activity, or as a result of a complex pathway, e.g. restriction of access to a heritage resource resulting in the gradual erosion of its significance, which is dependent on ritual patterns of access. The following table provides an outline as to the relationship between the significance of a heritage context, the intensity of development and the significance of heritage impacts to be expected.

Table 3: Direct Impact Assessment Criteria

	TYPE OF DEVELOPMENT			
HERITAGE CONTEXT	**CATEGORY A**	**CATEGORY B**	**CATEGORY C**	**CATEGORY D**
CONTEXT 1 High heritage Value	Moderate heritage impact expected	High heritage impact expected	Very high heritage impact expected	Very high heritage impact expected
CONTEXT 2 Medium to high heritage value	Minimal heritage impact expected	Moderate heritage impact expected	High heritage impact expected	Very high heritage impact expected
CONTEXT 3 Medium to low heritage value	Little or no heritage impact expected	Minimal heritage impact expected	Moderate heritage impact expected	High heritage impact expected
CONTEXT 4 Low to no heritage value	Little or no heritage impact expected	Little or no heritage impact expected	Minimal heritage value expected	Moderate heritage impact expected

NOTE: A DEFAULT "LITTLE OR NO HERITAGE IMPACT EXPECTED" VALUE APPLIES WHERE A HERITAGE RESOURCE OCCURS OUTSIDE THE IMPACT ZONE OF THE DEVELOPMENT.

HERITAGE CONTEXTS	CATEGORIES OF DEVELOPMENT
Context 1: Of high intrinsic, associational and contextual heritage value within a national, provincial and local context, i.e. formally declared or potential Grade 1, 2 or 3A heritage resources **Context 2:** Of moderate to high intrinsic, associational and contextual value within a local context, i.e. potential Grade 3B heritage resources. **Context 3:** Of medium to low intrinsic, associational or contextual heritage value within a national, provincial and local context, i.e. potential Grade 3C heritage resources **Context 4:** Of little or no intrinsic, associational or contextual heritage value due to disturbed, degraded conditions or extent of irreversible damage.	**Category A: Minimal intensity development** - No rezoning involved; within existing use rights. - No subdivision involved. - Upgrading of existing infrastructure within existing envelopes - Minor internal changes to existing structures - New building footprints limited to less than 1000m2. **Category B: Low-key intensity development** - Spot rezoning with no change to overall zoning of a site. - Linear development less than 100m - Building footprints between 1000m2-2000m2 - Minor changes to external envelop of existing structures (less than 25%) - Minor changes in relation to bulk and height of immediately adjacent structures (less than 25%). **Category C: Moderate intensity development** - Rezoning of a site between 5000m2-10 000m2. - Linear development between 100m and 300m. - Building footprints between 2000m2 and 5000m2 - Substantial changes to external envelop of existing structures (more than 50%) - Substantial increase in bulk and height in relation to immediately adjacent buildings (more than 50%) **Category D: High intensity development** - Rezoning of a site in excess of 10 000m2 - Linear development in excess of 300m. - Any development changing the character of a site exceeding 5000m2 or involving the subdivision of a site into three or more erven. - Substantial increase in bulk and height in relation to immediately adjacent buildings (more than 100%)

6.4 Site significance and impact rating

Refer to Section 6.3.1, Section 6.3.2 & Section 6.3.3 for background on the rating of impacts and recommendation of management actions for sites of heritage potential. Impact thresholds and management measures for the sites are further discussed in section 6.3.5.

6.4.1 Site AGES-WH729-SA01: LSA Occurrence

1. SITE DESCRIPTION : Later Stone Age Occurrence							
1.1 General Site Description							
A single ESA chopping tool.							
1.2 Site features / artefacts / Other							
Site Location							
Province / District	Northwest Province			Map Number	2624DD		
Farm / Settlement / Zone	Woodhouse 729IN						
Co-ordinates	Site AGES-WH729-SA01	S26.98320	E24.78847				
Site Type							
Surface sites	X			Caves and rock shelters			
Larger open-air sites				Sealed sites (deposits			
River deposits				Other			
Site Function							
Living / habitation				Kill			
Ceremonial				Burial			
Trading / Barter				Art			
Quarry / Mining / Smelting				Other	**X - unknown**		
Site Placement							
Valley floor		Hill top		Vlei/swamp		River Mouth	
Dam		River Bank		Slope		Plains	X
Other / Comments							
Vegetation							
Riverine forest		Bushveld		Savannah		Mountain forest	
Thornveld		Grassland		Cultivated	X	Other	**X - Savannah**
Age Classification							
Stone Age	X	Early Iron Age		Middle Iron Age		Later Iron Age	
Historical		Other					
Material Culture							
Midden		House Remains		Stone Walling		Stone Structures	
Granary		Grinding Stone (L)		Grinding Stone (U)		Granary Stand	
Metal		Ceramics (Potter)		Ceramics (Porcelain)		Stone (non-lithic)	X
Metal slag		Tuyere		Fauna		Bead (Glass)	
Bead (OES / Shell)		Glass		Lithics	X	Smelting Residues	
Other:				Other:			
1.3 Site Condition							
The site integrity has been compromised due to loss of primary context.							
2. SITE EVALUATION							
2.1 Heritage Value (NHRA, section 2 [3])					**High**	**Medium**	**Low**
It has importance to the community or pattern of South Africa's history or pre-colonial history.							X
It possesses unique, uncommon, rare or endangered aspects of South Africa's natural or cultural heritage.							X
It has potential to yield information that will contribute to an understanding of South Africa's natural and cultural heritage.						X	
It is of importance in demonstrating the principle characteristics of a particular class of South Africa's natural or							X

