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**LW CONSULTANTS: PROPOSED BIESIEPUTS PROSPECTING
PROJECT ON A PORTION OF THE FARM BIESIEPUTS 67, ZF
MGCAWU DISTRICT MUNICIPALITY, NORTHERN CAPE
PROVINCE**

Archaeological Impact Assessment



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ARCHAEOLOGICAL IMPACT ASSESSMENT (AIA) FOR THE BIESIEPUTS PROSPECTING PROJECT ON A PORTION OF THE FARM BIESIEPUTS 67 IN THE ZF MGCAWU DISTRICT MUNICIPALITY, NORTHERN CAPE PROVINCE

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I, Nelius Le Roux Kruger, declare that –

- I act as the independent specialist;
- I am conducting any work and activity relating to the proposed Biesieputs Prospecting Project in an objective manner, even if this results in views and findings that are not favourable to the client;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have the required expertise in conducting the specialist report and I will comply with legislation, 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, AMAFA and the CRM section of ASAPA), regulations and any guidelines that have relevance to the proposed activity;
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EXECUTIVE SUMMARY

This report details the results of an Archaeological Impact Assessment (AIA) study for the proposed Biesieputs Prospecting Project on a portion of the farm Biesieputs 67 south of Postmasburg in the ZF Mgcawu District Municipality, Northern Cape Province. The project entails the proposed prospecting for Manganese over a prospecting area of approximately **1440ha**. 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.

Project Title	Biesieputs Prospecting Project
Project Location	S28.531508° E22.834313° (Relative midpoint of property)
1:50 000 Map Sheet	2822DB
Farm Portion / Parcel	Portion of the farm Biesieputs 67
Magisterial District / Municipal Area	ZF Mgcawu District Municipality
Province	Northern Cape Province

The Northern Cape Province at large encompasses a significant heritage legacy. Numerous sites, documenting Earlier, Middle and Later Stone Age habitation occur across the province, mostly in open air locales or in sediments alongside rivers or pans. Specifically, the Kathu Archaeological Complex approximately 70km north of Postmasburg with sites such as Kathu Pan, Kathu Townlands and Bestwood has yielded material of international scientific importance, documenting Earlier, Middle and Later Stone Age industries, habitation and settlement patterns. 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. Sites dating to the Iron Age occur in the north eastern part of the 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. Locally, previous research in the Postmasburg area focused on the history of prehistoric specularite mining and more recently, Culture Resources Management studies have confirmed the distribution of Middle and Later Stone age artefacts in calcrete deposits around pans and springs.

The project area occurs on a portion of the farm Biesieputs which has remained relatively pristine over previous decades. A number of sites of heritage potential were documented in the project area and the following recommendations provide an outline for the management of the heritage landscape within the Biesieputs Prospecting Project area:

- A Palaeontological Assessment should be considered for the development. 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.
- Two larger scatters of MSA material (**Site EXIGO-BP-SA01, Site EXIGO-BP-SA02**) were documented on Biesieputs. In places, the tools occur in larger quantities where the presence of diagnostic formal tools was noted and these occurrences are of medium significance. In addition, it is highly likely that Stone Age material will occur elsewhere on the property in association with calcrete exposures and water sources. As such, potential impact on these Stone Age occurrences is likely to occur and it might be anticipated that drilling holes 3, 4, 5, 12, 13 and 14 specifically could impact directly on Stone Age sites and it is primarily recommended that the locations of these holes be reconsidered in order to avoid impact on the sites. Here, a conservation buffer of at least 50m should be maintained around identified Stone Age scatters. However, should this mitigation measure prove unachievable it is recommended that these sites be subject to Phase 2 mitigation conducted by a professional archaeologist with experience in Stone Age archaeology, preferably a specialist that understands the archaeology of the area. A permit in terms of Section 35 of the NHRA (Act No 25 of 1999) will have to be obtained from the responsible heritage authority
 - The Biesieputs farmstead associated buildings (**Site EXIGO-BP-HP01**) on the property is of medium significance as the site has the potential to inform on architectural, settlement and social developments in the Postmasburg heritage landscape. Even though the farmstead occur outside indicated prospecting impact areas, it is essential that long-term conservation of structures at the sites be ensured. It is primarily recommended that a conservation buffer of at least 100m be maintained around the sites. The respective sites should be monitored on a frequent basis by a heritage specialist or an informed ECO in order to detect any short / long term impacts on the features at the earliest opportunity. The details of management and monitoring measures and protocols should be detailed in a heritage site management plan for each of the sites. Heritage site management involves the control of elements that make up the physical and social environment of a site and that have an effect on it. It is also recommended that the general landscape around the farmstead and the site conservation buffer zones be monitored by an informed ECO in order to avoid the destruction of previously undetected heritage remains
 - Lastly, should any subsurface paleontological, archaeological or historical material or heritage resources be exposed during construction activities, all activities should be suspended and the archaeological specialist should be notified immediately. 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. Should any subsurface paleontological / archaeological / historical material and /or graves/human remains be uncovered, all activities should be suspended and the archaeological specialist should be alerted immediately. It should be noted that mitigation measures are valid for the duration of the development process, and mitigation measures might have to be implemented on additional features of heritage importance not detected during this Phase 1 assessment (e.g. uncovered during the construction process).

Heritage resources of medium significance occur within the Biesieputs Prospecting Project area. The intensity of impact on the general heritage landscape is considered to be moderate but it is the opinion of the author of this Archaeological Impact Assessment Report that the proposed project may proceed from a culture resources management perspective, provided that mitigation and management measures for these sites are implemented and that no previously undetected subsurface heritage remains are encountered during prospecting.

Biesieputs Prospecting Project Identified Heritage Sites:

Site Code	Coordinates S E	Short Description	Mitigation Requirement
EXIGO-BP-SA01	S28.520248° E22.818947°	Middle Stone Age Occurrences	<p>Avoidance: Avoid sites / occurrences and implement conservation buffer of 50m.</p> <p>Phase 2 Assessment: If impact cannot be avoided, site analysis by means of artefact collection, sampling and analysis subject to relevant permitting.</p> <p>Site Monitoring: Site monitoring by an informed ECO in order to avoid the destruction of previously undetected heritage remains.</p>
EXIGO-BP-SA02	S28.546416° E22.841190°		
EXIGO-BP-HP01	S28.519281° E22.821443°	Historical Period Farmstead	<p>Site Monitoring & Management: Site monitoring by an informed ECO in order to detect and avoid impact on the site. Site management plan.</p>

It is essential that cognisance be taken of the larger archaeological landscape of the Northern Cape Province and the Kathu region in order to avoid the destruction of previously undetected heritage sites. Should any previously undetected heritage resources be exposed or uncovered during construction phases of the proposed project, these should immediately be reported to the NC-PHRA. 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 (NC-PHRA, 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

NOTATIONS AND TERMS/TERMINOLOGY

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

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.

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.

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.

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

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.

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

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.

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.

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.

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.

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.

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,

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

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.

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.

LIST OF ABBREVIATIONS

Abbreviation	Description
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)

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1 BACKGROUND

1.1 Scope and Motivation

Exigo Sustainability was commissioned by LW Consultants for an Archaeological Impact Assessment (AIA) study for the proposed Biesieputs Prospecting Project in the Northern Cape 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

Exigo Sustainability's expertise ensures that all projects be conducted to the highest international ethical and professional standards. As archaeological specialist for Exigo Sustainability, 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

The author was contracted to undertake a heritage assessment of areas demarcated for the application of a mining right on a portion of the remaining extent of the farm Biesieputs. The project entails the proposed prospecting for Manganese over a prospecting area of approximately **1440ha**.

At least 17 drilling holes are proposed for various localities on the Biesieputs property in order to test the subsurface geology of the area (See Figure 1-2).

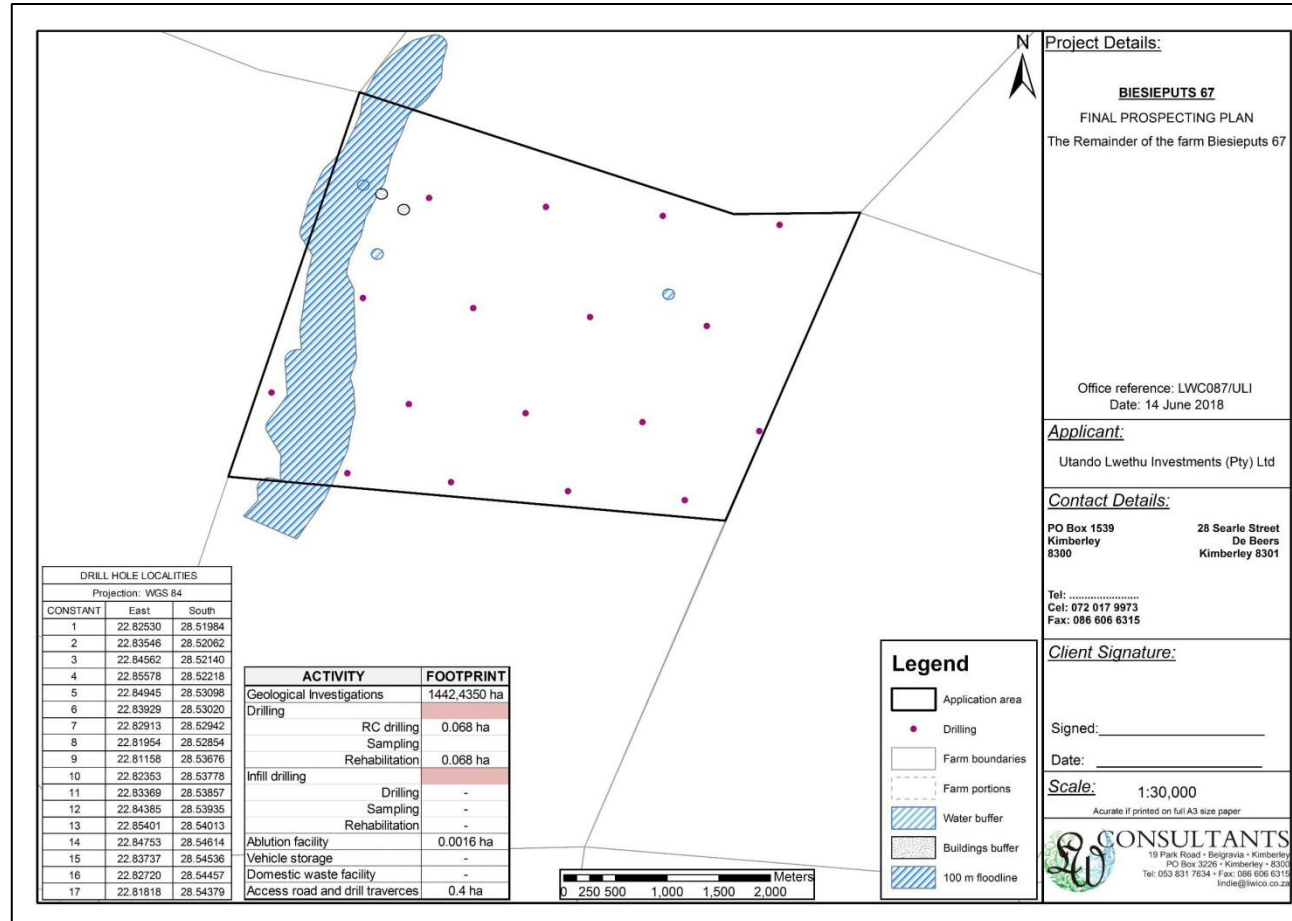


Figure 1-1: Project map of the proposed Biesieputs Prospecting Project subject property.

