

DIGBY WELLS
ENVIRONMENTAL

SAHRIS Case ID: 8971

**Basic Assessment Report:
Environmental Management Plan
in support of the Prospecting
Rights Application for Mooihoek
255KT and Driekop 253KT, near
Steelpoort, Limpopo Province**

Heritage Basic Assessment Report

Project Number:

MMC3745

Prepared for:

Mawetse (SA) Mining Corporation (Pty) Ltd

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Digby Wells and Associates (South Africa) (Pty) Ltd
(Subsidiary of Digby Wells & Associates (Pty) Ltd). Co. Reg. No. 2010/008577/07. Turnberry Office Park, 48
Grosvenor Road, Bryanston, 2191. Private Bag X10046, Randburg, 2125, South Africa
Tel: +27 11 789 9495, Fax: +27 11 789 9498, info@digbywells.com, www.digbywells.com




Directors: DJ Otto, GB Beringer, LF Koeslag, AJ Reynolds (Chairman) (British)*, J Leaver*, GE Trusler
(C.E.O)
*Non-Executive





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Project Name:	Basic Assessment Report: Environmental Management Plan in support of the Prospecting Rights Application for Mooihoek 255KT and Driekop 253KT, near Steelpoort, Limpopo Province
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Name	Responsibility	Signature	Date
Natasha Higgitt Assistant Heritage Resources Management Consultant ASAPA Member No.335	Overall Report Compiler and site visit		December 2015
Justin du Piesanie Heritage Resources Management Consultant: Archaeology Specialist ASAPA Member No 270	1 st Review		December 2015
Johan Nel Heritage Resources Management: Unit Manager ASAPA Member No 095	Final Reviewer		December 2015

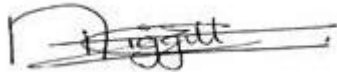
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Digby Wells and Associates (Pty) Ltd

Contact person: Natasha Higgitt

Turnberry Office Park	Tel:	011 789 9495
48 Grosvenor Road	Fax:	011 789 9498
Bryanston	E-mail:	natasha.higgitt@digbywells.com
2191		

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Full name:	Natasha Higgitt
Title/ Position:	Assistant Heritage Management Consultant: Archaeologist
Qualification(s):	BA Honours in Archaeology
Experience (years):	5 years' experience
Registration:	Association of Southern African Professional Archaeologists (ASAPA) South African Museums Association (SAMA)

EXECUTIVE SUMMARY

Digby Wells Environmental (Digby Wells) has been appointed by Rustenburg Platinum Mines (Pty) Ltd (RPM) to compile an Environmental Management Plan (EMP) in support of a Prospecting Right Application (PRA). The PRA is for the farms Mooihoek 255KT and Driekop 253KT north of Steelpoort, in the Sekhukhuneland Magisterial District, Limpopo Province.

The EMP and PRA will be completed in terms of the National Environmental Management Act (NEMA) Environmental Impact Assessment (EIA) Regulations, 2014, with reference to listed activity 20 of GN R.983.

This report constitutes a Heritage Basic Assessment Report (HBAR) to inform the overall Basic Assessment Report (BAR).

The PRA is for the prospecting of Platinum Group Metals (PGM) and associated minerals. Prospecting activities will include invasive and non-invasive methods. Non-invasive methods will include a ground magnetic survey and a non-intrusive survey that will not have an impact on the receiving environment. Invasive methods will include diamond core drilling to ascertain the stratigraphy sequence and the reef horizons of the ore body. It is anticipated that a maximum of four boreholes will be drilled over a five year period.

The following Scope of Work (SoW) has been completed:

- Brief literature review based on existing impact assessment reports in the surrounding area and available databases; and
- Historical layering to identify potential structures older than 60 years and changes in the cultural landscape;
- Pre-disturbance survey of the proposed study area to record the current state of the cultural landscape;
- Developing cultural significance of identified heritage resources;
- Impact Assessment and possible sources of risk; and
- Recommend mitigation measures.

Geologically, the study area is underlain by the Bushveld complex. The study area lies within the Western Limb of the Rustenburg Layered Suite that is a mafic formation (magma flows), which does not contain any sedimentary layers and therefore no fossils

Archaeologically, Early (EFC) and Late Farming Community (LFC), historical sites and burial grounds have been recorded within the regional and site specific study area, though none of these sites have been identified within 100 m of the proposed prospecting boreholes.

Based on the results of the desktop study and pre-disturbance survey, no heritage impacts are envisioned for the Mooihoek and Driekop PRA. No significant heritage resources were identified within 100 m of the proposed prospecting boreholes during the desktop study.

Heritage resources were identified at a local level including Stone Age surface occurrences, an EFC site and a grave, though none were identified near the borehole locations. No heritage resources or surface indicators of sub-surface heritage resources were identified during the pre-disturbance survey.

Potential risks to heritage resources include accidental damage or destruction to identified and un-identified heritage resources during site clearance for temporary road/route construction, prospecting sites and rehabilitation purposes.

Based on the findings of this report, Digby Wells recommends the following mitigation and management plans:

- Exemption from further palaeontological assessments for the proposed infrastructure footprint as the palaeo-sensitivity is insignificant;
- No prospecting activities can occur within 100 m of identified heritage resources;
- Chance Finds Procedures must be developed and implemented part of the EMP that clearly describe the process and appropriate management of the exposure of previously unidentified heritage resources; and
- Additionally, should the prospecting prove to be successful and a Mining Right be applied for, a full HRM process should be implemented inclusive of a Heritage Impact Assessment (HIA).



LIST OF ACRONYMS, ABBREVIATIONS AND TERMS

Abbreviation	Meaning
ASAPA	Association of Southern African Professional Archaeologists
BA	Bachelor of Arts
Bsc	Bachelor of Science
Digby Wells	Digby Wells Environmental
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
ESA	Early Stone Age
ESTA	Extension of Security of Tenure Act (Act No. 62 of 1997)
GIS	Geographical Information System
GPS	Global Positioning System
HBAR	Heritage Basic Assessment Report
HIA	Heritage Impact Assessment
Hons	Honours degree
HRA	Heritage Resources Authority
HRM	Heritage Resources Management
ICOMOS	International Council on Monuments and Sites
LSA	Late Stone Age
LIHRA	Limpopo Provincial Heritage Resources Authority
MA	Master of Arts
MPRDA	Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
MSA	Middle Stone Age
MSc	Master of Science
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SAMA	South African Museum Association
SoW	Scope of Work
Ste	Structure
UNESCO	United Nations Education, Scientific and Cultural Organisation
UP	University of Pretoria
Wits	University of the Witwatersrand



GLOSSARY

Term	Definition
Archaeologist	A trained professional who uses scientific methods to excavate record and study archaeological sites and deposits.
Artefact	Any object manufactured or modified by human beings.
Burial Grounds and Graves Consultation (BGGC)	The regulated consultation process required in terms of Section 36 of the NHRA and Regulations IX and XXI to the Act when burial grounds and graves are identified within a project area.
Ceramic (syn. pottery)	In an archaeological context any vessel or other object produced from natural clay that has been fired. Indigenous ceramics associated with Farming Communities are low-fired wares, typically found as potsherds. Imported and more historic ceramics generally include high-fired wares such as porcelain, stoneware, etc.
Cultural significance (CS)	<p>The aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance. A heritage may have cultural significance or other special value because of its:</p> <ul style="list-style-type: none"> ■ Importance in the community, or pattern of South Africa's history. Possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage ■ Potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage. Importance in demonstrating the principal characteristic of a particular class of South Africa's natural or cultural places or objects. ■ Importance in exhibiting particular aesthetic characteristics valued by a community or cultural group. ■ Importance in demonstrating a high degree of creative or technical achievement at a particular period. ■ Strong or special association with a particular community or cultural group for social, cultural or spiritual reasons. ■ Strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa. ■ Significance relating to the history of slavery in South Africa.
Development	<p>Any physical intervention, excavation, or action, other than those caused by natural forces, which may in the opinion of a heritage authority in any way result in a change to the nature, appearance or physical nature of a place, or influence its stability and future well-being, including:</p> <ul style="list-style-type: none"> ■ Construction, alteration, demolition, removal or change of use of a place or a structure at a place ■ Carrying out any works on or over or under a place. ■ Subdivision or consolidation of land comprising, a place, including the structures or airspace of a place. ■ Constructing or putting up for display signs or hoardings. ■ Any change to the natural or existing condition or topography of land.



	<ul style="list-style-type: none"> ■ Any removal or destruction of trees, or removal of vegetation or topsoil.
Early Farming Community/ies	The first Farming Communities (also known as Early Iron Age) that appear in the souther archaeological record during the early first millenium CE. The EFC period is generally dated from c. 200 CE to 1000 CE.
Farming Community/ies	Term signifying the appearance in the southern African archaeological of Bantu-speaking agricultural based societies from the early first millenium CE. The term replaces the <i>Iron Age</i> as a more accurate description for groups who practiced agriculture and animal husbandry, extensive manufacture and use of ceramics, and metalworking. The Farming Community period is divided into an Early and Late phase. The use of Later Farming Communities especially removes the artificial boundary between archaeology and history.
Field Rating	<p>SAHRA requires heritage resources to be provisionally rated in accordance with Section 7 of the NHRA that provides a three tier grading system of resources that form part of the national estate. The rating system distinguishes between four categories:</p> <ul style="list-style-type: none"> ■ 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. ■ General Protected: i.e. generally protected in terms of Sections 33 to 37 of the NHRA.
Formal protection	Places with qualities so exceptional that they are of special national significance as national heritage sites or that have special qualities as provincial heritage sites.
General protection	<p>General protections are afforded to:</p> <ul style="list-style-type: none"> ■ Objects protected in terms of laws of foreign states. ■ Structures older than 60 years. ■ Archaeological and palaeontological sites and material and meteorites. ■ Burial grounds and graves. ■ Public monuments and memorials.
Grave	A place of interment and includes the contents, headstone or other marker of such a place, and any other structure on or associated with such place.
Heritage Assessment (HIA) Impact	An assessment of the cultural significance of, and possible impacts on, diverse heritage resources that may be affected by a proposed development. A HIA may include several specialist elements such as archaeological, built environment and palaeontological studies. The HIA must supply the heritage authority with sufficient information about the sites to assess, with confidence, whether or not it has any objection to a development, indicate the conditions upon which such development might proceed and assess which sites require permits for destruction, which sites require mitigation and what measures should be put in place to protect sites that should be conserved. The content of HIA reports are clearly outlined in Section 38(3) of the NHRA and SAHRA Minimum Standards.
Heritage resource	Any place or object of cultural significance.



Heritage resources management	<ul style="list-style-type: none"> ■ Process required when development is intended categorised as: Any linear development exceeding 300m in length. ■ Construction of a bridge or similar structure exceeding 50 m in length. ■ Any activity which will change the character of a site exceeding 0.5 hectares in extent or involving three or more existing erven or subdivisions thereof or that have been consolidated within the past five years or costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority. ■ Re-zoning of a site exceeding one hectare in extent. ■ Any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority.
Heritage site	<p>Any place declared to be a national heritage site by SAHRA or a place declared to be a provincial heritage site by a provincial heritage resources authority.</p>
Late Farming Community/ies	<p>Farming Communities who either developed / evolved from EFC groups, or who migrated into southern African from the late first millenium / early second millenium CE. The LFC period evidences distinct changes in socio-political organisation, settlement patterns, trade and economic activities, including extensive trade routes. The LFC period is generally dated from c. 1000 CE well into the modern historical period of the nineteenth century.</p>
Middle Stone Age	<p>The South African MSA dates from ~300 Kya to c. 30 Kya. This period is associated with the changing behavioural patterns and the emergence of modern cognitive abilities in early <i>Homo sapiens species</i>. The lithic industries that characterise the MSA are typically more complex tools with diagnostic identifiers, including convergent flake scars, multi-faceted platforms, retouch and backing. Assemblages are characterised as refined lithic technologies such as prepared core techniques, retouched blades and points manufactured from good quality raw material.</p>
National estate	<ul style="list-style-type: none"> ■ The national estate as defined in Section 3 of the NHRA, i.e. heritage resources of South Africa which are of cultural significance or other special value for the present community and for future generations. The national estate may include: Places, buildings, structures and equipment of cultural significance. ■ Places to which oral traditions are attached or which are associated with living heritage. ■ Historical settlements and townscapes. ■ Landscapes and natural features of cultural significance. ■ Geological sites of scientific or cultural importance. ■ Archaeological and palaeontological sites. ■ Graves and burial grounds, including ancestral graves, royal graves and graves of traditional leaders, graves of victims of conflict, graves of individuals designated by the Minister by notice in the Gazette, historical graves and cemeteries, and other human remains which are not covered in terms of the National Health Act, 2003. ■ Sites of significance relating to the history of slavery in South Africa. ■ Movable objects, including objects recovered from the soil or waters of



	<p>South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens; objects to which oral traditions are attached or which are associated with living heritage; ethnographic art and objects; military objects; objects of decorative or fine art; objects of scientific or technological interest.</p> <ul style="list-style-type: none"> ■ Books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1(xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996).
Palaeontological	Any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace.
Pre-disturbance survey (syn. reconnaissance)	A survey to record a site as it exists, with all the topographical and other information that can be collected, without excavation or other disturbance of the site.
Provisional protection	A protected area or heritage resource provisionally protected by SAHRA or a provincial heritage resources authority by a notice in the Gazette or Provincial Gazette.



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1 Introduction

Digby Wells Environmental (Digby Wells) has been appointed by Mawetse (SA) Mining Corporation (Pty) Ltd (Mawetse) to compile an Environmental Management Plan (EMP) in support of a Prospecting Right Application (PRA). The PRA is for the farms Mooihoek 255KT and Driekop 253KT, north of Steelpoort in the Sekhukhuneland Magisterial District, Limpopo Province.

The EMP and PRA will be completed in terms of the National Environmental Management Act, 1999 (Act No. 107 of 1999) (NEMA) Environmental Impact Assessment (EIA) Regulations, 2014 with reference to listed activity 20 of GN R. 983.

Digby Wells was appointed to undertake the necessary environmental and social studies required for the EMP and PRA. This report constitutes a Heritage Basic Assessment Report (HBAR) to inform the overall Basic Assessment Report (BAR).

1.1 Project Background

Mawetse intends to conduct prospecting activities on the properties discussed above. Digby Wells will be compiling an EMP for the PRA for Listed Activities in terms of the legal framework presented in section 2.6 below. A Basic Assessment (BA) process will be undertaken in support of the EMP.

1.2 Project description and activities

Prospecting activities will include invasive and non-invasive methods. Non-invasive methods include a ground magnetic survey and a non-intrusive survey that will not have an impact on the receiving environment. The ground magnetic survey will aid in the identification of areas to be drilled to obtain the required data for the mapping of the ore body. Datasets supplied by the Council of Geoscience will be used along with and remote sensing methods such as satellite and aerial imagery to define the extent of the ore body. Airborne geophysical surveys and field reconnaissance of the area will be also be undertaken to aid in the determination of the potential extent of the ore body.

1.2.1 Construction Phase (Site clearing)

No construction will take place as no permanent infrastructure will be established. Activities will be limited to possible temporary access roads, as well as the clearing of vegetation for the construction of the prospecting drill site. Three sumps will be constructed to separate and store oil, sludge and water. The prospecting sites will be an area approximately 10 m x 10 m. Cleared topsoil will be stockpiled on site to a maximum height of 1 m.

1.2.2 Operational Phase (Drilling)

Invasive methods will include diamond core drilling to ascertain the stratigraphic sequence and the reef horizons of the ore body. It is anticipated that a maximum of four boreholes will be drilled over a five year period.

No permanent infrastructure will be constructed as part of the prospecting activities.

1.2.3 Decommissioning Phase (Rehabilitation)

The sumps, access roads/tracks and prospecting sites will be rehabilitated following the prospecting activities.

The rehabilitation activities will include the following:

- Rehabilitation of each prospecting drill site concurrently with the prospecting work schedule. As the drill rig is removed from the site, rehabilitation will commence; and
- Where necessary, the site will be ripped where the soil has become compressed and compacted.

1.2.4 Project Activities

The Project will trigger EIA Regulations, 2014 Listed Activities listed in Table 1-1 below.

Table 1-1: Listed activities

Activity No.	Activity	GN R Activity	NHRA Trigger
Establishment and Operational Phase			
1	Any activity which requires a prospecting right in terms of the MPRDA including earthworks directly related to the prospecting of a mineral resource	GN R983 Listing Notice 1 Activity 20	Section 38 (8)

Based on the project activities, only Activity 20 of Listing Notice 1 is triggered, however the above project activities will be considered during the impact assessment.

1.2.5 Project location

The site specific project area is located 12.5 km north from the town of Steelpoort. Location details for the Project area summarised in Table 1-2 below.