cultural places or objects.			
It has importance in exhibiting particular aesthetic characteristics valued by a particular community or cultural group.			X
It has importance in demonstrating a high degree of creative or technical achievement at a particular period.		X	
It has marked or special association with a particular community or cultural group for social, cultural or spiritual reasons (sense of place).			X
It has strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa.			X
It has significance through contributing towards the promotion of a local sociocultural identity and can be developed as a tourist destination.			X
It has significance relating to the history of slavery in South Africa.			X
It has importance to the wider understanding of temporal changes within cultural landscapes, settlement patterns and human occupation.		X	

2.2 Field Register Rating	
National/Grade 1 [should be registered, retained]	
Provincial/Grade 2 [should be registered, retained]	
Local/Grade 3A [should be registered, mitigation not advised]	
Local/Grade 3B [High significance; mitigation, partly retained]	
Generally Protected A [High/Medium significance, mitigation]	
Generally protected B [Medium significance, to be recorded]	
Generally Protected C [Low significance, no further action]	X

2.3 Sphere of Significance	High	Medium	Low
International			
National			
Provincial			
Local			X
Specific community			

3. IMPACT RATING AND MITIGATION

3.1 Impact assessment

APPROXIMATE DISTANCE FROM DEVELOPMENT: 0 - 100 METERS

NATURE OF IMPACT: HISTORICAL, SCIENTIFIC.

EXTENT OF IMPACT: Local

SPECIALIST LEVEL OF CONFIDENCE IN DEGREE OF IMPACT AND SEVERITY: High

3.2 Impact Significance and Severity

		Without Management*	With Management*
General assessment of impacts on resource (Refer to Section 7.3.1)	Duration	**Permanent**	**Short Term**
	Intensity	**Low**	**Low**
	Probability	**Probable**	**Improbable**
	Impact Significance	**Low**	**Negligible**

3.3 Direct Impact Rating

Direct impact on resource	None (the potential development does not adversely or positively affect the heritage resource)	
	Peripheral / Indirect (the heritage resource or its setting is located in proximity to the footprint of the potential development)	X
	Destruction / Direct (the heritage resource or site is physically located within the footprint of the potential development)	

Direct impact rating (Refer to Section 7.3.2) Note that a default "no impact expected" value applies where a heritage resource occurs outside the impact matrix or applicable conservation buffers of the development.	**Minimal Impact Expected**

3.4 Recommended Management* (refer to section 7.3.3)

No further action.

Comments on recommended management
No further action.

4. APPLICABLE LEGISLATION AND LEGAL REQUIREMENTS
- National Heritage Resources Act (Act no. 25 of 1999) - Local and regional provisions, laws and by-laws

6.4.2 Site AGES-BW728-IA01: IA Enclosures

1. SITE DESCRIPTION : Possible Later Iron Age Farmer Period Structures			
1.2 General Site Description			
Circular stone wall structures and foundation structures of stone walls.			
1.2 Site features / artefacts / Other			
Site Location			
Province / District	Northwest Province	Map Number	2624DD
Farm / Settlement / Zone	Woodhouse 729IN		
Co-ordinates	Site AGES-BW728-IA01	S26.97404	E24.81211

Site Type			
Surface sites	X	Caves and rock shelters	
Larger open-air sites		Sealed sites (deposits	
River deposits		Other	

Site Function			
Living / habitation	X	Kill	
Ceremonial		Burial	
Trading / Barter		Art	
Quarry / Mining / Smelting		Other	

Site Placement							
Valley floor		Hill top		Vlei/swamp		River Mouth	
Dam		River Bank		Slope	X	Plains	
Other / Comments							

Vegetation							
Riverine forest		Bushveld		Savannah		Mountain forest	
Thornveld		Grassland	X	Cultivated	X	Other	X - Savannah

Age Classification							
Stone Age		Early Iron Age		Middle Iron Age		Later Iron Age	X
Historical		Other					

Material Culture							
Midden		House Remains		Stone Walling	X	Stone Structures	X
Granary		Grinding Stone (L)		Grinding Stone (U)		Granary Stand	
Metal		Ceramics (Potter)		Ceramics (Porcelain)		Stone (non-lithic)	X
Metal slag		Tuyere		Fauna		Bead (Glass)	
Bead (OES / Shell)		Glass		Lithics		Smelting Residues	
Other:				Other:			

1.3 Site Condition
The site integrity has been severely compromised as most sections of wall structures have almost completely collapsed.