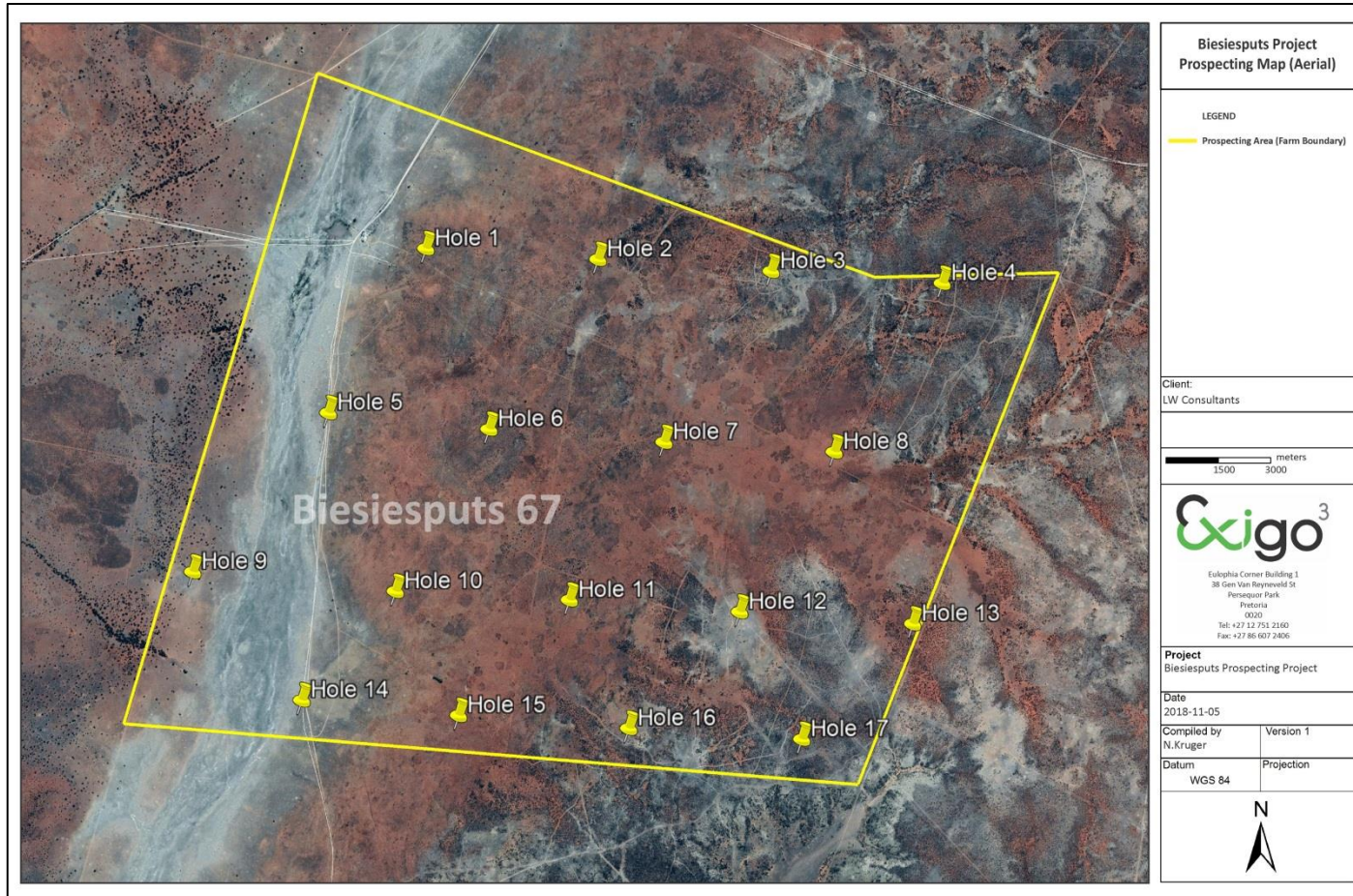


Figure 1-2: Aerial map of the proposed Biesieputs Prospecting Project indicating the locations or proposed drilling holes.

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. It is also a legal requirement for certain development categories which may have an impact on heritage resources. 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, archaeological sites and material and graves as well as burial sites. The objective of this legislation is to ensure that developers implement 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 and rate 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 its 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 No 25 of 1999 (section 35) the following features are protected as cultural heritage resources:

- a. Archaeological artifacts, structures and sites older than 100 years
- b. Ethnographic art objects (e.g. prehistoric rock art) and ethnography
- c. Objects of decorative and visual arts
- d. Military objects, structures and sites older than 75 years

- e. Historical objects, structures and sites older than 60 years
- f. Proclaimed heritage sites
- g. Grave yards and graves older than 60 years
- h. Meteorites and fossils
- i. Objects, structures and sites of scientific or technological value.

In addition, the national estate includes the following:

- a. Places, buildings, structures and equipment of cultural significance
- b. Places to which oral traditions are attached or which are associated with living heritage
- c. Historical settlements and townscapes
- d. Landscapes and features of cultural significance
- e. Geological sites of scientific or cultural importance
- f. Archaeological and paleontological importance
- g. Graves and burial grounds
- h. Sites of significance relating to the history of slavery
- i. Movable objects (e.g. archaeological, paleontological, meteorites, geological specimens, military, ethnographic, books etc.)

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) and 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 and burial grounds are commonly divided into the following subsets:

- a. ancestral graves
- b. royal graves and graves of traditional leaders
- c. graves of victims of conflict
- d. graves designated by the Minister
- e. historical graves and cemeteries
- f. human remains

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 Ordinance on Excavations (Ordinance no. 12 of 1980) 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.

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

This act (Act 107 of 1998) states that a survey and evaluation of cultural resources must be done in areas where development projects, that will change the face of the environment, will be undertaken. The impact of the development on these resources should be determined and proposals for the mitigation thereof are made. Environmental management should also take the cultural and social needs of people into account. Any disturbance of landscapes and sites that constitute the nation's cultural heritage should be avoided as far as possible and where this is not possible the disturbance should be minimized and remedied.

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 of developed and (b) make recommendations for protection or mitigation of the impact on the sites.

A detailed guideline of statutory terms and requirements is supplied in Addendum 1.

2 REGIONAL CONTEXT

2.1 Area Location

The proposed development area for the Biesieputs Prospecting Project is situated on a portion of the farm Biesieputs No 435 approximately 30km south-west of the town Postmasburg in the ZF Mgcawu District Municipality, Northern Cape Province. The R383 regional road connecting with Postmasburg routes directly east of the project area. Biesieputs is situated approximately 220km south-east of the Northern Cape town of Upington and 280km west of Kimberley. The study areas appear on 1:50000 map sheet 2822DB (see Figure 2-1) and coordinates for the proposed project are as follows:

- **Relative Midpoint:** S28.531508° E22.834313°

2.2 Area Description: Receiving Environment

The Northern Cape area around Postmasburg receives around 200-400 mm of rain in the summer months. The local vegetation is classified as Karroid Bushveld where a transition occurs between trees in a mixed grassveld, typical to the Bushveld complex, to a Karoo landscape with more open grasslands and succulents (Acocks 1988). The geology of the region is underlain by rocks older than 1000 million years and the overburden consists mainly of geologically recent Kalahari sand, which in turn is un-fossiliferous. Some quartzites also occur on area on the landscape. Previous studies in the area indicated that the area is underlain more specifically by Proterozoic-aged rocks belonging to the Asbestos Hills Subgroup of the Transvaal Supergroup (Beaumont 2009). A number of small natural pans are scattered across the landscape. The semi-arid area around Postmasburg supports a scrub cover, largely vaalbos (*Tarchonanthus capensis*), interspersed with sparse, mainly thorn-bearing bush which includes swarthaak (*Acacia detinens*), kameeldoring (*Acacia giraffae*), soetdoring (*Acacia karroo*), witgatboom (*Boschia albitrunca*) and kareeboom (*Rhus lancea*).

2.3 Site Description

The Biesieputs Prospecting Project is situated on a portion of the farm Biesieputs No 435. The western border of Biesieputs is characterised by a vast seepage forming a wetland during wet spells for north to south. The property inclines gradually to the east to form calcrete and manganese rich outcrops. A number of farm roads access roads occur across the property which is currently used for game and livestock farming.

There is evidence of small-scale prospecting for Manganese on the farm but for the most part the property remains relatively pristine.

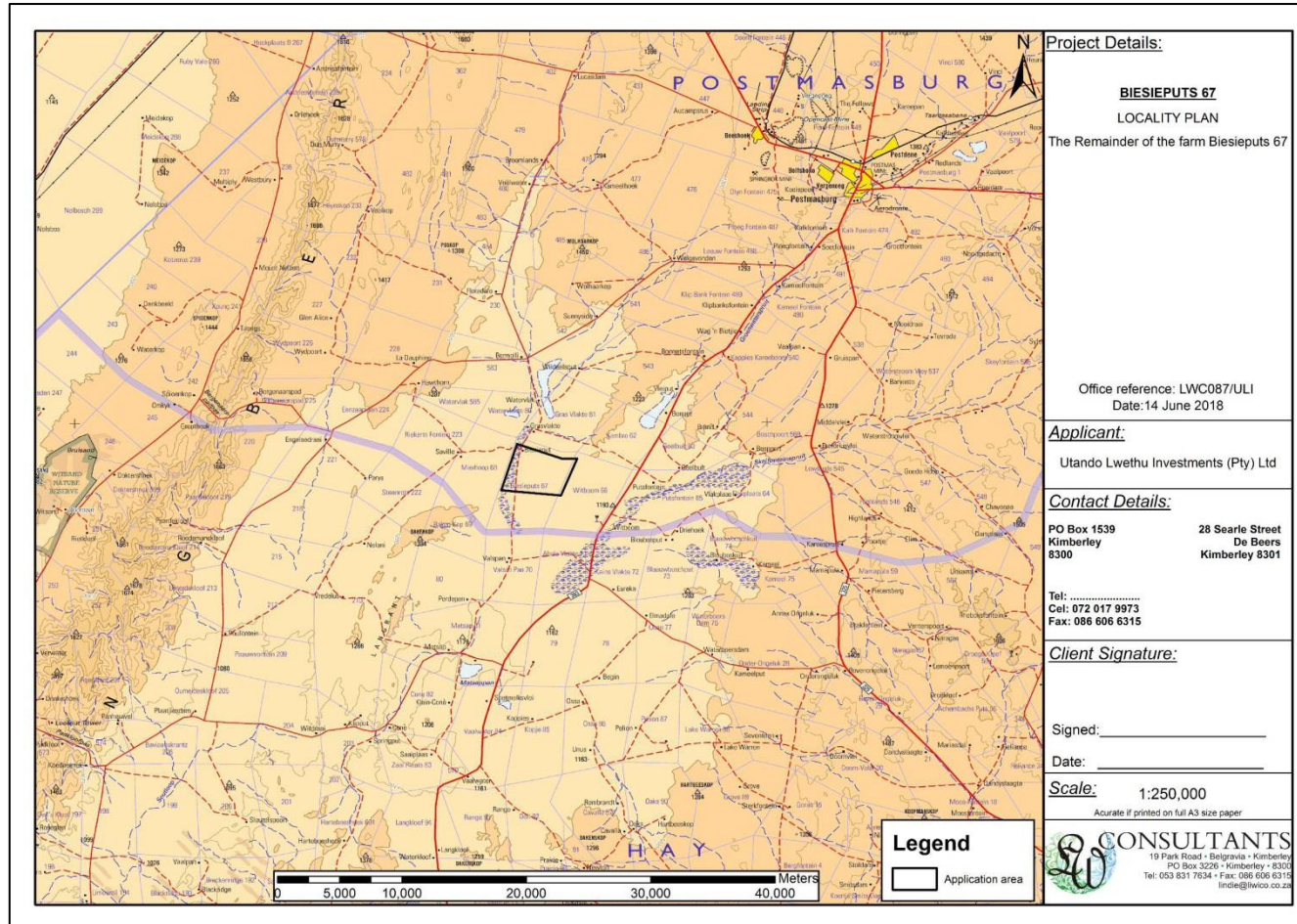


Figure 2-1: 1:50 00 Map representation of the location of the proposed Biesieputs Prospecting Project (sheet 2822DB).