Table 1-2: Location of the proposed expansion area

Province	Limpopo Province
Magisterial District / Local Authority	Sekhukhuneland Magisterial District
District Municipality	Greater Sekhukhune District Municipality
Local Municipality	Greater Tubatse Local Municipality
Nearest Town	Steelpoort
Property Name and Number	Mooihoek 255KT Driekop 253KT



1: 50 000 Map Sheet	2430 CA Steelpoort
GPS Co-ordinates (relative centre point of study area)	-24.539354
	30.135823

The location of the proposed prospecting boreholes is summarised in Table 1-3 below

Table 1-3: Proposed prospecting borehole locations

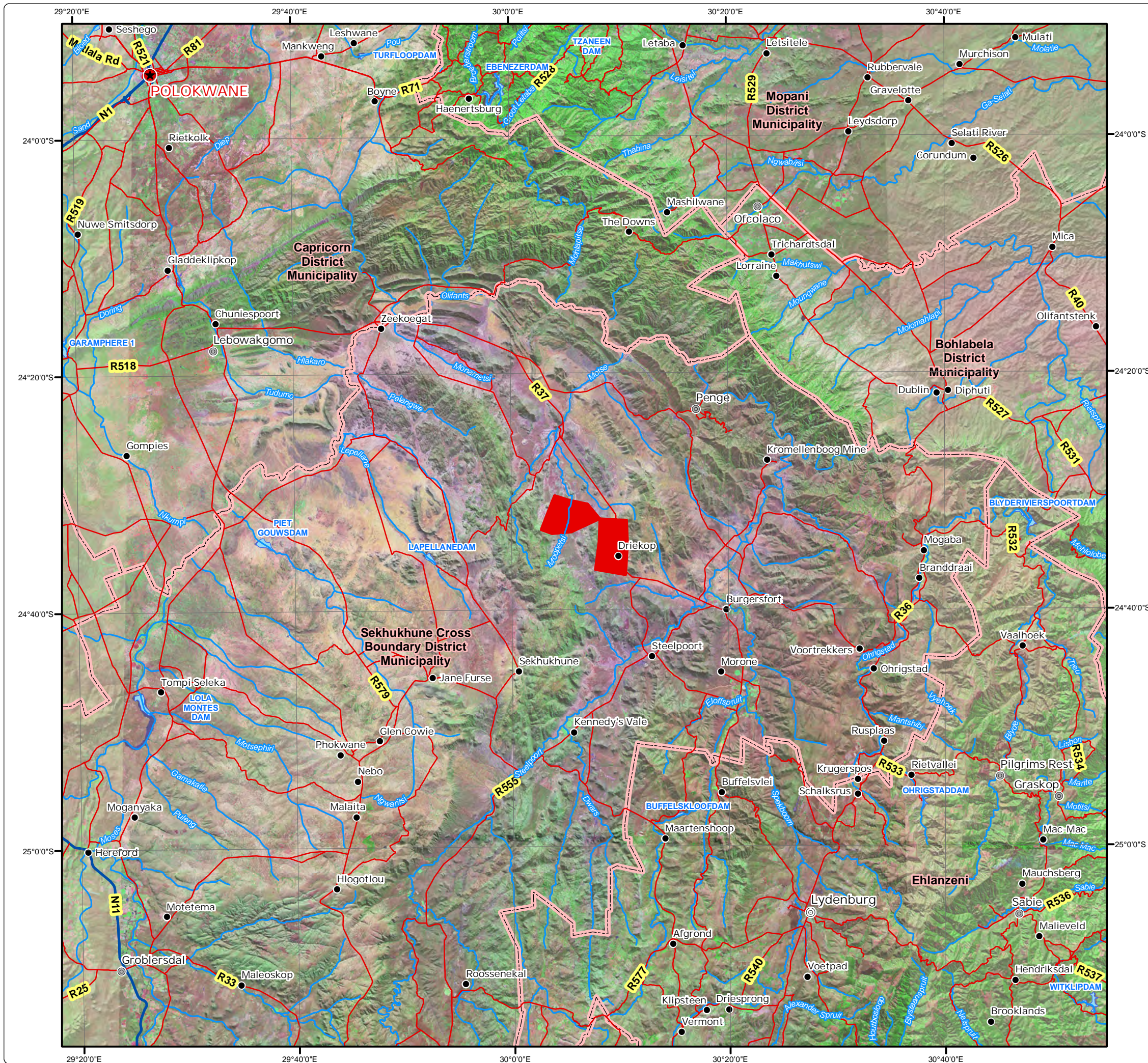
Borehole	Latitude	Longitude
001	-24.571005	30.154687
002	-24.584149	30.137168
003	-24.514698	30.071267
004	-24.539213	30.096119

Mawetse PR EMP

Regional Setting

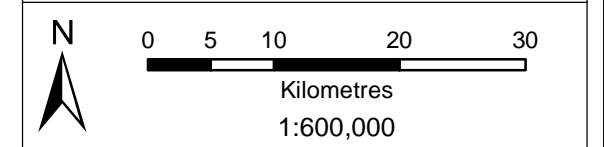
Legend

- Project Area
- City
- Secondary Town
- Other Town
- Settlement
- Main Road
- National Road
- River
- Dam
- District Municipality



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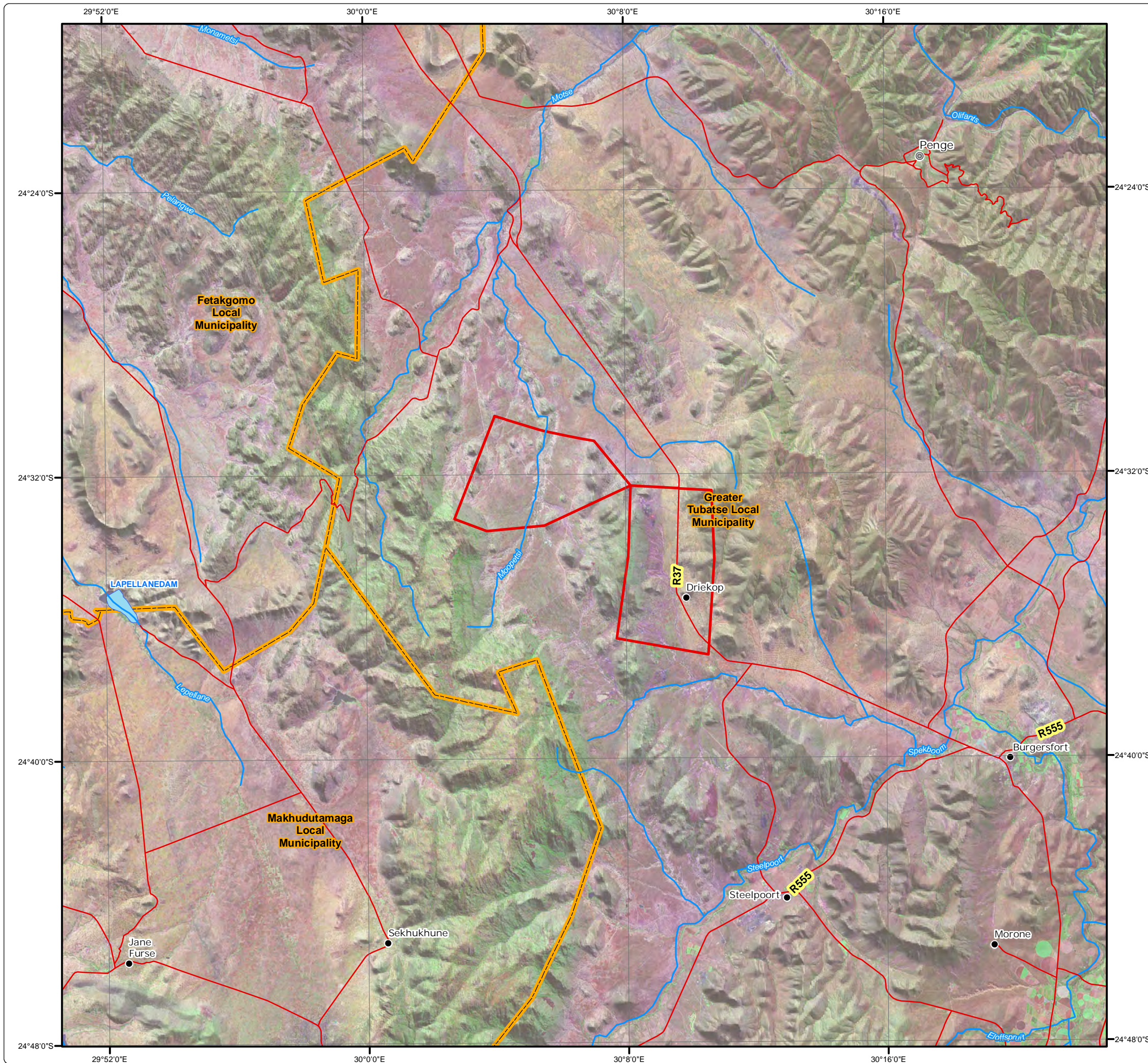


Mawetse PR EMP

Local Setting

Legend

- Project Area
- Other Town
- Settlement
- Main Road
- River
- Dam
- Local Municipality Boundary



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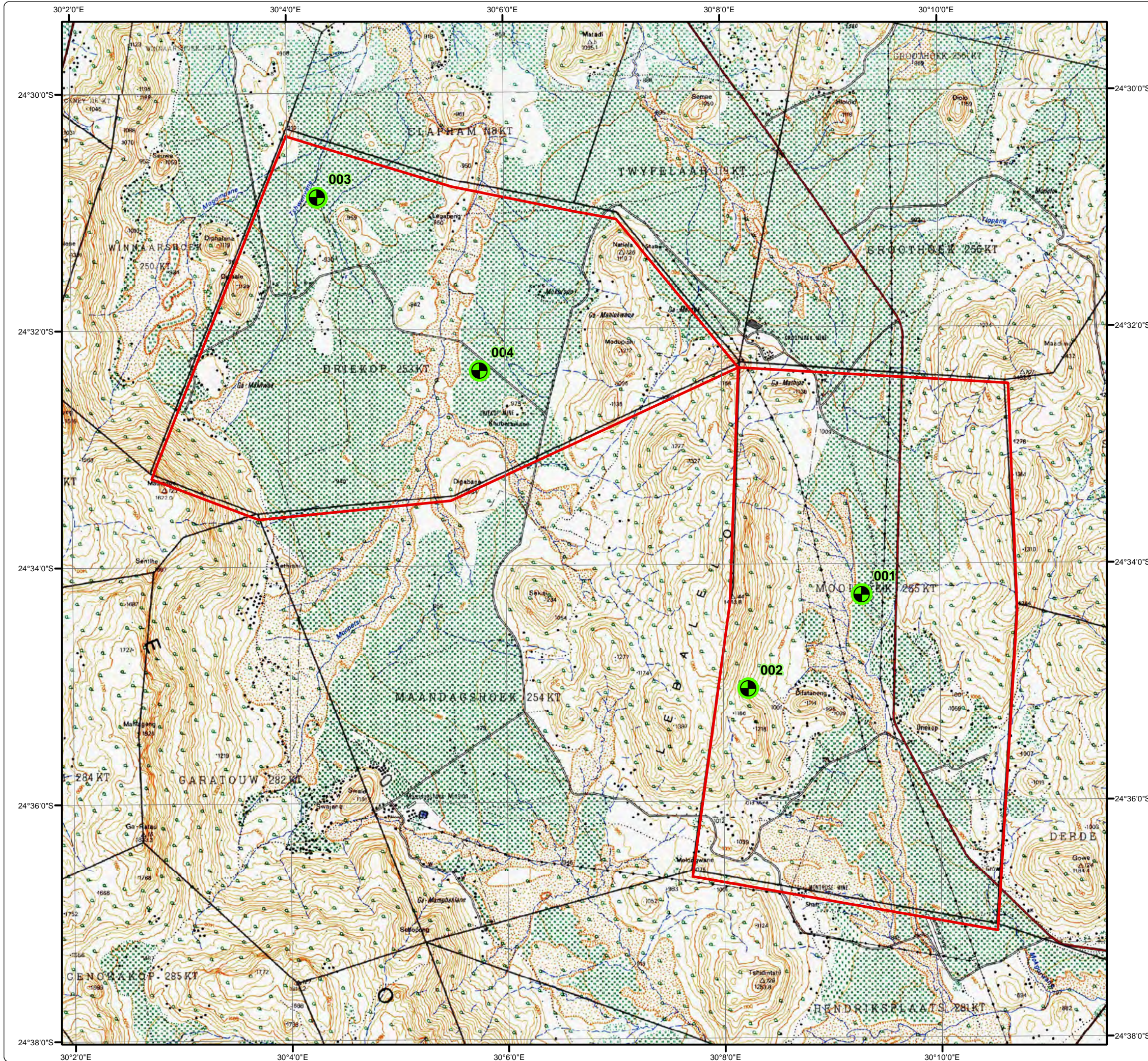


Mawetse PR EMP

Site Specific Setting

Legend

-  Project Area
-  Proposed Prospecting Boreholes

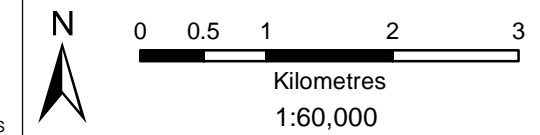


2430AC Moroka
2430CA Steelpoort



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 Central Meridian: 31°E Date: 14/12/2015





1.3 Scope of Work

The Terms of Reference (ToR) issued to Digby Wells required that a BA process be completed for the EMP and PRA. This BA process needed to include a Heritage Resources Management (HRM) process. The HRM process comprised a Notification of Intent to Develop (NID) and a HBAR for submission to the South African Heritage Resources Agency (SAHRA) and Limpopo Provincial Heritage Resources Agency (LIHRA).

1.4 Purpose and contents of report

The purpose of this HRM process, including the NID and HBAR is to:

- Timeously furnish responsible heritage resources authorities (HRAs) with the project information;
- Provide HRAs with details regarding the location, nature and extent of the proposed activities;
- Identify the specific heritage sensitivities in the study area, including acceptable levels of change in relation to assigned cultural significance;
- Provide specialist recommendations for appropriate and feasible mitigation measures; and
- Ensure compliance with applicable legislation referred to in Chapter 3 below.

This report is structured as follows:

- Chapter 1 summarises the project description and project activities;
- Chapter 2 describes the methodology undertaken during the HRM process and the compilation of this report;
- Chapter 3 provides a brief outline of the legal framework applicable to the HRM process;
- Chapter 4 provides a description of the cultural heritage baseline and affected environment;
- Chapter 5 discusses the impact assessment undertaken; and
- Chapter 6 provides a summary of the most salient points of the heritage assessment and recommendations for appropriate mitigation measures where required.

2 Methodology

The following activities were completed during the HRM process:

- Defining study areas;
- Data collection;

- Developing cultural significance of identified heritage resources; and
- Completing an impact assessment.

2.1 Defining Study Areas

Three 'concentric' study areas were defined for the purposes of this study. These areas are defined below; each one encompasses its precursor and exceeds it in scale:

- The **regional study area** - this area was defined as the Greater Sekhukhune District Municipality (GSDM). Where necessary, the regional study area was extended outside the boundaries of the district municipality to include much wider regional expressions of specific types of heritage resources and historical events as shown in Plan 1.
- The **local study area** – the area most likely to be influenced by any changes to heritage resources in the study area, or where project development could cause heritage impacts. This area was defined as the immediate surrounding properties / farms, as well as the affected Greater Tubatse Local Municipality (GTLM) (See Plan 2).
- The **site-specific study area** – this is the area where heritage impacts are most probable due to development. This area is defined as the extent of the farm portions, of the proposed study area including any buffer areas around the study area that may be required. (See Plan 3).

The relevance of defining study area arises from the fact that heritage resources do not exist in isolation to the greater natural and social (including socio-cultural, -economic and -political) environment. There is also a legal requirement to provide suggested field ratings for identified heritage resources (see Section 2.3 below). These field ratings aim to assist responsible heritage resources authorities in grading resources into three categories in terms of national (Grade I), provincial (Grade II) and local (Grade III) concern based on their importance and consequent official (i.e. State) management effort required. The type and level of baseline information required to adequately predict heritage impacts varies between these categories.

2.2 Data Collection

Data collection is necessary to develop a cultural heritage baseline profile, discussed in Section 4. Gathered information assisted in the development of the cultural heritage baseline profile, determination of cultural significance, and assessment of impacts. Qualitative and quantitative data were collected for the HBAR.



2.2.1 Legal review

Relevant national legislation were reviewed and summarised in section 2.6. The purpose was to ensure that the Mooihoek and Driekop EMP and PRA process adhered to all conditions contained in these documents.

2.2.2 Literature review and desktop data collection

Relevant information was sourced from available reports, publications, websites and cartographic sources, listed in section 8.

Table 2-1: Summary of reviewed information sources

Relevant Previous Heritage Studies		
Author	Report Type	Area/development
Birkholtz & Steyn, 2005	HIA	Dwarsrivier 372KT and Thorncliffe 374KT
Fourie, 2008	AIA	Mooihoek 255KT
Huffman & Schoeman, 2000	AIA	Lebalelo Pipeline
Hutten, 2008	HIA	Groothoek Residential and Industrial Development
Roodt, 2003a	HIA	Der Brochen Tailings Dams
Van Schalkwyk, 2001	AIA	Sekhukhuneland
du Piesanie, 2012	HIA	Sylvania

Historical layering was completed for the site specific area and aimed to identify historical heritage resources. Historical layering is a process whereby diverse cartographic sources from various time periods are layered chronologically using Geographic Information System (GIS). The rationale behind historical layering is three fold as follows:

- Provides relative dates based on the presence/absence of visible features;
- To identify changes in the cultural landscape; and
- Identifies potential locations where heritage resources may exist within an area.

Cartographic sources referred to in this report are listed in Table 2-2 below.

**Table 2-2: Relevant reviewed cartographic sources**

Aerial photographs						
Job no.	Flight plan	Photo no.	Map ref.	Area	Date	Reference
131	007	74967 - 74970	2330 2331 2430	Tzaneen/Ohrigstad	1938	131/1938
	008	74988 - 74990				
	012	75066 - 75067				
	017	75155 - 75160				
325	027	07508 - 07512	2330 2331 2430 2431 2530 2531	Pilgrim's Rest/Sabie/Leydsdorp	1954	325/1954
	028	07610				
	029	07635				

2.2.3 Pre-disturbance survey

The pre-disturbance survey was undertaken by Natasha Higgitt, a qualified and accredited archaeologist on 9 December 2015. The site specific project area was surveyed through pedestrian methods using an unstructured and unsystematic approach. Each proposed prospecting boreholes was inspected for heritage resources. A 100 m² buffer zone was surveyed around each borehole. One of the boreholes (002) could not be surveyed as the only access road had been washed away by recent heavy rains.

The survey was recorded as a GPS track logs and the landscape was documented through photographic and written records.