2. SITE EVALUATION

2.1 Heritage Value (NHRA, section 2 [3])	High	Medium	Low
It has importance to the community or pattern of South Africa's history or pre-colonial history.		X	
It possesses unique, uncommon, rare or endangered aspects of South Africa's natural or cultural heritage.		X	
It has potential to yield information that will contribute to an understanding of South Africa's natural and cultural heritage.		X	
It is of importance in demonstrating the principle characteristics of a particular class of South Africa's natural or cultural places or objects.		X	
It has importance in exhibiting particular aesthetic characteristics valued by a particular community or cultural group.		X	
It has importance in demonstrating a high degree of creative or technical achievement at a particular period.		X	
It has marked or special association with a particular community or cultural group for social, cultural or spiritual reasons (sense of place).		X	
It has strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa.		X	
It has significance through contributing towards the promotion of a local sociocultural identity and can be developed as a tourist destination.			X
It has significance relating to the history of slavery in South Africa.			X
It has importance to the wider understanding of temporal changes within cultural landscapes, settlement patterns and human occupation.		X	

2.2 Field Register Rating	
National/Grade 1 [should be registered, retained]	
Provincial/Grade 2 [should be registered, retained]	
Local/Grade 3A [should be registered, mitigation not advised]	
Local/Grade 3B [High significance; mitigation, partly retained]	
Generally Protected A [High/Medium significance, mitigation]	
Generally protected B [Medium significance, to be recorded]	X
Generally Protected C [Low significance, no further action]	

2.3 Sphere of Significance	High	Medium	Low
International			
National			
Provincial			
Local		X	
Specific community			

3. IMPACT RATING AND MITIGATION

3.1 Impact assessment

APPROXIMATE DISTANCE FROM DEVELOPMENT: 0 - 100 METERS

NATURE OF IMPACT: HISTORICAL, AESTHETIC, SOCIAL, SCIENTIFIC, ARCHITECTURAL & VISUAL.

EXTENT OF IMPACT: Local

SPECIALIST LEVEL OF CONFIDENCE IN DEGREE OF IMPACT AND SEVERITY: High

3.2 Impact Significance and Severity

		Without Management*	With Management*
General assessment of impacts on resource (Refer to Section 7.3.1)	Duration	**Permanent: High**	**Permanent: Low**
	Intensity	**Low**	**Low**
	Probability	**Highly Probable**	**Improbable**
	Impact Significance	**High**	**Negligible**

3.3 Direct Impact Rating

Direct impact on resource	None (the potential development does not adversely or positively affect the heritage resource)	
	Peripheral / Indirect (the heritage resource or its setting is located in proximity to the footprint of the	X

	potential development)	
	Destruction / Direct (the heritage resource or site is physically located within the footprint of the potential development)	

Direct impact rating (Refer to Section 7.3.2) Note that a default "no impact expected" value applies where a heritage resource occurs outside the impact matrix or applicable conservation buffers of the development.	**High Heritage Impact Expected.**

3.4 Recommended Management* (refer to section 7.3.3)

Mitigation / Monitoring

Comments on recommended management

Monitoring: It is necessary that the sites be monitored to ensure that heritage resources are not impacted on. If further impact occurs, or is envisaged at any stage of development and operation the following will be required:

- **Documentation of sites.**
- **Further desktop study and community consultation to more accurately ascertain context of sites.**
- **Relevant Permitting from Heritage Resources Authority where applicable. .**

4. APPLICABLE LEGISLATION AND LEGAL REQUIREMENTS

- **National Heritage Resources Act (Act no. 25 of 1999)**
- **Local and regional provisions, laws and by-laws**

6.4.3 Site AGES-BW728-HP01: Historical Farmstead

1. SITE DESCRIPTION : Recent Historical Remains

1.3 General Site Description

The remains of a recent, and Historical Period farmstead Brandwagt.

1.2 Site features / artefacts / Other

Site Location

Province / District	Nortwest Province	Map Number	2624DD
Farm / Settlement / Zone	Brandwacht 728IN		
Co-ordinates	Site AGES-BW728-HP01	S26.97261	E24.81512

Site Type

Surface sites	X	Caves and rock shelters	
Larger open-air sites		Sealed sites (deposits	
River deposits		Other	

Site Function

Living / habitation	X	Kill	
Ceremonial		Burial	
Trading / Barter		Art	
Quarry / Mining / Smelting		Other	**X – Refuse**

Site Placement

Valley floor		Hill top		Vlei/swamp		River Mouth	
Dam		River Bank		Slope		Plains	X
Other / Comments							

Vegetation

Riverine forest		Bushveld		Savannah		Mountain forest	
Thornveld		Grassland		Cultivated	X	Other	**Savannah**

Age Classification

Stone Age		Early Iron Age		Middle Iron Age		Later Iron Age	
Historical	X	Other	**X – recent historical / contemporary**				

Material Culture

Midden	X	House Remains	X	Stone Walling		Stone Structures	X
Granary		Grinding Stone (L)		Grinding Stone (U)		Granary Stand	

Metal	X	Ceramics (Potter)		Ceramics (Porcelain)	X	Stone (non-lithic)	X
Metal slag		Tuyere		Fauna	X	Bead (Glass)	
Bead (OES / Shell)		Glass	X	Lithics		Smelting Residues	
Other: **X – Plastics**				Other: **X - Wood**			

1.3 Site Condition

The integrity of the Historical structures is fair but some structures are not maintained.

