

LW CONSULTANTS: THE PROPOSED ZEEKOEBAART 306 PRA PROJECT, ZF MGCAWU DISTRICT MUNICIPALITY, NORTHERN CAPE PROVINCE

HERITAGE SCOPING STUDY

Submitted subject to Section 38(3) and Section 38(8) of the NHRA

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HERITAGE SCOPING STUDY (HS) OF DEMARCTED AREAS ON ZEEKOEBAAR 9, FARM 1 (BOEGOEBERG WATER RESERVE), ERVEN OF BOEGOEBERG SETTLEMENT, FARMS MISSING 153, CARTER BLOCK 584, ZEEKOEBAART 306, FARM 307, FARM 308, BOVEN ZEEKOEBAART 131, ROCKSBURG 301, FARM 312 AND FARM 309 FOR THE PROPOSED ZEEKOEBAART 306 PRA PROJECT IN THE ZF MGCAWU DISTRICT MUNICIPALITY, NORTHERN CAPE PROVINCE

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I, Nelius Kruger, declare that –

- I act as the independent specialist;
- I am conducting any work and activity relating to the proposed Zeekoebaart 306 PRA 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, EC-PHRA and the CRM section of ASAPA), regulations and any guidelines that have relevance to the proposed activity;
- I have not, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this declaration are true and correct.



Signature of specialist

Name: Nelius Kruger

Date: 2 September 2023

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The Heritage Consultant promotes the conservation of sensitive archaeological and heritage resources and uncompromisingly adheres to 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). In order to ensure best practices and ethics in the examination, conservation and mitigation of archaeological and heritage resources, The Heritage Consultant follows the Minimum Standards: Archaeological and Palaeontological Components of Impact Assessment as set out by the South African Heritage Resources Agency (SAHRA) and the CRM section of the Association for South African Professional Archaeologists (ASAPA).

EXECUTIVE SUMMARY

This report details the results of a Heritage Scoping Study (HS) for the proposed Zeekoebaart 306 PRA Project on Zeekoebaart 9, Farm 1 (Boegoeberg Water Reserve), Erven of Boegoeberg Settlement, farms Missing 153, Carter Block 584, Zeekoebaart 306, Farm 307, Farm 308, Boven Zeekoebaart 131, Rocksburg 301, farm 312 and Farm 309 in the ZF Mgcawu District Municipality, Northern Cape Province. The project entails prospecting for Manganese, Iron, Copper, Chrome, Tin, Tungsten, Zink, Cobalt, Silver and Sphalerite within the boundaries of the project area which totals **23000ha** in surface extent. The report includes background information on the area's archaeology, its representation in Southern Africa, and the history of the larger area under investigation. The HS considers sites such as archaeological and historical sites and features, graves and places of religious and cultural significance and considerations are made with regards to potential impact of the proposed project on heritage resources.

Project Title	Zeekoebaart 306 PRA Project
Project Type / Scope	Prospecting
Project Impact Footprint/s Area	Prospecting Area: 23000ha
Project Location	S29.034412° E22.247109°
1:50 000 Map Sheet	2822CC, 2822CD, 2922AA, 2922AB
Farm Portion / Parcel	Zeekoebaart 9, Farm 1 (Boegoeberg Water Reserve), Erven of Boegoeberg Settlement, farms Missing 153, Carter Block 584, Zeekoebaart 306, Farm 307, Farm 308, Boven Zeekoebaart 131, Rocksburg 301, farm 312 and Farm 309
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. Archaeological artefacts are widespread throughout Bushmanland and the Karoo and generally comprise what is commonly referred to as background scatter. Other aspects of heritage encountered in the region from time to time include rock art. 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 Groblershoop 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. In terms of heritage resources, the landscape around Zeekoebaart 9, Farm 1 (Boegoeberg Water Reserve), Erven of Boegoeberg Settlement, farms Missing 153, Carter Block 584, Zeekoebaart 306, Farm 307, Farm 308, Boven Zeekoebaart 131, Rocksburg 301, farm 312 and Farm 309 is primarily well known for the occurrence of Stone Age and Colonial Period heritage. Here, heritage landscapes and sites of varied heritage significance occur - or are likely to occur within the project areas demarcated for the Zeekoebaart 306 PRA Project. Generally, heritage resources in the project area are most probably localised and spatially confined and project impact areas can easily be micro sited during the EIA phase to avoid sensitive heritage resources where necessary.

The following observations on the heritage potential of the project area are made based on desktop and site observations:

Archaeology:

- A Heritage Impact Assessment conducted by ACO associated at the Boegeboerg Dam in the project documented extensive scatters of stone artefacts likely to be from the Middle Stone Age, with a few grindstones present at one of the sites. The assessment also noted the presence of low stone walls on the south side of the Orange River and on the mountain slope, said to be probable been hunting blinds.
- Generally, in this landscape shallow soils cover a combination of calcrete, shale and dolerite substrates, and large sections in the landscape are exposed to sheet erosion, specifically along low lying areas and drainage lines. Dolerite and sandstone are present, while exotic rocks occur in the gravel of the Orange River bed and terraces. These provide suitable material for stone tool production during the Earlier, Middle and Later Stone Ages. MSA and LSA tool scatters are known to occur along water courses, pans and dry river beds and such material have been found in the project area. These tools might include formal tools such as blades, scrapers, adzes and points and microliths as well as debitage.
- Mountain crests, small hills and foothills and rock outcrops occur in the project area, for example Boegoeberg, Berg after die Huis and Wendam se Berg and Hardeberg. Occupation sites dating to the Later Stone Age (LSA) associated with Hunter Gatherers and Herders are known to occur in such locales. Here, scatters of stone artefacts such as stone tools, ostrich eggshell, fragments of pottery and beads are common. Crudely built Herder stone wall enclosures might remain in these areas. In addition, Historical Period fortifications in the form of temporary stone barricades and defenses are known to occur on low rises around Groblershoop.
- MSA and LSA tool scatters are also known to be found near outcrops and geomorphological exposures where source rock was exploited for the manufacturing of stone tools. Large boulders, frequently dolerite occurring throughout the project area, are commonly associated with Hunter Gatherer and Herder rock art in the form of engravings. In addition, stone “gongs” are often found in these areas on koppies and rocky outcrops.
- All archaeological sites and artefacts are protected under the National Heritage Resource Act (NHRA 1999) and, depending on the range, extent and integrity of site and artefact contexts, the significance of archaeological remains in the project areas might range from low to high.

Colonial / Historical Period and Built Environment:

- In this landscape, farmsteads and werfs dating to the last centuries often hold historically significant buildings and features such as farm houses, corbelled huts, sheds, stone kraals, and “dorsvloers” (threshing floors). A number of farmsteads occur in the project area, including Boegoeberg, Seekoebaard, Onder Seekoebaard, Seekoeibaardsnek and Soutputs. The ACO associates study noted that these buildings provide good examples of vernacular architecture generally rare in the project landscape. Many of these buildings have vernacular pitched roof structures with more recent additions. An analysis of historical topographical maps and aerial photographs indicate the presence of the werfs from at least 1950 and the compounds are older than 60 years and generally protected under the National Heritage Resource Act (NHRA 1999). The sites might afford a better understanding of architectural, settlement and social developments in the Brittan landscape. Highly sensitive burial sites are also known to occur around farmstead complexes. Small-scale farming and agriculture are prevalent around farmsteads in the project areas. Here, potential historical farmscapes might be encountered.
- Occasional remains of “veewagterhuise” or shepherds’ huts dating to the Colonial Period are scattered across farms in this landscape. These buildings are usually constructed out of undressed sandstone blocks and glass, rusted metal fragments, fragments of ceramics, earthenware and bone are often found in middens associated with these huts. Even though these occurrences are often poorly preserved, they might be protected under the National Heritage Resource Act (NHRA 1999) if older

than 60 years.

- Digging and / or quarrying seem to have occurred at single localities in the project area. Here, one might encounter remnants of historical mining and quarrying but the significance of such sites is not always apparent.

Cultural Landscape

- Generally, the proposed project area and its surrounds are characterized by rural Karoo and Bushmanland farmlands, flatter grass plains and low mountain vegetation. Mountains and hills on the target properties for the project are indicated on topographic maps with unique names such as "Luisdraai", "Klaar se Rant" and "Sandhoek" and other landscape features indicated, include "Wendam se Berg" and "Berg agter die Huis". In addition, the Boegeberg Dam holds a rich recent history. Cognisance should be taken of the fact that these features might hold certain intangible heritage value or they might be regarded as sites of "Living Heritage" in the cultural landscape.

Cemeteries / Burial Sites

- In their assessment, ACO associates documented an informal graveyard as well as two isolated graves or probable graves. The graveyard lies alongside the access road to Zeekoebaart and one grave is within about one metre of the edge of the road. In the sandy floodplain just downstream of the cliff where the weir is are two possible graves, one is a cement headstone seemingly propped up in the sand. Many people died during construction of the Boegoeburg Weir but it is apparently not known where they were buried
- Generally, burial sites frequently occur around farmstead complexes within family cemeteries, for example the Boegoeburg, Zeekoebaart, Onder Zeekoebaart, Zeekoebaardsnek and Soutpans farmsteads but in some instances packed stones or rocks indicate the presence of informal pre-colonial burials in this landscape. In addition, human remains and burials are often 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 therefore important to remember that 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.
- Cemeteries, burial places and graves are viewed to have a high significance and they are protected under the National Heritage Resource Act (NHRA 1999)

As a general guideline and to reduce impacts on heritage resources to a minimum, the following recommendations should be considered in the planning, implementation and management phases of the Project:

- If required by the commenting authority (SAHRA), the HS should be expanded to an integrated Phase 1 Heritage Impact Assessment (HIA) including findings of a walkdown of final project impact areas to document all sites, features and objects.
- Under no circumstances may any artefacts be removed, destroyed or interfered with by anyone on the site; and Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999), Section 51.
- The term "Living Heritage" can broadly refer to a place of cultural heritage and sacred nature; with cultural attributions that are not generally physically manifested. Ritual and symbolic spaces and practices, and the material residues thereof convey an intangible cultural significance beyond the physical site or artefact, where the meaning of the ritual area speaks directly of a sense of place and lived experience. Such sites might occur on the project area or its surroundings and due cognisance

should be taken of these sites of “Living Heritage” in the cultural landscape.

- It is recommended that all graves and cemeteries that might occur in the project surrounds be conserved and excluded from impact emanating from any future development. Where impact on such resources would prove to be inevitable, the correct human remains repatriation procedures should be observed at all times. These procedures should include public notification of intent to relocate the remains, consultation with descendant communities, close liaison with - and approval from local authorities, adherence to any local laws and / bylaws, and correct grave relocation methodologies.
- It is possible that groups, farmers and locals living in the area have occupied the region for many generations and have expressed long-term cultural associations with the region. Therefore, it is important to ascertain from these respondents whether there are any further undetected sites of cultural significance in the area to which they relate and / or attach cultural meaning.

Ultimately, it is recommended that the archaeological and cultural heritage of this part of the Northern Cape Province be respected. The management of heritage resources, as stipulated by National and International Heritage resources agencies (e.g. SAHRA) should be aligned with any future activity by means of cultural mitigation and / or management plans developed in conjunction with heritage authorities and specialists

It should be noted that this HS and site sensitivity included above are solely based on off-site desktop findings and the heritage sensitivity of the Zeekoebaart 9, Farm 1 (Boegoeberg Water Reserve), Erven of Boegoeberg Settlement, farms Missing 153, Carter Block 584, Zeekoebaart 306, Farm 307, Farm 308, Boven Zeekoebaart 131, Rocksburg 301, farm 312 and Farm 309 property remain tentative pending further detailed site inspection as part of the Heritage Impact Assessment (HIA) process, subject to section 38 of the National Heritage Resources Act (NHRA - Act 25 of 1999).