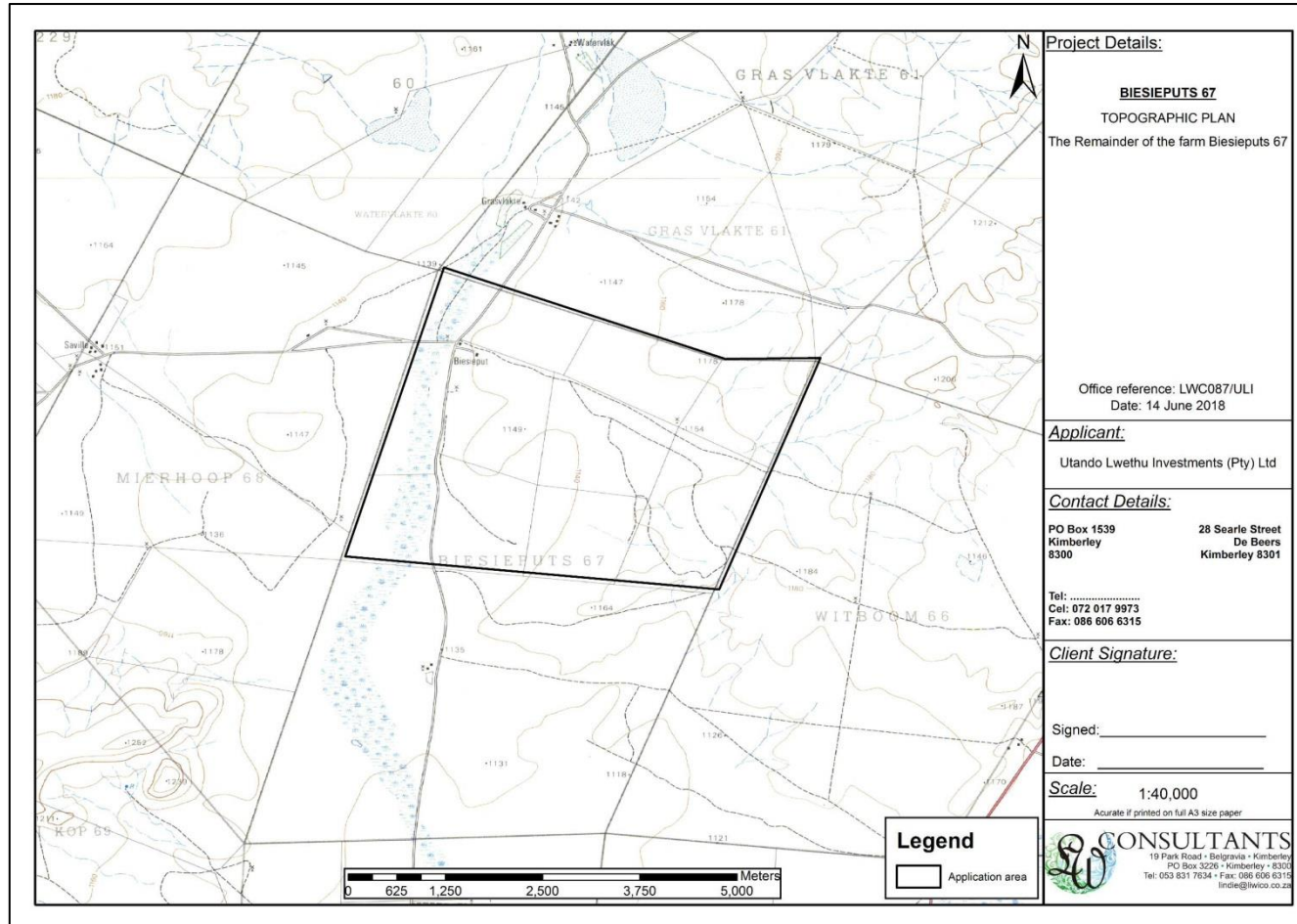


Figure 2-2: Map representation of the regional setting for the proposed Biesieputs Prospecting Project.

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

This assessment functioned around data from a desktop study which employed existing sources of information in order to inform on the archaeo-historical landscape. The relatively large extent of the area under study necessitated the utilization of several unpublished archival databases and unpublished Heritage Assessment reports to give a comprehensive representation of known sites in the study area. Furthermore, numerous academic papers and research articles supplied a historical context for the proposed project and archival sources, aerial photographs, historical maps and local histories were used to map out the landscape's heritage. These include:

- Morris, D. & Beaumont, P.B. 1994. Ouplaas 2 Rock Engravings, Danielskuil. An unpublished report by the McGregor Museum.
- Morris, D. 1999. Proposed mining areas and properties at Ulco, Northern Cape, Including the vicinities of Gorrokop and Groot Kloof. An unpublished report by the McGregor Museum.
- Beaumont, P.B. 2000. Archaeological Impact Assessment: Archaeological Scoping Survey for the purpose of an EMPR for the Sishen Iron Ore Mine. An unpublished report by the McGregor Museum.
- Beaumont, P.B. 2004. Heritage EIA of two areas at Sishen Iron Ore Mine. An unpublished report by the McGregor Museum.
- Morris, D. 2005. Report on a Phase 1 Archaeological Assessment of Proposed Mining Areas of the Farms Bruce, King, Mokaning and Parson, Between Postmasburg and Kathu, Northern Cape. An unpublished report by the McGregor Museum.
- Beaumont, P.B. 2006a. Phase 1 Heritage Impact Assessment Report on Erf 1439, Remainder of Erf 2974, Remainder of Portion 1 of the Farm Uitkoms 463, and Farms Kathu 465 and Sims 462 at and near Kathu in the Northern Cape Province. An unpublished report by the McGregor Museum.
- Beaumont, P.B. 2006b. Phase 1 Heritage Impact Assessment Report on Portions A and B of the Farm Sims 462, Kgalagadi District, Northern Cape Province. An unpublished report by the McGregor Museum.
- Beaumont, P.B., 2006c. Phase 1 Heritage Impact Assessment Report on Portion 48 and the remaining Portion of Portion 4 of the Farm Bestwood 459, Kgalagadi District, Northern Cape Province. An Archaeological Impact Assessment report by the Archaeology Department, McGregor Museum.
- Beaumont, P.B. 2007. Supplementary Archaeological Impact Assessment report on sites near or on the Farm Hartnolls 458, Kgalagadi District Municipality, Northern Cape Province.
- Beaumont, P.B. 2008a. Phase 1 Archaeological Impact Assessment Report on Portion 459/49 of the farm Bestwood 459 at Kathu, Kgalagadi District Municipality, Northern Cape Province.
- Beaumont, P.B. 2008b. Phase 1 Heritage Impact Assessment Report on a portion of the remainder of the farm Sekgame 461, Kathu, Gamagara Municipality, Northern Cape 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. An unpublished report by Pr. Archaeologist/Heritage Specialist.

- Dreyer, C. 2008a. First Phase Archaeological and Cultural Heritage Assessment of the proposed residential developments at a portion of the remainder of the farm Bestwood 459 Rd, Kathu, Northern Cape. An unpublished report by Pr. Archaeologist/Heritage Specialist.
- Dreyer, C. 2008b. First Phase Archaeological and Cultural Heritage Assessment of the proposed Bourke project, ballast site and crushing plant at Bruce Mine, Dingleton, near Kathu, Northern Cape. An unpublished report by Pr. Archaeologist/Heritage Specialist.
- Kaplan, J.M. 2008. Phase 1 Archaeological Impact Assessment: proposed housing development, Erf 5168, Kathu, Northern Cape Province. An unpublished report by the Agency for Cultural Resources Management.
- Morris, D. 2008. Archaeological and Heritage Phase 1 Impact Assessment for proposed upgrading of Sishen Mine diesel depot storage capacity at Kathu, Northern Cape. An unpublished report by the McGregor Museum.
- Van der Ryst, MM & Küsel, SU. 2011. Specialist report on the Stone Age and other heritage resources at Kolomela, Postmasburg, Northern Cape.
- Kaplan, J. Heritage Impact Assessment proposed mixed use development in Kathu, Northern Cape Province. Remainder & Portion 1 of the Farm Sims 462, Kuruman RD. Prepared for: Enviroafrica.
- Morris, D. 2014. Rectification and/or regularisation of activities relating to the Bestwood township development near Kathu, Northern Cape: Phase 1 Archaeological Impact Assessment.
Walker S.J.H., Chazan M., Lukich V. & Morris D. 2013. A second Phase 2 archaeological data recovery at the site of Kathu Townlands for Erf 5116: Kathu, Northern Cape Province.
- Walker, S.J., Chazan, M & Morris, D. 2013. Kathu Pan: location and significance. A report requested by SAHRA for the purpose of nomination.
- Webley, L & Halkett, D. 2010. Baseline archaeological survey of the farm Driehoekspan 435, between Olifantshoek and Postmasburg in the Northern Cape Province. UCT: Archaeology Contracts Office

3.1.2 Aerial Survey and Mapping

Aerial photography is often employed to locate and study archaeological sites, particularly where larger scale area surveys are performed. This method was applied to assist the foot and automotive site surveys where 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. In addition, historical aerial photos obtained during the archival search were scrutinized and features that were regarded as important in terms of heritage value were identified and if they were located within the boundaries of the project area they were physically visited in an effort to determine whether they still exist and in order to assess their current condition and significance. By superimposing high frequency aerial photographs with images generated with Google Earth as well as historical aerial imagery, potential sensitive areas were subsequently identified, geo-referenced and transferred to a handheld GPS device. These areas served as referenced points from where further vehicular and pedestrian surveys were carried out.

Historical aerial imagery and historical maps indicate the presence of the Biesieputs farmstead at around 1950. In addition, a comparison between historical and more recent aerial imagery indicates that the Biesieputs farm has not been subjected to landscape transformation in past decades.



Figure 3-1: Historical maps dating to 1969 (top left), 1983 (top right) and 2009 (bottom) indicating the project area (red outline). Note the general absence of man-made features on the maps besides for the Biesieputs farmstead.

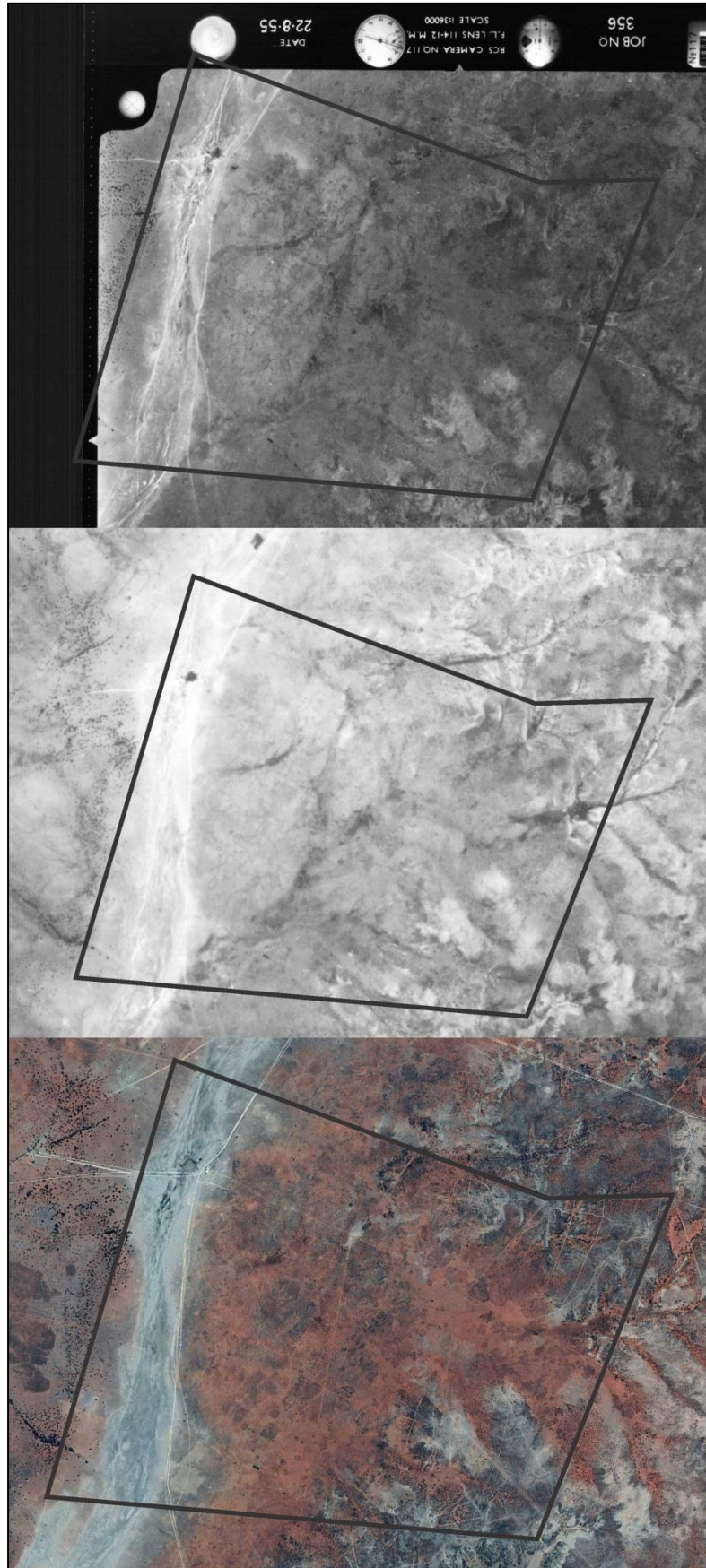


Figure 3-2: A series of aerial imagery dating to 1955 (top), 1965 (middle) and 2017 (bottom) indicating the project area (black outline). Note the presumed absence of man-made features on the earlier images.

3.1.3 Field Survey

Archaeological survey implies the systematic procedure of the identification of archaeological sites. An archaeological survey of the proposed Biesieputs property was conducted in October 2018. The process encompassed a field survey in accordance with standard archaeological practice by which heritage resources are observed and documented. In order to establish a heritage baseline and to ensure a high probability of site recording the property was examined on foot and in a motor vehicle. GPS reference points identified during the aerial survey were also visited and random spot checks were made (see detail in previous section). 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.