2. SITE EVALUATION

2.1 Heritage Value (NHRA, section 2 [3])	High	Medium	Low
It has importance to the community or pattern of South Africa's history or pre-colonial history.		X	
It possesses unique, uncommon, rare or endangered aspects of South Africa's natural or cultural heritage.			X
It has potential to yield information that will contribute to an understanding of South Africa's natural and cultural heritage.		X	
It is of importance in demonstrating the principle characteristics of a particular class of South Africa's natural or cultural places or objects.		X	
It has importance in exhibiting particular aesthetic characteristics valued by a particular community or cultural group.			X
It has importance in demonstrating a high degree of creative or technical achievement at a particular period.			X
It has marked or special association with a particular community or cultural group for social, cultural or spiritual reasons (sense of place).		X	
It has strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa.		X	
It has significance through contributing towards the promotion of a local sociocultural identity and can be developed as a tourist destination.			X
It has significance relating to the history of slavery in South Africa.			X
It has importance to the wider understanding of temporal changes within cultural landscapes, settlement patterns and human occupation.		X	

2.2 Field Register Rating	
National/Grade 1 [should be registered, retained]	
Provincial/Grade 2 [should be registered, retained]	
Local/Grade 3A [should be registered, mitigation not advised]	
Local/Grade 3B [High significance; mitigation, partly retained]	
Generally Protected A [High/Medium significance, mitigation]	X
Generally protected B [Medium significance, to be recorded]	
Generally Protected C [Low significance, no further action]	

2.3 Sphere of Significance	High	Medium	Low
International			
National			
Provincial			
Local		X	
Specific community			

3. IMPACT RATING AND MITIGATION

3.1 Impact assessment

APPROXIMATE DISTANCE FROM DEVELOPMENT: 0 METERS

NATURE OF IMPACT: HISTORICAL, AESTHETIC, SOCIAL, SCIENTIFIC, ARCHITECTURAL

EXTENT OF IMPACT: Local

SPECIALIST LEVEL OF CONFIDENCE IN DEGREE OF IMPACT AND SEVERITY: High

3.2 Impact Significance and Severity

General assessment of impacts on resource	Without Management*	With Management*

(Refer to Section 7.3.1)	Duration	Permanent	Short Term
	Intensity	Moderate	Low
	Probability	Probable	Improbable
	Impact Significance	Moderate	Negligible

3.3 Direct Impact Rating

Direct impact on resource	None (the potential development does not adversely or positively affect the heritage resource)	
	Peripheral / Indirect (the heritage resource or its setting is located in proximity to the footprint of the potential development)	X
	Destruction / Direct (the heritage resource or site is physically located within the footprint of the potential development)	

Direct impact rating (Refer to Section 7.3.2) Note that a default "no impact expected" value applies where a heritage resource occurs outside the impact matrix or applicable conservation buffers of the development.	**High Heritage Impact Expected.**

3.4 Recommended Management* (refer to section 7.3.3)

Monitoring / Avoidance

Comments on recommended management

Monitoring: It is necessary that the sites be monitored to ensure that previously undetected heritage resources are not impacted on. If further impact occurs, or is envisaged at any stage of development and operation the following will be required:

- **Documentation of sites.**
- **Further desktop study and community consultation to more accurately ascertain context of sites.**
- **Relevant Permitting from Heritage Resources Authority where applicable. .**

4. APPLICABLE LEGISLATION AND LEGAL REQUIREMENTS

- **National Heritage Resources Act (Act no. 25 of 1999)**
- **Local and regional provisions, laws and by-laws**

6.4.4 Site AGES-WH729-FT01: Stone feature

1. SITE DESCRIPTION : Stone feature

1.4 General Site Description

Stone feature.