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

TABLE OF CONTENTS

EXECUTIVE SUMMARY.....	4
1 BACKGROUND	12
1.1 SCOPE AND PROJECT BRIEF	12
1.2 PROJECT DIRECTION	14
1.3 PROJECT TERMS OF REFERENCE.....	14
2 LEGISLATIVE FRAMEWORK.....	17
2.1 CRM: LEGISLATION, CONSERVATION AND HERITAGE MANAGEMENT	17
2.1.1 <i>Legislation regarding archaeology and heritage sites</i>	17
2.1.2 <i>Background to HIA and AIA Studies</i>	18
2.2 RATING OF SIGNIFICANCE	19
3 REGIONAL CONTEXT.....	20
3.1 AREA LOCATION	20
3.2 AREA DESCRIPTION: RECEIVING ENVIRONMENT	20
3.3 SITE DESCRIPTION	20
4 METHOD OF ENQUIRY.....	24
4.1 SOURCES OF INFORMATION	24
4.1.1 <i>Desktop Study</i>	24
4.1.2 <i>Remote Sensing</i>	25
4.1.3 <i>Map Data</i>	25
4.2 LIMITATIONS.....	25
5 ARCHAEO-HISTORICAL CONTEXT.....	28
5.1 THE ARCHAEOLOGY OF SOUTHERN AFRICA	28
5.2 DISCUSSION: THE GROBLERSHOOP HERITAGE LANDSCAPE.....	28
5.2.1 <i>Early History and the Stone Ages</i>	29
5.2.2 <i>Pastoralism and the last 2000 years</i>	31
5.2.3 <i>A Landscape of Rock Markings</i>	31
5.2.4 <i>Later History: Reorganization, Colonial Contact and living heritage</i>	32
6 THE ZEEKOEBAART 306 PROJECT AREA: HERITAGE SENSITIVITY AND SITE PROBABILITY.....	34
6.1 HERITAGE SENSITIVITY.....	34
6.1.1 <i>Palaeontology</i>	34
6.1.2 <i>Archaeology</i>	35
6.1.3 <i>Colonial Period and recent times</i>	36
6.1.4 <i>Graves</i>	37
6.1.5 <i>Other Sites / Features</i>	38
6.2 HERITAGE POTENTIAL AND SITE PROBABILITY	39
6.2.1 <i>Archaeology</i>	39
6.2.2 <i>Colonial / Historical Period and Built Environment</i>	40
6.2.3 <i>Cultural Landscape</i>	41
6.2.4 <i>Cemeteries and Burial Sites</i>	41
7 SITE SIGNIFICANCE AND POTENTIAL IMPACTS.....	44
7.1 GENERAL ASSESSMENT OF IMPACTS ON RESOURCES.....	44
7.1.1 <i>Direct, indirect and cumulative effects</i>	44
7.2 IMPACT RATING CRITERIA	44
7.2.1 <i>Extent</i>	44
7.2.2 <i>Duration</i>	44
7.2.3 <i>Magnitude severity</i>	44
7.2.4 <i>Probability</i>	44
7.2.5 <i>Impact Significance</i>	45
7.3 EVALUATION OF IMPACT: THE ZEEKOEBAART 306 PRA PROJECT.....	45
7.3.1 <i>Archaeology</i>	45
7.3.2 <i>Built Environment</i>	45
7.3.3 <i>Cultural Landscape</i>	45
7.3.4 <i>Graves / Human Burials Sites</i>	45

8	RECOMMENDATIONS	46
8.1	FURTHER TERMS OF REFERENCE.....	47
9	BIBLIOGRAPHY	49
10	ADDENDUM 1: HERITAGE LEGISLATION BACKGROUND	52
10.1	CRM: LEGISLATION, CONSERVATION AND HERITAGE MANAGEMENT	52
10.1.1	Legislation regarding archaeology and heritage sites.....	52
10.1.2	Background to HIA and AIA Studies.....	53
10.2	ASSESSING THE SIGNIFICANCE OF HERITAGE RESOURCES	54
	- CATEGORIES OF SIGNIFICANCE	55
11	ADDENDUM 2: CONVENTIONS USED TO ASSESS THE SIGNIFICANCE OF HERITAGE	57
11.1	SITE SIGNIFICANCE MATRIX.....	57
11.2	IMPACT ASSESSMENT CRITERIA	57
11.3	DIRECT IMPACT ASSESSMENT CRITERIA	59
11.4	MANAGEMENT AND MITIGATION ACTIONS.....	60

LIST OF FIGURES

Figure 1-1:	Aerial map indicating the project locality (green outline) subject to the Zeekoebaart 306 PRA Project.	16
Figure 3-1:	1:250 00 Map representation of the location of the proposed Zeekoebaart 306 PRA Project (sheet 2822CC, 2822CD, 2922AA, 2922AB).....	20
Figure 3-2:	1:250 00 Map representation of the location of the proposed Zeekoebaart 306 PRA Project (sheet 2822CC, 2822CD, 2922AA, 2922AB).....	21
Figure 3-2:	Map representation of the Zeekoebaart 306 PRA Project target properties.....	22
Figure 3-3:	Aerial map providing a regional context for the proposed Zeekoebaart 306 PRA Project area.....	23
Figure 4-1:	SAHRIS Map of the project area indicating current commercial projects and environmental applications lodged in the project area. The project subject to this assessment is shaded in yellow.....	24
Figure 4-2:	Historical topographic map indicating the prospecting area (black outline) within the historical landscape. Farmsteads and potential man-made structures are indicated with red circles and blue polygons indicate drainages and rivers.	26
Figure 4-3:	A historical "Map of portion of Hay" compiled by the University of Cape Town Libraries in 1905. Note that the project area indicated with the yellow block falls within the so-called "Campbell Rand Beds".	27
Figure 5-1:	Early Stone Age (Acheulian) handaxe from the Kathu Pan site (http://www.museumsc.co.za).....	29
Figure 5-2:	Typical ESA handaxe (left) and cleaver (center). To the right is a MSA scraper (right, top), point (right, middle) and blade (right, bottom).....	30
Figure 6-1:	SAHRIS Paleontological sensitivity map of the project area, indicating a moderate to low fossil sensitivity for the project area (red outline).	34
Figure 6-2:	Examples of banded ironstone artefacts (left) and typical MSA blade (right) from the larger project landscape (ACO Associates cc 2013).....	35
Figure 6-3:	Two quartzite lower grindstones from the project landscape (ACO Associates cc 2013).	35
Figure 6-3:	View of stone walling occurring in the project landscape (ACO Associates cc 2013).	36
Figure 6-3:	View of stone walling occurring in the project landscape (ACO Associates cc 2013).	36
Figure 6-4:	Views of vernacular farm houses in the landscape (ACO Associates cc 2013).....	36
Figure 6-5:	Views of vernacular farm houses and house ruins in the landscape (ACO Associates cc 2013).	37
Figure 6-6:	View of stone kraals in the landscape (ACO Associates cc 2013).....	37
Figure 6-7:	View of two informal burials in the landscape (ACO Associates cc 2013).	38
Figure 6-8:	View of a grave in the landscape (ACO Associates cc 2013).	38
Figure 6-9:	The Boegoeberg Weir during construction in 1930 (www.boegoebergcoroute.co.za).	39
Figure 6-10:	The Boegoeberg Weir during construction in 1930 (www.boegoebergcoroute.co.za).	39
Figure 6-11:	Aerial map indicating areas of heritage potential and possible heritage impacts.	43

1 BACKGROUND

1.1 Scope and Project Brief

LW Consultants, on behalf of MR Tshenolo Iron Ore Investments requested a Heritage Scoping Study (HS) study for the proposed Zeekoebaart 306 PRA Project in the Northern Cape Province. MR Tshenolo Iron Ore Investments intends to embark on prospecting activities for Manganese, Iron, Copper, Chrome, Tin, Tungsten, Zink, Cobalt, Silver and Sphalerite on Zeekoebaart 9, Farm 1 (Boegoeberg Water Reserve), Erven of Boegoeberg Settlement, farms Missing 153, Carter Block 584, Zeekoebaart 306, Farm 307, Farm 308, Boven Zeekoebaart 131, Rocksburg 301, farm 312 and Farm 309 in the Northern Cape Province. The project boundary extends over an area which totals **23000ha** in surface extent (refer to Figure 1-1).

The exploration activities on the proposed project area will be done in various phases, which will include a detailed desktop study, geophysical and surface sampling as well as Reverse Circulation Percussion and Diamond Core drilling to delineate the various commodity zones possibly underlying the property to determine minable resources.

- Phase 1

o Geological investigation

▪ Literature research

Extract all relative information on the subject area of interest via internet searches and visiting libraries of relevant universities to obtain a comprehensive background

▪ Aerial photography

Obtain the relevant photos from Mobray and/or the Council for Geo-Science of the area and by studying it, mark all the recognized outcrops for field investigations

▪ Visit surrounding mines

Try to obtain permission to visit the surrounding farms and/or mines to obtain more knowledge of what can be expected at depth regarding the geological formations and ore characteristics.

▪ Geological overview

All results obtained during the previous phases and activities are communicated and explained within the geological overview. Within this report all data is summarized with recommendations on future work planned.

▪ Detailed exploration planning

Based on the information obtained during the previous work done a prospecting plan will be drafted, which will include the preferred geophysical method to be implemented and suggested survey lines.

- Phase 2

o Geophysical survey

The method decided will be based on knowledge obtained during the desktop study and will be applied on pre-defined survey lines to demarcate the sub-outcrop/s of the ore bodies.

o Geological overview

Linear mapping will be done and the geological overview updated to confirm the outcrops delineated during the aeriels and the geophysical survey studies on possible identified outcrops not recognized earlier.

o Surface sampling

Soil and stream sampling will be done to obtain the locality of the sub-outcrop/s of the Lower Critical Zone on the property. Sampling will be done according the specifications as set out in the Prospecting plan mentioned earlier.

o Sample analyses

Samples taken during the soil and stream sampling exercise are analysed for the applied commodities to identify the possible extent of the ore body down dip.

- Progress Report

A comprehensive report will be drafted as part of the annual report of the DMR&E and possible early investor.

- **Phase 3**

- Drilling

The number of drill holes are not known at present, but is not foreseen to be more than 30 holes initially, as it can only be determined once the area underlain by the Critical Zone is known. The drill hole spacing and depth (for calculation purposes an estimation of 100 m is used) are also dependent on the geometry of the underlying commodity band/s, as well as the underlying geological structure/s.

Drill will be as follows:- RC drilling will be done from surface to penetrate through the overburden where after the hole will be cased and the formations containing the commodity layers will be core drilled. The drilling will be done according the procedures as stipulated by ISO for ore resource determination.

- Logging and sampling

All drill holes will be logged every meter containing information such as hole locations, hole depth, ore depth and other geological structures encountered within the hole. The drill chips/core samples will be taken and stored within the appropriate containers and safeguarded for future referencing.

Portions of the drill chips/core representing the ore will be taken and placed in bags for sample analyses. Each sample will be marked with the hole number and the sample number. The sample number will also appear on the hole's log sheet for accuracy purposes of the programme and results to be obtained.

- Rehabilitation

Rehabilitation will be done as suited for both percussion and core drilling. Each hole will be cased and sealed, before the drilled overburden is backfilled into the hole. Each hole will be fully rehabilitated before commencing to the next drill location. In this way rehabilitation is time and cost effective.

- Sample analyses

The samples emanated from the drilling exercise will be analysed for resource grade calculations.

- Data input an mapping

All data obtained during the proposed activities will be digitally captured and already existing maps updated to five more detailed and accurate models of the study area.

- Geological Report

The progress report for the drilling done will be used to inform the resource geologist what needs to be done during geological modelling of the ore body. It will also be used during the 3rd year as part of the yearly report to the DMR&E.

- **Phase 4**

- Geological modelling

A 3-D geological model will be created of the ore body/s, using all borehole information, to illustrate the geometry of the various ore body layers in relation to each other and the surface for later planning of mining activities.

- Ore resources

The grades of the minerals sought after as analysed by the laboratory will be interpreted into the 3-D grade distribution and volumes of the ore, also called in in-situ grade. Cut-off values will be applied to obtain mineable resources.

- **Phase 5**

o Feasibility study including:-

▪ Geological and mineable resources

Geological resources will be divided into indicated resources and proven reserves. The minable resources will be determined by applying various cu-off criteria such as grade, depth below surface and thickness.

▪ Financial models

Various cost models will be generated by interpreting cost structures into the geological model to determine payable mining zones. The latter will also be used to refine the mining model/s

▪ Business plan

A business plan will be drafted that will include all geological information, proposed mining plans and the various financial models to either generate further financial support by means of listing on a stock exchange or private investment.

The rationale of this HS is to determine the presence of heritage resources such as archaeological and historical sites and features, graves and places of religious and cultural significance on a desktop level; to consider the impact of the proposed project on such heritage resources, and to submit initial recommendations with regard to the cultural resources management measures that may be required at affected sites / features. Ultimately, the process aims to identify significant heritage issues or constraints which may be encountered during project development. In addition, the study identifies relevant heritage mitigation and management actions in order to inform time frames, infrastructure options and possible “show stoppers”.

1.2 Project Direction

Mr Neels Kruger acts 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).