3.1.4 General Public Liaison

During consultation with the owner of Biesieputs, it was indicated that – to his knowledge - no known human burials or heritage sites occurs in the project area.

3.2 Limitations

3.2.1 Access

The Study Area is accessed via farm roads connecting to the R383 road to Postmasburg. Access control is applied to the area relevant to this assessment but no access restrictions were encountered during the site visit as the author was accompanied by the owner of the farm. However, the owner requested to accompany the author during the site survey which hampered free movement across the property.

3.2.2 Visibility

The surrounding vegetation in the project area mostly comprised out of mixed grasslands and scrubs. The general visibility at the time of the AIA survey (October 2018) ranged between moderate to low in more pristine areas (to the west) and high visibility in transformed zones (see Figures 3-3 to 3-16). In single cases during the survey sub-surface inspection was possible. Where applied, this revealed no archaeological deposits.



Figure 3-3: View of the general landscape in a central portion of the project area.



Figure 3-4: View of scattered stones where prospecting in previous years were conducted..



Figure 3-5: View of large open plains across a seep and wetland area to the west of the project area.



Figure 3-6: Another view of large open plains across a seep and wetland area to the west of the project area.



Figure 3-7: View of deep red sands along an eastern sector of the project area, looking west.



Figure 3-8: Calcrete surfaces visible along the eastern border of the property.



Figure 3-9: View of the project area along its northern boundary.



Figure 3-10: View of a large water pan and seep bordering the site to the south.



Figure 3-11: More calcrete exposures visible in the project area.



Figure 3-12: View of the project area along its western periphery, looking north.



Figure 3-13: A further view of the expansive seep and wetland forming the western border of the site.



Figure 3-14: View of deep red sands in the south-west of the project area.

3.2.3 Limitations and Constraints

The foot and vehicular site survey for the Biesieputs Prospecting 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:

- **Visibility:** Visibility proved to be a constraint in areas with denser surface cover, as well as portions where vegetation is more pristine.
- **Survey Time and Extent:** Survey time proved to be a constraint due to the relatively large surface extent of the property. Therefore, foot and vehicular site surveys focused around areas tentatively identified as sensitive (i.e. along drainage lines and those noted during the aerial survey) during aerial surveys.
- **Access and movement:** Since the owner requested to accompany the author during the site survey, free movement across the property was hampered during the site survey.

Thus, even though it might be assumed that survey findings are representative of the heritage landscape of the project area for the Biesieputs Prospecting Project, 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, impact assessment ratings by Exigo Specialist are generally done using the Plomp¹ impact assessment matrix scale supplied by Exigo. According to this matrix scale, each heritage receptor in the study area is given an impact assessment. A cumulative assessment for the proposed project is also included.

4 ARCHAEO-HISTORICAL CONTEXT

4.1 The archaeology of Southern Africa

Archaeology in Southern Africa is typically divided into two main fields of study, the **Stone Age** and the **Iron Age** or **Farmer 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: <i>Australopithecines</i> <i>Homo habilis</i> <i>Homo erectus</i>	Typically large stone tools such as hand axes, choppers and cleavers.
Middle Stone Age 250 000 – 25 000 YCE	Pleistocene	First <i>Homo sapiens</i> species	Typically smaller stone tools such as scrapers, blades and points.
Late Stone Age 20 000 BC – present	Pleistocene / Holocene	<i>Homo sapiens sapiens</i> 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.

¹ Plomp, H.,2004

<p>Historical / Colonial Period ±1850 AD – present</p>	<p>Holocene</p>	<p>Various Bantu-speaking groups as well as European farmers, settlers and explorers</p>	<p>Remains of historical structures e.g. homesteads, missionary schools etc. as well as, glass, porcelain, metal and ceramics.</p>
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4.2 The Northern Cape Heritage Landscape

The history of the Northern Cape 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 province, 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. Sites dating to the Iron Age occur in the north eastern part of the 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.

4.2.1 Early History and the Stone Ages

According to archaeological research, the earliest ancestors of modern humans emerged some two to three million years ago. The remains of Australopithecine and *Homo habilis* have been found in dolomite caves and underground dwellings in the Bankeveld at places such as Sterkfontein and Swartkrans near Krugersdorp. *Homo habilis*, one of the Early Stone Age hominids, is associated with Oldowan artefacts, which include crude implements manufactured from large pebbles. The Acheulian industrial complex replaced the Oldowan industrial complex during the Early Stone Age. This phase of human existence was widely distributed across South Africa and is associated with *Homo erectus*, who manufactured hand axes and cleavers from as early as one and a half million years ago. Oldowan and Acheulian artefacts were also found four to five decades ago in some of the older gravels (ancient river beds and terraces) of the Vaal River and the Klip River in Vereeniging. The earliest ancestors of modern man may therefore have roamed the Vaal valley at the same time that their contemporaries occupied some of the dolomite caves near Krugersdorp. Middle Stone Age sites dating from as early as two hundred thousand years ago have been found all over South Africa. Middle Stone Age hunter-gatherer bands also lived and hunted in the Orange and Vaal River valleys. These people, who probably looked like modern humans, occupied campsites near water but also used caves as dwellings. They manufactured a wide range of stone tools, including blades and point s that may have had long wooden sticks as hafts and were used as spears. The Late Stone Age commenced twenty thousand years ago or somewhat earlier. The various types of Later Stone Age industries scattered across the country are associated with the historical San and Khoi-Khoi people. The San were renowned as formidable hunter-gatherers, while the Khoi-Khoi herded cattle and small stock during the last two thousand years. Late Stone Age people manufactured tools that were small but highly effective, such as arrow heads and knives.

The Northern Cape has a wealth of pre-colonial archaeological sites (Beaumont & Morris 1990; Morris & Beaumont 2004). Archaeological sites in this landscape are not randomly scattered within the landscape and they occur either near water or close to local source of highly-prized raw materials, banded iron formation (BIF), specularite and jaspilite. The landscape around the town of Kathu, 70km north of Postmasburg, is vastly rich in archaeological material dating to Earlier and Middle Stone Ages. These are subject to on-going archaeological research. The Kathu Complex sites contain important ESA Acheulian and

transitional ESA/MSA Fauresmith assemblages (Beaumont, 1990, 2004, 2013; Herries, 2011; Chazan et al, 2012; Wilkins & Chazan, 2012, Walker et al, 2014). Walker et al (2014) suggest that the intensive occupation of the Kathu region can be linked to the availability of water resources. Current research projects are yielding important data on typologies, lithic technologies, technological innovations, complex spatial organization and also dates for the ESA Acheulian and for the MSA assemblages. North-east of Kathu several newly-found ESA sites with LCT's and an associated range of tools occur in sand quarries and on a hilltop at Uitkoms Farm and the Bestwood locality (Chazan et al, 2012). 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.

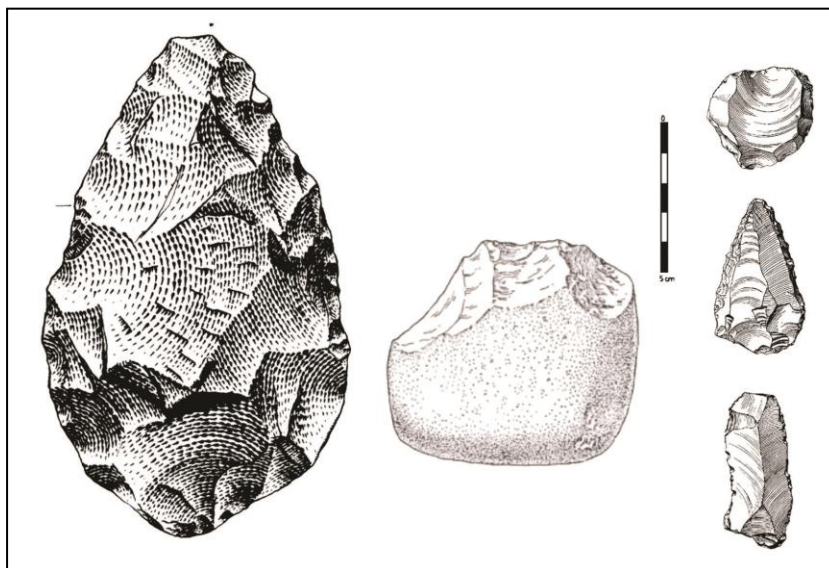


Figure 4-1: Typical ESA handaxe (left) and cleaver (center). To the right is a MSA scraper (right, top), point (right, middle) and blade (right, bottom).

More specifically, most of the studies conducted in this landscape located surface scatters of Stone Age artefacts of limited significance (e.g. Dreyer 2008a, 2008b; Kaplan 2008) if not actual Stone Age sites. Many studies referred to the Kathu Pan site, an ancient limestone sinkhole formation as well as the Uitkoms 1 site on Kathu Hill with its high number of Stone Age artefacts (e.g. SAHRIS case number 4785). A survey for the expansion of the Sishen Mine immediately to the south of the current study area Beaumont (2000) recorded surface LSA lithics which he stated were not associated with living sites. This study also listed a large number of Stone Age artefacts as well as two Iron Age collections from the near vicinity of the study area and accessioned in the McGregor Museum. Partially overlapping and to the south of the study area Beaumont (2004) recorded only surface scatters of possible Acheulian lithics while later studies in approximately the same area located no heritage resources (Beaumont 2005a, 2005b) or, again, a few scattered stone tools of MSA appearance (Morris 2008). Morris (2001) undertook a survey near Postmasburg locating surface scatters of stone artefacts, but noting that the area between Postmasburg and Kathu is known for specularite workings and that any development should take cognisance of this.

It is important to note a concern raised by Morris (2014: unpagged) that a “consistent issue in the assessment of the presence or absence of archaeological deposits in and around Kathu ... is the fact that the landscape is often capped by (1) calcrete (not uniformly ancient – Walker et al 2013) and (2) younger Gordonia Formation Aeolian sands (Almond 2014)”. That subsurface archaeological remains may occur under overlying soils and calcretes should be taken into account when archaeological and heritage surveys are undertaken.



Figure 4-2: Early Stone Age (Acheulian) handaxe from the Kathu Pan site (<http://www.museumsonc.co.za>).



Figure 4-3: Left - Middle Stone Age hafted points, similar to those documented at the Kathu Pan site (<http://www.newscientist.com/article/dn22508-first-stonetipped-spear-thrown-earlier-than-thought.html>). Right - the 'Master Hand-Axe' from Kathu Pan.

4.2.2 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). According to Beaumont (2000) pecked engravings, originally from the farms Sishen 543 and Bruce 544, were donated to the McGregor Museum with some engravings located on the grounds of the Sishen Iron Ore Mine as well. More engraving sites are known from further afield including one on the farm Palingpan. It is also worth noting that two rock shelters on the northern and southern faces of GaMohaana (Gamohana), situated in the Kuruman Hills north-west of the town, contain Later Stone Age remains and rock paintings.

4.2.3 Prehistoric Mining and Metallurgy

Surface occurrence of specularite (i.e. a variety of hematite) and prehistoric specularite workings are known to occur in the Northern Cape. One of these historic mines occurs at Doornfontein near Postmasburg, which dates to 1200 BP (Thackeray 1983). Specularite used to be transported in ostrich eggshells and pottery containers (Thackeray 1983). Various oral accounts indicate that Skeyfontein was visited by Khoi Herding people, Iron Age Tswana and San hunter – gatherers. More recently, asbestos mines were operated north-west of Kuruman on the farms Riries and Mt Vera during the 20th century. The archaeological excavations undertaken by Beaumont and Bashier (1974) and Thackeray et al (1983) have revealed that the mining of specularite at Doornfontein and Tsantsabane/Blinkklipkop commenced during this time. Blinkklipkop for example is located 66.7km south of the study area. During this initial period the mining activities would have been undertaken by San hunter-gatherers and Kora pastoralists. Only after the 17th century were such mining activities likely also undertaken by the Iron Age Tswana groups.