2.2.4 Site naming

Site identified in previous relevant studies are prefixed by the SAHRIS case or map number and the original site name used by the author, i.e. **2529DD/HH06**

2.3 Developing cultural significance and field ratings

2.3.1 Cultural significance

Determining the CS of heritage resources, and assign field ratings to these, are legal requirements as described in section 2.6 below.

CS was determined based on identified resources' importance or contribution to four broad value categories: aesthetic, historical, scientific and social values. The resources'

importance or contributions to these values were considered in terms of associative (qualitative) and / or rarity (quantitative) attributes. These attributes were based on the data collected and collated into the cultural heritage baseline profile described in Section 4 below.

Qualitative data was used to identify any associative attributes such as notable people or groups, important events, or significant aspects that may be associated with the resource.

Quantitative data was used to determine the rarity of any attributes based on other similar examples that may exist elsewhere.

The integrity or condition of resources further influenced the CS. Integrity is largely determined based on resources' current, observed state of conservation, as well as notable changes made to it over the years.

A detailed methodology statement is provided in Appendix B.

2.3.2 Field Ratings

Field ratings assist the responsible heritage resources authority to grade heritage resources into national (Grade I), provincial (Grade II) or local (Grade III) categories. Each category requires specific minimum required mitigation measures and consequent management responsibilities. Field ratings are closely linked to the importance rating, described in Section 0 below. The field rating process therefore aimed to facilitate the decision-making process.

A detailed methodology statement is provided in Appendix B.

2.4 Impact assessment

Impacts to heritage resources can be broadly divided into three categories – direct, indirect and cumulative. The assessments of these impacts are done by assigning a numerical value to the significance of the identified impacts.

The assessment of impacts inherently considers the CS and field ratings. The consequence of the potential impact was weighted against the parameters intensity, spatial scale and duration. To identify the significance of the impact, the consequence was measured against the probability of the impact occurring.

The magnitude of the potential impact was applied to both pre- and post-mitigation scenarios with the aim of removing all negative impacts on heritage resources, and enhancing positive ones.

A detailed methodology statement is provided in Appendix B.

2.5 Constraints and Limitations

The following constraints and limitation were associated with the project:

- Detailed development footprints and borehole positions were not available at the time of the pre-disturbance survey and compilation of this report. The proposed prospecting locations were plotted by the Digby Wells GIS unit for approval from



Mawetse. Should the proposed prospecting locations be amended, this will result in a gap in the results of the heritage pre-disturbance survey;

- Access to one of the borehole locations (002) was not possible at the time of the survey;
- In view of its locality and potential heritage impact, one of the proposed boreholes (002) may need to be re-sited during the course of the geological surveys. Since no on-site work will take place during this phase, the consulting geologist will be able to re-assess the location prior to the commencement of operations. After the new location has been finalised, the point will be inspected by a qualified archaeologist who will make further recommendations if necessary;
- Many tangible heritage resources, specifically archaeological resources, commonly occur below the surface, and may not be identified, documented and assessed without intrusive and destructive methods. Intrusive archaeological assessments require permits issued in terms of section 35 of the NHRA. However, these are not issued as part of so-called Phase impact assessments. Therefore, the findings in the reviewed literature, and especially existing HIA reports, are in themselves limited to surface observations.

2.6 Consultant and Specialists¹

Natasha Higgitt compiled the overall DHBAR. She obtained her Bachelor of Arts (BA) Honours degree in Archaeology in 2010 from the University of Pretoria. She held the position of Assistant Heritage Consultant: Archaeology Specialist at Digby Wells. She has more than 5 years' experience in archaeological survey and gained further generalist heritage experience since her appointment at Digby Wells in South Africa and Liberia.

Natasha is a professional member of the Association of Southern African Archaeologists (ASAPA) (*Member No. 335*).

Justin du Piesanie undertook the first technical review of this DHBAR. He obtained his Master of Science (MSc) degree in Archaeology from the University of the Witwatersrand in 2008, specialising in the Southern African Iron Age. Justin also attended courses in architectural and urban conservation through the University of Cape Town's Faculty of Engineering and the Built Environment Continuing Professional Development Programme in 2013. He currently holds the position of Heritage Management Consultant: Archaeologist at Digby Wells. He has over 9 years combined experience in HRM in South Africa, including heritage assessments, archaeological mitigation and grave relocation. Justin has gained further generalist experience since his appointment at Digby Wells in Botswana, Burkina Faso, the Democratic Republic of Congo, Liberia and Mali on projects that have required

¹ Detailed curricula vitae of the specialists are attached as Appendix A

compliance with International Finance Corporation (IFC) requirements such as Performance Standard 8: Cultural Heritage.

Justin is a professional member of ASAPA (*Member No. 270*) and the International Council on Monuments and Sites (ICOMOS) South Africa (*Member No. 14274*).

Johan Nel undertook the second technical review of this DHBAR. He has more than 15 years of combined experience in the field of HRM including archaeological and heritage assessments, grave relocation, social consultation and mitigation of archaeological sites. He has gained experience both within urban settings and remote rural landscapes. Since 2010 he has been actively involved in environmental management that has allowed Johan to investigate and implement the integration of heritage resources management into EIA's. Many of the projects since have required compliance with IFC requirements such as Performance Standard 8: Cultural Heritage. This exposure has allowed Johan to develop and implement a HRM approach that is founded on international best practice, leading international conservation bodies such as the United Nations Educational, Scientific and Cultural Organisation (UNESCO) and ICOMOS and aligned to the South African legislation. Johan has worked in most South African Provinces, as well as Swaziland, the Democratic Republic of the Congo, Liberia and Sierra Leone.

Johan is a professional member of ASAPA (*Member No. 095*), accredited CRM practitioner, and a member of ICOMOS South Africa (*Member No. 13839*).

3 Legal and policy framework

This section outlines the general legal and policy framework within which the proposed EMP and PRA is being undertaken. This includes national and provincial legislation, local legislation and policy as well as international best practice standards.

3.1 Minerals and Petroleum Resources Development Act, Act No. 28 of 2002 (MPRDA)

The MPRDA is the overarching legislation that regulates all mining activities in the Republic of South Africa. Section 5(4) states that no person may mine or commence with any work incidental thereto on any area without an approved EMP. An EMP does not explicitly require a heritage study and therefore does not trigger a NHRA section 38(8) application. However, an EMP and PRA do require a BAR or EIA to be conducted.

The EIA or BAR must therefore be conducted in accordance with section 38 of the MPRDA that give effect to the general objectives of integrated environmental management encapsulated in Chapter 5 of the NEMA. The EIA must furthermore speak to impacts that the mining will have on the environment in accordance with section 24(7) of the NEMA.



3.2 National Environmental Management Act, Act No. 107 of 1998 (as amended) (NEMA)

This Act requires that sustainable development requires the integration of social, economic and environmental factors in the planning, implementation and evaluation of decisions so as to ensure that development serves present and future generations. The Act further sets out the process for public participation in terms of the 2014 NEMA Regulations

A BAR must be completed when a development triggers any activity in Listing Notice 1 of the EIA Regulations, 2014. Chapter 4 Section 19 states that where a basic assessment must be applied for, the BAR consider impacts and risks associated with the proposed project, it must include specialist reports (i.e. heritage and cultural aspects and impacts must be considered) and an EMP.

3.3 NEMA Regulations 2014

The NEMA Regulations provide a list of activities that would trigger the NEMA and what needs to be completed in the event of such activities i.e. the completion of a BAR or a full EIA process.

Listing Notice 1 Activity 20 deals with the operation of any activity that requires a prospecting rights in terms of section 16 of the Mineral and Petroleum Development Act (Act No. 28 of 2002) (MPRDA). Activities summarised in Listing Notice 1 requires a BAR to be completed as stated in section 3.2 above.

3.4 National Heritage Resources Act, Act No. 25 of 1999 (NHRA)

The NHRA is the overarching legislation that protects and regulates the management of heritage resources in South Africa. This Act considers various heritage resources as forming part of the national estate, contemplated in Section 3. In addition, certain other categories are afforded automatic formal or general protection. Sections considered relevant to this project are outlined below:

- Formal protection:
 - National and provincial heritage sites, Section 27;
 - Certain types of protected areas, Section 28; and
 - Heritage areas, Section 32.
- General protection:
 - Certain structures with demonstrable cultural significance or that are older than 60 years, Section 34;
 - Archaeological and palaeontological resources, Section 35;
 - Burial grounds and graves, Section 36; and

- All public monuments and memorials, Section 37.

Section 5 of the NHRA encapsulates general principles for HRM that this specialist heritage component of the Project aims to adhere to. Section 38 outlines the HRM process and minimum requirements that need to be complied with namely:

- Subsection (8) requires a HIA study to be conducted if an impact assessment is required in terms of any other Act such as the NEMA and MPRDA; and
- Subsection (3) outlines the minimum information that must be included in a HIA report.

This HBAR was completed to comply in part with sections 38 of the Act and will be submitted to the SAHRA and LIHRA for statutory comment.

3.5 SAHRA Mining and Prospecting Guidelines

SAHRA published prerequisites for mining and prospecting projects with regards to heritage resources in 2006 (SAHRA APMHOB Permit Committee, 2006) All superficial mining projects are likely to impact in one way or another on archaeological sites. Impact assessments are required before any disturbance of the landscape. In order to do this, a specialist report is required to allow the relevant authority to assess whether this approval can be granted. As such, no mining, prospecting or development can take place without prior heritage assessment and approval.

4 Cultural Heritage Baseline Description

The cultural baseline is based on information sources from previous HIAs conducted in the area and databases described in section 2.2.2 above. The baseline considered all study areas as discussed in section 2.1 above. The natural environment, geology, paleontological potential, Stone Age, Farming Communities and historical periods were investigated and are discussed below.

The cultural landscape of the regional and local study area can be categorised by the occurrence of Middle Stone Age (MSA) accumulations, Early (EFC) and Later Farming Communities (LFC), and historical settlements.

4.1 Regional and Local Study Area

4.1.1 Geology and Palaeontological Sensitivity

The geology underlying the regional and local study areas is that of the Bushveld Complex (Refer to Plan 4). The Bushveld Complex comprises the largest preserved mafic layered intrusions in the world. It consists of felsic and mafic igneous rocks, containing the world's



largest platinum-group elements ore reserves (Johnson, et al., 2006). The lithostratigraphy of the Bushveld Complex specific to the project area is summarised in Table 4-1 below.

The project area lies within the eastern limb of the Rustenburg Layered Suite that date from c. 2 500 Ma to around 2 000 Ma of the Eoproterozoic Era. The predominant rocks that comprise the Rustenburg Layered Suite include gabbro and gabbro-norite – both igneous in origin and hence usually devoid of fossils (Cawthorn, et al., 2006, pp. 263-264; SAHRA, 2013c).

Table 4-1: Lithographic units and fossil sensitivity (adapted from Johnson et al 2006 and SAHRIS²)

Ma	Eon	Era		Lithostratigraphic units		Lithology	Sensitivity	Fossils	
2000-2050	Proterozoic	Eoproterozoic	Vaalian	Bushveld Complex	Rustenburg Layered (Vdr)	Critical Zone	Winterveld Norite-Anorthosite	Zero	None
2500							Mooihoek Pyroexnite	Zero	None
							Undertermined Quaternary	Zero	None

² <http://www.sahra.org.za/sahris/fossil-heritage-layer-browser> accessed 23/04/2015

4.1.2 Stone Age

The Stone Age is represented by the presence of Early Stone Age (ESA), MSA and Later Stone Age (LSA) sites throughout the Mpumalanga-Limpopo Highveld region. The ESA can be dated between ± 2 Million years BP and 250 000 years BP is defined by the occurrence of large hand axes and cleavers produced from coarse-grained material (Esterhuysen & Smith, 2007). The MSA is characterised by the presence of blades and points manufactured from good quality raw material dated to between ± 250 000 years to ± 20 000 years BP. Bone tools, shell beads and pendants, as well as the use of ochre are also present in the MSA (Deacon & Deacon, 1999). The LSA lithic assemblage contains microlithic technology and composite tools like bows and arrows and can be dated to approximately 20 000 years BP. The LSA shows strong signs of ritual practises and complex societies, as well as rock art. Herders or pastoralists emerge towards the end of the LSA, with ceramics and domesticated stock (Deacon & Deacon, 1999).

A surface occurrence of MSA tools was identified 32 km north-west from the site specific project area (2429BD25). The MSA tools included flakes and core identified within an eroded area (Van Schalkwyk, 2001). Several surface occurrences of MSA tools were recorded in an eroded area 38 km south of the project area (Birkholtz & Steyn, 2005).

4.1.3 Early Farming Communities

The Farming Community period marks the arrival of Bantu-speakers who brought with them agriculture and metal working skills. Archaeologically, common identifiers of this period in the regional study area include ceramics and stone walled settlements (associated with the Late Farming Communities).

Stone walled settlements identified in the regional study area are classified as *Badfontein* type walling. *Badfontein* walling sites have been dated to as early as 1550 AD (Huffman, 2007). The sites are associated with the group known as the Koni. The origins of the group are unclear, however they settled in and around Lydenburg and Middleburg around the 15th and 16th centuries (Huffman, 2007). Metal working sites with metal slag and tuyere pipe fragments have also been identified within 46.5 km of the site specific study project area (Roodt, 2003a).

Communal activity areas are also common in the local study area. These consist of several grinding hollows and areas usually grouped or in a line as shown by Figure 4-1 below. Several were recorded 45 km south of the site specific study area (du Piesanie, 2012).



Figure 4-1: Example of communal activity area (du Piesanie, 2012)

Rock engravings in the Highveld region are predominantly associated with the Nguni speakers, such as the well-known Boomplaats site near Lydenburg approximately 50 km south-east of the project area. These engravings are thought to represent stone walled settlements within the area and can be found on large boulders located on the slopes of hills (Maggs, 1995; Smith & Zubieta, 2007).

4.1.4 Later Farming Communities and Historical Period

The LFC period and historical period overlap in this part of the country as the area saw the movements of many different groups, including white settlers. The historical period is commonly associated with contact between white Europeans with Bantu-speaking groups, and consequent *written* records³.

The epicentre of the Pedi group (descendants of the Sotho-Tswana language groups) was located to the north of Lydenburg. The Pedi and the Boers soon established the Steelpoort River as a border between themselves in 1857. The Pedi leader Sekwati died in 1861 and his grave is located 4.7 km from the proposed PRA area (2430CA4). His successor, Sekhukhune, initially honoured the agreed upon border, however, he became uneasy with the arrival of the Berlin Missionaries. From 1867, the Pedi under Sekhukhune began to raid Boer homesteads and settlements. The Boers declared war on 16 May 1876 and built forts around the towns of Lydenburg and Middleburg. The Pedi, however, were starving due to the amount of time spent on raids, rather than farming. Sekhukhune eventually gave in and paid a fine of 2 000 head of cattle to the Transvaal Republic. When the Transvaal was

³ The author acknowledges that in southern Africa the last 500 years represents a formative period that is marked by enormous internal economic invention and political experimentation that shaped the cultural contours and categories of modern identities outside of European contact. This period is currently not well documented and is being explored through the 500 year initiative (Swanepoel, et al., 2008)



annexed by the British, he was taxed by the British. When Sekhukhune announced that he was planning on becoming the paramount chief of all the tribes in the Lydenburg district in 1878, the British marched on him but were forced to turn back due to an outbreak of horse sickness. The Boer forts were re-occupied by the British which served to keep the Pedi within their borders. In 1879, Sekhukhune was attacked and captured. His settlement was destroyed and he was sent to prison in December 1879. He was eventually released but was murdered by a rival chief in 1883 (Smith, 1969).

4.2 Site Specific Study Area

4.2.1 Geology and Palaeontological Potential of the Study Area

According to the SAHRIS PalaeoSensitivity Map, the site specific area is located in an area of very low palaeontological sensitivity as depicted in Figure 4-2 below (SAHRIS, 2014). As stated in section 4.1.1 above, the Bushveld Complex is a predominantly igneous formation, and is devoid of fossils.

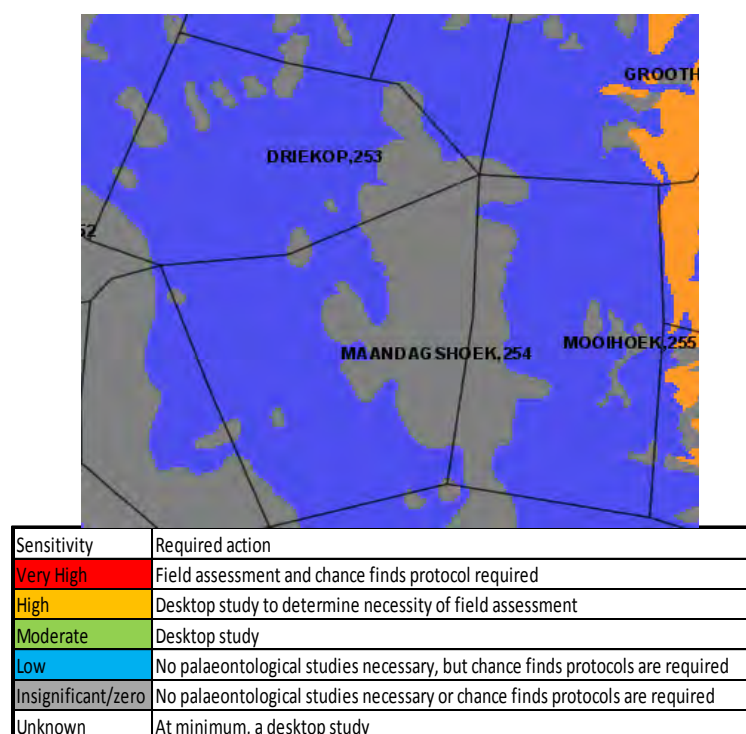


Figure 4-2: Palaeontological sensitivity of the site specific study area

4.2.2 Stone Age

The literature review did not identify any Stone Age resources within the site specific area and these heritage resources are not discussed further in this section.