1.3 Project 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 **terms of reference for** heritage specialist input area:

- Provide a description of the heritage landscape of the project area in terms of cultural context and provenience by means of a detailed desktop background study;
- Provide a description of known and documented historical archaeological artefacts, structures

(including graves) and settlements – if present - in the project area by means of a detailed desktop study;

- Compile the above into a broad heritage baseline for the project area and discuss the nature and degree of significance of this heritage baseline landscape;
- Provide a level of probability of site distribution and occurrence in the project area.
- Estimate the extent and severity of potential developmental impacts on the heritage landscape as a result of the planned development and associated actions;
- Drawing on findings from this desktop assessment, guide the project planning in terms of potential heritage impact.
- Recommend further heritage assessment requirements for the project based on the heritage landscape and its estimated sensitivity.
- Provide an integrated Heritage Scoping Report complying to SAHRA's minimum standards for Heritage Impact Assessment Studies and Reporting and the National Heritage Resources Act, 1999.
- Provide a PDA Report, complying to SAHRA's minimum standards for Heritage Desktop Study Studies and Reporting and the National Heritage Resources Act, 1999.
- Liaise and consult with the relevant Heritage Resources Authority (Northern Cape-PHRA) with regards to the initial NID, the HIA process and review comments from the authority

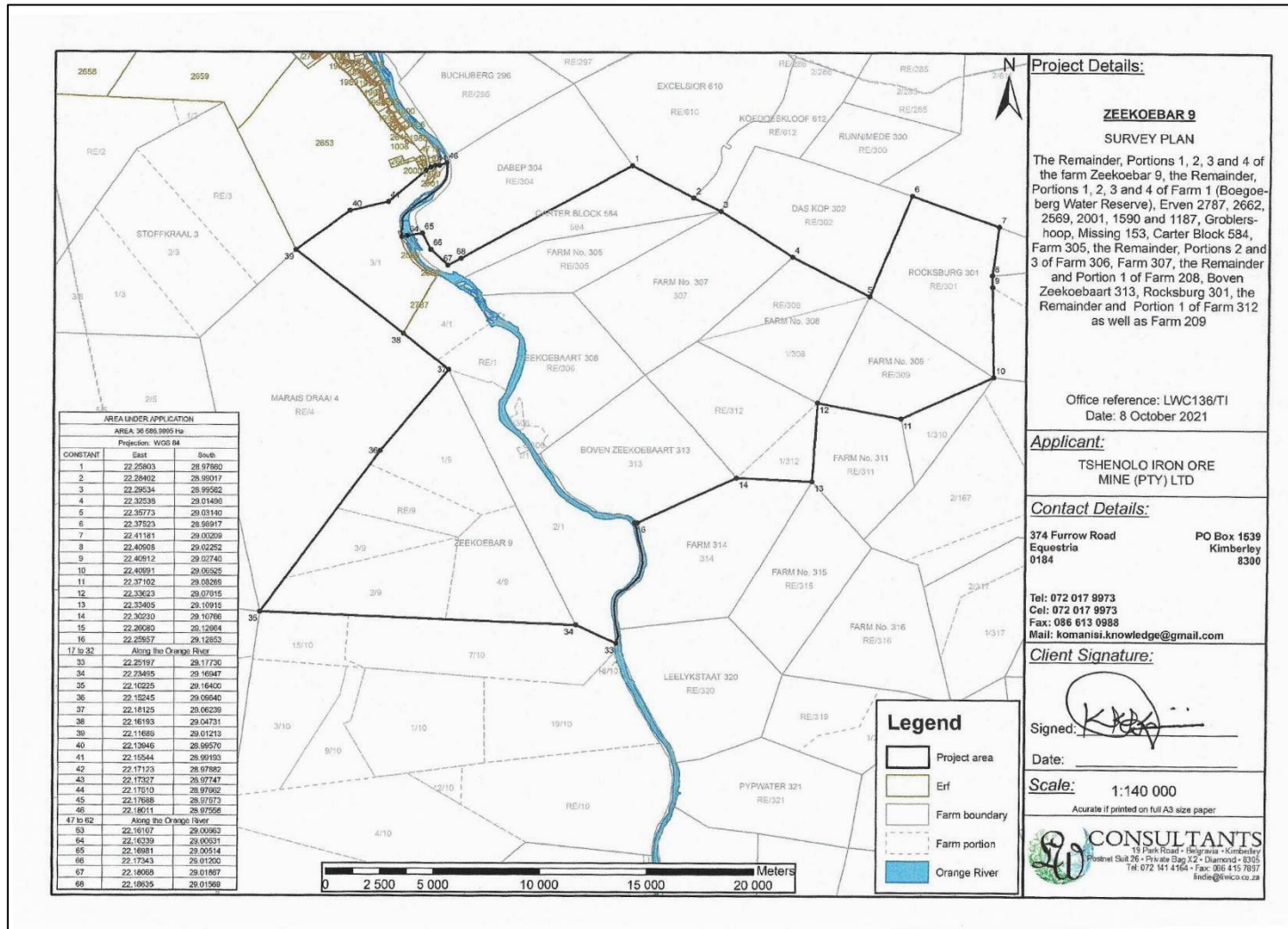


Figure 1-1: Aerial map indicating the project locality (green outline) subject to the Zeekoebaart 306 PRA Project.

2 LEGISLATIVE FRAMEWORK

2.1 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.

2.1.1 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 artefacts, 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 sites
- 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.

2.1.2 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.

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

2.2 Rating of significance

The National Heritage Resources Act (Act no 25 of 1999) also stipulates the assessment criteria and grading of archaeological sites. The following categories are distinguished in Section 7 of the Act:

- *Grade I:* Heritage resources with qualities so exceptional that they are of special national significance;
- *Grade II:* Heritage resources which, although forming part of the national estate, can be considered to have special qualities which make them significant within the context of a province or a region;
- *Grade III:* Other heritage resources worthy of conservation, and which prescribes heritage resources assessment criteria, as set out in section 3(3) of the act.

Significance is influenced by the context and state of the archaeological site. Six criteria were considered following Kruger (2019):

- 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.

The categories of significance were based on the above criteria the above and the grading system outlined in NHRA and summarised below:

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, auguring), 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 reinternment [including 2a, 2b & 3]

3 REGIONAL CONTEXT

3.1 Area Location

The proposed Zeekoebaart 306 PRA Project occurs on Zeekoebaart 9, Farm 1 (Boegoeberg Water Reserve), Erven of Boegoeberg Settlement, farms Missing 153, Carter Block 584, Zeekoebaart 306, Farm 307, Farm 308, Boven Zeekoebaart 131, Rocksburg 301, farm 312 and Farm 309 in the Tsantsabane Local Municipality and the ZF Mgcawu District Municipality of the Northern Cape Province. The site is situated along the Orange River more or less 30km southeast of the town of Groblershoop and Upington occurs approximately 120km northwest of the study area.

The study areas appear on 1:50000 map sheet 2822CC, 2822CD, 2922AA, 2922AB (see Figure 3-1), generally at the following coordinate:

Farm 431: S29.034412° E22.247109°

3.2 Area Description: Receiving Environment

The Northern Cape area around Groblershoop 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. At the Boegoeberg Dam the Orange River is about 500 m wide and islands of silt and reeds occur immediately downstream. The very limited floodplain upstream (to the southeast) is grassed while that downstream is sandy with riverine. The substrate is generally rocky and vegetation cover very limited.

3.3 Site Description

The project area on Zeekoebaart 9, Farm 1 (Boegoeberg Water Reserve), Erven of Boegoeberg Settlement, farms Missing 153, Carter Block 584, Zeekoebaart 306, Farm 307, Farm 308, Boven Zeekoebaart 131, Rocksburg 301, farm 312 and Farm 309 seems largely untransformed with evidence of human settlement in small sections. Portions of the farms are mountainous - particularly along the Orange River - with a number of drainage lines scattered across this area. The current land-use is mainly grazing by livestock and game, although the area closer to the Orange River is currently the Boegoeberg Water Reserve. Neighboring farms are being used for livestock grazing and game farming. The major land use of the study area as classified by the Environmental Potential Atlas of South Africa (2000) is vacant / unspecified land.

Figure 3-1: 1:250 00 Map representation of the location of the proposed Zeekoebaart 306 PRA Project (sheet 2822CC, 2822CD, 2922AA, 2922AB).

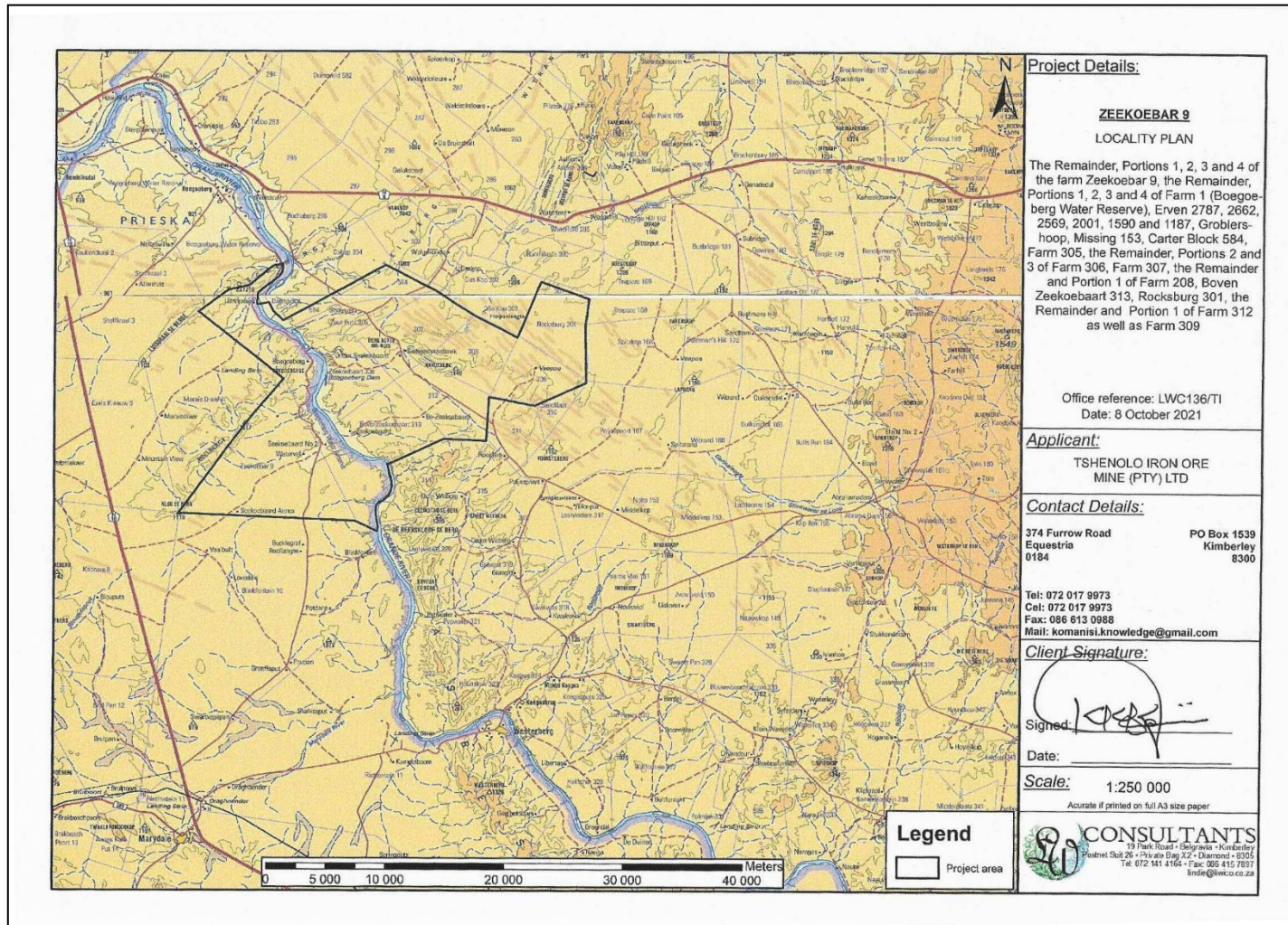


Figure 3-2: 1:250 00 Map representation of the location of the proposed Zeekoebaart 306 PRA Project (sheet 2822CC, 2822CD, 2922AA, 2922AB).

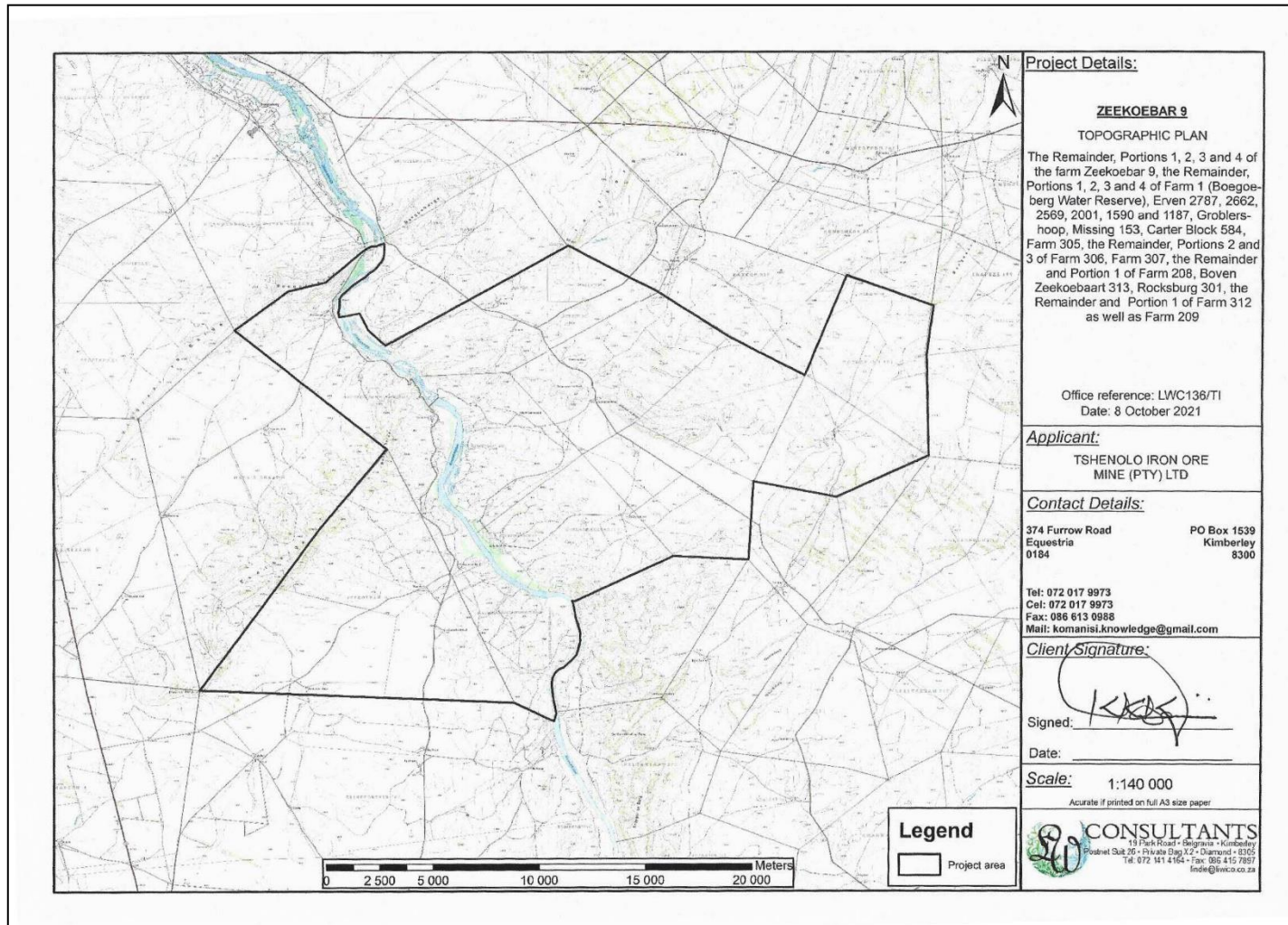


Figure 3-2: Map representation of the Zeekoebaart 306 PRA Project target properties.