4.2.4 Iron Age / Farmer Period

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). The Thlaping and Thlaro moved southward into the area presently known as the Northern Cape. A century later they were settled in areas as far south as Majeng (Langeberg), Tsantsabane (Postmasburg) and Tlhaka le Tlou (Daniëlskuil) (Snyman, 1986). In terms of the Thlaro specifically, Breutz (1963) states that after they broke away from the Hurutshe during the period between 1580 and 1610, they travelled along the Molopo River and the Southern Kalahari before arriving at the confluence of the Kudumane, Mosaweng and Molopo. From here they established themselves at Tsowe (west of Morokweng), Gathlose (10.9km south-east of the study area), Majeng (Langberg), Khoiise (Khuis on the Molopo River) and Tlhaka-la-Tlou (present day Daniëlskuil situated roughly 72km south-east of the study area). It is evident that the study area and surrounding landscape would be been central within the overall settlement area of the two Tswana groups at the time. During this time the Kora moved into the area. Due to their superior firearms they applied increasing pressure on the Thlaping and Thlaro groups. In the end the Thlaping moved into a north eastern direction to settle in the

general vicinity of Dithakong, north-east of present-day Kuruman. The Thlaro settled in areas to the west and north-west of the Thlaping (Snyman, 1986). The settlement of the Thlaping in the vicinity of Kuruman occurred during the reign of Molehabangwe. This period in the history of the Thlaping was seen as a period of wealth and power, and at the time they even had control of the *sibello* quarry near Blinkklip (Legassick, 2010). Important farmer period Iron Age remnants occur at the major Tswana town and pre-colonial stone-walled settlements of Dithakong. Local BaThlaping communities claimed not to have known who had made or lived in this earlier town but archaeological investigations have established Tswana affinities in the earlier settlement which includes features indicative of frontier complexity at this south-western edge of Tswana expansion. Early traveller accounts refer to an impressively large town consisting of mud houses, traces of which have yet to be located archaeologically.

4.2.5 Pastoralism and the last 2000 years

Until 2000 years ago, hunter-gatherer communities traded, exchanged goods, encountered and interacted with other hunter-gatherer communities. From about 2000 years ago the social dynamics of the Southern African landscape started changing with the immigration of two 'other' groups of people, different in physique, political, economic and social systems, beliefs and rituals. One of these groups, the Khoekhoe pastoralists or herders entered Southern Africa with domestic animals, namely fat-tailed sheep and goats, travelling through the south towards the coast. They also introduced thin-walled pottery common in the interior and along the coastal regions of Southern Africa. Their economic systems were directed by the accumulation of wealth in domestic stock numbers and their political make-up was more hierarchical than that of the hunter-gatherers.

4.2.6 Later History: The Colonial Period

Between the period of 1786 – 1795 a German deserter by the name of Jan Bloem established himself at Tsantsabane (Blinkklip) (Legassick, 2010). This place is located 5km north-east of the present-day town of Postmasburg. The settlement of Jan Bloem at the specularite mine may have been a way in which to control the valuable site and any trading activities associated with it. The first known visit to this area by European explorers (i.e. excluding European renegades and fugitives such as Jan Bloem) took place in 1801. The journey was undertaken by P.J. Truter and Dr. W. Somerville. They crossed over the Orange River in the vicinity of Prieska, and passed Blinkklip on their way to present-day Kuruman (Bergh, 1999). Although their exact route is not known, it is possible that their journey from present-day Postmasburg to Kuruman would have passed some distance to the east of the present study area. William Anderson and Cornelius Kramer, both of the London Missionary Society, established a mission station at a place called Leeuwenkuil between 1802 to 1813. The focus of their work was a group known as the Bastards. This group could be described as a cultural conglomeration descending not only from relationships between different cultures and races (i.e. European and Khoi), but also comprised remnants of Khoi and San groups as well as freed slaves. The particular group later became known as the Griqua. Due to the problems caused by the presence of lions at Leeuwenkuil, the mission station was moved in 1805 to Klaarwater. On 7 August 1813 the name of the settlement which had sprung up here was renamed Griquatown. This came about as a result of a number of proposals made by Reverend John Campbell, the Director of the London Missionary Society who was visiting the mission stations from this area at the time. He suggested that “...*the Bastards change their name to ‘Griqua’ and that Klaarwater became Griquatown. This was because ‘on consulting among themselves they found a majority were descended from a person of the name Griqua’...*” (Legassick, 2010). Griquatown is located 129km south of the present study area. Later, the German explorer Martin Hinrich Carl Lichtenstein travelled through the general vicinity of the study area. After crossing the Orange River in the vicinity of present-day Prieska, Lichtenstein’s party visited present-day Danielskuil, and by June 1805 they were at Blinkklip (Postmasburg), a well-known source for obtaining specular haematite. Archaeological investigations at Blinkklipkop (also known as Nauga) established a date of AD 800 for the

utilization of this particular rich source (Thackeray, et al 1983). From here they travelled further north and reached the Kuruman River where they met Tswana-speaking people. They followed the river downstream for three days, after which they followed a tributary to reach Lattakoe. From here they turned south and reached the Orange River on 11 July 1805. While on his way to the Kuruman River (and to the south thereof), Lichtenstein visited a small settlement consisting of “...about thirty flat spherical huts.” Although the people staying here were herdsmen who looked after the cattle of richer people living on the Kuruman River, they indicated that San (Bushmen) were also present in the area (Lichtenstein, 1930). Although Lichtenstein was certainly not the first European explorer to travel through this area (the Truter & Somerville expedition had for example passed through this area in 1801), or for that matter the last (Burchell travelled through the area in 1811 followed by John Campbell in 1813) (Bergh, 1999), Lichtenstein did leave behind a written record of this journey providing a valuable glimpse into the early history of the general surroundings of the study area. What is also significant about the visit of Lichtenstein is that his journey took him from present-day Postmasburg to a place known as Tsenin which is located north-west of Kuruman. As a result he would have passed in close proximity to the present study area.

During 1813 John Campbell of the London Missionary Society also visited the general vicinity of the study area. He arrived at Klaarwater on 9 June 1813, where he rested for a few days before continuing in a northern direction toward present-day Kuruman, passing through Blinkklip on the way (Bergh, 1999). Robert Moffat of the London Missionary Society established the mission station at Kuruman in 1824 (Erasmus, 2004). In 1885, the area between the Molopo River and the northern boundary of Griqualand West was proclaimed as the Crown Colony of British Bechuanaland by Sir Charles Warren proclaims. Its western boundary was defined by the Molopo River and its eastern extremity reached as far as Mafeking. The proclamation followed on a military operation under Warren’s command to occupy the Boer Republics of Stellaland and Goosen. As a result the Crown Colony of British Bechuanaland included the lands of the two republics as well as the land of various Tswana groups. At the time the study area was located near the southern boundary of this newly proclaimed territory. A number of so-called “native reserves” were established in this area in 1886 as a result of the work of a commission appointed by the British rulers of the Crown Colony of British Bechuanaland. These included Deben (19.1km north-west of the study area), Gatlhose (11.5km east of the study area), Maremane (27.9km south-east of the study area), Langberg (directly south-west of the farm Sekgame) as well as Kathu (directly west of the farm Sekgame) (Snyman, 1986). The establishment of so many “native reserves” in close proximity to the study area clearly support the suggestion made earlier that the study area was centrally located in the historic and prehistoric territories of Tswana groups such as the Thlaro and Thlaping. In the same year a trader by the name of John Ryan established a shop on the farm Bishop’s Wood. This farm is located 12.1km west of the study area.

Areas south of Kathu and Kuruman played a strategic role during the Anglo-Boer and towns such as Postmasburg, situated about 100km south of Kuruman, acted as an important link between the Boer forces from Transvaal to the Cape Colony south of the Orange River, providing ammunition and horses (Snyman 1985). The oral and written history of the Northern Cape pertaining to the last centuries is relatively abundant resulting from an assimilation of local folklore and Historical sources such as missionary accounts. The Historical period commenced when pioneers (in most cases, missionaries) arrived between the nineteenth century and early twentieth century, depending on the region. Later, larger populations established villages in the area, some of which are often still occupied today. During the 1930’s some of the Tswana communities consisted of a wealth of cattle that could be used to gain capital and purchase additional land. The Khoisan and Khoikhoi communities were not so lucky, because they were mostly used as labourers at various Tswana and European households (Wylie 1989).

The area known as Griqualand West was first ‘roughly’ surveyed by F. Orpen and W. Stow in 1872. During the Webley et al. (2010) survey of 20 farms to the west of Macarthy it was discovered that they were all surveyed and beaconsed between the years 1904 – 1911. This is very late when compared to the rest of the country. Many of the farm buildings are made of calcrete blocks and a fair percentage of farms have family graveyards.

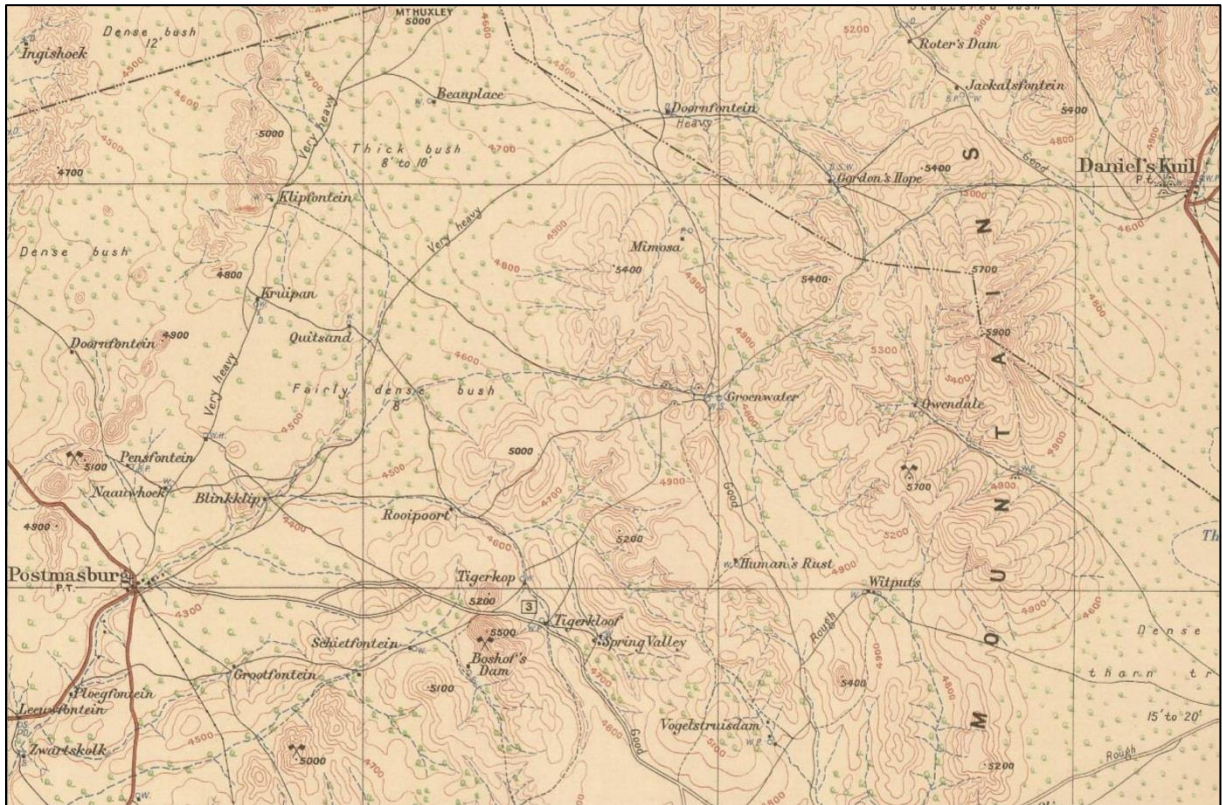


Figure 4-4: An archive map dating to 1904 of the Postmasburg and Danielskuil area.

In 1907 a number of trekboers from the southern Free State arrived in the general vicinity of the present study area (Erasmus, 2004) and the so-called “Native Locations” of Skeyfontein and Groenwater were established by Proclamation 131 of 1913 (Breutz, 1963). The town of Dibeng was laid out in 1914 on the banks of the Ga-Mogara River. This followed on the establishment of the Dibeng Dutch Reformed Church parish in 1909 (Erasmus, 2004). In 1927, the Gamagara Manganese Corporation Ltd and Central Manganese Ltd obtained options on farms in the vicinity of Lomoteng and Sishen (Snyman, 1988). An extension of the railway line from Koopmansfontein to Postmasburg was officially opened by the Minister of Railways, C.W. Malan in 1930. This meant that Postmasburg was now one of the few towns in the Northern Cape which boasted a direct rail link. While the extension of the railway line to Beeshoek was built by the Manganese Corporation further extensions to Lohatla and Manganore (1936), Sishen (1953) and Hotazel (1961) were undertaken by the South African Railways (Snyman, 1983). During 1930 an Englishman by the name of Pringle-Smith was appointed by S.A. Manganese to devise and execute a “...thorough prospecting programme of S.A. Manganese’s properties...” (S.A. Manganese, 1977:46). This meant that the prospecting work undertaken in 1927 and which had been halted due to the poor financial climate and the lack of a railway link could now be proceeded with. Within a relatively short spate of time Pringle-Smith started opening up the beds on the farms Kapstewel and Doornput. However, the company did not have the market which for example the Manganese Corporation possessed at the time, and as a result the ore was stockpiled at these two farms. Pringle-Smith left the Postmasburg area in 1932 after the

financial implications of the Great Depression worsened the situation for S.A. Manganese to such an extent that he was asked to agree to a much lower salary (S.A. Manganese, 1977). Due to the financial impacts of the Great Depression, a number of smaller manganese mining companies were closed down in the early 1930s. A period of amalgamation followed which resulted in the South African Manganese Limited as well as the Associated Manganese Miners of South Africa Limited becoming the leaders in the manganese mining industry (Snyman, 1983).