1.2 Site features / artefacts / Other

Site Location

Province / District	Nortwest Province	Map Number	2624DD
Farm / Settlement / Zone	Brandwacht 728IN		
Co-ordinates	Site AGES-WH729-FT01	S26.98394	E24.78895

Site Type

Surface sites	X	Caves and rock shelters	
Larger open-air sites		Sealed sites (deposits	
River deposits		Other	

Site Function

Living / habitation		Kill	
Ceremonial		Burial	
Trading / Barter		Art	
Quarry / Mining / Smelting		Other	X – unknown

Site Placement

Valley floor		Hill top		Vlei/swamp		River Mouth	
Dam		River Bank		Slope		Plains	X
Other / Comments							

Vegetation

Riverine forest		Bushveld		Savannah		Mountain forest	

Thornveld		Grassland		Cultivated	X	Other	X – Savannah

Age Classification							
Stone Age		Early Iron Age		Middle Iron Age		Later Iron Age	
Historical		Other	X – Unknown				

Material Culture							
Midden		House Remains		Stone Walling		Stone Structures	X
Granary		Grinding Stone (L)		Grinding Stone (U)		Granary Stand	
Metal		Ceramics (Potter)		Ceramics (Porcelain)		Stone (non-lithic)	
Metal slag		Tuyere		Fauna		Bead (Glass)	
Bead (OES / Shell)		Glass		Lithics		Smelting Residues	
Other:				Other:			

1.3 Site Condition
The site integrity is poor.

2. SITE EVALUATION			
2.1 Heritage Value (NHRA, section 2 [3])	**High**	**Medium**	**Low**
It has importance to the community or pattern of South Africa's history or pre-colonial history.			X
It possesses unique, uncommon, rare or endangered aspects of South Africa's natural or cultural heritage.			X
It has potential to yield information that will contribute to an understanding of South Africa's natural and cultural heritage.			X
It is of importance in demonstrating the principle characteristics of a particular class of South Africa's natural or cultural places or objects.			X
It has importance in exhibiting particular aesthetic characteristics valued by a particular community or cultural group.			X
It has importance in demonstrating a high degree of creative or technical achievement at a particular period.			X
It has marked or special association with a particular community or cultural group for social, cultural or spiritual reasons (sense of place).			X
It has strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa.			X
It has significance through contributing towards the promotion of a local sociocultural identity and can be developed as a tourist destination.			X
It has significance relating to the history of slavery in South Africa.			X
It has importance to the wider understanding of temporal changes within cultural landscapes, settlement patterns and human occupation.			X

2.2 Field Register Rating	
National/Grade 1 [should be registered, retained]	
Provincial/Grade 2 [should be registered, retained]	
Local/Grade 3A [should be registered, mitigation not advised]	
Local/Grade 3B [High significance; mitigation, partly retained]	
Generally Protected A [High/Medium significance, mitigation]	
Generally protected B [Medium significance, to be recorded]	
Generally Protected C [Low significance, no further action]	X

2.3 Sphere of Significance	High	Medium	Low
International			
National			
Provincial			
Local			X
Specific community			

3. IMPACT RATING AND MITIGATION

3.1 Impact assessment			
APPROXIMATE DISTANCE FROM DEVELOPMENT: 0 METERS			
NATURE OF IMPACT: NONE			
EXTENT OF IMPACT: Local			
SPECIALIST LEVEL OF CONFIDENCE IN DEGREE OF IMPACT AND SEVERITY: High			
3.2 Impact Significance and Severity			
General assessment of impacts on resource (Refer to Section 7.3.1)		**Without Management***	**With Management***
	Duration	**Permanent**	**Short Term**
	Intensity	**Low**	**Low**
	Probability	**Definite**	**Improbable**
	Impact Significance	**Negligible**	**Negligible**
3.3 Direct Impact Rating			
Direct impact on resource	None (the potential development does not adversely or positively affect the heritage resource)		
	Peripheral / Indirect (the heritage resource or its setting is located in proximity to the footprint of the potential development)		**X**
	Destruction / Direct (the heritage resource or site is physically located within the footprint of the potential development)		
Direct impact rating (Refer to Section 7.3.2) Note that a default "no impact expected" value applies where a heritage resource occurs outside the impact matrix or applicable conservation buffers of the development.		**Negligible Impact Expected.**	
3.4 Recommended Management* (refer to section 7.3.3)			
Monitoring			
Comments on recommended management			
Monitoring: Monitor status and function of feature **If human remains are found, the following actions would be required:** - **Suspension of all activities.** - **Notification of Heritage Specialist and SAHRA** - **Documentation of site.** - **Possible exhumation and reburial** - **Full social consultation.** - **Possible conservation management and protection measures.** - **Relevant Permitting from Heritage Resources Authority.**			
4. APPLICABLE LEGISLATION AND LEGAL REQUIREMENTS			
- **Human Tissue Act (Act 65 of 1983 as amended).** - **Removal of Graves and Dead Bodies Ordinance (Ordinance no. 7 of 1925)** - **Ordinance on Excavations (Ordinance no. 12 of 1980)** - **Local and regional provisions, laws and by-laws** - **National Heritage Resources Act (Act no. 25 of 1999)** - **Permit from SAHRA for removal**			

6.5 Discussion: Evaluation of Results

Previous studies conducted in the larger Vryburg area suggest a rich and diverse archaeological landscape and cognisance should nonetheless be taken of archaeological material that might be present in surface and sub-surface deposits along drainage lines and at water pans. The following impact assessment discussion summarises the extent of heritage significance and impact on resources, cognisant of this rich larger archae-historical landscape (refer to Table 6 for impact assessment matrix).