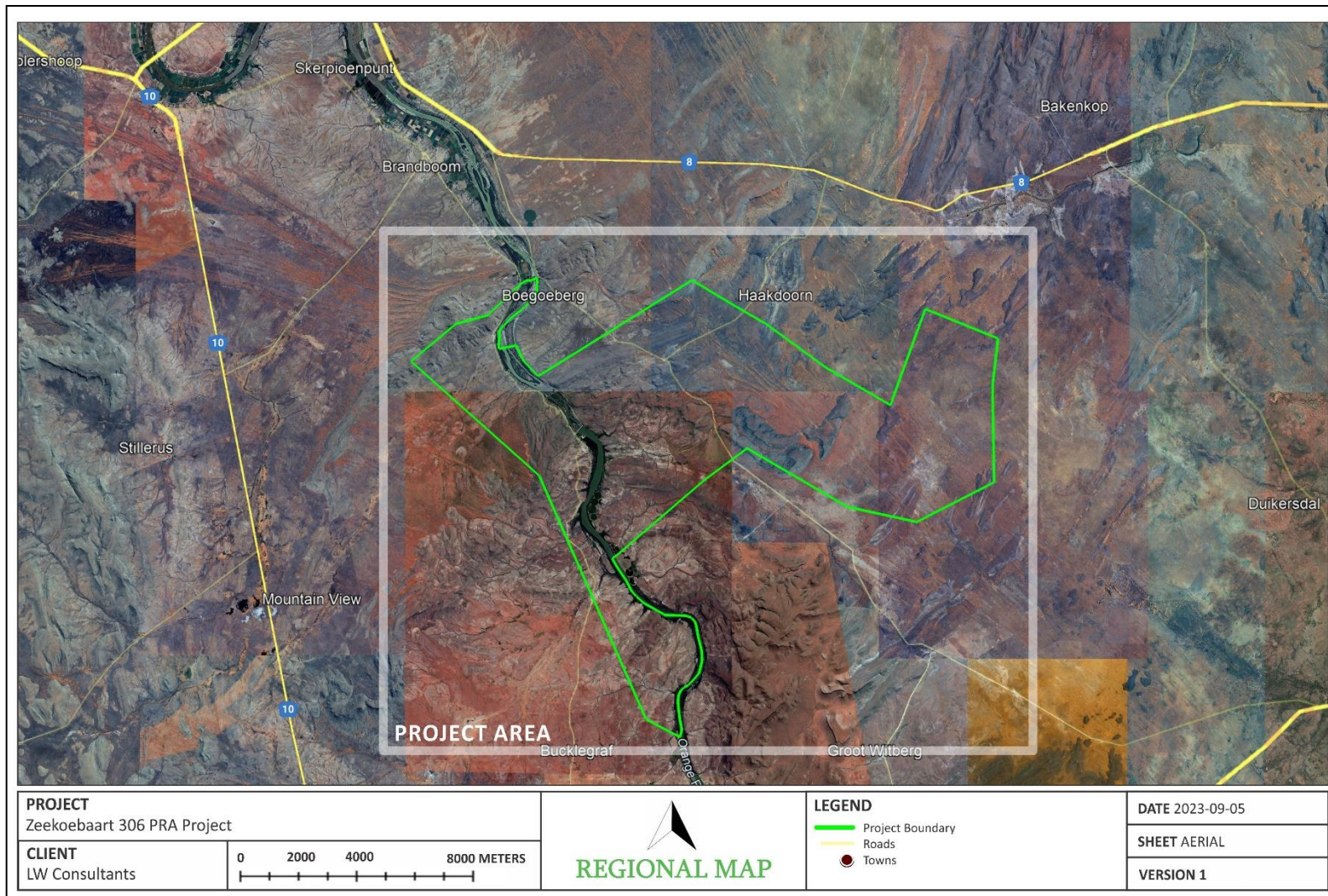


Figure 3-3: Aerial map providing a regional context for the proposed Zeekoebaart 306 PRA Project area.

4 METHOD OF ENQUIRY

4.1 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.

4.1.1 Desktop Study

The larger landscape around Groblershoop has been relatively well documented in terms of its archaeology and history. A desktop study was prepared in order to contextualize the proposed project within a larger historical milieu. The study focused on relevant previous studies, archaeological and archival sources, aerial photographs, historical maps and local histories, all pertaining to the project area and the larger landscape of this section of the Northern Cape Province.

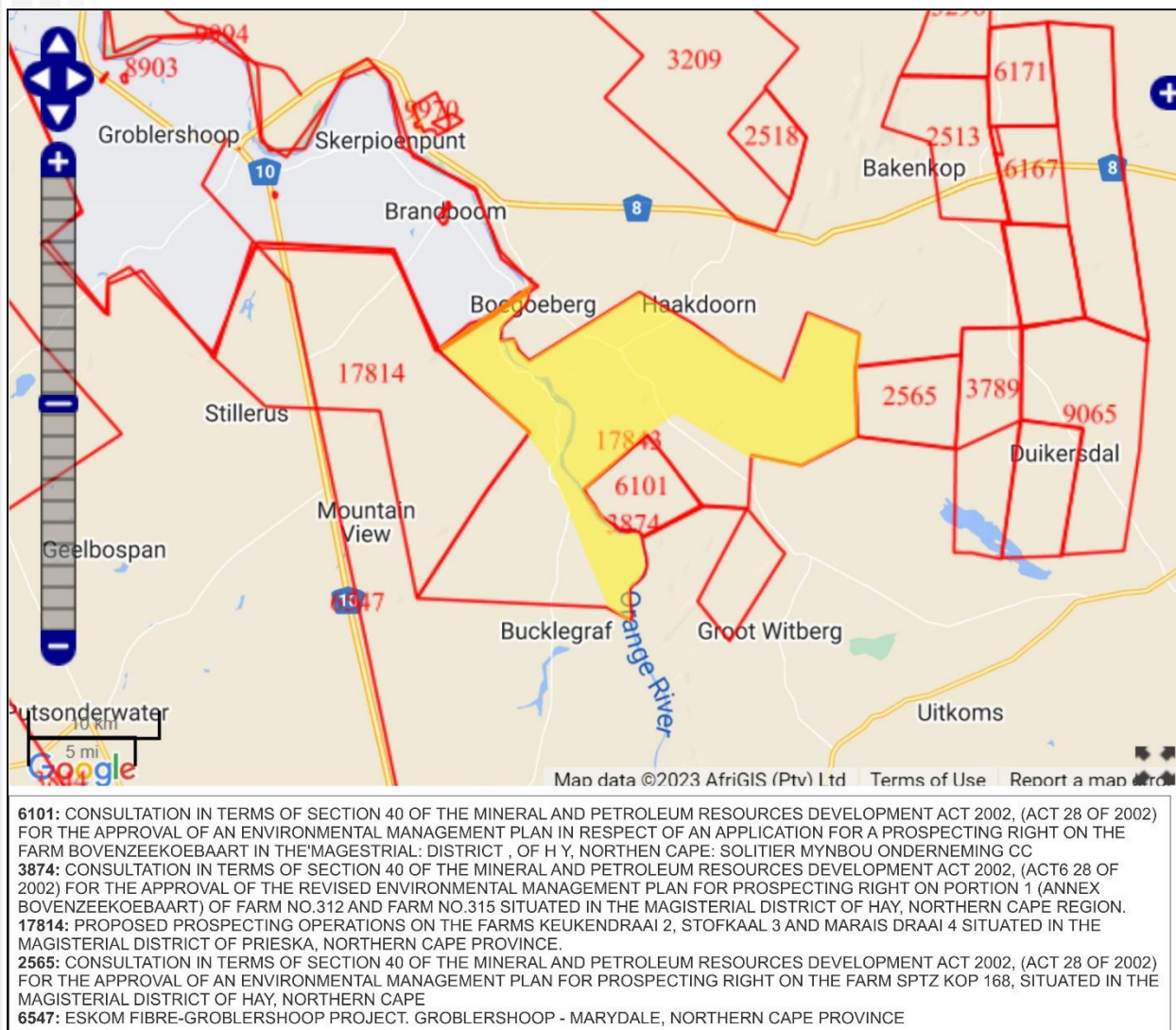


Figure 4-1: SAHRIS Map of the project area indicating current commercial projects and environmental applications lodged in the project area. The project subject to this assessment is shaded in yellow.

A small number of Cultural Resources Management (CRM) projects have been conducted in the larger Groblershoop area. Many of the studies, captured on the South African Heritage Resources Information System (SAHRIS), were conducted for prospecting and mining right applications in the larger region. Of particular interest to this assessment is a HIA and PDA conducted by ACO Associates cc and Natura Viva cc

in 2013:

- Orton, J & Webley, L. 2013. Heritage Impact Assessment for the proposed Boegoeberg Hydropower Station near Groblershoop, Northern Cape. ACO associates cc.
- Almond, J. 2013. Palaeontological heritage assessment: desktop study for the proposed Boegoeberg Hydropower Station near Groblershoop, Northern Cape. Natura Viva cc

4.1.2 Remote Sensing

Aerial photography is often employed to locate and study archaeological sites, particularly where larger scale area surveys are performed. The site assessment of the project area relied heavily on this method to assist the challenging foot site survey. Here, depressions, variation in vegetation, soil marks and landmarks were examined and 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. By superimposing high frequency aerial photographs with images generated with Google Earth as well as historical aerial imagery, potential sensitive areas were subsequently identified and geo-referenced.

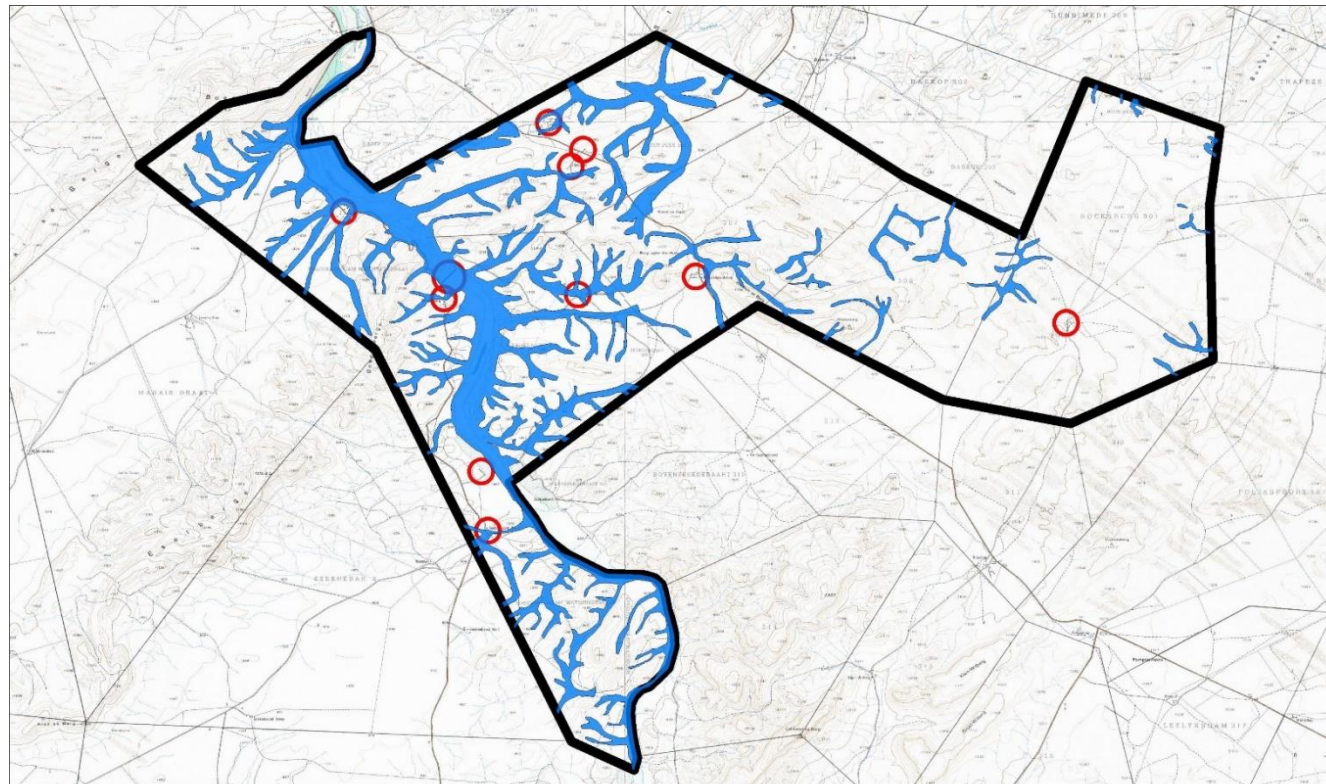
4.1.3 Map Data

Similar to the aerial survey, the assessment of the project area relied heavily on archive and more recent map renderings of the Groblershoop area to assist in the potential identification of heritage sites, where historical and current maps of the project area were examined. By merging data obtained from the desktop study and the aerial survey, sites and areas of possible heritage potential were plotted on these maps of the larger Groblershoop area using GIS software. These maps were then superimposed on high-definition aerial representations in order to graphically demonstrate the geographical locations and distribution of potentially sensitive landscapes.