A geological assessment of the minerals and ore deposits of the Postmasburg District was undertaken by the South African Geological Survey between 1932 and 1937. One member of the geological team was Dr Leslie Gray Boardman. His responsibility was to work on manganese and haematite deposits in the district. Apart from the manganese deposits near Postmasburg, Dr Boardman also identified large deposits of iron ore deposits on farms along the northern end of their area of study including Sishen, Bruce and King (S.A. Manganese, 1977). These three farms are located 3.4km, 3.5km and 12.9km south of the present study area. After the willingness of the South African Railways Administration to extend the railway line from Postmasburg to Kapstewel and Lohatla became known, the entire manganese industry north of Postmasburg changed for the better. An example of this was that S.A. Manganese stepped up operations on the farm Kapstewel. The work here was overseen by Captain T.L.H. Shone (S.A. Manganese, 1977). The promise of railway extensions to this area also resulted in other mining activities such as the establishment of a mining company by the name of Gloucester Manganese. This company was established to mine the manganese deposits on the farm Gloucester. Shortly thereafter an amalgamation took place between Gloucester Manganese and the Manganese Corporation which resulted in the formation of the Associated Manganese Mines of South Africa Limited (Ammosal). Ammosal re-erected the old ore handling plant from Beeshoek on the farm Gloucester and the operations here represented a large portion of the total manganese production of 250,000 tons (S.A. Manganese, 1977).

During the late 1940s the decision was made by two of the bigger role players in the manganese mining industry around Postmasburg for the mining of haematite iron ore to commence in earnest. S.A. Manganese in conjunction with the African Metals Corporation (Amcor) established a new company known as Manganore Iron Mining Ltd. to work on the iron ore deposits owned by them. These deposits were *inter alia* located on the farms Klipfontein, Kapstewel and Doornput (S.A. Manganese, 1977). All three these farms are located roughly 45km south of Sishen. At around 1950, Dr. L.G. Boardman was assessing the ore reserves at Manganore and Lohathla as well as the farm Lilyveld for S.A. Manganese. He found that the latter farm contained large quantities of haematite iron ore and persuaded the directors of S.A. Manganese to acquire the farm (S.A. Manganese, 1977). In 1953 Iscor commenced iron production at Sishen (Snyman, 1983). In the same year the railway line from Postmasburg to Sishen was extended to haul ore to Iscor's plants in Pretoria, Vanderbijlpark and Newcastle (Erasmus, 2004). In 1973 a second mine was opened at Sishen to supply export iron ore to Saldanha Bay. During the same year the town of Kathu was established to accommodate employees for the new mine (Erasmus, 2004). The 860km long Sishen-Saldanha railway line was completed in 1977 and the town of Kathu received municipal status in 1980 (Erasmus, 2004). 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).

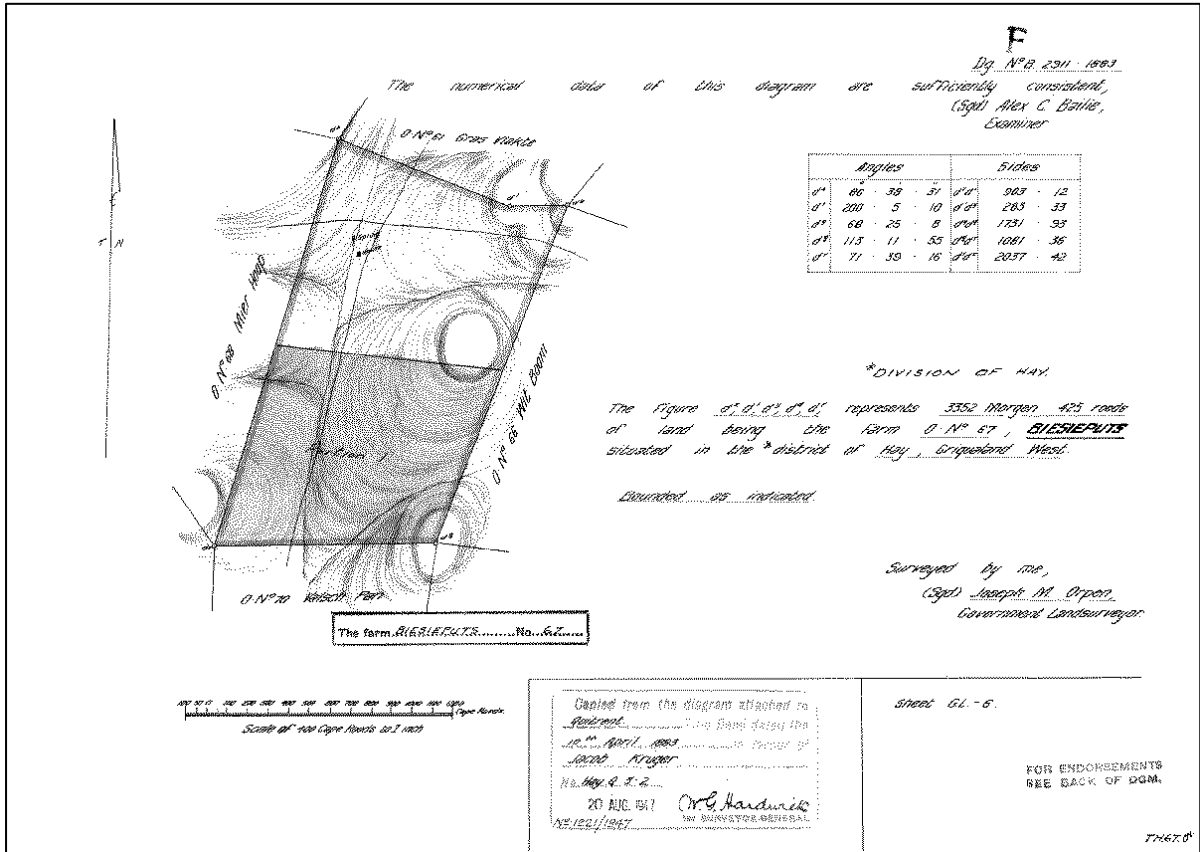


Figure 4-5: Title deed for the farm Biesieputs c.1883.

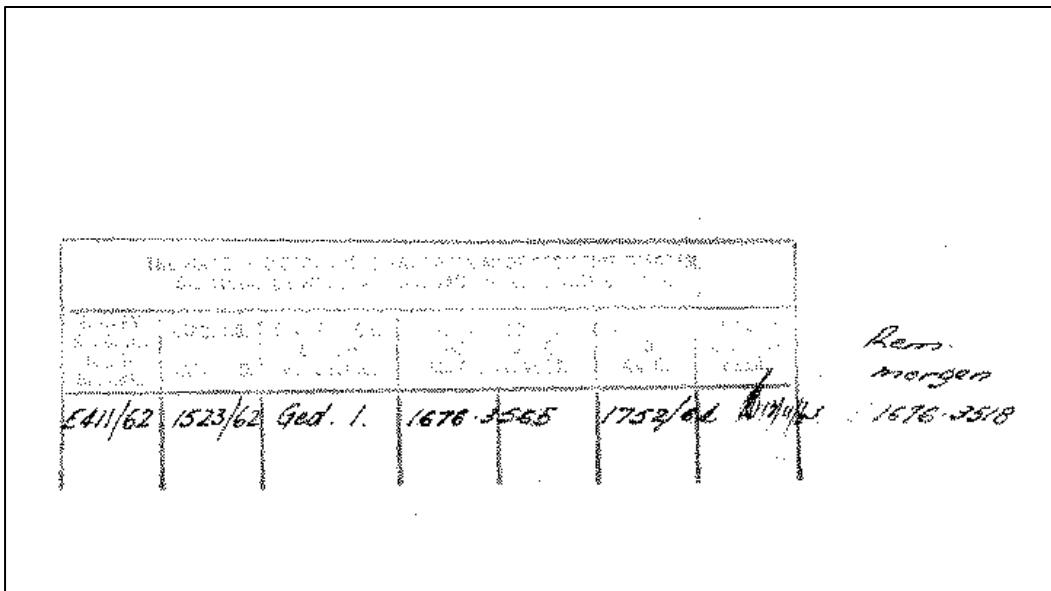


Figure 4-6: Title deed information for the farm Biesieputs c.1883.

5 RESULTS: ARCHAEOLOGICAL SURVEY

As noted above, Stone Age material and other heritage receptors occur abundantly in the landscape around Postmasburg. The presence of Stone Age people in the landscape can probably be attributed to the abundance of locally available raw material for the manufacture of stone tools. During the site survey, Stone Age material was documented and the density of the scatters were arbitrarily estimated by placing a one-meter drawing frame, sub-divided into quadrants, on a randomly-selected area displaying higher amounts of surface lithics. By plotting the counts of all lithic elements present in the 1x1 metre square relative density per m² was established and rated on a scale of low (<10), medium (10-20) and high (>20). This method has been adapted as expedient and non-invasive sampling technique that is particularly useful in value assessment of lithic occurrences during Phase 1 AIA's (see Van Der Ryst 2012). As for the rest of the project area, the survey subject to this assessment identified one site of Historical value. These sites were uniquely coded Exigo-BP-SA xx (Exigo Biesieputs Prospecting Stone Age xx) and Exigo-BP-HP xx (Exigo Biesieputs Prospecting Historical Period xx).

5.1 The Stone Age

- **Site Exigo-BP-SA01 (S28.520248° E22.818947° - north, S28.542110° E22.816982° - south)**

A large distribution of Middle Stone Age (MSA) material occurs along the rim of the seepage and wetland areas toward the west of the property of where precipitation and groundwater have exposed the stone tools, originally deposited in a decomposing calcrete rock layer. Here, the superficial geology is a thin and patchy covering of Hutton Sands overlying massive calcrete. Formal tools such as points, broken blades, and scrapers as well as a number of cores, produced on fine grained raw materials were noted. Preliminary examinations of some of the lithics which occurs in medium densities in places indicated that flakes displayed faceted platforms, characteristic of the MSA. Prepared cores show evidence of the use of the Levallois technique, where surfaces on the core are shaped in order to generate a specific formal tool when flaked from the core. Use wear and marks and secondary retouch are clearly visible on formal tools and a number of tools show signs of secondary retouch and in some instances cores display peripheral preparation. Artefacts are generally made from locally available fine-grained materials such as ironstone, indurated shale and jasperlite. The location of the scatter corresponds with a general Stone Age site distribution pattern in the area where archaeological sites in the landscape occur near water sources such as rivers and pans or close to local sources of highly-prized raw materials in lithic manufacture. Previous research by the McGregor Museum in Kimberly attributed related occurrences in the area to the Middle Stone Age (e.g. Beaumont & Morris 1990), dating to between 200 000 and 20 000 YBP.

The Stone Age representations at this site are of interest due to the higher density of the scatters in places and it is rated as of medium scientific value and potential and a specialist analysis of lithics from the site might provide a further understanding of the development and spread of the MSA in the Northern Cape and the Postmasburg Landscape.



Figure 5-1: View of calcrete exposures to the north of Site Exigo-BP-SA01.



Figure 5-2: View of calcrete exposures to the south of Site Exigo-BP-SA01.



Figure 5-2: Broken MSA points from Site Exigo-BP-SA01.



Figure 5-2: MSA side scrapers from Site Exigo-BP-SA01.



Figure 5-3: Large MSA core tools from Site Exigo-BP-SA01.

- **Site Exigo-BP-SA02 (S28.546416° E22.841190°)**

Another scatter of MSA lithic occurrences were identified along the south eastern border of the property, again where natural elements such as precipitation and groundwater have exposed the stone tools within a decomposed subsurface calcrete rock layer and there seems to be some mixing of an earlier MSA assemblage with a few lithics from the more recent LSA utilization but the individual artefacts show a predominant MSA signature. Preliminary examinations of the lithics, which includes chunks, utilised flakes and side scrapers as well as adzes and core tools indicate that a number of the flakes display faceted platforms, characteristic of the MSA. Use wear and marks are clearly visible on formal tools. The raw material used in the production of the lithics is mostly hornfels and shale, known to have been a favoured raw material for making stone artefacts. Stone Age tools made from these materials on many throughout the Northern Cape as a desirable raw material which was targeted by LSA people for its superior flaking qualities. These open-air collections probably represent a palimpsest of visits by prehistoric groups up to the LSA.