4.2.3 Farming Community

An Early Farming Community (EFC) site was uncovered during earthworks for the Lebelelo Pipeline (2430CA5) (Huffman & Schoeman, 2011). The site consisted of seven storage pits containing ash, pottery and cattle dung. The occupational layers were identified approximately 30 cm below the surface. There were no surface indicators of the site, and therefore was not recorded during the Archaeological Impact Assessment (AIA) conducted for the pipeline. This site is located within the site specific study area and 520 m from the closest proposed prospecting borehole (See Plan 5).

4.2.4 Historical period

Several stone structures were identified on the farm of Grootehoek, located immediately north of the farm of Mooihoek (Hutten, 2008). According to consultations with the local chief, the sites were confirmed to be temporary structures built by the people from Motlolo village as they were first settling into the valley in the late 1950's. Several grinding stones were found within the structures; however, no other artefacts could be identified within the sites.

According to a previous AIA conducted on Mooihoek 255KT, one grave (MHC001) is present within the proposed PRA area (Fourie, 2008) and 1.3 km from the closest proposed prospecting borehole (See Plan 5). The AIA does not provide a date for the grave; however, it is defined as a historic grave.

Historical aerial imagery shows how the project area has been altered since 1938. In 1938, much of the farm of Mooihoek was dominated by informal agricultural activities (See Figure 4-3). There are signs of residential dwellings; however, these are spaced far apart and not clustered into villages. There are small clusters of residential dwellings around the foot of the small koppies that scatter the farm of Driekop, with very little agricultural activities (See Figure 4-4).

By 1954, the R37 Provincial road had been built that transects the project area. The agricultural activities on Mooihoek have increased; with minimal residential dwellings present (See Figure 4-6). The amount of residential dwellings and agricultural activities had increased on Driekop between 1938 and 1954 as shown in Figure 4-5. This is consistent with the movement of the Motlolo people into the area in the 1950s.

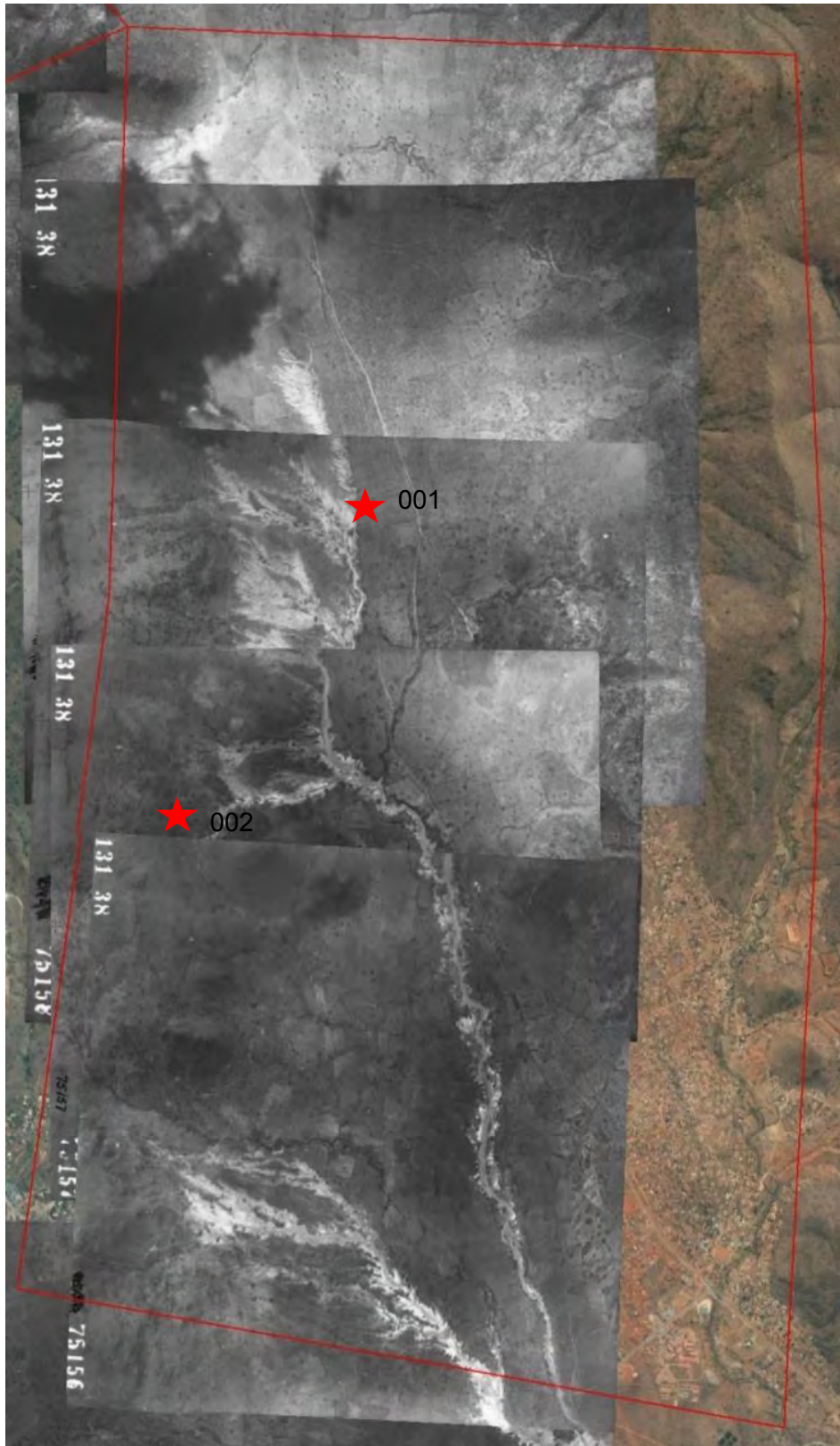


Figure 4-3: 1938 aerial imagery of Mooihoek 255KT showing the location of the proposed prospecting boreholes

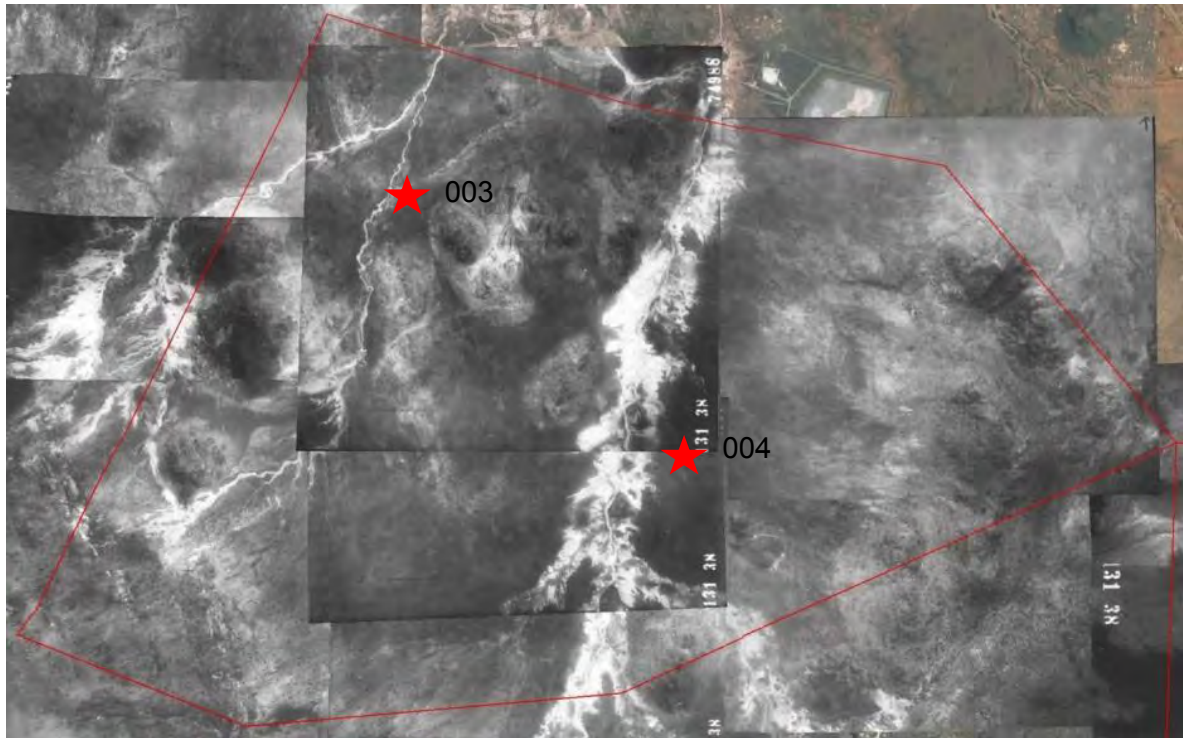


Figure 4-4: 1938 aerial imagery of Driekop 253KT showing the location of the proposed prospecting boreholes

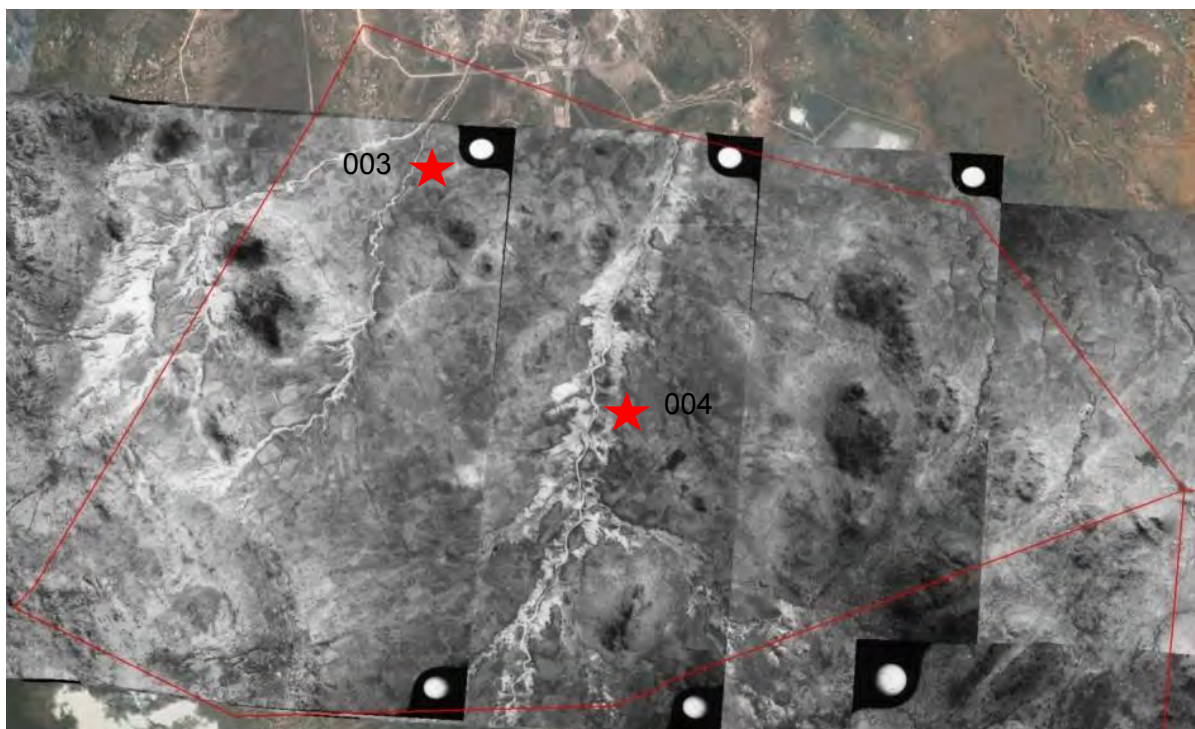


Figure 4-5: 1954 aerial imagery of Driekop 253KT showing the location of the proposed prospecting boreholes

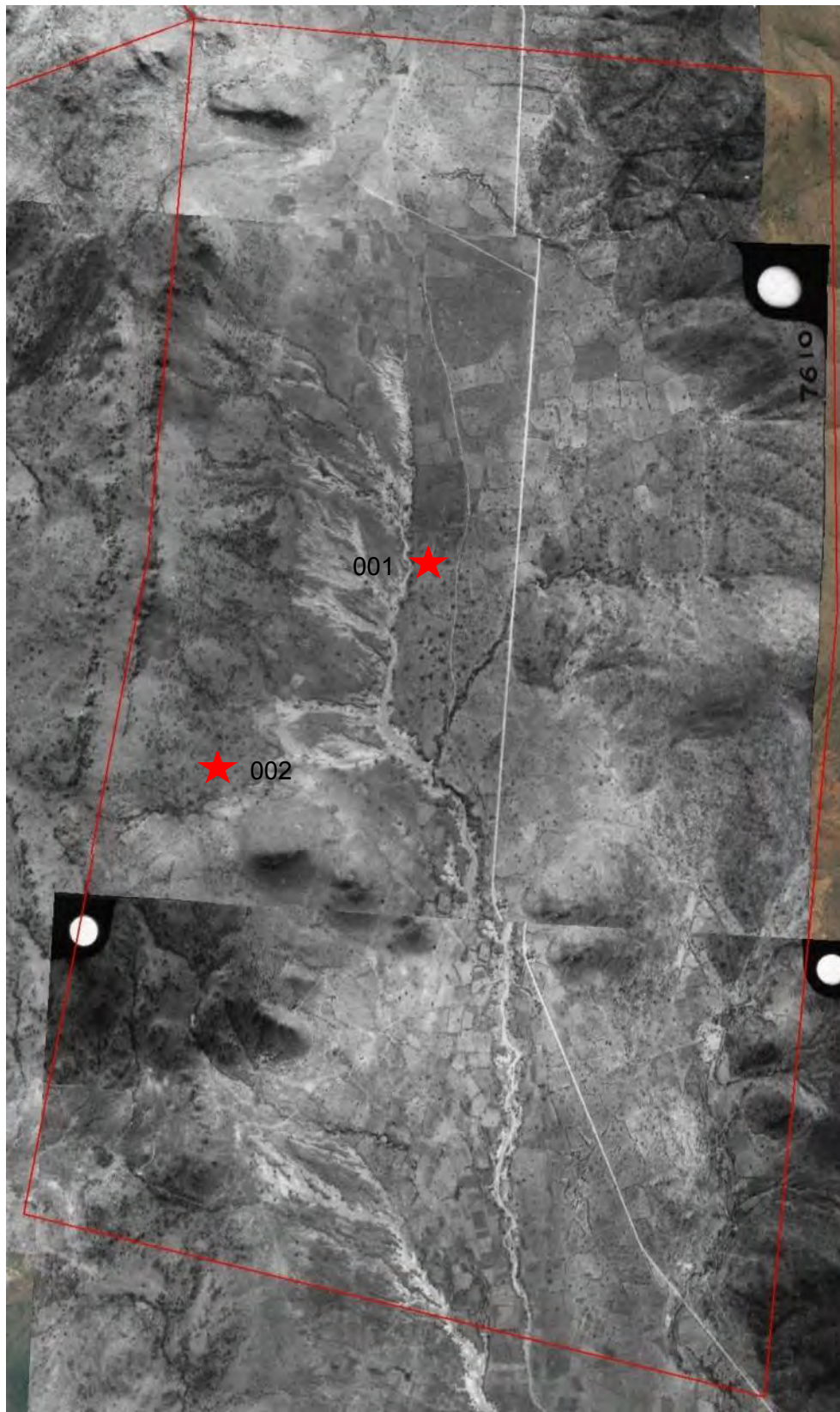


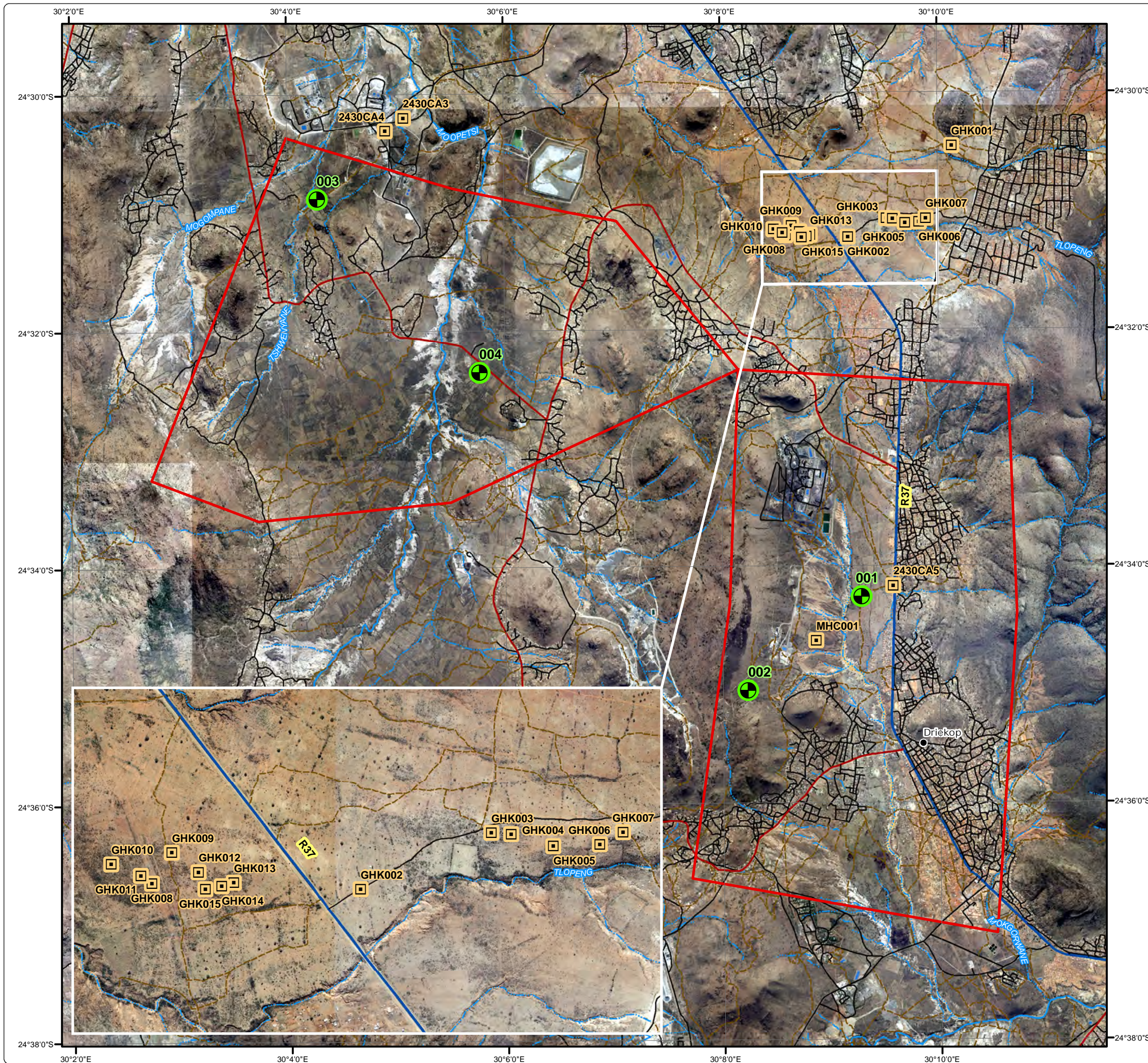
Figure 4-6: 1954 aerial imagery of Mooihoek 255KT showing the location of the proposed prospecting boreholes

Mawetse PR EMP

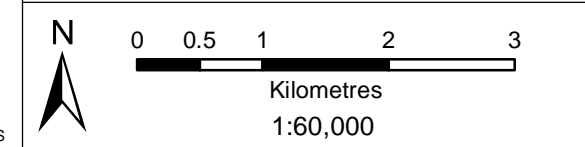
Desktop Study Heritage Sites

Legend

- Project Area
- Heritage Sites (Desktop Study)
- ⊕ Proposed Prospecting Boreholes
- Settlement
- National/Arterial Route
- Main Road
- Minor Road
- Track
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam
- Non-Perennial Pan/Stream



Projection: Transverse Mercator Ref #: kam.MMC3745.201512.120
 Datum: WGS 1984 Revision Number: 1
 Central Meridian: 31°E Date: 17/12/2015



4.2.5 Results of pre-disturbance survey

Borehole location 001 is pictured in the top left corner in Figure 4-7 below. Borehole location 002 was not visited as the access road had been washed away by recent heavy rains. The approximate location of Borehole 002 is depicted in the top right corner in Figure 4-7 below. Borehole location 003 is shown in the pictures in the middle row and Borehole 004 is presented in the bottom row of Figure 4-7 below.