4.2 Limitations

The main limitation of this Scoping Study is the fact that it was undertaken at a desktop level, employing secondary information and data generated through off-site methods (e.g. aerial survey, literature review). As such, the study merely infers a level of probability of the presence of cultural, historical, or archaeological sites of significance. In this instance, detailed field assessments would have to be required once impact areas have been established in order to confirm the presence of sites of significance.

As this study was conducted on desktop level only, it should be noted that the findings are not a complete representation of the heritage landscape of the project area as the possibility exists that individual sites could be missed due to the sometimes inaccurate and often subjective nature of desktop data. The subterranean nature of some archaeological sites, dense vegetation cover and visibility constraints sometimes distort heritage representations and any additional heritage resources located during development phases must be reported to the Heritage Resources Authority or an archaeological specialist.



VERKLARING	REFERENCE	VERKLARING	REFERENCE
Grans, Internasionale	Boundaries, International	Rivers, standhoudend	Rivers, perennial
Spoorweë, Dubbelspoor	Boundaries, Provincial	Rivers, nie standhoudend	Rivers, non-perennial
Geleëtrassier	Railways, Double	Moerasse of Vies	Marshes or Vies
Enkelspoor	Electrifiseer	Panne, Pann	Pans, Lakes
Straalpoor	Single	Suikerme, Pyplyn (P), Vane	Weirs, Pipelines (P), Furrows
van Mineerle, Substraat, etc.	Narrow Gauge	Damme, Kanale	Dams, Canals
Hout	Mineral, Sugar Cane, etc.	Foosme, Watergate of Putte	Fountains, Waterholes or Weirs
Sekondêre	Roads, National	Wind of Motorpomp	Wind or Motor Pumps
Anders	Main	Foosentrum	Photo Centres
Diontopasie en Vloetspas	Secondary	Sand en Sanddune	Sand and Sand Dunes
Vuurtoring, Nasionale Monumente	Other	Verpoopte Oalbede	Eroded Areas
Telegraaf- of Telefoonlyn	Tracks and Footpaths	Hoogte	Contours
Engelinge	Lighthouses, National	Bewerkte Lande	Cultivated Lands
Hoogte	Telegraph or Telephone Lines	Boerde, Wingerde	Orchards, Vineyards
Trië, Bakers	Power Lines	Plantasies	Plantations
Poortstasie, Winkels, Houtale	Bench Marks (height to coast level)	Windkutte en Lins	Windbreaks and Avenues
Post- of Telegraafkantore	Trië, Bakers	Verpoopte Bosse, Bosveld	Scattered Bush, Bushveld
Kaarte	Post Stations, Stores, Hotels	Digne, Bos en Woude	Dense Bush and Forests
Skagrowwe, Sandgate	Post or Telegraph Offices	Kakus	Cactus
Hydrant	Marine Kute, Cable, Krad		
Kran	Spot Heights (the fact)		
Kuiering, Rotatgouwe	Quarries, Sandpits		
Dwaal	Mine Dumps		
	Kran		
	Coastal Rocks, Rock Outcrops		
	Fence		

Figure 4-2: Historical topographic map indicating the prospecting area (black outline) within the historical landscape. Farmsteads and potential man-made structures are indicated with red circles and blue polygons indicate drainages and rivers.

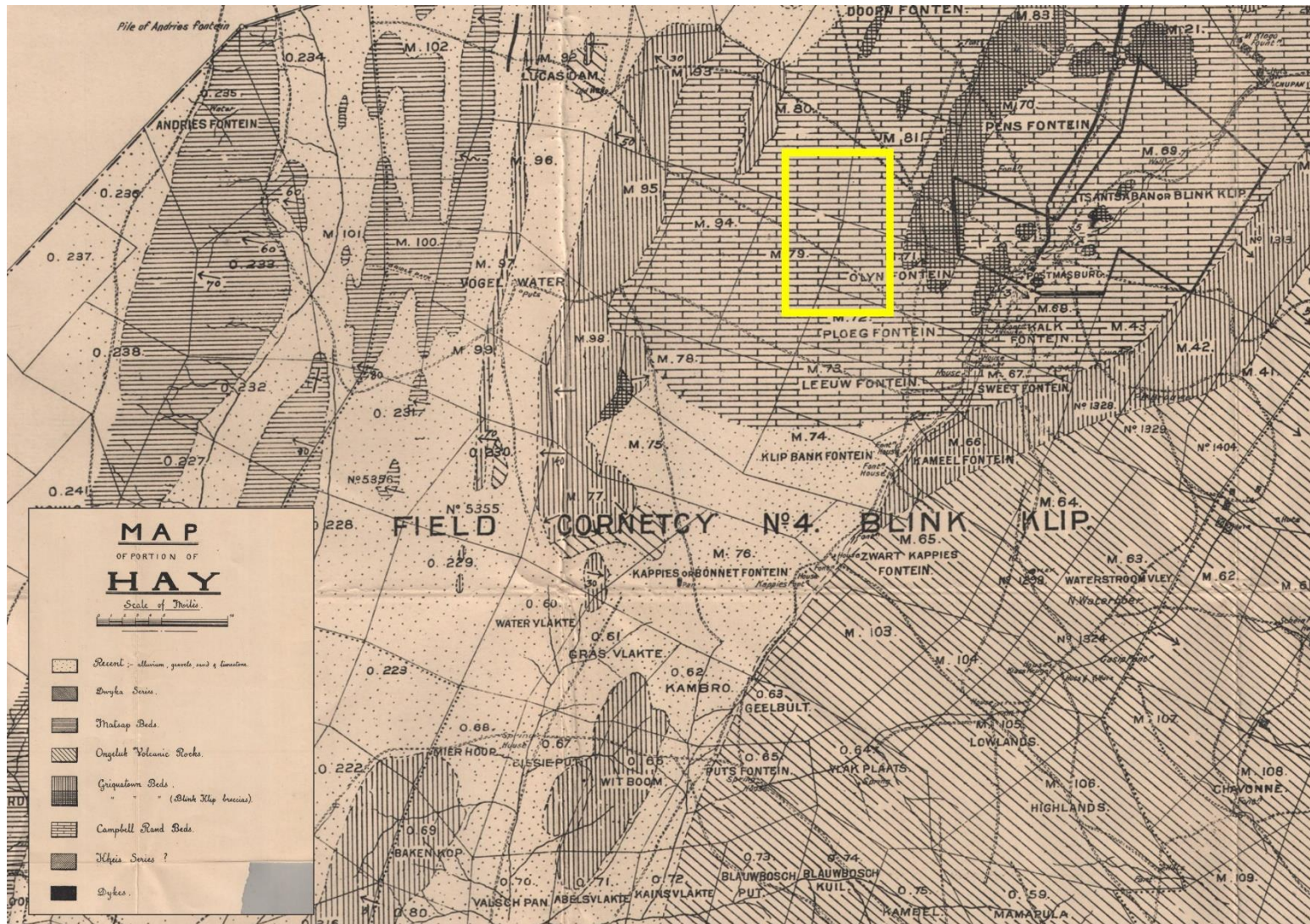


Figure 4-3: A historical “Map of portion of Hay” compiled by the University of Cape Town Libraries in 1905. Note that the project area indicated with the yellow block falls within the so-called “Campbell Rand Beds”.

5 ARCHAEO-HISTORICAL CONTEXT

5.1 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 (commonly restricted to the interior and north-east coastal areas of Southern Africa)	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 (commonly restricted to the interior and north-east coastal areas of Southern Africa)	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 (commonly restricted to the interior and north-east coastal areas of Southern Africa)	Holocene	Various Bantu-speaking groups including Venda, Thonga, Sotho-Tswana and Zulu	Distinct ceramics, grinding stones, iron objects, trade objects, remains of iron smelting activities including iron smelting furnace, iron slag and residue as well as iron ore.
Historical / Colonial Period ±1850 AD – present	Holocene	Various Bantu-speaking groups as well as European farmers, settlers and explorers	Remains of historical structures e.g. homesteads, missionary schools etc. as well as, glass, porcelain, metal and ceramics.

5.2 Discussion: The Groblershoop 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. In the Bushmanland and the Karoo, archaeological artefacts are widespread throughout and generally comprise what is commonly referred to as “background scatter”. Other aspects of heritage encountered in the region from time to time include rock art, historical buildings and ruins and graves.

Little archaeological work has been carried out along the Orange River with the only two areas well researched being the Richtersveld far to the west and the Middle Orange River area far to the southeast, between Hopetown and Colesburg.

5.2.1 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 Riverton Area 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. 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 points that may have had long wooden sticks as hafts and were used as spears. The Stone Age archaeological wealth of the Northern Cape is unequalled by any of the other provinces in South Africa. Stone Age sites are not randomly scattered within the landscape and they occur either near water sources or close to local sources of two highly-prized raw materials, specularite and jaspilite. As such, tools dating to all phases of the Stone Age are mostly found in the vicinity of larger watercourses.



Figure 5-1: Early Stone Age (Acheulian) handaxe from the Kathu Pan site (<http://www.museumsonc.co.za>).

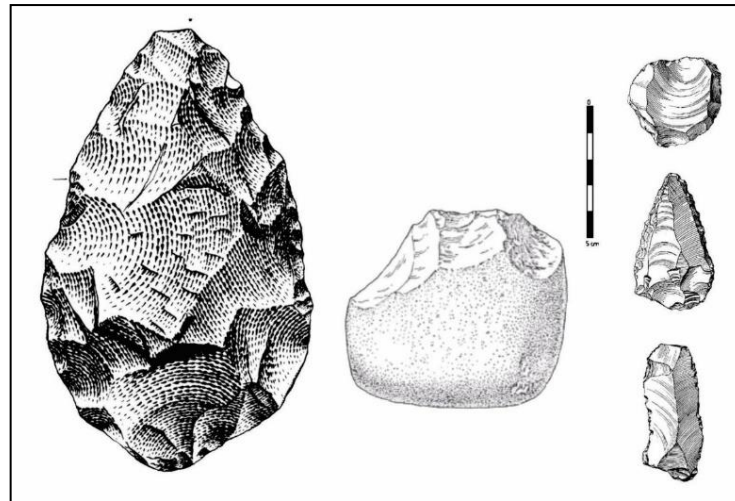


Figure 5-2: Typical ESA handaxe (left) and cleaver (center). To the right is a MSA scraper (right, top), point (right, middle) and blade (right, bottom).

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.

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.

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. In the areas around Groblershoop, widely scattered stone artefacts pertaining to the Early (ESA) and Middle (MSA) Stone Ages (e.g. Dreyer 2006, 2012; Morris 2006, 2007, 2012; Van Rhyneveld 2007; Webley 2013) are

known to be found. It is relevant to note a statement in Beaumont et al. (1995:240): “Thousands of square kilometres of Bushmanland are covered by a low density lithic scatter.” They note that collections of artefacts generally contain moderately to well weathered items ascribable to the ESA and less or even unweathered artefacts pertaining to the MSA. Morris (2012), commenting on artefacts found to the east of Groblershoop says: “Preservation context is poor – these are essentially lag deposits on eroding surfaces and hence of low significance”. This statement is applicable to much of what we commonly find in Bushmanland. Later Stone Age (LSA) material is occasionally noted, particularly in dune areas (e.g. Morris 2012), but these are uncommon. However, it should be noted that sites very similar to those recorded along the river banks in the Richtersveld (Orton 2007; Smith *et al.* 2001; Webley 1997) have also been found recently in similar contexts at Augrabies (Orton & Webley 2013) and could certainly be expected elsewhere along the Orange River.

5.2.2 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 Khoekhoen 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.