The Stone Age representations are of interest due to the higher density of the scatters in places and it is rated as of medium scientific value and potential and a specialist analysis of lithics from the site might provide a further understanding of the development and spread of the MSA in the Northern Cape and the Postmasburg Landscape.



Figure 5-4: View of surface stone scatters and calcrete exposures at Site Exigo-BP-SA02.



Figure 5-5: MSA scrapers and core tools from Site Exigo-BP-SA02.



Figure 5-6: MSA scrapers and blades from Site Exigo-BP-SA02.



Figure 5-7: View of MSA lithics from Site Exigo-BP-SA02.



Figure 5-8: MSA scrapers from Site Exigo-BP-SA02

5.2 The Iron Age Farmer Period

A frontier zone between in the later Iron Age and Colonial times, the Northern Cape Province landscape holds remnants of precolonial Iron Age Farmer Period remnants. However, the site inspection produced no Iron Age farmer sites.

5.3 Historical / Colonial Period and recent times

Postmasburg and its surroundings have a long and extensive Colonial Period settlement history. From around the first half of the 19th century, the area was frequented by explorers, missionaries and farmers who all contributed to a recent history of contact and conflict. The remnants of recent occupation and mining are scattered across the landscape but no Historical / Colonial Period occurrences were observed in the project areas. In terms of the built environment, the project area has no significance, as there are no old buildings, structures, or features, old equipment, public memorial or monuments in the project area.

- Site Exigo-BP-HP01 S28.519281° E22.821443°

The Biesieputs farmstead occurs along the western boundary of the property and the project area. Here, a farmhouse and outbuildings were constructed out of plastered up brick with pitched corrugated iron roofs and wooden window frames and doors in places. An analysis of historical topographical maps and aerial photographs indicate the presence of the farmstead from at least 1955 and the buildings are thus older than 60 years and generally protected under the National Heritage Resource Act (NHRA 1999). The site

might afford a better understanding of architectural, settlement and social developments in the Postmasburg landscape and it is of medium heritage significance.



Figure 5-9: View of the Biesieputs farmhouse at Site Exigo-ZPM-CP03.



Figure 5-14: Aerial imagery of the Biesieputs farmstead dating to 1955 (bottom) and 2010 (top).

5.4 Graves

No graves of human burial places were noted during the site investigation. In the rural areas of the Northern Cape Province graves and cemeteries often occur within settlements or around homesteads but they are also randomly scattered around archaeological and historical settlements. The probability of informal human burials encountered during development should thus not be excluded. Should any unmarked human burials/remains be found during the course of construction, work in the immediate vicinity should cease and the find must immediately be reported to the archaeologist, or the South African Heritage Resources Agency (SAHRA). Under no circumstances may burials be disturbed or removed until such time as necessary statutory procedures required for grave relocation have been met.

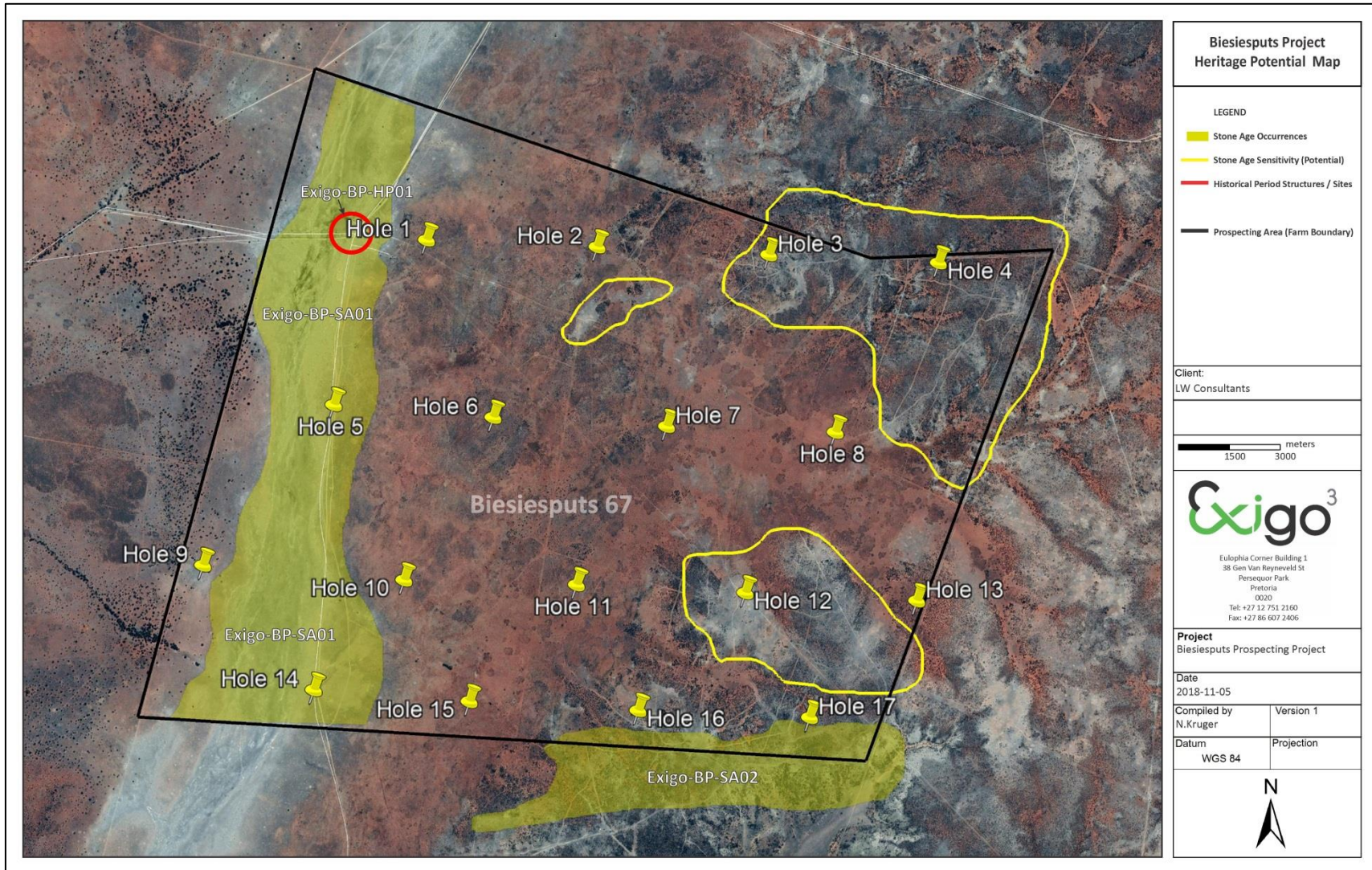


Figure 5-15: Aerial map indicating the location of sites discussed in the text.

6 RESULTS: STATEMENT OF SIGNIFICANCE AND IMPACT RATING

6.1 Potential Impacts and Significance Ratings³

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. A guideline for the rating of impacts and recommendation of management actions for areas of heritage potential within the study area is supplied in Section 10.2 of the Addendum.

6.1.1 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.

6.1.2 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 (refer to Section 10.3 in the Addendum for an outline of the relationship between the significance of a heritage context, the intensity of development and the significance of heritage impacts to be expected).

The following table summarizes impacts to MSA sites at **Site EXIGO-BP-SA01** and **Site EXIGO-BP-SA02** of **medium** significance located within the project area.

NATURE OF IMPACT: Impacts could involve displacement or destruction of heritage structures or features in the proposed Project area.		
	Without mitigation	With mitigation
EXTENT	Local	Local
DURATION	Permanent	Permanent
MAGNITUDE	Major	Minor
PROBABILITY	Probable	Negligible
SIGNIFICANCE	Medium	Low
STATUS	Negative	Neutral
REVERSIBILITY	Non-reversible	Non-reversible
IRREPLACEABLE LOSS OF RESOURCES?	Yes	No

³ Based on: Winter, S. & Baumann, N. 2005. *Guideline for involving heritage specialists in EIA processes: Edition 1.*

CAN IMPACTS BE MITIGATED?	N.A
MITIGATION: Avoidance, Phase 2 Specialist site analysis, site monitoring by ECO, procedure for chance finds, destruction permitting.	
CUMULATIVE IMPACTS: No cumulative impact is anticipated.	
RESIDUAL IMPACTS: n/a	

The following table summarizes impacts to the Historical Period heritage structure at **Site EXIGO-BP-HP01** of **medium** significance located in close proximity of the project area.

NATURE OF IMPACT: Impacts could involve displacement or destruction of heritage structures or features in the project area.		
	Without mitigation	With mitigation
EXTENT	Local	Local
DURATION	Permanent	Permanent
MAGNITUDE	Major	Minor
PROBABILITY	Probable	Negligible
SIGNIFICANCE	Medium	Low
STATUS	Negative	Neutral
REVERSIBILITY	Non-reversible	Non-reversible
IRREPLACEABLE LOSS OF RESOURCES?	Yes	No
CAN IMPACTS BE MITIGATED?	N.A	
MITIGATION: Avoidance, Site monitoring by ECO, Site Management.		
CUMULATIVE IMPACTS: No cumulative impact is anticipated.		
RESIDUAL IMPACTS: n/a		

6.1.3 Discussion: Evaluation of Results and Impacts

A large number of archaeological and historical studies have been conducted in the larger Postmasburg and Kathu areas, inferring a rich and diverse archaeological landscape. The farm Biesieputs has remained largely pristine over past decades and heritage receptors occur on the property. In addition, cognisance should be taken of previously undetected archaeological material that might be present in sub-surface deposits.

6.1.4 Archaeology

MSA stone tools were documented on Biesieputs. In places, the tools occur in larger quantities where the presence of diagnostic formal tools was noted and these occurrences are of medium significance. IN addition, it is highly likely that Stone Age material will occur elsewhere n the property in association with calcrete exposures and water sources. As such, potential impact on these Stone Age occurrences is likely to occur and it might be anticipated that drilling holes 3, 4, 5, 12, 13 and 14 specifically could impact directly on Stone Age sites. In terms of the area’s Stone Age it is important to note a concern raised by Morris (2014: unpagged) that a “consistent issue in the assessment of the presence or absence of archaeological

deposits in and around Kathu ... is the fact that the landscape is often capped by (1) calcrete (not uniformly ancient – Walker et al 2013) and (2) younger Gordonia Formation Aeolian sands (Almond 2014)". That subsurface archaeological remains may occur under overlying soils and calcretes should be taken into account when archaeological and heritage surveys are undertaken.

6.1.5 Built Environment

A number of Historical Period buildings and contemporary farmsteads occur in the landscape around Postmasburg and the Biesieputs farmstead occurs in the property, dating to the early 20th century. The site is older than 60 years and it is generally protected under the NHRA. The site will probably not be directly impacted by proposed prospecting activities but cognisance should be taken of potential indirect impact on the sites over the long term. As for the rest of the project area, the general landscape holds significance in terms of the built environment as the area comprises historical farming remnants and relatively newly established mining areas.

6.1.6 Cultural Landscape

Even though the larger Kathu area north of Postmasburg comprises a rich cultural landscape, pockets of the landscape around the proposed project area has been transformed by mining and prospecting development. Further away from the project area, the landscape is typical of the Northern Cape Kalahari, with large flat parcels with deep Hutton sands, areas of undulating hills, large mountains to the west and flatter plains in-between. This landscape stretches over many kilometres and the proposed project is unlikely to result in a significant impact on the landscape.