Figure 4-7: Current state of the landscape at borehole locations



The site specific study area is characterised by flat topography and dominated by patches of *Dichrostachys cinerea* (sickle bush). The soil type at borehole location 001 was a red sandy soil, while the soil type at 003 and 004 were dark brown/black clay. The boreholes 003 and 004 were located in floodplain areas hence the deep clay in those areas.

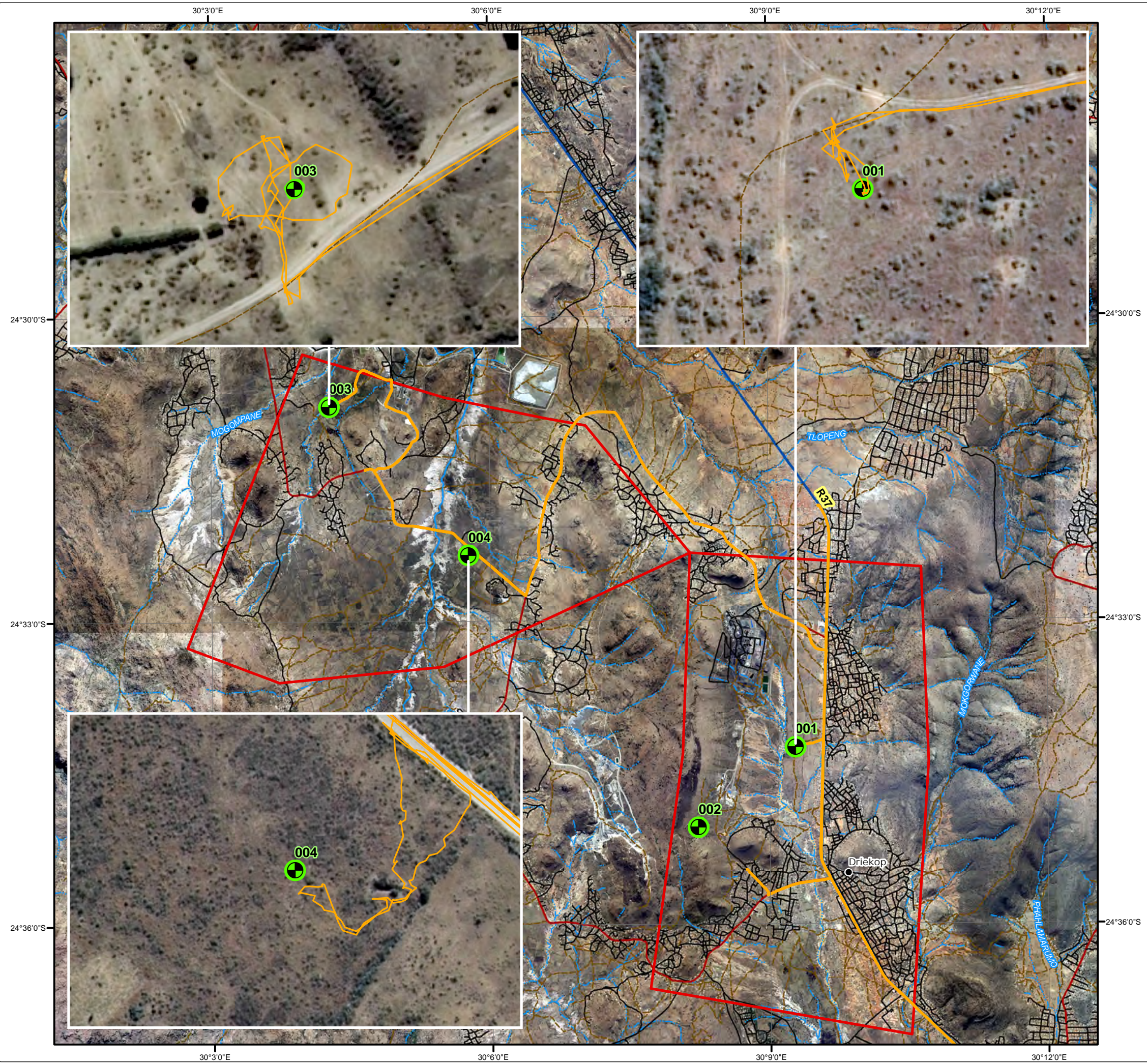
The three prospecting borehole locations visited were situated in old agricultural fields and had been previously disturbed by these activities. No heritage resources were identified within 100 m of the proposed prospecting borehole locations during the pre-disturbance survey (See Plan 6 below).

Mawetse PR EMP

Heritage Survey Results

Legend

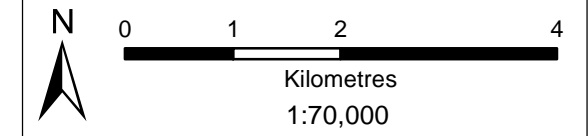
- Project Area
- ⊕ Proposed Prospecting Boreholes
- Settlement
- Track Log
- National/Arterial Route
- Main Road
- Minor Road
- Track
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam
- Non-Perennial Pan/Stream




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Projection: Transverse Mercator Ref #: kam.MMC3745.201512.054
 Datum: WGS 1984 Revision Number: 1
 Central Meridian: 31°E Date: 14/12/2015





5 Heritage Impact Assessment

Based on the results of the desktop study and pre-disturbance survey, no heritage impacts are envisioned for the Project. No significant heritage resources were identified within 100 m of the proposed prospecting borehole locations during the desktop study. Heritage resources were identified at a local level including Stone Age surface occurrences, EFC sites, burial grounds and historical structures, though none were identified within 100 m of the prospecting borehole locations. No heritage resources or surface indicators of sub-surface heritage resources were identified during the pre-disturbance survey. While no impacts are envisioned for the two heritage resources identified within the proposed prospecting area, the CS of the heritage resources has been completed to assist with the implementation of the recommendations i.e. Chance Finds Procedures.

5.1 Cultural Significance

The assessment of CS considered criteria defined in Box 2 above. The CS assigned to the identified heritage resources is summarised in Table 5-1 and presented in detail in Table 5-2.

Table 5-1: Summary of identified heritage resources

Summary of Identified Heritage Resources and CS	Number
Very High CS	1
Burial / grave	1
MHC001	1
Low CS	1
Early Farming Community Site	1
Lebalelo EFC Site	1
Grand Total	2

Table 5-2: Cultural Significance of identified heritage resources

Resource ID	Resource Period	Type	Description	Cultural Significance	CS Motivation	Field Rating Value	Field Rating	Field Rating Motivation Guidance	Field Rating Motivation
Lebalelo EFC Site	Early Farming Community (c. 200 CE to 1000 CE) (EFC)	Site	Early Farming Community site with seven storage pits containing ash, pottery and cattle dung. The occupational layers were identified 30cm below the surface.	Low	The site can be considered in particular dimensions against historical and scientific criteria.	2.00	General Protection IV B	Resources under general protection in terms of NHRA sections 34 to 37 with Low significance	The heritage sites are defined according to section 2 of the NHRA and are generally protected under Section 35 of the NHRA



MHC001	Union of South Africa (1910 CE to 1961 CE)	Burial / grave	Single grave	High	The site can be considered in particular dimensions against historical and social criteria.	3,00	General Protection IV A	Resources under general protection in terms of NHRA sections 34 to 37 with Medium to Medium-High significance	The heritage sites are defined according to section 2 of the NHRA and are generally protected under Section 36 of the NHRA
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The Lebalelo EFC site is of low CS as the integrity of the site has been reduced due to the construction of the Lebalelo Water Pipeline. If the site had not been disturbed, the CS would have been medium, requiring more in-depth mitigation measures.

The grave is of high CS due to the local significance of burial grounds to communities. This site should be avoided and clearly demarcated to ensure no accidental damage occurs.

5.2 Impact Assessment

No heritage resources were identified within 100 m of the prospecting boreholes. As such, no impact assessment has been conducted as part of this HBAR. Potential risks and unplanned events have been identified and are discussed below.

5.3 Unplanned Events and Low Risks

Risks are defined as the potential consequence(s) of an interaction combined with its likelihood. Should a risk eventuate, it will manifest as an impact. These concepts are often misconstrued and lead to disproportionate amounts of effort spent on assessing minor risks with potentially insignificant impacts, at the cost of overlooking more important ones.

Broad mitigation and monitoring measures were provided for low risks and unplanned events **were not assessed in detail** (i.e., with significance ratings). In general monitoring is an accepted form of mitigation for low risks.

Certain project activities may represent low risks to heritage resources or cause unplanned events. Low risks, where identified, can be monitored to gauge if the baseline changes and mitigation is required. Unplanned events are events that can occur on any project and cannot be monitored, but can, however, be planned for to reduce the severity of potential impacts if and where they occur.

Based on the proposed project activities, potential unplanned events and the associated impacts and management measures have been identified and summarised in Table 5-3 below.

**Table 5-3: Unplanned events and their management measures**

Unplanned event	Potential impact	Mitigation/ Management/ Monitoring
Accidental damage or destruction of identified heritage resources	Damage and/or destruction of heritage resources generally protected under section 34 to 37 of the NHRA	No prospecting activities can occur within 100 m of identified heritage resources. The identified heritage resources must be clearly demarcated to ensure no accidental damage occurs.
Accidental exposure of unidentified heritage resources	Damage and/or destruction of heritage resources generally protected under section 34 to 37 of the NHRA	Chance Finds Procedures (CFPs) must be developed and included as a condition of authorisation that clearly describes the reporting process and appropriate management of the exposure of previously unidentified heritage resources. The established and defined CFPs must be implemented prior to any development taking place as part of the prospecting activities

6 Recommendations

Chance Finds Procedures (CFPs) must be developed and included in the EMP that clearly describes the process and appropriate management of the exposure of previously unidentified heritage resources. The established and defined CFPs must be implemented prior to any development taking place.

Project specific monitoring and management measures must be developed as a condition of authorisation. The protocol must detail required monitoring activities, ideally during construction, administrative reporting structures and management / mitigation measures in the event of damage to structures generally protected under section 34 - 37 of the NHRA.

It is recommended that detailed CFPs must be developed, but as minimum, the following be included in the EMP.

- The Environmental Control Officer and/or contractors must inspect groundworks during site clearance;
- Should any heritage resources be uncovered during site clearance, the find must be stabilised and the site must be secured to protect it from further damage;
- The find must be reported and a qualified archaeologist must be contacted to assess the find;
- Should the find be significant, a report must be written regarding the find and any mitigation measures conducted. The report will include recommendations for any additional specialist work that may be necessary, or request approval to continue with the development.



7 Conclusion

The site specific project area is located 12.5 km north of Steelpoort, GTLM, Limpopo Province. Geologically, the site specific area is underlain by the Bushveld Complex which does not hold palaeontological resources and the paleontological sensitivity is negligible

Archaeologically, Stone Age, EFC, LFC, historical sites, and burial grounds have been recorded within the larger regional, local and site specific study areas under consideration here, though none of these sites have been identified within 100 m of the proposed prospecting boreholes.

Based on the results of the desktop study and pre-disturbance survey, no heritage impacts are envisioned for the Mooihoek and Driekop PRA. No significant heritage resources were identified within 100 m of the proposed prospecting boreholes during the desktop study. Heritage resources were identified at a local level including Stone Age surface occurrences, an EFC site and a grave, though none were identified near the borehole locations. No heritage resources or surface indicators of sub-surface heritage resources were identified during the pre-disturbance survey.

Potential risks to heritage resources include accidental damage or destruction to identified and un-identified heritage resources during site clearance for temporary road/route construction, prospecting sites and rehabilitation purposes.

Based on the findings of this report, Digby Wells recommends the following mitigation and management plans:

- Exemption from further palaeontological assessments for the proposed infrastructure footprint as the palaeo-sensitivity is insignificant;
- No prospecting activities can occur within 100 m of identified heritage resources;
- Chance Finds Procedures, must be developed and implemented as part of the EMP that clearly describe the reporting process and appropriate management of the exposure of previously unidentified heritage resources; and
- Additionally, should the prospecting prove to be successful and a Mining Right be applied for, a full HRM process should be implemented inclusive of a Heritage Impact Assessment (HIA).

8 References

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- SAHRA APMHOB Permit Committee, 2006. *Assessment and Mitigation of Archaeological and Palaeontological Heritage Resources as Prerequisites for Mining and Prospecting*. Cape Town: South African Heritage Resources Agency.

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Smith, K. W., 1969. The fall of the Pedi of the North-Eastern Transvaal. *The Journal of African History*, 10(2), pp. 237-252.

Van Schalkwyk, J., 2001. *A survey of Cultural Resources in five location of the Steelpoort area of Sekhukhuneland, Northern Province*. Sunnyside: National Cultural History Museum.

Heritage Basic Assessment Report

Basic Assessment Report: Environmental Management Plan in support of the Prospecting Rights Application for Mooihoek 255KT and Driekop 253KT, near Steelpoort, Limpopo Province

MMC3745



DIGBY WELLS
ENVIRONMENTAL

Appendix A: Specialist CV



DIGBY WELLS
ENVIRONMENTAL

NATASHA HIGGITT

Ms Natasha Higgitt
Assistant Heritage Consultant
Social Department
Digby Wells Environmental

1 EDUCATION

- University of Pretoria
- BA Degree (2008)
- Archaeology Honours (2010)
- Title of Dissertation- Pass the Salt: An Archaeological analysis of lithics and ceramics from Salt Pan Ledge, Soutpansberg, for evidence of salt working and interaction.