A site dating to the **Stone Age Period** in occurs in the study area.

- A single Earlier Stone Age cleaver was located near the ESKOM Woodhouse Substation on the farm Woodhouse (**Site AGES-WH729-SA01)**. No other diagnostic stone tools or debris were identified in the area and the site is of low scientific value due to the low lithic density and the general loss of context for the artefact. The impact on the resource by the proposed activity is anticipated to be peripheral, and

should it occur it will be permanent. **The significance of the impact on the heritage resources is considered to be NEGLIBLE.**

Sites dating to the **Iron Age Farmer Period** in occur in the study area.

- A number of collapsed rough stone structures, resembling small circular stone enclosures were documented along the proposed power line route on the farm Brandwagt (**Site AGES-BW728-IA01)**. The structures, which possibly date to the Later Iron Age Farmer Period, are of medium-low significance due to the poor preservation of the structures, the general absence of associated material culture and the general disturbed and altered state of the immediate surroundings, implying a loss of context for the sites. The impact on the resource by the proposed activity is anticipated to be peripheral, and should it occur it will be permanent. **The significance of the impact on the heritage resources is considered to be LOW and the threshold of the impact can be limited to a NEGLIBLE impact by the implementation of mitigation measures (monitoring) for the site, if / when required.**

Sites dating to the **Historical / Colonial Period** in occur in the study area.

- The Brandwagt farmstead which is currently in use, as well as possible Historical Period farmstead structures such as an old barn on the farm Brandwagt (**Site AGES-BW728-HP01)** are of medium significance since the site might yield information on the regional expansion of Colonial farming and architectural developments in the area The impact on the resource by the proposed activity is anticipated to be peripheral, and should it occur it will be permanent. **The significance of the impact on the heritage resources is considered to be LOW and the threshold of the impact can be limited to a NEGLIBLE impact by the implementation of mitigation measures (avoidance/monitoring) for the site, if / when required.**

Other features occur in the study area.

- A small elongated stone structure was located near the south-western offset of the power line corridor on the farm Woodhouse (**Site AGES-WH729-FT01).** The function and context of the feature is not known but it is most likely the result of subsurface geo-technical investigations in the area. However, it might also be a human burial. The impact on the feature by the proposed activity is anticipated to be peripheral, and should it occur it will be permanent. **The significance of the impact on this heritage resource is considered to be NEGLIBLE (should the feature not be a heritage resource) or MODERATE (if the feature is identified as a heritage resource e.g. a burial) but the threshold of the impact can, in both cases be limited to a NEGLIBLE impact by the implementation of mitigation measures (avoidance / monitoring) for the sites, if / when required.**

Heritage resources have been documented in the proposed Carocraft Power Line Project footprint areas. From a culture resources management perspective, no lasting impact on heritage resources is foreseen, provided that the heritage component be closely monitored by the ECO during the construction process in order to avoid the destruction of existing, and previously undetected heritage remains. Should any previously undetected heritage remains be uncovered, the archaeologist should be alerted immediately. In the opinion of the author of this Archaeological Impact Assessment Report, the proposed Carocraft Power Line Project may proceed subject to recommendations contained in this assessment, endorsed by the relevant Heritage Resources authorities

Table 6: Impact assessment matrix for the Carocraft Power Line Development Heritage Resources (See Section 6.3.1 B) as well as weights and values below

Site	Activity	Impact	P	D	S	M/S	Significance Before Mitigation		Mitigation Measures	P	D	S	M / S	Significance After Mitigation
Pre-Construction, Construction, Operation and Closure									**Pre-Construction and Construction Phase**					
Site AGES-WH729-SA01	Pre-Construction, Construction, Operation and Closure	Loss of Heritage Resource and Attributes	2	5	1	2	32	Negligible	Monitoring / Avoidance	1	1	1	2	4 Negligible
Site AGES-BW728-IA01	Pre-Construction, Construction, Operation and Closure	Loss of Heritage Resource and Attributes	4	5	1	4	40	Low	Monitoring / Avoidance	1	1	1	2	4 Negligible
Site AGES-BW728-HP01	Pre-Construction, Construction, Operation and Closure	Loss of Heritage Resource and Attributes	4	5	1	2	32	Low	Monitoring / Avoidance	1	1	1	2	4 Negligible
Site AGES-WH729-FT01	Pre-Construction, Construction, Operation and Closure	Loss of Heritage Resource and Attributes	4	5	1	2	48	Negligible	Monitoring / Avoidance	1	1	1	2	4 Negligible