5.2.3 A Landscape of Rock Markings

Rock engravings are mostly found in the interior plateau of South Africa for example in Kimberley and the Karoo. Evidence exists of rock art paintings occurring in caves and shelters at the Wonderwerk Caves, Kuruman Hills, Ghaap Escarpment and scattered sites in the Karoo. Rock engravings have also been identified at Driekopseiland that is positioned in the close vicinity of Kimberley Town. Driekopseiland is evident of more than ninety percent of geometric engraving sites (Morris 1988). Geometrics have been identified at the Kuruman valley and the middle Orange area (Morris 1988). Engravings tend to be found at rock walls, low outcrops, or clusters of surface stone. The Wildebeest Kuil 1 Rock Art site, a declared ProZeekoebar 9, Farm 1 (Boegoeberg Water Reserve), Erven of Boegoeberg Settlement, farms Missing 153, Carter Block 584, Zeekoebaart 306, Farm 307, Farm 308, Boven Zeekoebaart 131, Rocksburg 301, farm 312 and Farm 309a Heritage Site (2008), is characterized by a fairly prominent hill surrounded by a number of ‘kuils’ or non-perennial water holes and wetlands. The hill itself is host to more than 400 petroglyphs, including both naturalistic and abstract engravings, in fine-line and pecked technique. LSA deposits are scattered about the immediate terrain with deposits closer to the hill indicative of residential outlines and activity or knapping areas. Extensive LSA use of the landscape is evidenced by even more engravings on the glacial pavements of the farm Nooitgedacht, just north of Platfontein. Further afield the Driekopseiland site, one of the most prolific engraving sites in the country is host to more than 3,600 images, engraved into the glaciated andesite of the Riet River’s banks (Morris 1990a). Closer to the Vaal River, at the Bushmans’ Fountain site, Klipfontein, more than 4,500 engravings have been recorded across the approximate 9ha site (Morris 1990b). The many petroglyph sites across the Northern Cape signal an aesthetic and spiritual expression of a modern LSA cognition. The LSA archaeological record is directly associated with San history, dating conservatively back to around 40-27kya, whilst the Khoe is reported to have entered the country around 2kya (Mitchell 2002). Both groups are known to have traded with Later Iron Age communities and Colonial settlers. 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).

5.2.4 Later History: Reorganization, Colonial Contact and living heritage.

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).

Because of its distance from the Cape Colony, this arid part of South Africa's interior was generally not colonised until fairly late. Most land grants date to the late 19th or early 20th centuries. The first farmers to arrive in the Groblershoop area did so in about 1870. As a result, historical material is likely to be relatively scarce, while farm buildings are usually 20th century. A hydro-electric generator and pump were built in the area by A.J. Litchfield, while Charles Newberry built a water turbine on the farm Winstead in 1913. Seven soldiers are buried on this same farm, 25 km east of Groblershoop and a short distance to the north of the present study area. The graves relate to the Boer Rebellion of 1914.

6 THE ZEEKOEBAART 306 PROJECT AREA: HERITAGE SENSITIVITY AND SITE PROBABILITY

In terms of heritage resources, the landscape around Zeekoebar 9, Farm 1 (Boegoeberg Water Reserve), Erven of Boegoeberg Settlement, farms Missing 153, Carter Block 584, Zeekoebaart 306, Farm 307, Farm 308, Boven Zeekoebaart 131, Rocksburg 301, farm 312 and Farm 309 is primarily well known for the occurrence of Stone Age and Colonial Period heritage remains. Small portions of the project subject property have been transformed in places by historical and recent mining and digging risking the sterilization of these zones of heritage remains. ACO associates conducted a Heritage Impact Assessment for the proposed Boegoeberg Hydropower Station¹ in the project area and that study provides a good representation of heritage resources in the project area and possibly occurring existing in the larger landscape.

6.1 Heritage sensitivity

6.1.1 Palaeontology

Almond (2013)² noted that the Boegoeberg area is overlain by igneous and sedimentary rocks of Precambrian and much younger, Tertiary or Quaternary age. The main Precambrian bedrock units concerned are basement granites (Skalkseput Granite), Precambrian volcanics of the Venterdorp Group, marine carbonate sediments of the Campbell Rand Subgroup (Transvaal Supergroup) and a spectrum of shallow marine to fluvial sediments and igneous rocks of the Olifantshoek Supergroup. Late Cenozoic superficial sediments within the development footprint mainly comprise alluvium along the River Orange and more minor watercourses, rubbly colluvium (e.g. scree), surface gravels, and aeolian sands of the Gordonia Formation (Kalahari Group). The project area falls within potentially paleontologically sensitive zone and a Palaeontological Desktop Assessment (PDA) was commissioned for the proposed project. Cognisance should be taken of further recommendations included in the PDA Report.

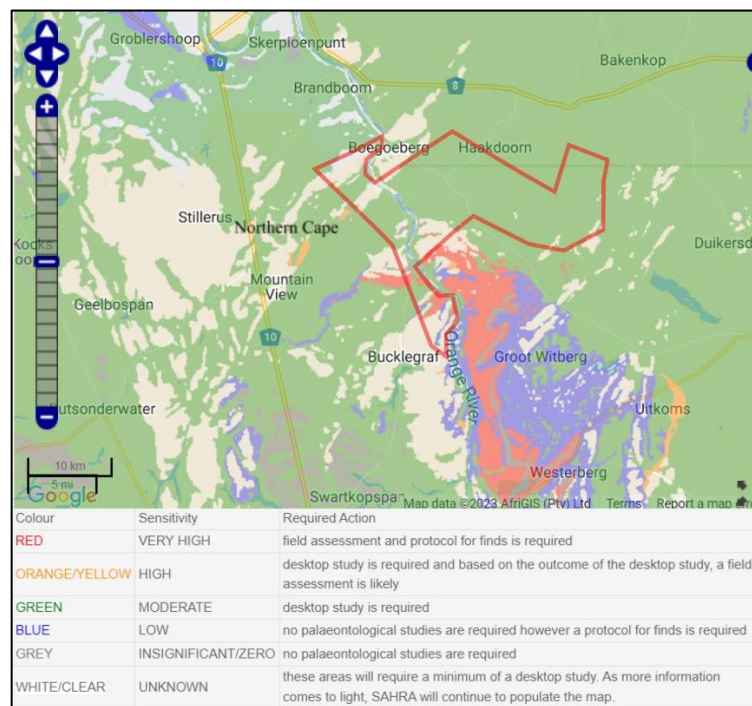


Figure 6-1: SAHRIS Paleontological sensitivity map of the project area, indicating a moderate to low fossil sensitivity for the project area (red outline).

¹ Orton, J & Webley, L. 2013. Heritage Impact Assessment for the proposed Boegoeberg Hydropower Station near Groblershoop, Northern Cape. ACO associates cc

² Almond, J. 2013. Palaeontological heritage assessment: desktop study for the proposed Boegoeberg Hydropower Station near Groblershoop, Northern Cape. Natura Viva cc

6.1.2 Archaeology

Material from the earlier, middle and later Stone Age occur widely across the Northern Cape Province and local archaeological research has indicated how Stone Age material often occurs along drainage lines, in rock shelters, along ridges, the rims of pans and in cave sites. In this area, deep Hutton Sands rest on decomposing dolerite and calcrete formations where Stone Age artefacts are known to occur in these dolerite and occasional calcrete patches. These geomorphological exposures might prove sensitive in terms of the occurrence of stone artefacts and Earlier (ESA), Middle (MSA) and Later Stone Age (LSA) material. Similarly, Stone Age manufacturing sites are known to occur along ridges near sources of stone suitable for stone tool making and such areas could contain remnants of Stone Age manufacturing sites. Stone Age occurrences are also known to occur along the eroded banks of rivers and drainage lines in this landscape Later Stone Age shelters and rock art might be encountered along hilltops slopes and ridges.

In their assessment in the project area, ACO associates noted the presence of an extensive scatter of stone artefacts above the cliff at the Boegoeberg Weir. Here, MSA and LSA artefacts and a few grindstones were found and other MSA tools were also noted along the banks for the Orange River. It was noted that a cluster of low stone walls occurs on the south side of the Orange River and on the mountain slope and it was indicated that these stone walls are fairly typical of pre-colonial walling from the Karoo (Hart 1989; Sampson 1984, 1985). They may have been hunting blinds in that they face down towards the river valley. ACO also indicated that rock art is said to occur in the mountains near the start of the access road to the farm Zeekoebaart.



Figure 6-2: Examples of banded ironstone artefacts (left) and typical MSA blade (right) from the larger project landscape (ACO Associates cc 2013).



Figure 6-3: Two quartzite lower grindstones from the project landscape (ACO Associates cc 2013).



Figure 6-3: View of stone walling occurring in the project landscape (ACO Associates cc 2013).



Figure 6-3: View of stone walling occurring in the project landscape (ACO Associates cc 2013).

6.1.3 Colonial Period and recent times

The Northern Cape has 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. An analysis of historical aerial photographs and topographic maps indicate that a farmstead and other buildings occur Boegoeberg, Seekoebaard, Onder Seekoebaard, Seekoeibaardsnek and Soutputs. ACO associates noted a few farm buildings in the project area and it is indicated that many of these buildings provide good examples of vernacular architecture generally rare in the project landscape. Many of these buildings have vernacular pitched roof structures with more recent additions. These sites are older than 60 years and the features are generally protected under the National Heritage Resource Act (NHRA 1999).



Figure 6-4: Views of vernacular farm houses in the landscape (ACO Associates cc 2013).



Figure 6-5: Views of vernacular farm houses and house ruins in the landscape (ACO Associates cc 2013).



Figure 6-6: View of stone kraals in the landscape (ACO Associates cc 2013).

6.1.4 Graves

In the rural areas of the Northern Cape Province graves and cemeteries sometimes occur within settlements or around farmsteads but they are also randomly scattered around archaeological and historical settlements. The probability of human burials encountered around areas where Boegoeberg, Seekoebaart, Onder Seekoebaart, Seekoeibaardsnek and Soutputs farmstead are situated, should thus be considered. 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.

In their assessment, ACO associates documented an informal graveyard as well as two isolated graves or probable graves. The graveyard lies alongside the access road to Zeekoebaart and one grave is within about one metre of the edge of the road. In the sandy floodplain just downstream of the cliff where the weir is are two possible graves, one is a cement headstone seemingly propped up in the sand. Many people died during construction of the Boegoeberg Weir but it is apparently not known where they were buried. Here, 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 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.



Figure 6-7: View of two informal burials in the landscape (ACO Associates cc 2013).



Figure 6-8: View of a grave in the landscape (ACO Associates cc 2013).

6.1.5 Other Sites / Features

The Boegoeberg Weir occurring in the project area is a heritage structure since it was built between 1929 and 1933. The dam has a long history. The following account is taken from an article by Van Vuuren (2009); the weir was proposed in the late 1920s as a job creation project for poor Afrikaaners in the region. The idea of a weir and irrigation canal was, however, being considered as early as 1872. The first plan put together was only in 1895 but it was considered too costly and was shelved. The idea was frequently discussed in parliament until in 1906 the scheme was revived but in a different and cheaper configuration. Work began in 1906 using black labour but stopped in 1907 as the costs were deemed to be too high. Then, in 1929 when the Great Depression hit the world and there was a severe drought in South Africa, the government suddenly ordered construction of the Boegoeberg Weir to provide labour for poor whites. Although built by the Department of Irrigation, the funding was supplied by the Department of Labour. The weir and canal were treated as separate developments and the construction camp for the weir was on Zeekoebaart. Cofferdams were made from sandbags and all work on these and the main weir was carried out by hand. Although people of colour were not allowed to work on the project, white children as young as nine years old were at times employed. A school and hospital were also built. Approximately 50 people (including 38 children) are said to have died during construction of the project. Although the weir had proceeded far enough to begin supplying the canal by 1932, it was only in 1934 that the 121 km long canal was completed.

In addition, mining and quarrying activities are indicated on a topographic map of Zeekoebaart 9, Farm 1 (Boegoeberg Water Reserve), Erven of Boegoeberg Settlement, farms Missing 153, Carter Block 584, Zeekoebaart 306, Farm 307, Farm 308, Boven Zeekoebaart 131, Rocksburg 301, farm 312 and Farm 309 and

special historical, cultural or social associations for the site needs to be established. It should be noted that sites and structures derived from early mining older than 60 years, are protected under the National Heritage Resource Act (NHRA 1999).

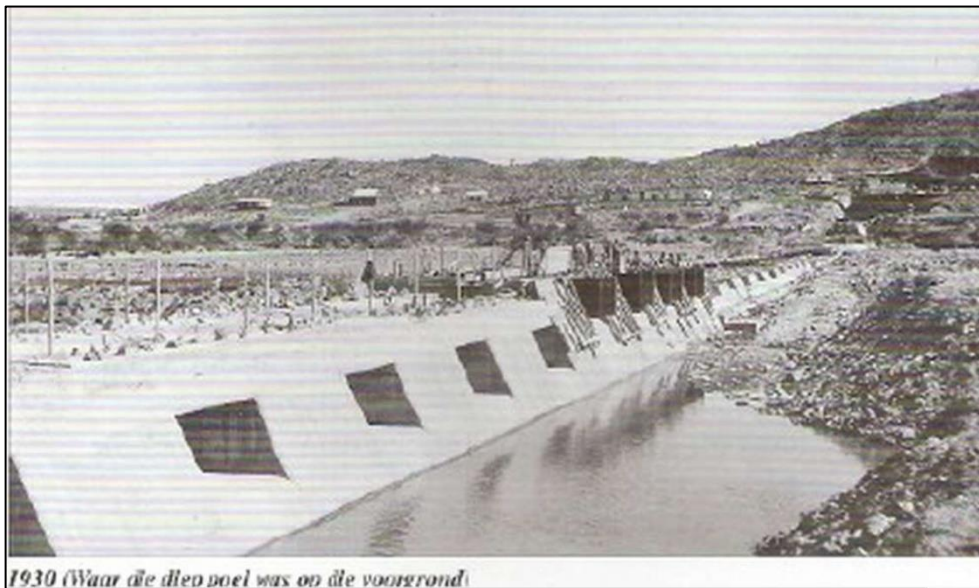


Figure 6-9: The Boegoeberg Weir during construction in 1930 (www.boegoebergcoroute.co.za).