6.1.7 Graves / Human Burials Sites

No human burials were documented in the project area and no impact on human remains is foreseen. In the rural areas of the Northern Cape Province graves and cemeteries often occur within settlements or around farmsteads in family burial grounds but they are also randomly scattered around archaeological and historical settlements. The probability of additional and informal human burials encountered during development should thus not be excluded. In addition, human remains and burials are commonly found close to archaeological sites; they may be found in "lost" graveyards, or occur sporadically anywhere as a result of prehistoric activity, victims of conflict or crime. It is often difficult to detect the presence of archaeological human remains on the landscape as these burials, in most cases, are not marked at the surface. Human remains are usually observed when they are exposed through erosion. In some instances packed stones or rocks may indicate the presence of informal pre-colonial burials. If any human bones are found during the course of construction work then they should be reported to an archaeologist and work in the immediate vicinity should cease until the appropriate actions have been carried out by the archaeologist. Where human remains are part of a burial they would need to be exhumed under a permit from either SAHRA (for pre-colonial burials as well as burials later than about AD 1500). Should any unmarked human burials/remains be found during the course of construction, work in the immediate vicinity should cease and the find must immediately be reported to the archaeologist, or the South African Heritage Resources Agency (SAHRA). Under no circumstances may burials be disturbed or removed until such time as necessary statutory procedures required for grave relocation have been met

Heritage resources of medium significance occur within the Biesieputs Prospecting Project area. The intensity of impact on the general heritage landscape is considered to be moderate but it is the opinion of the author of this Archaeological Impact Assessment Report that the proposed project may proceed from a culture resources management perspective, provided that mitigation and management measures

for these sites are implemented and that no previously undetected subsurface heritage remains are encountered during prospecting.

6.2 Management actions

Recommendations for relevant heritage resources management actions are vital to the conservation of heritage resources. A general guideline for recommended management actions is included in Section 10.4 of the Addendum.

OBJECTIVE: prevent unnecessary disturbance and/or destruction of previously undetected heritage receptors.

For MSA lithic occurrences (Site EXIGO-BP-SA01, Site EXIGO-BP-SA02) of medium significance the following are required in terms of heritage management and mitigation:

PROJECT COMPONENT/S	All phases of construction and operation.		
POTENTIAL IMPACT	Damage/disturbance to sites and subsurface features and deposits.		
ACTIVITY RISK/SOURCE	Digging foundations and trenches into sensitive deposits that are not visible at the surface.		
MITIGATION: TARGET/OBJECTIVE	To conserve the historical fabric of the sites and to locate undetected heritage remains as soon as possible after disturbance so as to maximize the chances of successful rescue/mitigation work.		
MITIGATION: ACTION/CONTROL	RESPONSIBILITY	TIMEFRAME	
Preferred Mitigation Procedure			
Avoidance: Implement a heritage conservation buffer of at least 50m around the heritage receptors, where possible move prospecting drilling holes to avoid the heritage resources and the proposed conservation buffer.	DEVELOPER QUALIFIED HERITAGE SPECIALIST	Prior to the commencement of construction and earth-moving.	
Alternative Mitigation Procedure (if preferred mitigation procedure is not feasible)			
Phase 2 Assessment: Site sampling, artefact collection analysis by a qualified Stone Age archaeologist if sites are impacted on. Subject to collection and excavation permitting. Destruction Permitting: Apply for relevant destruction permits from heritage authorities if sites are impacted on.	SUITABLY QUALIFIED HERITAGE SPECIALIST	Prior to the commencement of construction and earth-moving.	
Fixed Mitigation Procedure (required)			
Site Monitoring: Regular examination of trenches and excavations by a qualified Stone Age Specialist.	SUITABLY QUALIFIED HERITAGE SPECIALIST	Monitor as frequently as practically possible.	
PERFORMANCE INDICATOR	Archaeological sites are discovered and mitigated with the minimum amount of unnecessary disturbance.		
MONITORING	Successful location of sites by person/s monitoring.		

For the Biesieputs Historical Period farmstead (Site EXIGO-BP-HP01) of low significance within the project area the following are required in terms of heritage management and mitigation:

PROJECT COMPONENT/S	All phases of construction and operation.		
POTENTIAL IMPACT	Damage/destruction of sites.		
ACTIVITY RISK/SOURCE	Vibrations and dust which might impact on the sites over the long terms.		
MITIGATION: TARGET/OBJECTIVE	To detect negative impact on heritage remains / structures as soon as possible after disturbance so as to maximize the chances of successful rescue/mitigation work.		
MITIGATION: ACTION/CONTROL	RESPONSIBILITY	TIMEFRAME	
Fixed Mitigation Procedure (required)			
Avoidance: Implementation of 100m conservation buffer around sites. Site Monitoring: Regular examination of structures and features to detect potential short term / long term impacts at the earliest opportunity. Site Management: Implementation of site management plans detailing conservation measures for the sites in order to avoid long term direct / indirect impact on the sites.	ECO HERITAGE PRACTITIONER	Monitor as frequently as practically possible.	
PERFORMANCE INDICATOR	Archaeological sites are discovered and mitigated with the minimum amount of unnecessary disturbance.		
MONITORING	Successful location of sites by person/s monitoring.		

7 RECOMMENDATIONS

The proposed Biesieputs Prospecting Project is situated in a rich cultural landscape. The Kathu Pan, Kathu Townlands and Bestwood Stone Age sites near Kathu north of Postmasburg are of notable scientific significance and other heritage sites, spanning from at least 1.5 million years to very recent historical periods occur in the area. Locally, Stone Age material occurs abundantly on the farm Biesieputs and the following recommendations provide an outline for the management of the heritage landscape around the proposed Biesieputs Prospecting Project Area:

- A Palaeontological Assessment should be considered for the development. Should fossil remains such as fossil fish, reptiles or petrified 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.
- Two larger scatters of MSA material (**Site EXIGO-BP-SA01, Site EXIGO-BP-SA02**) were documented on Biesieputs. In places, the tools occur in larger quantities where the presence of diagnostic formal tools was noted and these occurrences are of medium significance. In addition, it is highly likely that Stone Age material will occur elsewhere on the property in association with calcrete exposures and water sources. As such, potential impact on these Stone Age occurrences is likely to occur and it might be anticipated that drilling holes 3, 4, 5, 12, 13 and 14 specifically could impact directly on Stone Age sites and it is primarily recommended that the locations of these holes be reconsidered in order to avoid impact on the sites. Here, a conservation buffer of at least 50m should be maintained around identified Stone Age scatters. However, should this mitigation

measure prove unachievable it is recommended that these sites be subject to Phase 2 mitigation conducted by a professional archaeologist with experience in Stone Age archaeology, preferably a specialist that understands the archaeology of the area. A permit in terms of Section 35 of the NHRA (Act No 25 of 1999) will have to be obtained from the responsible heritage authority

- The Biesieputs farmstead associated buildings (**Site EXIGO-BP-HP01**) on the property is of medium significance as the site has the potential to inform on architectural, settlement and social developments in the Postmasburg heritage landscape. Even though the farmstead occur outside indicated prospecting impact areas, it is essential that long-term conservation of structures at the sites be ensured. It is primarily recommended that a conservation buffer of at least 100m be maintained around the sites. The respective sites should be monitored on a frequent basis by a heritage specialist or an informed ECO in order to detect any short / long term impacts on the features at the earliest opportunity. The details of management and monitoring measures and protocols should be detailed in a heritage site management plan for each of the sites. Heritage site management involves the control of elements that make up the physical and social environment of a site and that have an effect on it. It is also recommended that the general landscape around the farmstead and the site conservation buffer zones be monitored by an informed ECO in order to avoid the destruction of previously undetected heritage remains
- Lastly, should any subsurface paleontological, archaeological or historical material or heritage resources be exposed during construction activities, all activities should be suspended and the archaeological specialist should be notified immediately. 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. Should any subsurface paleontological / archaeological / historical material and /or graves/human remains be uncovered, all activities should be suspended and the archaeological specialist should be alerted immediately. It should be noted that mitigation measures are valid for the duration of the development process, and mitigation measures might have to be implemented on additional features of heritage importance not detected during this Phase 1 assessment (e.g. uncovered during the construction process).

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

- As Palaeontological remains occur where bedrock has been exposed, all geological features should be regarded as sensitive.
- Water sources such as drainage lines, fountains and pans would often have attracted human activity in the past. As Stone Age material the larger landscape should be regarded as potentially sensitive in terms of possible subsurface deposits.

8 GENERAL COMMENTS AND CONDITIONS

This AIA report serves to confirm the extent and significance of the heritage landscape of the proposed Biesieputs Prospecting Project 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.
- Formal MSA stone tools.
- Formal LSA stone tools.
- Potsherds

- Iron objects.
- Beads made from ostrich eggshell and glass.
- Ash middens and cattle dung deposits and accumulations.
- 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 AMAFA, SAHRA, the National Resources Act and the CRM section of ASAPA will be required.

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 (SAHRA).

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10 ADDENDUM 1: HERITAGE LEGISLATION BACKGROUND

10.1 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.

10.1.1 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.

d. 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-

- (d) *destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;*
- (e) *destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;*

- (f) *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*
- (g) *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-

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

e. 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.

10.1.2 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 of 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 m² 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 m² 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:

- (k) The identification and mapping of all heritage resources in the area affected;*
- (l) 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;*
- (m) an assessment of the impact of the development on such heritage resources;*
- (n) 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;*
- (o) the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;*
- (p) if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and*
- (q) 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 aesthetics, 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. Heritage resources management and conservation

10.2 Assessing the Significance of Heritage Resources

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.

- 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 (MP-PHRA).
- 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 60 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.

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

11 ADDENDUM 2: CONVENTIONS USED TO ASSESS THE SIGNIFICANCE OF HERITAGE

11.1 Site Significance Matrix

According to the NHRA, Section 2(vi) the **significance** of heritage sites and artefacts is determined by its aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technical value in relation to the uniqueness, condition of preservation and research potential. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these. The following matrix is used for assessing the significance of each identified site/feature.

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.			
It possesses unique, uncommon, rare or endangered aspects of South Africa’s natural or cultural heritage.			
It has potential to yield information that will contribute to an understanding of South Africa’s natural and cultural heritage.			
It is of importance in demonstrating the principle characteristics of a particular class of South Africa’s natural or cultural places or objects.			
It has importance in exhibiting particular aesthetic characteristics valued by a particular community or cultural group.			
It has importance in demonstrating a high degree of creative or technical achievement at a particular period.			
It has marked or special association with a particular community or cultural group for social, cultural or spiritual reasons (sense of place).			
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.			
It has significance through contributing towards the promotion of a local sociocultural identity and can be developed as a tourist destination.			
It has significance relating to the history of slavery in South Africa.			
It has importance to the wider understanding of temporal changes within cultural landscapes, settlement patterns and human occupation.			
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]			
2.3 Sphere of Significance	High	Medium	Low
International			
National			
Provincial			

Local			
Specific community			

11.2 Impact Assessment Criteria

The following table provides a guideline for the rating of impacts and recommendation of management actions for sites of heritage potential.

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. sitespecific, local, regional, national or international) and the relationship between the heritage resource, its setting and its associations.

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.

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.

Duration

Here it should be indicated whether the lifespan of the impact will be:

- Short term, (needs to be defined in context)
- Medium term, (needs to be defined in context)
- Long term where the impact will persist indefinitely, possibly beyond the operational life of the activity, either because of natural processes or by human intervention; or
- Permanent where mitigation either by natural process or by human intervention 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.

Intensity

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; and
- High, where heritage value is altered to the extent that it will temporarily or permanently be damaged or destroyed.

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

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.

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.

11.3 Direct Impact Assessment Criteria

The following table provides an outline of the relationship between the significance of a heritage context, the intensity of development and the significance of heritage impacts to be expected

	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			
<p>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</p> <p>Context 2: Of moderate to high intrinsic, associational and contextual value within a local context, i.e. potential Grade 3B heritage resources.</p> <p>Context 3: Of medium to low intrinsic, associational or contextual heritage value within a national, provincial and local context, i.e. potential</p>	<p>Category A: Minimal intensity development</p> <ul style="list-style-type: none"> - 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. <p>Category B: Low-key intensity development</p> <ul style="list-style-type: none"> - Spot rezoning with no change to overall zoning of a site. - Linear development less than 100m 			

<p>Grade 3C heritage resources</p> <p>Context 4: Of little or no intrinsic, associational or contextual heritage value due to disturbed, degraded conditions or extent of irreversible damage.</p>	<ul style="list-style-type: none"> - 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%). <p>Category C: Moderate intensity development</p> <ul style="list-style-type: none"> - 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%) <p>Category D: High intensity development</p> <ul style="list-style-type: none"> - 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%)
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11.4 Management and Mitigation Actions

The following table provides a guideline of relevant heritage resources management actions is vital to the conservation of heritage resources.

<p>No further action / Monitoring</p> <p>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.</p> <p>Avoidance</p> <p>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.</p> <p>Mitigation</p> <p>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.</p> <p>Compensation</p> <p>Compensation is generally not an appropriate heritage management action. The main function of management actions should be to conserve the resource for the benefit of future generations. Once lost it cannot be renewed. The circumstances around the potential public or heritage benefits would need to be exceptional to warrant this type of action, especially in the case of where the impact was high.</p> <p>Rehabilitation</p> <p>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:</p> <ul style="list-style-type: none"> - 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. <p>Enhancement</p>
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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