2 LANGUAGE SKILLS

- English - Excellent (read, write and speak)
- Afrikaans - Fair (read, write and speak)
- Italian – Poor (Speaking only)

3 EMPLOYMENT

- July 2011 to Present: Assistant Heritage Consultant at Digby Wells Environmental
- April 2011 to June 2011: Lab assistant at the Albany Museum Archaeology Department, Grahamstown, Eastern Cape
- April 2010 to March 2011: Intern at the Archaeology Department, Albany Museum, Grahamstown, Eastern Cape under the Department of Sports, Recreation, Arts and Culture, Eastern Cape Government, South Africa (DSRAC)

4 FIELD EXPERIENCE

- Human remains rescue excavation at St Francis Bay, Eastern Cape
- Human remains rescue excavation at Wolwefontein, Eastern Cape
- Recorded two rock art sites at Blaauwbosch Private Game Reserve, Eastern Cape



- Attended a 2 week excavation/study tour in the Friuli Region in Italy, organised by the *Società Friulana di Archeologia*, sponsored by *Ente Friuli nel Mondo*, and excavated a 12th century medieval castle
- Attended a 2 week excavation in Limpopo, Waterpoort Archaeological Project organised by Xander Antonites (Yale PhD Candidate)
- A total of 5 University of Pretoria Archaeology field schools in Limpopo and Gauteng spanning over 4 years

5 PROJECT EXPERIENCE

- Notification of Intent to Develop for the Doornkloof Flood Remedial Measures Project, Centurion, Gauteng Province for Iliso Consulting (Pty) Ltd (Digby Wells Environmental)
- Notification of Intent to Develop for the Oakleaf Open Cast Coal Mine, Bronkhorstspuit, Gauteng Province for Oakleaf Resources (Digby Wells Environmental)
- Notification of Intent to Develop for the Rietfontein 101IS Prospecting Project for Rustenburg Platinum (Digby Wells Environmental)
- Heritage Impact Assessment for the Weltevreden Open Cast Coal Mine, Belfast, Mpumalanga for Northern Coal (Pty) Ltd (Digby Wells Environmental)
- Notification of Intent to Develop for the Grootegeeluk Expansion Project, Lephalale, Limpopo Province for Exxaro Resources (Pty) Ltd (Digby Wells Environmental)
- Notification of Intent to Develop and Heritage Statement for the London Road Petrol Station, Alexandria, Gauteng for ERM Southern Africa (Pty) Ltd (Digby Wells Environmental)
- Heritage Impact Assessment for the Roodepoort Strengthening Project, Roodepoort, Gauteng for Fourth Element (Digby Wells Environmental)
- Heritage Statement for the Stoffel Park Bridge Upgrade, Mamelodi, Gauteng for Iliso Consulting (Pty) Ltd (Digby Wells Environmental)
- Heritage Statement for the Witrand Prospecting EMP, Bethal, Mpumalanga for Rustenburg Platinum (Digby Wells Environmental)
- Heritage Statement for the Onverwacht Prospecting EMP, Kinross, Mpumalanga for Rustenburg Platinum (Digby Wells Environmental)
- Heritage Statement for a Proposed Acetylene Gas Production Facility, located near Witkopdorp, Daleside, south of Johannesburg, Gauteng Province for Erm Southern Africa (Pty) Ltd (Digby Wells Environmental)
- Heritage Impact Assessment for the Platreef Platinum Project, Mokopane, Limpopo for Platreef Resources (Digby Wells Environmental)
- Heritage Statement for ATCOM and Tweefontein Dragline Relocation Project, near Witbank, Mpumalanga Province for Jones and Wagner Consulting Civil Engineers (Digby Wells Environmental)



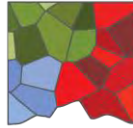
- Heritage Statement Report for the Wilgespruit Bridge Upgrade, Pretoria, Gauteng Province for Iliso Consulting (Pty) Ltd (Digby Wells Environmental)
- Heritage Statement Report for the Kosmosdal sewer pipe bridge upgrade, Pretoria, Gauteng Province for Iliso Consulting (Pty) Ltd (Digby Wells Environmental)
- Phase 1 Heritage Impact Assessment for the Thabametsi Coal Mine, Lephalale, Limpopo for Exxaro Coal (Digby Wells Environmental)
- Heritage Statement for the Zandbaken Coal Mine Project, Zandbaken 585 IR, Sandbaken 363 IR and Bosmans Spruit 364 IS, Standerton, Mpumalanga for Xtrata Coal South Africa (Digby Wells Environmental)
- Phase 1 Heritage Impact Assessment for the Brakfontein Thermal Coal Mine, Mpumalanga for Universal Coal (Digby Wells Environmental)
- Development of a RAP for Aureus Mining for the New Liberty Gold Mine Project, Liberia (Digby Wells Environmental)
- Phase 1 Archaeological Impact Assessment for the MBET Pipeline, Steenbokpan, Limpopo (Digby Wells Environmental)
- Notice of Intent to Develop and Cultural Resources Pre-Assessment for Orlight SA (PTY) Ltd Solar PV Project. 2012. (Digby Wells Environmental)
- Agricultural Survey for Platreef ESIA, Mokopane, Limpopo. 2011. (Digby Wells Environmental)
- Cultural Resources Pre-Assessment for the Proposed Sylvania Everest North Mining Development in Mpumalanga, near Lydenburg. 2011. (Digby Wells Environmental)
- Phase 2 Mitigation of Archaeological sites at Boikarabelo Coal Mine, Steenbokpan, Limpopo. 2011. (Digby Wells Environmental)
- Cultural Resources Pre-Assessment for Proposed Platinum Mine Prospecting in Mpumalanga, near Bethal for Anglo Platinum. 2011. (Digby Wells Environmental)
- Cultural Resources Pre-Assessment for proposed Platinum Mine at Mokopane, Limpopo for Ivanhoe Platinum. 2011. (Digby Wells Environmental)
- Phase 1 AIA Mixed-use housing Development, Kwanobuhle, Extension 11, Uitenhage, Eastern Cape. 2011.
- Phase 1 AIA Centane to Qholora and Kei River mouth road upgrade survey, Mnquma Municipality, Eastern Cape. 2011. (SRK Consulting)
- Phase 1 AIA Clidet Data Cable survey, Western Cape, Northern Cape, Free State and Eastern Cape. 2011. (SRK Consulting)
- Phase 1 AIA Karoo Renewable Energy Facility, Victoria West, Northern Cape. 2011. (Savannah Environmental)
- Phase 1 AIA Windfarm survey in Hamburg, Eastern Cape. 2010. (Savannah Environmental)



- Phase 1 AIA Windfarm survey in Molteno, Eastern Cape. 2010. (Savannah Environmental)
- Phase 1 AIA Housing Development at Motherwell, P.E. 2010. (SRK Consulting)
- Phase 1 AIA Sand quarry survey in Paterson, Eastern Cape. 2010. (SRK Consulting)
- Phase 1 AIA Quarry Survey at Victoria West. 2010. (Acer [Africa] Environmental Management Consultants)
- Phase 1 AIA Quarry Survey at Port Elizabeth. 2010. (E.P Brickfields)

6 PROFESSIONAL AFFILIATIONS

- Association of Southern African Professional Archaeologists (ASAPA): Professional member
- Association of Southern African Professional Archaeologists (ASAPA): CRM Practitioner (Field Supervisor: Stone Age, Iron Age and Rock Art)
- South African Museums Association (SAMA): Member



DIGBY WELLS

ENVIRONMENTAL

Mr. Justin du Piesanie
Heritage Management Consultant: Archaeologist
Social Sciences Department
Digby Wells Environmental

1 Education

Date	Degree(s) or Diploma(s) obtained	Institution
2013	Continued Professional Development Programme, Architectural and Urban Conservation: Researching and Assessing Local Environments	University of Cape Town
2008	MSc	University of the Witwatersrand
2005	BA (Honours) (Archaeology)	University of the Witwatersrand
2004	BA	University of the Witwatersrand
2001	Matric	Norkem Park High School

2 Language Skills

Language	Written	Spoken
English	Excellent	Excellent
Afrikaans	Proficient	Good

3 Employment

Period	Company	Title/position
08/2011 to present	Digby Wells Environmental	Heritage Management Consultant: Archaeologist

Digby Wells and Associates (South Africa) (Pty) Ltd (Subsidiary of Digby Wells & Associates (Pty) Ltd). Co. Reg. No. 2010/008577/07. Fern Isle, Section 10, 359 Pretoria Ave Randburg Private Bag X10046, Randburg, 2125, South Africa
Tel: +27 11 789 9495, Fax: +27 11 789 9498, info@digbywells.com, www.digbywells.com

Directors: A Sing*, AR Wilke, DJ Otto, GB Beringer, LF Koeslag, AJ Reynolds (Chairman) (British)*, J Leaver*, GE Trusler (C.E.O)
*Non-Executive

Period	Company	Title/position
2009-2011	University of the Witwatersrand	Archaeology Collections Manager
2009-2011	Independent	Archaeologist
2006-2007	Maropeng & Sterkfontein Caves UNESCO World Heritage Site	Tour guide

4 Professional Affiliations

Position	Professional Body	Registration Number
Member	Association for Southern African Professional Archaeologists (ASAPA); ASAPA Cultural Resources Management (CRM) section	270
Member	International Council on Monuments and Sites (ICOMOS)	14274
Member	Society for Africanist Archaeologists (SAfA)	N/A

5 Publications

- Huffman, T.N. & du Piesanie, J.J. 2011. Khami and the Venda in the Mapungubwe Landscape. *Journal of African Archaeology* 9(2): 189-206

6 Experience

I have 5 years experiences in the field of heritage resources management (HRM) including archaeological and heritage assessments, grave relocation, social consultation and mitigation of archaeological sites. During my studies I was involved in academic research projects associated with the Stone Age, Iron Age, and Rock Art. These are summarised below:

- Wits Fieldschool - Excavation at Meyersdal, Klipriviersberg Johannesburg (Late Iron Age Settlement).
- Wits Fieldschool - Phase 1 Survey of Prentjiesberg in Ugie / Maclear area, Eastern Cape.
- Wits Fieldschool – Excavation at Kudu Kopje, Mapungubwe National Park Limpopo Province.

- Wits Fieldschool – Excavation of Weipe 508 (2229 AB 508) on farm Weipe, Limpopo Province.
- Survey at Meyerdal, Klipriviersberg Johannesburg.
- Mapping of Rock Art Engravings at Klipbak 1 & 2, Kalahari.
- Survey at Sonop Mines, Windsorton Northern Cape (Vaal Archaeological Research Unit).
- Excavation of Kudu Kopje, Mapungubwe National Park Limpopo Province.
- Excavation of KK (2229 AD 110), VK (2229 AD 109), VK2 (2229 AD 108) & Weipe 508 (2229 AB 508) (Origins of Mapungubwe Project)
- Phase 1 Survey of farms Venetia, Hamilton, Den Staat and Little Muck, Limpopo Province (Origins of Mapungubwe Project)
- Excavation of Canteen Kopje Stone Age site, Barkley West, Northern Cape
- Excavation of Khami Period site AB32 (2229 AB 32), Den Staat Farm, Limpopo Province

Since 2011 I have been actively involved in environmental management throughout Africa, focusing on heritage assessments in compliance with International Finance Corporation (IFC) Performance Standards and other World Bank Standards and Equator Principles. This exposure to environmental, and specifically heritage management has allowed me to work to international best practice standards in accordance with international conservation bodies such as UNESCO and ICOMOS. In addition, I have also been involved in the collection of quantitative data for a Relocation Action Plan (RAP) in Burkina Faso. The exposure to this aspect of environmental management has afforded me the opportunity to understand the significance of integration of various studies in the assessment of heritage resources and recommendations for feasible mitigation measures. I have worked throughout South Africa, as well as Burkina Faso, the Democratic Republic of Congo, Liberia and Mali.

7 Project Experience

Please see the following table for relevant project experience:



Project Title	Project Location	Date:	Description of the Project	Role of Firm in the Project	Own Role in the Project	Time involved (man months)	Name of Client	Contract Outcomes	Reference
Klipriviersberg Archaeological Survey	Meyersdal, Gauteng, South Africa	2005 2006	Survey of residential development in Meyersdal. This included the recording of identified stone walled settlements through detailed mapping and photographs. Included was the Phase 2 Mitigation of two stone walled settlements	Archaeological Impact Assessments	Researcher, Archaeological Assistant	2 months		Completed survey, excavations and reporting	Archaeological Resource Management (ARM) Prof T.N. Huffman thomas.huffman@wits.ac.za
Sun City Archaeological Site Mapping	Sun City, Pilanesberg, North West Province, South Africa	2006 2006	Recording of an identified Late Iron Age stonewalled settlement through detailed mapping	Mapping	Archaeological Assistant, Mapper	1 month	Sun City	Completed mapping	Archaeological Resources Management (ARM) Prof T.N. Huffman thomas.huffman@wits.ac.za
Witbank Dam Archaeological Impact Assessment	Witbank, Mpumalanga, South Africa	2007 2007	Archaeological survey for proposed residential development at the Witbank dam	Archaeological Impact Assessment	Archaeological Assistant	1 week		Completed Archaeological Impact Assessment report	Archaeological Resources Management (ARM) Prof T.N. Huffman thomas.huffman@wits.ac.za
Archaeological Assessment of Modderfontein AH Holdings	Johannesburg, Gauteng, South Africa	2008 2008	Archaeological survey and basic assessment of Modderfontein Holdings	Archaeological Impact Assessment	Archaeologist	1 month		Completed the assessment of 13 properties	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com
Heritage Assessment of Rhino Mines	Thabazimbi, Limpopo Province, South Africa	2008 2008	Heritage Assessment for expansion of mining area at Rhino Mines	Heritage Impact Assessment	Archaeologist	2 weeks	Rhino Mines	Completed the assessment	Archaeological Resources Management (ARM) Prof T.N. Huffman thomas.huffman@wits.ac.za
Cronimet Project	Thabazimbi, Limpopo Province, South Africa	2008 2008	Archaeological survey of Moddergat 389 KQ, Schilpadnest 385 KQ, and Swartkop 369 KQ,	Archaeological Impact Assessment	Archaeologist	1 weeks	Cronimet	Completed field survey and reporting	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com



Eskom Thohoyandou SEA Project	Limpopo Province, South Africa	2008 2008	Heritage Statement defining the cultural landscape of the Limpopo Province to assist in establishing sensitive receptors for the Eskom Thohoyandou SEA Project	Heritage Statement	Archaeologist	2 months	Eskom	Completed Heritage Statement	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com
Wenzelrust Excavations	Shoshanguve, Gauteng, South Africa	2009 2009	Contracted by the Heritage Contracts Unit to help facilitate the Phase 2 excavations of a Late Iron Age / historical site identified in Shoshanguve	Excavation and Mapping	Archaeologist	1 week	Heritage Contracts Unit	Completed excavations	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com
University of the Witwatersrand Parys LIA Shelter Project	Parys, Free State, South Africa	2009 2009	Mapping of a Late Iron Age rock shelter being studied by the Archaeology Department of the University of the Witwatersrand	Mapping	Archaeologist	1 day	University of the Witwatersrand	Completed mapping of the shelter	University of the Witwatersrand Karim Sadr karim.sadr@wits.ac.za
Transnet NMPP Line	Kwa-Zulu Natal, South Africa	2010 2010	Heritage Survey of the Anglo-Boer War Vaalkrans Battlefield where the servitude of the NMP pipeline	Heritage Impact Assessment	Archaeologist	1 week	Umlando Consultants	Completed survey	Umlando Consultants Gavin Anderson umlando@gmail.com
Archaeological Impact Assessment – Witpoortjie Project	Johannesburg, Gauteng, South Africa	2010 2010	Heritage survey of Witpoortjie 254 IQ, Mindale Ext 7 and Nooitgedacht 534 IQ for residential development project	Archaeological Impact Assessment	Archaeologist	1 week	ARM	Completed survey for the AIA	Archaeological Resources Management (ARM) Prof T.N. Huffman thomas.huffman@wits.ac.za
Der Brochen Archaeological Excavations	Steelpoort, Mpumalanga, South Africa	2010 2010	Phase 2 archaeological excavations of Late Iron Age Site	Archaeological Excavation	Archaeologist	2 weeks	Heritage Contracts Unit	Completed excavations	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com
De Brochen and Booyensdal Archaeology Project	Steelpoort, Mpumalanga, South Africa	2010 2010	Mapping of archaeological sites 23, 26, 27, 28a & b on the Anglo Platinum Mines De Brochen and Booyensdal	Mapping	Archaeologist	1 week	Heritage Contracts Unit	Completed Mapping	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com



Eskom Thohoyandou Electricity Master Network	Limpopo Province, South Africa	2010 2010	Desktop study to identify heritage sensitivity of the Limpopo Province	Desktop Study	Archaeologist	1 Month	Strategic Environmental Focus	Completed Report	Strategic Environmental Focus (SEF) Vici Napier vici@sefsa.co.za
Bathhako Mine Expansion	North-West Province, South Africa	2010 2010	Mapping of historical sites located within the Bathhako Mine Expansion Area	Mapping	Archaeologist	1 week	Heritage Contracts Unit	Completed Mapping	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com
Kibali Gold Project Grave Relocation Plan	Oriental Province, Democratic Republic of Congo	2011 2013	Implementation of the Grave Relocation Project for the Randgold Kibali Gold Project	Grave Relocation	Archaeologist	2 years	Randgold Resources	Successful relocation of approximately 3000 graves	Kibali Gold Mine Cyrille Mutombo Cyrille.c.mutombo@kibaligold.com
Kibali Gold Hydro-Power Project	Oriental Province, Democratic Republic of Congo	2012 2014	Assessment of 7 proposed hydro-power stations along the Kibali River	Heritage Impact Assessment	Heritage Consultant	2 years	Randgold Resources	Completed Heritage Impact Assessment	Randgold Resources Charles Wells Charles.wells@randgoldresources.com
Everest North Mining Project	Steelpoort, Mpumalanga, South Africa	2012 2012	Heritage Impact Assessment on the farm Vygenhoek	Heritage Impact Assessment	Heritage Consultant	6 months	Aquarius Resources	Completed Heritage Impact Assessment	Aquarius Resources
Environmental Authorisation for the Gold One Geluksdal TSF and Pipeline	Gauteng, South Africa	2012 2012	Heritage impact Assessment for the proposed TSF and Pipeline of Geluksdal Mine	Heritage Impact Assessment	Heritage Consultant	4 months	Gold One International	Completed Heritage Impact Assessment	Gold One International
Platreef Burial Grounds and Graves Survey	Mokopane, Limpopo Province, South Africa	2012 2012	Survey for Burial Grounds and Graves	Burial Grounds and Graves Management Plan	Heritage Consultant	4 months	Platreef Resources	Project closed by client due to safety risks	Platreef Resources Gerick Mouton
Resgen Boikarabelo Coal Mine	Limpopo Province, South Africa	2012 2012	Archaeological Excavation of identified sites	Archaeological Excavation	Heritage Consultant	4 months	Resources Generation	Completed excavation and reporting, destruction permits approved	Resources Generation Louise Nicolai
Bokoni Platinum Road Watching Brief	Burgersfort, Limpopo Province, South Africa	2012 2012	Watching brief for construction of new road	Watching Brief	Heritage Consultant	1 week	Bokoni Platinum Mine	Completed watching brief, reviewed report	Bokoni Platinum Mines (Pty) Ltd