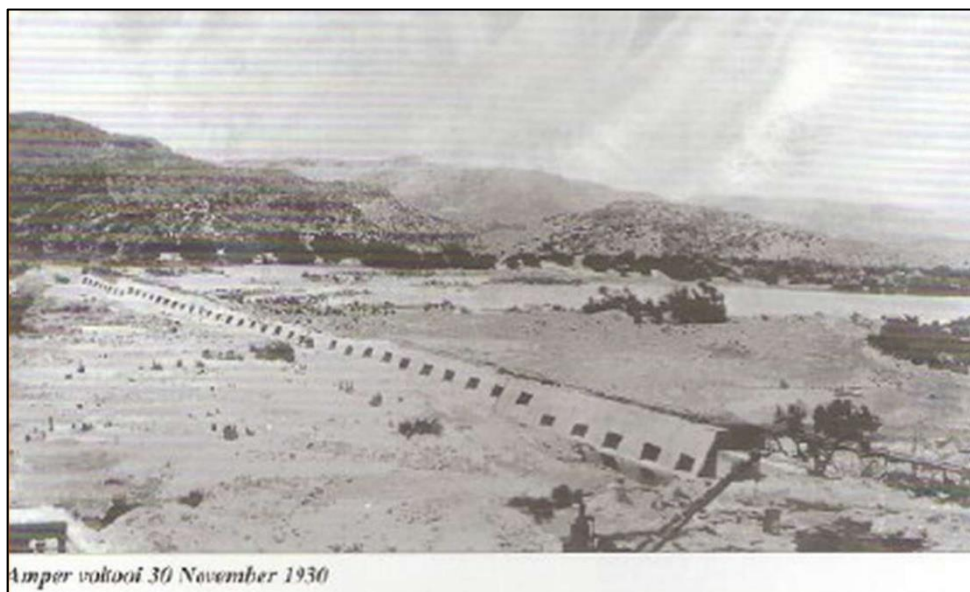


Figure 6-10: The Boegoeberg Weir during construction in 1930 (www.boegoebergcoroute.co.za).

6.2 Heritage Potential and Site Probability

The synthesis of data in this report suggests a landscape which holds cultural heritage resources and a further medium probability of the occurrence of cultural heritage sites could be expected in the Zeekoebaart 306 PRA Project area.

6.2.1 Archaeology

- In the project area, shallow soils cover a combination of calcrete, shale and dolerite substrates, and large sections in the landscape are exposed to sheet erosion, specifically along low lying

- areas and drainage lines. Dolerite and sandstone are present, while exotic rocks occur in the gravel of the Orange River bed and terraces. These provide suitable material for stone tool production during the Earlier, Middle and Later Stone Ages. MSA and LSA tool scatters are known to occur along water courses, pans and dry river beds and such material have been found in the project area. These tools might include formal tools such as blades, scrapers, adzes and points and microliths as well as debitage.
- Mountain crests, small hills and foothills and rock outcrops occur in the project area. Occupation sites dating to the Later Stone Age (LSA) associated with Hunter Gatherers and Herders are known to occur in such locales. Here, scatters of stone artefacts such as stone tools, ostrich eggshell, fragments of pottery and beads are common. Crudely built Herder stone wall enclosures might remain in these areas. In addition, Historical Period fortifications in the form of temporary stone barricades and defences are known to occur on low rises around Victoria West.
 - MSA and LSA tool scatters are also known to be found near outcrops and geomorphological exposures where source rock was exploited for the manufacturing of stone tools. Large boulders, frequently dolerite occurring throughout the project area, are commonly associated with Hunter Gatherer and Herder rock art in the form of engravings. In addition, stone “gongs” are often found in these areas on koppies and rocky outcrops.
 - All archaeological sites and artefacts are protected under the National Heritage Resource Act (NHRA 1999) and, depending on the range, extent and integrity of site and artefact contexts, the significance of archaeological remains in the project areas might range from low to high

6.2.2 Colonial / Historical Period and Built Environment

- In this landscape, farmsteads and werfs dating to the last centuries often hold historically significant buildings and features such as farm houses, corbelled huts, sheds, stone kraals, and “dorsvloers” (threshing floors). The Boegoeberg, Seekoebaard, Onder Seekoebaard, Seekoeibaardsnek and Soutputs farmsteads occur in the project area. An analysis of historical topographical maps and aerial photographs indicate the presence of the werfs from at least 1950 and the compound is older than 60 years and generally protected under the National Heritage Resource Act (NHRA 1999). The sites might afford a better understanding of architectural, settlement and social developments in the Victoria West landscape. Highly sensitive burial sites are also known to occur around farmstead complexes. Small-scale farming and agriculture are prevalent around farmsteads in the project areas. Here, potential historical farmscapes might be encountered.
- Occasional remains of “veewagterhuise” or shepherds’ huts dating to the Colonial Period are scattered across farms in this landscape. These buildings are usually constructed out of undressed sandstone blocks and glass, rusted metal fragments, fragments of ceramics, earthenware and bone are often found in middens associated with these huts. Even though these occurrences are often poorly preserved, they might be protected under the National Heritage Resource Act (NHRA 1999) if older than 60 years.
- The remains and remnants of Anglo-Boer War battlegrounds, field hospitals, concentration camps and cemeteries are found in this landscape and such sites are protected under the National Heritage Resource Act (NHRA 1999) where they are of Provincial heritage significance. Anglo-Boer War remnants might be present in the project area.
- Digging and / or quarrying seem to have occurred at single localities in the project area. Here, one might encounter remnants of historical mining and quarrying but the significance of such sites is not always apparent.

6.2.3 Cultural Landscape

- Generally, the proposed project area and its surrounds are characterized by rural Karoo farmlands, flatter grass plains and low mountain vegetation. Mountains and hills on the target properties for the project are indicated on topographic maps with unique names such as “Luisdraai”, “Klaar se Rant” and “Sandhoek” and other landscape features indicated, include “Wendam se Berg” and “Berg agter die Huis”. In addition, the Boegeberg Dam holds a rich recent history. Cognisance should be taken of the fact that these features might hold certain intangible heritage value or they might be regarded as sites of “Living Heritage” in the cultural landscape.

6.2.4 Cemeteries and Burial Sites

- Burial sites frequently occur around farmstead complexes within family cemeteries, for example possibly at the Boegeberg, Seekoebaard, Onder Seekoebaard, Seekoeibaardsnek and Soutputs farmsteads but in some instances packed stones or rocks indicate the presence of informal pre-colonial burials in this landscape. In addition, human remains and burials are often 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 therefore important to remember that the presence of archaeological human remains on the landscape is often detected with difficulty as these burials, in most cases, are not marked at the surface.
- Cemeteries, burial places and graves are viewed to have a high significance and they are protected under the National Heritage Resource Act (NHRA 1999)

The following table provides a n estimate as to archaeological remains to be expected within the study area based on the wealth of archaeological evidence in these regions:

Time Period	Sites Examples	Characteristic Material Culture	Archaeological Footprint	Probability of site occurrence
Palaeontology and Fossils	Ghaap Plateau	Fossilized faunal and botanical remain.	Such resources are typically found in specific geographical areas, e.g. the Karoo and are embedded in ancient rock and limestone/calcrete formations. Exposed by road cuttings and quarry excavation.	Medium Probability
Earlier Stone Age	Tshipise Mapungubwe Bosbokpoort	Large hand axes, cleavers, cores and residue material.	Buried unless disturbed.	Medium Probability
Middle Stone Age	Uitenpast Maremani Tshipise Ha-Dowe Mapungubwe	Specialised formal stone tools such as points, blades and scrapers. Cores and residue.	Surface scatters, found in erosion gullies, dongas and open scatters.	Medium Probability
Later Stone Age	Mapungubwe Machete Ratho	Specialised formal microlithic stone tools such as points, blades and scrapers as well as cores and residue. Rock Art.	Usually associated with rock shelters. Artefacts occur in buried deposits or surface scatters.	Medium Probability
Early Iron Age	Broederstroom	Potsherds, iron objects, house remains, glass beads, ostrich egg shell beads, middens, fauna.	Generally buried with few ceramics on surface.	Improbable
Middle Iron Age	Mapungubwe Pontdrif	Potsherds, iron objects, house remains, glass beads,	Sites are primarily open, visible kraals, grain bin foundations and	Improbable

	Kromdraai	ostrich egg shell beads, middens, trade goods such as porcelain, some stone walling.	ceramic scatters.	
Later Iron Age	Magaliesberg Kaditswene Molokwane	Potsherds, iron objects, house remains, glass beads, ostrich egg shell beads, middens, trade goods such as porcelain, extensive stone walling.	Khami/Venda sites specifically have a high visibility due to the stone walling and visible ceramic scatters kraal.	Improbable
Mining / Metallurgy	Rooiberg Verdun	Residues associated with metallurgy including slag, ore, metal objects, and hammer stones.	Sites are primarily open, visible stone enclosures in secluded areas.	High Probability
Rock Art and Markings	Waterberg Olieboomspoor	Fine line and finger paintings, grooves, cupules, engravings.	Usually associated with rock shelters and outcrops.	Medium Probability
Colonial Period: Structures	Schoemansdal Valdezia Mission Makapansgat	Foundation structures, house remains.	Colonial period sites generally have a high visibility due to preservation and visible material remains scatters.	High Probability
Colonial Period: Middens / Dumps	Schoemansdal Valdezia Mission Makapansgat	Glass, porcelain, potsherds, metal objects such as tin cans.	Colonial period sites generally have a high visibility due to preservation and visible material remains scatters.	High Probability
Battle and military sites	Fort Westfort Wonderboom Fort	Artefacts associated with conflict including spears, arrow heads, ammunition, rifles.	It is sometimes hard to identify sites of conflict as a result of the short duration and limited impact that such events incur.	Medium Probability
Burials over 100 years	Schoemansdal Makapansgat Maremani	Stone cairns, circles and ovals.	Prehistoric burials are sometimes hard to identify as they frequently occur in cattle kraals or as parts of stone wall structures.	High Probability
Burials younger than 60 years	Ga -Rankuwa	Marble head stones	More recent burials can be identified by headstones and grave dressings frequently present on these structures.	High Probability

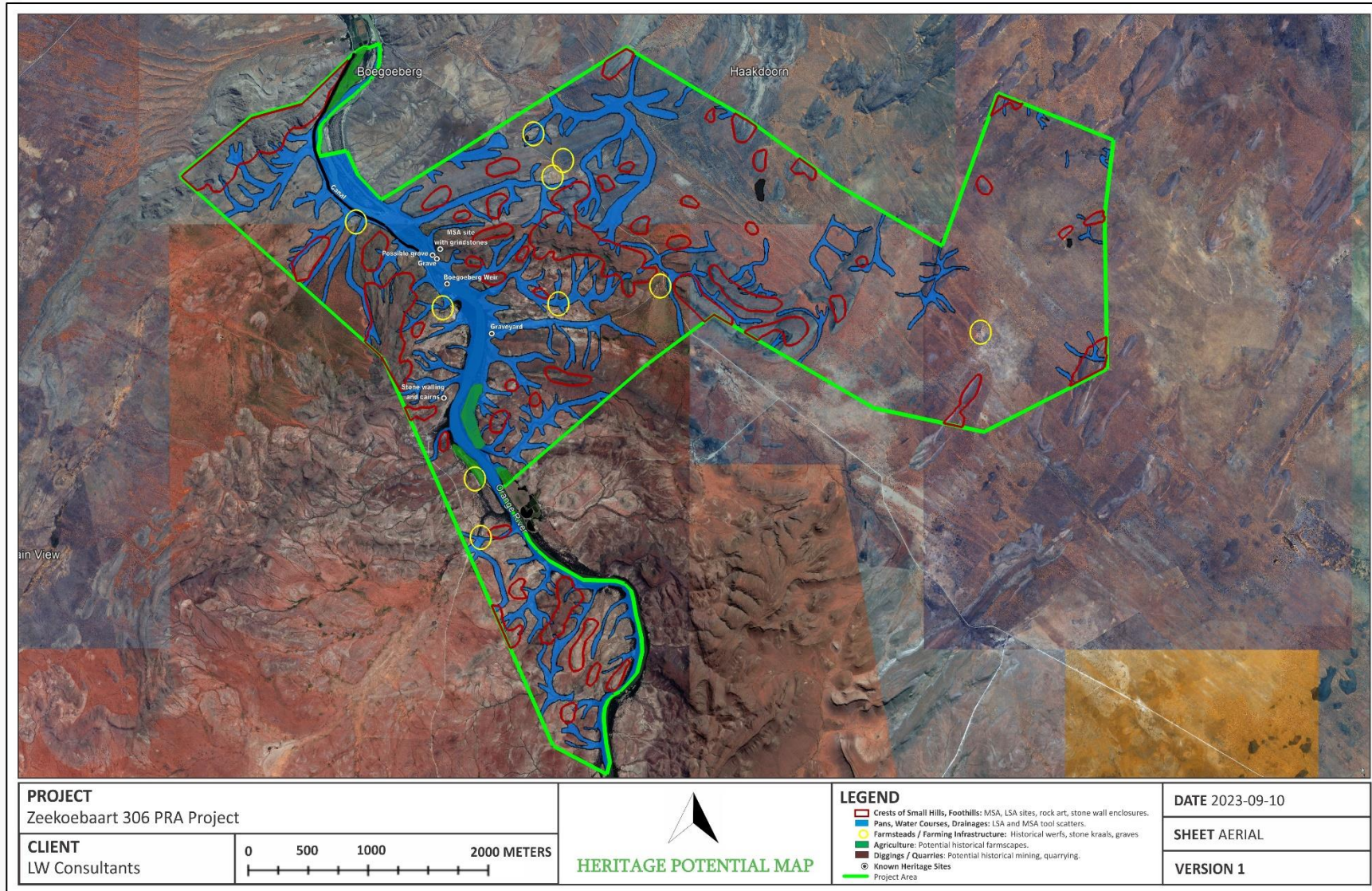


Figure 6-11: Aerial map indicating areas of heritage potential and possible heritage impacts.