Aspect	Description	Weight	Aspect	Description	Weight	Aspect	Description	Weight	Aspect	Description	Weight	Aspect	Description	Weight
Probability	Improbable	1	Duration	Short term	1	Scale	Local	1	Magnitude/Severity	Low	2	Significance	Sum(Duration, Scale, Magnitude) x Probability	
	Probable	2		Medium term	3		Site	2		Medium	6		Negligible	<20
	Highly Probable	4		Long term	4		Regional	3		High	8		Low	<40
	Definite	5		Permanent	5								Moderate	<60
													High	>60

6.6 Heritage Management Actions

Recommendations for relevant heritage resources management actions are vital to the conservation of heritage resources. Recommended management actions may include the following:

- **No further action / Monitoring**

Where no heritage resources have been documented, heritage resources occur well outside the impact zone of any development or the primary context of the surroundings at a development footprint has been largely destroyed or altered, no further immediate action is required. Site monitoring during development, by an ECO or the heritage specialist are often added to this recommendation in order to ensure that no undetected heritage\ remains are destroyed.

- **Avoidance**

This is appropriate where any type of development occurs within a formally protected or significant or sensitive heritage context and is likely to have a high negative impact. Mitigation is not acceptable or not possible. This measure often includes the change / alteration of development planning and therefore impact zones in order not to impact on resources.

- **Mitigation**

This is appropriate where development occurs in a context of heritage significance and where the impact is such that it can be mitigated to a degree of medium to low significance, e.g. the high to medium impact of a development on an archaeological site could be mitigated through sampling/excavation of the remains. Not all negative impacts can be mitigated.

- **Rehabilitation**

Rehabilitation is considered in heritage management terms as a intervention typically involving the adding of a new heritage layer to enable a new sustainable use. It is not appropriate when the process necessitates the removal of previous historical layers, i.e. restoration of a building or place to the previous state/period. It is an appropriate heritage management action in the following cases:

- The heritage resource is degraded or in the process of degradation and would benefit from rehabilitation.

- Where rehabilitation implies appropriate conservation interventions, i.e. adaptive reuse, repair and maintenance, consolidation and minimal

loss of historical fabric.

- Where the rehabilitation process will not result in a negative impact on the intrinsic value of the resource.

- **Enhancement**

Enhancement is appropriate where the overall heritage significance and its public appreciation value are improved. It does not imply creation of a condition that might never have occurred during the evolution of a place, e.g. the tendency to sanitize the past. This management action might result from the removal of previous layers where these layers are culturally of low significance and detract from the significance of the resource. It would be appropriate in a range of heritage contexts and applicable to a range of resources. In the case of formally protected or significant resources, appropriate enhancement action should be encouraged. Care should,

however, be taken to ensure that the process does not have a negative impact on the character and context of the resource. It would thus have to be carefully monitored.

The following heritage management actions are recommended for heritage resources documented in the Carocraft Power Line footprint and study areas:

Site		Mitigation: Action	Responsible Party	Time Frame
Site AGES-WH729-SA01 Site AGES-BW728-IA01	Site AGES-WH729-FT01 Site AGES-BW728-HP01			
		Mitigation Surface collection and sampling of MSA artefacts by a Stone Age Specialist.	Qualified Stone Age Specialist Tertiary institution.	Before construction commences, during construction phases,
X	X	**Monitoring** Periodic monitoring of excavation activities during the construction period to ensure that no sub- surface deposits are missed	Contracted heritage practitioner, ECO	During construction period.
	X	**Avoidance** Steps to adjust development planning in order not to impact on resources.	Developer, in conjunction with contracted heritage practitioner	During construction period.

7 RECOMMENDATIONS

The larger landscape around Vryburg is rich in pre-historical and historical remnants but areas directly adjacent to the farm Rhodes seem to have been less densely occupied during prehistoric and historic times. Cognisant of this landscape and the need for the conservation of its heritage resources, the following recommendations are made based on general observations in the proposed Carocraft Power Line Development Area:

- A Palaeontological Impact Assessment is recommended where bedrock is to be impacted and, should fossil remains such as fossil fish, reptiles or petrified wood be exposed during construction, these objects should carefully safeguarded and the relevant heritage resources authority (SAHRA) should be notified immediately so that the appropriate action can be taken by a professional palaeontologist.
- Considering the localised nature of heritage remains, the general monitoring of the development progress is recommended for all stages of the project. Should any subsurface palaeontological, archaeological or historical material, or burials be exposed during construction activities, all activities should be suspended and the archaeological specialist should be notified immediately.
- A single Earlier Stone Age cleaver was located near the ESKOM Woodhouse Substation (**Site AGES-WH729-SA01).** No other diagnostic stone tools or debris were identified in the area and the artefact context has largely been lost and thus, the site is of low scientific value. The significance of the impact on the resource by the proposed development is considered to be low and no further action is thus recommended for the management of the heritage resource.
- A number of collapsed rough stone structures, resembling small circular stone enclosures (**Site AGES-BW728-IA01)** which possibly date to the Later Iron Age Farmer Period, are of medium-low significance due to the poor preservation of the structures, the general absence of associated material culture and the general disturbed and altered state of the immediate surroundings, implying a loss of context for the sites. It is recommended that any activities pertaining to the construction of the power line in the area be monitored in order to closely control any possible impact on the sites. Should previously undetected heritage remains be exposed at any stage, construction activities should be aborted until such time that a qualified and registered CRM practitioner has assessed heritage resources and made recommendations on the management of such resources..
- The Brandwagt farmstead which is currently in use, as well as possible Historical Period farmstead structures such as an old barn occur on the farm Brandwagt (**Site AGES-BW728-HP01)** are of medium significance since the site might yield information on the regional expansion of Colonial farming and architectural developments in the area. It is recommended that any activities pertaining to the development in the area be monitored in order to avoid any possible impact on previously undetected heritage remains in the area. Should the structures be directly impacted by development activities, destruction permit from the relevant heritage resources authority (SAHRA) should be obtained.
- A small elongated stone structure of unknown function (**Site AGES-WH729-FT01)** was located near the ESKOM Woodhouse Substation on the farm Woodhouse. It is highly probable that the feature is the result of recent geo-technical investigations in this area but cognisance should be taken of the possibility that the structure might be an informal burial site, based on its general appearance. It is thus recommended that this area be closely monitored in order to avoid the destruction of a potentially sensitive heritage resource. Since the intrinsic heritage and social value of graves and cemeteries are highly significant, these resources require special management measures. Should human remains be discovered at any stage, these should be reported to the Heritage Specialist and relevant authorities (SAHRA) and development activities should be suspended until the site has been inspected by the

Specialist. The Specialist will advise on further management actions and possible relocation of human remains in accordance with the Human Tissue Act (Act 65 of 1983 as amended), the Removal of Graves and Dead Bodies Ordinance (Ordinance no. 7 of 1925), the National Heritage Resources Act (Act no. 25 of 1999) and any local and regional provisions, laws and by-laws pertaining to human remains. A full social consultation process should occur in conjunction with the mitigation of cemeteries and burials.

- It is essential that cognisance be taken of the larger archaeological landscape of the area in order to avoid the destruction of previously undetected heritage sites. It should be stated that it is likely that further undetected archaeological remains might occur elsewhere in the Study Area along water sources and drainage lines, fountains and pans would often have attracted human activity in the past. Also, since Stone Age material seems to originate from below present soil surfaces in eroded areas, the larger landscape should be regarded as potentially sensitive in terms of possible subsurface deposits. Burials and historically significant structures dating to the Colonial Period occur on farms in the area and these resources should be avoided during all phases of construction and development of the Power Line.

In addition to these site-specific recommendations, careful cognizance should be taken of the following:

- Water sources such as drainage lines, fountains and pans would often have attracted human activity in the past.
- As Palaeontological remains occur where bedrock has been exposed, such geological features should be regarded as sensitive in terms of impacts on fossilized resources.

8 GENERAL COMMENTS AND CONDITIONS

This AIA report serves to confirm the extent and significance of the heritage landscape of the proposed Carocraft Power Line Development area. The larger heritage horizon encompasses rich and diverse archaeological landscapes and cognisance should be taken of heritage resources and archaeological material that might be present in surface and sub-surface deposits. If, during construction, any possible archaeological material culture discoveries are made, the operations must be stopped and a qualified archaeologist be contacted for an assessment of the find. Such material culture might include:

- Formal Earlier Stone Age stone tools such as handaxes, choppers and cleavers.
- Formal Middle Stone Age stone tools such as points, blades and scrapers.
- Formal Later Stone Age stone tools such a microlithic blades, points and scrapers.
- Lithic residues and debris such as stone cores and flakes.
- Decorated and undecorated potsherds.
- Iron objects.
- Beads made from ostrich eggshell and glass.
- Ash middens and cattle dung deposits and accumulations.
- Animal bones and faunal remains.
- Human remains/graves.
- Stone walling or any sub-surface structures.
- Historical glass, tin or ceramics.
- Fossils.

If such site were to be encountered or impacted by any proposed developments, recommendations contained in this report, as well as endorsement of mitigation measures as set out by SAHRA, the National Resources Act and the CRM section of ASAPA will be required. Please note that this report is an archaeological scoping study only and does not include or exempt other required heritage impact assessments.

It must be emphasised that the conclusions and recommendations expressed in this archaeological heritage sensitivity investigation are based on the visibility of archaeological sites/features and may not therefore, represent the area's complete archaeological legacy. Many sites/features may be covered by soil and vegetation and might only be located during sub-surface investigations. If subsurface archaeological deposits, artefacts or skeletal material were to be recovered in the area during construction activities, all activities should be suspended and the archaeological specialist should be notified immediately **(*cf*. NHRA (Act No. 25 of 1999)**, Section 36 (6)).

It must also be clear that Archaeological Specialist Reports will be assessed by the relevant heritage resources authority. The final decision rests with the heritage resources authority, which should give a permit or a formal letter of permission for the destruction of any cultural sites.

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