SEGA Gold Mining Project	Burkina Faso	2012 2013	Socio Economic and Asset Survey	RAP	Social Consultant	3 months	Cluff Gold PLC	Completed field survey and data collection	Cluff Gold PLC
SEGA Gold Mining Project	Burkina Faso	2013 2013	Specialist Review of Heritage Impact Assessment	Reviewer	Heritage Consultant	1 week	Cluff Gold PLC	Reviewed specialist report and made appropriate recommendations	Cluff Gold PLC
Consbrey and Harwar Collieries Project	Breyton, Mpumalanga, South Africa	2013 2013	Heritage Impact Assessment for the proposed Consbrey and Harwar Collieries	Heritage Impact Assessment	Heritage Consultant	2 months	Msobo	Completed Heritage Impact Assessments	Msobo
New Liberty Gold Project	Liberia	2013 2014	Implementation of the Grave Relocation Project for the New Liberty Gold Project	Grave Relocation	Heritage Consultant	On-going	Aureus Mining	Project is on-going	Aureus Mining
Falea Uranium Mine Environmental Assessment	Falea, Mali	2013 2013	Heritage Scoping for the proposed Falea Uranium Mine	Heritage Scoping	Heritage Consultant	2 months	Rockgate Capital	Completed scoping report and recommended further studies	Rockgate Capital
Putu Iron Ore Mine Project	Petroken, Liberia	2013 2014	Heritage impact Assessment for the proposed Putu Iron Ore Mine, road extension and railway line	Heritage Impact Assessment	Heritage Consultant	6 months	Atkins Limited	Completed Heritage Impact Assessment and provided recommendations for further studies	Atkins Limited Irene Bopp Irene.Bopp@atkinglobal.com
Sasol Twistdraai Project	Secunda, Mpumalanga, South Africa	2013 2014	Notification of intent to Develop and Heritage Statement for the Sasol Twistdraai Expansion	NID	Heritage Consultant	2 months	ERM Southern Africa	Completed NID and Heritage Statement	ERM Southern Africa Alan Cochran Alan.Cochran@erm.com
Daleside Acetylene Gas Production Facility	Gauteng, South Africa	2013 2013	Project Management of the heritage study	NID	Project Manager	3 months	ERM Southern Africa	Project completed	ERM Southern Africa Kasantha Moodley Kasantha.Moodley@erm.com
Exxaro Belfast, Paardeplaats and Eerstelingsfontein GRP	Belfast, Mpumalanga, South Africa	2013 2014	Grave Relocation Plan for the Belfast, Paardeplaats and Eerstelingsfontein GRP	GRP	Project Manager, Heritage Consultant	On-going	Exxaro	Project is on-going	Exxaro Johan van der Bijl Johan.vanderbijl@exxaro.com



Nzoro 2 Hydro Power Project	Oriental Province, Democratic Republic of Congo	2014 2014	Social consultation for the Relocation Action Plan component of the Nzoro 2 Hydro Power Station	RAP	Social Consultant	On-going	Randgold Resources	Completed introductory meetings – project on-going	Kibali Gold Mine Cyrille Mutombo Cyrille.c.mutombo@kibaligold.com
Eastern Basin AMD Project	Springs, Gauteng, South Africa	2014 2014	Heritage Impact Assessment for the proposed new sludge storage facility and pipeline	Heritage Impact Assessment	Heritage Consultant	On-going	AECOM	Project is on-going	AECOM
Soweto Cluster Reclamation Project	Soweto, Gauteng, South Africa	2014 2014	Heritage Impact Assessment for reclamation activities associated with the Soweto Cluster Dumps	Heritage Impact Assessment	Heritage Consultant	On-going	ERGO	Project is on-going	ERGO Greg Ovens Greg.ovens@drdgold.com
Klipspruit South Project	Ogies, Mpumalanga, South Africa	2014 2014	NID and Heritage Statement for the Section 102 Amendment of the Klipspruit Mine EMP	NID	Heritage Consultant	On-going	BHP Billiton	Project is on-going	BHP Billiton
Klipspruit Extension: Weltevreden Project	Ogies, Mpumalanga, South Africa	2014 2014	NID and Heritage Statement for the expansion of the Klipspruit Mine	NID	Heritage Consultant	On-going	BHP Billiton	Project is on-going	BHP Billiton
Ergo Rondebult Pipeline Basic Assessment	Johannesburg, South Africa	2014 2014	NID and Heritage Statement for the construction of the Rondebult Pipeline	NID	Heritage Consultant	1 Week	ERGO	Completed screening assessment and NID	ERGO
Kibali ESIA Update Project	Oriental Province, Democratic Republic of Congo	2014 2014	Update of the Kibali ESIA for the inclusion of new open-cast pit areas	Heritage Impact Assessment	Heritage Consultant	On-going	Randgold Resources	Project is on-going	Randgold Resources Charles Wells Charles.wells@randgoldresources.com
GoldOne EMP Consolidation	Westonaria, Gauteng, South Africa	2014 2014	Gap analysis for the EMP consolidation of operations west of Johannesburg	Gap Analysis	Heritage Consultant	On-going	Gold One International	Project is on-going	Gold One International

JOHAN NEL

Mr Johan Nel

Unit manager: Heritage Resources Management

Social Sciences

Digby Wells Environmental

1 EDUCATION

Date	Degree(s) or Diploma(s) obtained	Institution
2014	Integrated Heritage Resources Management Certificate, NQF Level 6	Rhodes University
2002	BA (Honours) (Archaeology)	University of Pretoria
2001	BA	University of Pretoria
1997	Matric with exemption	Brandwag Hoërskool

2 LANGUAGE SKILLS

Language	Speaking	Writing	Reading
English	Excellent	Excellent	Excellent
Afrikaans	Excellent	Excellent	Excellent

3 EMPLOYMENT

Period	Company	Title/position
09/2011 to present	Digby Wells Environmental	Manager: Heritage Resources Management unit
05/2010-2011	Digby Wells Environmental	Archaeologist
10/2005-05/2010	Archaic Heritage Project Management	Manager and co-owner
2003-2007	Rock Art Mapping Project	Freelance archaeologist Resident archaeologist



2002-2003	Department of Anatomy, University of Pretoria	Special assistant: Anthropology
2001-2002	Department of Anatomy, University of Pretoria	Technical assistant
1999-2001	National Cultural History Museum & Department of Anthropology and Archaeology, UP	Assistant: Mapungubwe Project,

4 EXPERIENCE

Johan Nel has 13 years of combined experience in the field of cultural heritage resources management (HRM) including archaeological and heritage assessments, grave relocation, social consultation and mitigation of archaeological sites. I have gained experience both within urban settings and remote rural landscapes. Since 2010 I have been actively involved in environmental management that has allowed me to investigate and implement the integration of heritage resources management into environmental impact assessments (EIA). Many of the projects since have required compliance with International Finance Corporation (IFC) requirements and other World Bank standards. This exposure has allowed me to develop and implement a HRM approach that is founded on international best practice and leading international conservation bodies such as UNESCO and ICOMOS. I have worked in most South African Provinces, as well as Swaziland, the Democratic Republic of the Congo, Liberia and Sierra Leone. I am fluent in English and Afrikaans, with excellent writing and research skills.

5 PROFESSIONAL REGISTRATION

Position	Professional Body	Registration Number
Council member	Association for Southern African Professional Archaeologists (ASAPA); ASAPA Cultural Resources Management (CRM) section	095
Member	International Association of Impact Assessors (IAIA)	N/A
Member	International Council on Monuments and Sites (ICOMOS)	
Member	Society for Africanist Archaeologists (SAfA)	N/A



6 PUBLICATIONS AND CONFERENCE PAPERS

Authors and Year	Title	Published in/presented at
Nel, J. (2001)	Cycles of Initiation in Traditional South African Cultures.	South African Encyclopaedia (MWEB).
Nel, J. 2001.	Social Consultation: Networking Human Remains and a Social Consultation Case Study	Research poster presentations at the. Bi-annual Conference (SA3) Association of Southern African Professional Archaeologists the National Museum, Cape Town
Nel, J. 2002.	Collections policy for the WG de Haas Anatomy museum and associated Collections.	Unpublished. Department of Anatomy, School of Medicine: University of Pretoria.
Nel, J. 2004.	Research and design of exhibition for Eloff Belting and Equipment CC	Institute of Quarrying 35th Conference and Exhibition on 24 – 27 March 2004
Nel, J. 2004.	Ritual and Symbolism in Archaeology, Does it exist?	Research paper presented at the Bi-annual Conference (SA3) Association of Southern African Professional Archaeologists: Kimberley
Nel, J & Tiley, S. 2004.	The Archaeology of Mapungubwe: a World Heritage Site in the Central Limpopo Valley, Republic of South Africa.	Archaeology World Report, (1) United Kingdom p.14-22.
Nel, J. 2007.	The Railway Code: Gautrain, NZASM and Heritage.	Public lecture for the South African Archaeological Society, Transvaal Branch: Roedean School, Parktown.
Nel, J. 2009.	Un-archaeologically speaking: the use, abuse and misuse of archaeology in popular culture.	The Digging Stick. April 2009. 26(1): 11-13: Johannesburg: The South African Archaeological Society.
Nel, J. 2011.	'Gods, Graves and Scholars' returning Mapungubwe human remains to their resting place.' In: Mapungubwe Remembered.	University of Pretoria commemorative publication: Johannesburg: Chris van Rensburg Publishers.



Nel, J. 2012	HIAs for EAPs.	. Paper presented at IAIA annual conference: Somerset West.
Nel, J. 2013.	The Matrix: A proposed method to evaluate significance of, and change to, heritage resources.	Paper presented at the 2013 ASAPA Biennial conference: Gaborone, Botswana.
Nel, J. 2013	HRM and EMS: Uncomfortable fit or separate process.	. Paper presented at the 2013 ASAPA Biennial conference: Gaborone, Botswana.

7 PROJECT EXPERIENCE

7.1 Archaeological Surveys and Impact Assessments

- 2003-2004. Freelance consulting archaeologist. Roodt & Roodt CC. RSA. Archaeological surveys. Specialist.
- 2004-2005. Resident archaeologist Rock Art Mapping Project. University of KwaZulu-Natal. Kwazulu-Natal, RSA. Rock art mapping & recording. Specialist.

7.2 Archaeological Mitigation

- 2007. Archaeological investigation of Old Johannesburg Fort. Johannesburg Development Agency. Gauteng, RSA. Archaeological mitigation. Project manager.
- 2008. Final consolidated report: Watching Brief on Soutpansberg Road Site for the new Head Offices of the Department of Foreign Affairs, Pretoria Gauteng. Imbumba-Aganang D & C Joint Venture. Gauteng, RSA. Watching Brief. Project manager.
- 2011. Sessenge archaeological site mitigation. Randgold Resources. Doko, DRC. Archaeological mitigation. Specialist.
- 2011. Mitigation of three sites, Koidu Kimberlite Project. Koidu Holdings SA. Koidu, Sierra Leone. Archaeological mitigation. Project manager.
- 2012. Boikarabelo Phase 2 Mitigation of Archaeological Sites. Ledjadja Coal (Pty) Ltd. Limpopo, RSA. Archaeological permitting and mitigation. Project manager.
- 2012. Additional Archaeology Mitigation of Sites. Ledjadja Coal (Pty) Ltd. Limpopo, RSA. Archaeological permitting and mitigation. Project manager.
- 2013. Archaeological Excavations of Old Well, Rhodes University, Grahamstown. Rhodes University. Eastern Cape, RSA. Archaeological mitigation. Specialist.
- 2014. Archaeological Site Destruction. Ledjadja Coal (Pty) Ltd. Limpopo, RSA. Archaeological permitting and mitigation. Project manager.

7.3 Heritage Impact Assessments

- 2005. Final consolidated Heritage Impact Assessment report: Proposed development of high-cost housing and filling station, Portion of the farm Mooiplaats 147 JT. Go-Enviroscience. Mpumalanga, RSA. Heritage Impact Assessment. Project manager.
- 2006. Final report: Heritage resources Scoping survey and preliminary assessment for the Transnet Freight Line EIA, Eastern Cape and Northern Cape. ERM Southern Africa (Pty) Ltd. Northern & Eastern Cape, RSA. Heritage Scoping Assessment. Project manager.
- 2007. Proposed road upgrade of existing, and construction of new roads in Burgersfort, Limpopo Province. AGES South Africa (Polokwane). Limpopo, RSA. Heritage Impact Assessment. Project manager.
- 2007. Recommendation of Exemption: Above-ground SASOL fuel storage tanks located at grain silos in localities in the Eastern Free State. Sasol Group Services (Pty) Ltd. Free State, RSA. Letter of Exemption. Project manager.
- 2008. Summary report: Old dump on premises of the new Head Offices, Department of Foreign Affairs, Pretoria, Gauteng. Imbumba-Aganang D & C Joint Venture. Gauteng, RSA. Archaeological Impact Assessment. Project manager.
- 2008. Van Reenen Eco-Agri Development Project. Go-Enviroscience. Kwazulu-Natal & Free State, RSA. Heritage Impact Assessment. Project manager.
- 2008. Heritage Impact Assessment for proposed water pipeline routes, Mogalakwena District, Limpopo Province. AGES South Africa (Polokwane). Limpopo, RSA. Heritage Impact Assessment. Project manager.
- 2008. Phase 1 Heritage and Archaeological Impact Assessment: Proposed establishment of an access road between Sapekoe Drive and Koedoe Street, Erf 3366 (Extension 22) and the Remainder of Erf 430 (Extension 4). AGES South Africa (Polokwane). Limpopo, RSA. Heritage Impact Assessment. Project manager.
- 2008. Heritage resources scoping survey and preliminary assessment: Proposed establishment of township on Portion 28 of the farm Kennedy's Vale 362 KT, Steelpoort, Limpopo Province. AGES South Africa (Polokwane). Limpopo, RSA. Heritage Scoping Assessment. Project manager.
- 2008. Randwater Vlakfontein-Mamelodi water pipeline survey. Archaeology Africa CC. Gauteng, RSA. Heritage Impact Assessment. Specialist.
- 2010. Heritage Impact Assessment for conversion of PR to MRA. Georock Environmental. Northwest, RSA. Heritage Impact Assessment. Project manager.
- 2010. Temo Coal Project. Namane Commodities (Pty) Ltd. Limpopo, RSA. Heritage Impact Assessment. Specialist.
- 2011. Marapong Treatment Works. Ceenex (Pty) Ltd. Limpopo, RSA. Archaeological Impact Assessment. Project manager.

- 2011. Complete Environmental Authorisation. Rhodium Reefs Ltd. Limpopo, RSA. Archaeological Impact Assessment. Specialist.
- 2011. Big 5 PV Solar Plants. Orlight (Pty) Ltd. Western and Northern Cape, RSA. Heritage Impact Assessment. Specialist.
- 2011. Heritage Impact Assessment for Koidu Diamond Mine. Koidu Holdings SA. Koidu, Sierra Leone. Heritage Impact Assessment. Specialist.
- 2012. TSF and Pipeline. Gold One. Gauteng, RSA. Heritage Impact Assessment. Project manager.
- 2012. Kangra Coal Heritage Screening Assessment. ERM Southern Africa (Pty) Ltd. Mpumalanga, RSA. Heritage Screening Assessment. Project manager.
- 2012. Environmental and Social Studies. Platreef Resources (Pty) Ltd. Limpopo, RSA. Heritage specialist advice. Project manager.
- 2012. ESKOM Powerline EIA. Ledjadja Coal (Pty) Ltd. Limpopo, RSA. Notification of Intent to Develop. Project manager.
- 2012. Falea Project ESIA. Denison Mines Corp. (Rockgate Capital Corp). Falea, Mali. Heritage Impact Assessment. Specialist.
- 2012. EIA for Proposed Emergency Measures to Pump and Treat. AECOM SA (Pty) Ltd. Gauteng, RSA. Heritage Impact Assessment. Specialist.
- 2012. Tonguma Baseline Studies. Koidu Holdings SA. Tonguma, Sierra Leone. Heritage Impact Assessment. Specialist.
- 2012. Vedanta IPP. Black Mountain Mining (Pty) Ltd. Limpopo, RSA. Heritage Impact Assessment. Specialist.
- 2012. Boikarabelo Railway Realignment. Ledjadja Coal (Pty) Ltd. Limpopo, RSA. Heritage Impact Assessment. Specialist.
- 2012. Platreef ESIA. Platreef Resources (Pty) Ltd. Limpopo, RSA. Heritage Impact Assessment. Specialist.
- 2012. Roodekop EIA. Universal Coal Development 4 (Pty) Ltd. Mpumalanga, RSA. Heritage Impact Assessment. Specialist.
- 2012. Kangala HIA. Universal Coal Development 1 (Pty) Ltd. Mpumalanga, RSA. Heritage Impact Assessment and permitting. Specialist.
- 2012. Roodepoort Strengthening. Eskom Holdings SOC Ltd. Gauteng, RSA. Notification of Intent to Develop. Specialist.
- 2012. Trichardtsfontein EIA / EMP. Xstrata Coal South Africa. Limpopo, RSA. Heritage Impact Assessment. Specialist.
- 2012. Zandbaken EIA/EMPR. Xstrata Coal South Africa. Limpopo, RSA. Heritage Impact Assessment. Specialist.