7 SITE SIGNIFICANCE AND POTENTIAL IMPACTS

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 Addendum 3.

7.1 General assessment of impacts on resources³

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, of 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.

7.1.1 Direct, indirect and cumulative effects

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).

7.2 Impact Rating Criteria

7.2.1 Extent

Local	extend only as far as the footprint of the proposed activity/development
Site	Impact extends beyond the site footprint to immediate surrounds
Regional	within which development takes place, i.e. farm, suburb, town, community
National	Impact is on a national level

7.2.2 Duration

Short term	The impact will disappear with through mitigation or through natural processes
Medium term	The impact will last up to the end of the phases, where after it will be negated
Long term	impact will persist indefinitely, possibly beyond the operational life of the activity, either because of natural processes or by human intervention
Permanent	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

7.2.3 Magnitude severity

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

7.2.4 Probability

Improbable	where the possibility of the impact to materialize is very low either because of design or historic experience;
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³ Based on: Winter, S. & Baumann, N. 2005. *Guideline for involving heritage specialists in EIA processes: Edition 1.*

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.

7.2.5 Impact Significance

Low	negligible effect on heritage – no effect on decision
Medium	where it would have a moderate effect on heritage and – influences the decision
High	high risk of, a big effect on heritage. Impacts of high significance should have a major influence on the decision
Very high	high risk of, an irreversible and possibly irreplaceable impact on heritage – central factor in decision-making

7.3 Evaluation of Impact: The Zeekoebaart 306 PRA Project

7.3.1 Archaeology

It is probable that archaeological remains might be impacted in the project area. Here, Stone Age material might occur on decomposing dolerite and occasional calcrete patches in deep red sands. In addition, Stone Age material might occur in exposures around drainage lines and along ridges and hills.

7.3.2 Built Environment

The Zeekoebar 9, Farm 1 (Boegoeberg Water Reserve), Erven of Boegoeberg Settlement, farms Missing 153, Carter Block 584, Zeekoebaart 306, Farm 307, Farm 308, Boven Zeekoebaart 131, Rocksburg 301, farm 312 and Farm 309 farmstead and other man-made features remain on the properties and these sites are be protected under the NHRA. 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 residential zones, settlements and townlands. It is possible that sites and structures derived from early mining might occur in the project area and, if older than 60 years, such features are protected under the National Heritage Resource Act (NHRA 1999).

7.3.3 Cultural Landscape

Generally, the proposed project area and its surrounds are characterised by small farmlands around Zeekoebar 9, Farm 1 (Boegoeberg Water Reserve), Erven of Boegoeberg Settlement, farms Missing 153, Carter Block 584, Zeekoebaart 306, Farm 307, Farm 308, Boven Zeekoebaart 131, Rocksburg 301, farm 312 and Farm 309 and Groblershoop and surface mining towards the south. The cultural landscape of the study area revolves strongly around dryland agriculture and livestock grazing. Further away from the project area, the surroundings display undulating hills with flatter plains in the landscape.

7.3.4 Graves / Human Burials Sites

In the rural areas of the Northern Cape Province graves and cemeteries sometimes occur within settlements or around farmsteads but they are also randomly scattered around archaeological and historical settlements. The probability of human burials encountered around the Zeekoebar 9, Farm 1 (Boegoeberg Water Reserve), Erven of Boegoeberg Settlement, farms Missing 153, Carter Block 584, Zeekoebaart 306, Farm 307, Farm 308, Boven Zeekoebaart 131, Rocksburg 301, farm 312 and Farm 309 farmsteads should thus be considered. 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.

8 RECOMMENDATIONS

The cultural landscape of the Northern Cape encompasses a period of time that spans millions of years, covering human cultural development from the Stone Ages up to recent times. It depicts the interaction between the first humans and their adaptation and utilization to the environment, the migration of people, technological advances, warfare and contact and conflict. In terms of heritage resources, the landscape around Zeekoebaart 9, Farm 1 (Boegoeberg Water Reserve), Erven of Boegoeberg Settlement, farms Missing 153, Carter Block 584, Zeekoebaart 306, Farm 307, Farm 308, Boven Zeekoebaart 131, Rocksburg 301, farm 312 and Farm 309 is primarily well known for the occurrence of Stone Age and Colonial Period heritage. Portions of the property have been transformed by historical and recent mining risking the sterilization of these zones of heritage remains. In terms of the probability of site impact on the proposed, the following should be noted:

Archaeology:

- A Heritage Impact Assessment conducted by ACO associated at the Boegeboerg Dam in the project documented extensive scatters of stone artefacts likely to be from the Middle Stone Age, with a few grindstones present at one of the sites. The assessment also noted the presence of low stone walls on the south side of the Orange River and on the mountain slope, said to be probable been hunting blinds.
- Generally, in this landscape shallow soils cover a combination of calcrete, shale and dolerite substrates, and large sections in the landscape are exposed to sheet erosion, specifically along low lying areas and drainage lines. Dolerite and sandstone are present, while exotic rocks occur in the gravel of the Orange River bed and terraces. These provide suitable material for stone tool production during the Earlier, Middle and Later Stone Ages. MSA and LSA tool scatters are known to occur along water courses, pans and dry river beds and such material have been found in the project area. These tools might include formal tools such as blades, scrapers, adzes and points and microliths as well as debitage.
- Mountain crests, small hills and foothills and rock outcrops occur in the project area, for example Boegoeberg, Berg after die Huis and Wendam se Berg and Hardeberg. Occupation sites dating to the Later Stone Age (LSA) associated with Hunter Gatherers and Herders are known to occur in such locales. Here, scatters of stone artefacts such as stone tools, ostrich eggshell, fragments of pottery and beads are common. Crudely built Herder stone wall enclosures might remain in these areas. In addition, Historical Period fortifications in the form of temporary stone barricades and defences are known to occur on low rises around Groblershoop.
- MSA and LSA tool scatters are also known to be found near outcrops and geomorphological exposures where source rock was exploited for the manufacturing of stone tools. Large boulders, frequently dolerite occurring throughout the project area, are commonly associated with Hunter Gatherer and Herder rock art in the form of engravings. In addition, stone “gongs” are often found in these areas on koppies and rocky outcrops.
- All archaeological sites and artefacts are protected under the National Heritage Resource Act (NHRA 1999) and, depending on the range, extent and integrity of site and artefact contexts, the significance of archaeological remains in the project areas might range from low to high.

Colonial / Historical Period and Built Environment:

- In this landscape, farmsteads and werfs dating to the last centuries often hold historically significant buildings and features such as farm houses, corbelled huts, sheds, stone kraals, and “dorsvloers” (threshing floors). A number of farmsteads occur in the project area, including Boegoeberg, Seekoebaard, Onder Seekoebaard, Seekoeibaardsnek and Soutputs. The ACO associates study noted that these buildings provide good examples of vernacular architecture generally rare in the project landscape. Many of these buildings have vernacular pitched roof structures with more recent additions. An analysis of historical topographical maps and aerial photographs indicate the presence of the werfs from at least 1950 and the compounds are older than 60 years and generally protected under the

National Heritage Resource Act (NHRA 1999). The sites might afford a better understanding of architectural, settlement and social developments in the Brittan landscape. Highly sensitive burial sites are also known to occur around farmstead complexes. Small-scale farming and agriculture are prevalent around farmsteads in the project areas. Here, potential historical farmscapes might be encountered.

- Occasional remains of “veewagterhuise” or shepherds’ huts dating to the Colonial Period are scattered across farms in this landscape. These buildings are usually constructed out of undressed sandstone blocks and glass, rusted metal fragments, fragments of ceramics, earthenware and bone are often found in middens associated with these huts. Even though these occurrences are often poorly preserved, they might be protected under the National Heritage Resource Act (NHRA 1999) if older than 60 years.
- Digging and / or quarrying seem to have occurred at single localities in the project area. Here, one might encounter remnants of historical mining and quarrying but the significance of such sites is not always apparent.

Cultural Landscape

- Generally, the proposed project area and its surrounds are characterized by rural Karoo and Bushmanland farmlands, flatter grass plains and low mountain vegetation. Mountains and hills on the target properties for the project are indicated on topographic maps with unique names such as “Luisdraai”, “Klaar se Rant” and “Sandhoek” and other landscape features indicated, include “Wendam se Berg” and “Berg agter die Huis”. In addition, the Boegoeberg Dam holds a rich recent history. Cognisance should be taken of the fact that these features might hold certain intangible heritage value or they might be regarded as sites of “Living Heritage” in the cultural landscape.

Cemeteries / Burial Sites

- In their assessment, ACO associates documented an informal graveyard as well as two isolated graves or probable graves. The graveyard lies alongside the access road to Zeekoebaart and one grave is within about one metre of the edge of the road. In the sandy floodplain just downstream of the cliff where the weir is are two possible graves, one is a cement headstone seemingly propped up in the sand. Many people died during construction of the Boegoeberg Weir but it is apparently not known where they were buried
- Generally, burial sites frequently occur around farmstead complexes within family cemeteries, for example the Boegoeberg, Seekoebaard, Onder Seekoebaard, Seekoeibaardsnek and Soutputs farmsteads but in some instances packed stones or rocks indicate the presence of informal pre-colonial burials in this landscape. In addition, human remains and burials are often 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 therefore important to remember that 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. Cemeteries, burial places and graves are viewed to have a high significance and they are protected under the National Heritage Resource Act (NHRA 1999).

Ultimately, it is recommended that the archaeological and cultural heritage of this part of the Northern Cape Province be respected. The management of heritage resources, as stipulated by National and International Heritage resources agencies (e.g. SAHRA) should be aligned with any future activity by means of cultural mitigation and / or management plans developed in conjunction with heritage authorities and specialists.

8.1 Further Terms of Reference

It should be noted that this HS and site sensitivity included above are solely based on off-site desktop findings and the heritage sensitivity of the Zeekoebar 9, Farm 1 (Boegoeberg Water Reserve), Erven of Boegoeberg Settlement, farms Missing 153, Carter Block 584, Zeekoebaart 306, Farm 307, Farm 308, Boven Zeekoebaart

131, Rocksburg 301, farm 312 and Farm 309 properties remain tentative pending further detailed site inspection as part of the Heritage Impact Assessment (HIA) process, subject to section 38 of the National Heritage Resources Act (NHRA - Act 25 of 1999).

The following terms of reference for the HIA as part of the Environmental Authorisation Process, are required specifically for the Zeekoebaart 306 PRA Project terms of proposed operations:

- Provide a detailed description of all archaeological and heritage artefacts, structures, graves and settlements by means of the field inspection of all surface areas to be impacted by the planned exploration activities.
- Closely liaise with local communities and farm owners in order to identify additional archaeological, heritage and living heritage sites in the Project area.
- Contextualize any heritage resources and archaeological sites within the larger historical landscape by means of a detailed desktop-based background study.
- Estimate the level of significance/importance of the archaeological remains within the area.
- Assess any possible impact on the archaeological and historical remains within the area emanating from the proposed development activities.
- If necessitated by the development, propose possible mitigation measures for heritage resources, subject to a mandate from local authorities and according to international standards for best practise in Cultural Resources Management (CRM).
- Develop protection procedures for sacred sites and any other heritage features excluded from mitigation in conjunction with traditional guardians and elders and the local community.
- Liaise and consult with the relevant heritage resources management authorities (South African Heritage Resources Agency, Stakeholders).

It must be emphasised that the conclusions and recommendations expressed in this heritage scoping and sensitivity investigation are primarily based on desktop study findings and is thus not representative of the Project area's complete archaeological and historical 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.

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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, auguring), 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.

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. site-specific, 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

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

HERITAGE CONTEXT	TYPE OF DEVELOPMENT			
	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 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>	<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 - 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

	<ul style="list-style-type: none"> - 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