- 2013. ATCOM Tweefontein NID. Jones & Wagener (Pty) Ltd. Mpumalanga, RSA. Burial grounds and graves consultation, permitting and relocation. Project manager.
- 2013. Roodepoort Heritage Impact Assessment. Fourth Element Consulting (Pty) Ltd. Gauteng, RSA. Heritage Impact Assessment. Project manager.
- 2013. JHB BRT Phase 2 Heritage Impact Assessment. Iliso Consulting (Pty) Ltd. Gauteng, RSA. Heritage Impact Assessment. Project manager.
- 2013. Kangra Coal HIA. ERM Southern Africa (Pty) Ltd. Mpumalanga, RSA. Heritage Impact Assessment. Project manager.
- 2013. Slypsteen Bulk Sample Application. Summer Season Trading (Pty) Limited. Northern Cape, RSA. Heritage Impact Assessment. Project manager.
- 2013. Kempton Park Heritage Statement and NID. ERM Southern Africa (Pty) Ltd. Gauteng, RSA. Notification of Intent to Develop. Project manager.
- 2013. Sasol Twistdraai CFD. ERM Southern Africa (Pty) Ltd. Gauteng, RSA. Notification of Intent to Develop. Project manager.
- 2013. HRS & NID - River Crossings Upgrade. Iliso Consulting (Pty) Ltd. Gauteng, RSA. Notification of Intent to Develop. Project manager.
- 2013. Waterberg Prospecting Right Applications. Platinum Group Metals (Pty) Ltd. Limpopo, RSA. Notification of Intent to Develop. Project manager.
- 2013. Landau Waste Licence Application. Anglo Operations (Pty) Limited. Mpumalanga, RSA. Notification of Intent to Develop. Reviewer / specialist.
- 2013. Prospecting Right Consultation Report. Rustenburg Platinum Mines Limited. Mpumalanga, RSA. Notification of Intent to Develop. Reviewer / specialist.
- 2013. Witrand Prospecting EMP. Rustenburg Platinum Mines Limited. Mpumalanga, RSA. Notification of Intent to Develop. Reviewer / specialist.
- 2013. EMP Amendment for CST. Copper Sunset Trading (Pty) Ltd. Mpumalanga, RSA. Notification of Intent to Develop. Reviewer / specialist.
- 2013. Maseve IFC ESHIA. Maseve Investment (Pty) Ltd. Mpumalanga, RSA. Notification of Intent to Develop. Reviewer / specialist.
- 2013. Dalyshope ESIA. Anglo Operations (Pty) Limited. Limpopo, RSA. Heritage Impact Assessment. Specialist.
- 2013. Klipfontein Opencast Project. Bokoni Platinum Mines (Pty) Ltd. Limpopo, RSA. Heritage Impact Assessment. Specialist.
- 2013. Consbrey and Harwar MPRDA EIA/EMP. Msobo Coal (Pty) Ltd. Mpumalanga, RSA. Heritage Impact Assessment. Specialist.
- 2013. Slyphsteen 102 EMP Amendment. Summer Season Trading (Pty) Limited. Northern Cape, RSA. Heritage Impact Assessment. Specialist.



- 2013. Putu Iron Ore ESIA. Atkins Limited Incorporated. Putu, Liberia. Heritage Impact Assessment. Specialist.
- 2013. Ash backfilling at Sigma Colliery. Sasol Mining (Pty) Ltd. Gauteng, RSA. Notification of Intent to Develop. Specialist.
- 2013. Syferfontein Block 4 - Underground Coal Mining for Sasol. Sasol Mining (Pty) Ltd. Mpumalanga, RSA. Notification of Intent to Develop. Specialist.
- 2013. Prospecting Right Amendment to Include Bulk Sampling. Sikhuliso Resources (Pty) Ltd. Mpumalanga, RSA. Notification of Intent to Develop. Specialist.
- 2013. Nooitgedacht EIA, EMP Amendment & Gap Analysis. Xstrata Coal South Africa. Limpopo, RSA. Heritage Impact Assessment. Specialist.
- 2014. Gold One EMP Consolidation Phase 0. Gold One. Gauteng, RSA. Heritage Impact Assessment. Reviewer / specialist.
- 2014. Kilbarchan Audit and EIA. Eskom Holdings SOC Ltd. Kwazulu-Natal, RSA. Heritage Impact Assessment. Reviewer / specialist.
- 2014. Klipspruit Extension Environmental Assessment. BHP Billiton Energy Coal South Africa Limited. Mpumalanga, RSA. Heritage Impact Assessment. Reviewer / specialist.
- 2014. Klipspruit South BECSA EIA. BHP Billiton Energy Coal South Africa Limited. Mpumalanga, RSA. Heritage Impact Assessment. Reviewer / specialist.
- 2014. EIA/EMP Soweto Cluster. DRD GOLD ERGO (Ergo Mining (Pty) Ltd. Gauteng, RSA. Notification of Intent to Develop. Reviewer / specialist.
- 2014. London Road Heritage Statement. ERM Southern Africa (Pty) Ltd. Gauteng, RSA. Notification of Intent to Develop. Reviewer / specialist.
- 2014. Grootegeluk MPRDA, NEMA and IWULA. Exxaro Coal (Pty) Ltd. Limpopo, RSA. Notification of Intent to Develop. Reviewer / specialist.
- 2014. Kibali ESIA & EMP Update. Randgold Resources. Doko, DRC. Heritage Impact Assessment. Specialist.
- 2014. Nokuhle Colliery NEMA Process. HCI Coal (Pty) Ltd. Mpumalanga, RSA. Heritage Impact Assessment. Specialist.
- 2014. HRM Process for Hendrina Wet Ashing. Lidwala Consulting Engineers (Pty) Ltd. Mpumalanga, RSA. Heritage Impact Assessment. Specialist.
- 2014. Weltevreden NEMA. Northern Coal (Pty) Ltd. Mpumalanga, RSA. Heritage Impact Assessment. Specialist.
- 2014. Sasol Sigma Mooikraal Pipeline BA. Sasol Mining (Pty) Ltd. Mpumalanga, RSA. Notification of Intent to Develop. Specialist.



7.4 Burial Grounds and Graves Consultation and Relocation

- 2005. Report on exhumation, relocation and re-internment of 49 graves on Portion 10 of the farm Tygervallei 334 JR, Kungwini Municipality, Gauteng D Georgiades East Farm (Pty) Ltd. Gauteng, RSA. Burial grounds and graves consultation, permitting and relocation. Project manager.
- 2005. Southstock Collieries Grave Relocation. Doves Funerals, Witbank. Mpumalanga, RSA. Burial grounds and graves consultation, permitting and relocation. Project manager.
- 2005. Social consultation for Smoky Hills Platinum Mine Grave Relocation. PGS (Pty) Ltd. Limpopo, RSA. Stakeholder consultation on burial grounds and graves. Social consultant.
- 2005. Social consultation for Elawini Lifestyle Estate Grave Relocation. PGS (Pty) Ltd. Mpumalanga, RSA. Stakeholder consultation on burial grounds and graves. Social consultant.
- 2006. Social consultation for Zonkezizwe Grave Relocation. PGS (Pty) Ltd. Gauteng, RSA. Stakeholder consultation on burial grounds and graves. Social consultant.
- 2006. Social consultation for Motaganeng Residential Development Grave Relocation. PGS (Pty) Ltd. Mpumalanga, RSA. Stakeholder consultation on burial grounds and graves. Social consultant.
- 2006. Social consultation for Zondagskraal Coal Mine Grave (Pty) Ltd. Mpumalanga, RSA. Stakeholder consultation on burial grounds and graves. Social consultant.
- 2007. Exploratory excavation of an unknown cemetery at Du Preezhoek, Fountains Valley, Portion 383 of the farm Elandspoort 357 JR, Pretoria, Gauteng. Bombela Civil Joint Venture. Gauteng, RSA. Burial grounds and graves consultation, permitting and relocation. Project manager.
- 2007. Final consolidated report: Phase 2 test excavations ascertaining the existence of alleged mass graves, Tlhabane West, Extension 2, Rustenburg, Northwest Province. Bigen Africa Consulting Engineers. Northwest, RSA. Burial grounds and graves consultation, permitting and relocation. Project manager.
- 2007. Repatriation of Mapungubwe Human Remains. Department of Environmental Affairs and Tourism. Limpopo, RSA. Repatriation. Project manager.
- 2008. Report on skeletal material found at Pier 30, R21 Jones Street off-ramp, Kempton Park. Bombela Civil Joint Venture. Gauteng, RSA. Heritage Scoping Assessment. Project manager.
- 2011. Kibali Grave Relocation. Randgold Resources. Doko, DRC. International grave relocation. Specialist.
- 2012. Platreef Platinum Mine Burial Grounds and Graves Census. Platreef Resources (Pty) Ltd. Limpopo, RSA. Stakeholder consultation on burial grounds and graves. Project manager.



- 2013. New Liberty Grave Relocation Process. Aureus Mining Inc. Kinjor, Liberia. International grave relocation. Project manager.
- 2013. Bokoni Burial Grounds and Grave Census and Grave Relocation Plan. Bokoni Platinum Mines (Pty) Ltd. Limpopo, RSA. Stakeholder consultation on burial grounds and graves. Project manager.
- 2014. Arnot Colliery Grave Relocation Project. Exxaro Coal (Pty) Ltd. Mpumalanga, RSA. Burial grounds and graves consultation, permitting and relocation. Project manager.
- 2014. Paardeplaats and Belfast RAPs. Exxaro Coal (Pty) Ltd. Mpumalanga, RSA. Burial grounds and graves consultation, permitting and relocation. Reviewer / specialist.
- 2014. Thabametsi EIA, EMP, IWULA, IWWMP and PPP. Exxaro Coal (Pty) Ltd. Limpopo, RSA. Stakeholder consultation on burial grounds and graves. Specialist.

7.5 Research Reports and Reviews

- 2007. Research report on cultural symbols. Ministry of Intelligence Services. RSA. Research report. Project manager.
- 2007. Research report on the remains of kings Mampuru I and Nyabela. National Department of Arts and Culture. RSA. Research report. Project manager.
- 2012. Baseline Scoping and Pre-feasibility Songwe Rare Earth Element Project. Mkango Resources Limited. Songwe, Malawi. Heritage Impact Assessment. Reviewer / specialist.
- 2013. Fatal Flaw Analysis and EIA Process for AMD Man in Eastern Basin. AECOM SA (Pty) Ltd. Gauteng, RSA. Heritage Impact Assessment. Reviewer / specialist.

Heritage Basic Assessment Report

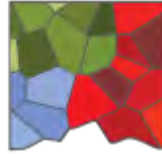
Basic Assessment Report: Environmental Management Plan in support of the Prospecting Rights Application for Mooihoek 255KT and Driekop 253KT, near Steelpoort, Limpopo Province

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Appendix B: Impact Assessment Methodology



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Heritage Resources Management: Assessment Matrix Methodology

Methodology Statement

October 2015

Digby Wells and Associates (South Africa) (Pty) Ltd
(Subsidiary of Digby Wells & Associates (Pty) Ltd). Co. Reg. No. 2010/008577/07. Turnberry Office Park, 48
Grosvenor Road, Bryanston, 2191. Private Bag X10046, Randburg, 2125, South Africa
Tel: +27 11 789 9495, Fax: +27 11 789 9498, info@digbywells.com, www.digbywells.com


Directors: DJ Otto, GB Beringer, LF Koeslag, AJ Reynolds (Chairman) (British)*, J Leaver*, GE Trusler
(C.E.O)
*Non-Executive



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This document has been prepared by Digby Wells Environmental.

Report Type:	Methodology Statement
Project Name:	Heritage Resources Management: Assessment Matrix Methodology

Name	Responsibility	Signature	Date
Johan Nel	HRM Unit Manager		23 October 2015

This report is provided solely for the purposes set out in it and may not, in whole or in part, be used for any other purpose without Digby Wells Environmental prior written consent.



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1 Introduction

This methodology provides an objective manner in which to evaluate the way in which project activities interact with cultural heritage resources. This interaction may result in an impact, adverse or beneficial, wholly or partially resulting from organisations activities.

In terms of heritage management, potential impacts to heritage resources must be assessed relative to the significance of the resource. The methodology employed in the assessment of potential impacts is discussed in more detail below.

2 Evaluation of Significance

The significance rating process is designed to provide a numerical rating of the cultural significance¹ of identified heritage resources. The evaluation was done as objectively as possible through a matrix developed by Digby Wells for this purpose. In addition, the methodology aims to allow ratings to be reproduced independently should it be required, provided that the same information sources are used.

This matrix takes into account heritage resources assessment criteria set out in subsection 3(3) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) (see Box 1), which determines the intrinsic, comparative and contextual significance of identified heritage resources. A resource's importance rating is based on information obtained through review of available credible sources and representivity or uniqueness (i.e. known examples of similar resources to exist). The final significance attributed to a resource furthermore takes into account the physical integrity of the fabric of the resource. The formula used to determine significance can be summarised in Box 2.

Dimension	Attributes considered	NHRA Ref.
Aesthetic & technical	1 Importance in aesthetic characteristics	S.3(3)(e)
	2 Degree of technical / creative skill at a particular period	S.3(3)(f)
Historical importance & associations	3 Importance to community or pattern in country's history	S.3(3)(a)
	4 Site of significance relating to history of slavery	S.3(3)(i)
	5 Association with life or work of a person, group or organisation of importance in the history of the country	S.3(3)(h)
Information potential	6 Possession of uncommon, rare or endangered natural or cultural heritage aspects	S.3(3)(b)
	7 Information potential	S.3(3)(c)
	8 Importance in demonstrating principle characteristics	S.3(3)(d)
Social	9 Association to community or cultural group for social, cultural or spiritual reasons	S.3(3)(g)

Box 1: NHRA section 3 criteria

The rationale behind the heritage value matrix takes into account the fact that a heritage resource's value is a direct indication of its sensitivity to change (impacts). Value therefore needs to be determined prior to the completion of any assessment of impacts.

¹ Cultural significance is defined in the NHRA as the intrinsic "aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance" of a heritage resource. These attributes are combined and reduced to four themes used in the Digby Wells significance matrix: aesthetic, historical, scientific and social.



This matrix rates the potential, or importance, of an identified resource relative to its contribution to certain values – aesthetic, historical, scientific and social.

The significance of a resource is directly related to the impact on it that could result from project-related activities, as it provides minimum accepted levels of change to the resource. The South African Heritage Resources Agency (SAHRA) has published minimum standards that include minimum required mitigation of heritage resources. These minimum requirements are integrated into the matrix to guide both assessments of impacts and recommendations for mitigation and management of resources.

The weight assigned to the various parameters for significance in the formula, significance ratings and recommended mitigation are presented in Table 3-1.

3 Field Rating

Although grading of heritage resources remains the responsibility of Heritage Resources Authorities (HRAs), SAHRA requires in terms of its Minimum Standards that heritage reports include Field Ratings for identified resources to comply with section 38 of the NHRA. The NHRA in terms of section 7 provides for a system of grading of heritage resources that form part of the national estate, distinguishing between three categories.

The field rating process is designed to provide a numerical rating of the recommended grading of identified heritage resources. The evaluation was done as objectively as possible by integrating the field rating into the significance matrix. Field ratings guide decision-making in terms of appropriate minimum required mitigation measures and consequent management responsibilities in accordance with section 8 of the NHRA. The formula used to determine field ratings is summarised in Box 3. The weight assigned to the various field rating parameters in the formula and the sum of the average ratings are presented in Table 3-1.

$$\text{Value} = \text{Importance} \times \text{Integrity}$$

where

$$\text{Importance} = \text{average sum}$$

of

$$\text{Aesthetic} + \text{Historic} + \text{Scientific} + \text{Social}$$

Box 2: CS formula

$$\text{Field Rating} = \text{average sum}$$

of

$$\text{Aesthetic} + \text{Historic} + \text{Scientific} + \text{Social}$$

Box 3: Field rating formula

Table 3-1: Ratings and descriptions used in determining CS and field ratings

Rating	IMPORTANCE <i>A heritage resource's contribution to aesthetic, historic, scientific and social value.</i>	INTEGRITY <i>The undivided or unbroken state, material wholeness, completeness or entirety of a resource or site</i>	FIELD RATING <i>Recommended grading of identified heritage resources in terms of NHRA Section 7</i>
-	Not assessed - dimension and/or attribute not considered in determining value.		Not assessed - dimension and/or attribute not considered in field rating.
0	The resource exhibits attributes that may be considered in a particular dimension, but it is so poorly represented that it cannot or does not contribute to the resource's overall value.	No information potential, complete loss of meaning, Fabric completely degraded, original setting lost	
1	Common, well represented throughout diverse cultural landscapes	Fabric poorly preserved, limited information, little meaning ascribed, extensive encroachment on setting	Resources under general protection in terms of NHRA sections 34 to 37 with Negligible significance <i>Grade IV C</i>
2	Generally well represented but exhibits superior qualities in comparison to other similar examples	Fabric is preserved, some information potential (quality questionable) and meaning evident, some encroachment on setting	Resources under general protection in terms of NHRA sections 34 to 37 with Low significance <i>Grade IV B</i>
3	The resource exhibits attributes that are rare and uncommon within a region. It is important to specific communities.	Fabric well preserved, good quality information and meaning evident, limited encroachment	Resources under general protection in terms of NHRA sections 34 to 37 with Medium to Medium-High significance <i>Grade IV A</i>
4	Rare and uncommon, value of national importance	Excellent preservation of fabric, high information potential of high quality, meaning is well established, no encroachment on setting	Resources under general protection in terms of NHRA sections 34 to 37 with High significance <i>Grade III B</i>
5	The resource exhibits attributes that are considered singular, unique and/or irreplaceable to the degree that its significance can be universally accepted.		Resources under general protection in terms of NHRA sections 34 to 37 with Very High significance <i>Grade III A</i>
6			Heritage resources under formal protection that can be considered to have special qualities which make them significant within the context of a province or a region <i>Grade II</i>
7			Heritage resources under formal protection that can be considered to have special qualities which make them significant within a national and / or international context. <i>Grade I</i>

4 Impact Assessment Methodology

The following are terms and definitions applicable to the Environmental Impact Assessment (EIA) concept (ISO 14001):

- **Project Activity:** Activities associated with the project that result in an environmental interaction during the different phases (construction, operation and decommissioning);
- **Interaction:** An “environmental interaction” is an element or characteristic of an activity, product, or service that interacts or can interact with the environment. Environmental interactions can cause environmental impacts (but may not necessarily do so). They can have either beneficial impacts or adverse impacts and can have a direct and decisive impact on the environment or contribute only partially or indirectly to a larger environmental change.
- **Environmental Aspect:** The term “environmental aspect” refers to the various natural and human environments that an activity may interact with. These environments extend from within the activity itself to the global system, and include air, water, land, flora, fauna (including people) and natural resources of all kinds.
- **Environmental Impact:** An “environmental impact” is a change to the environment that is caused either partly or entirely by one or more environmental interactions. An environmental interaction can have either a direct and decisive impact on the environment or contribute only partially or indirectly to a larger environmental change. In addition, it can have either a beneficial environmental impact or an adverse environmental impact.

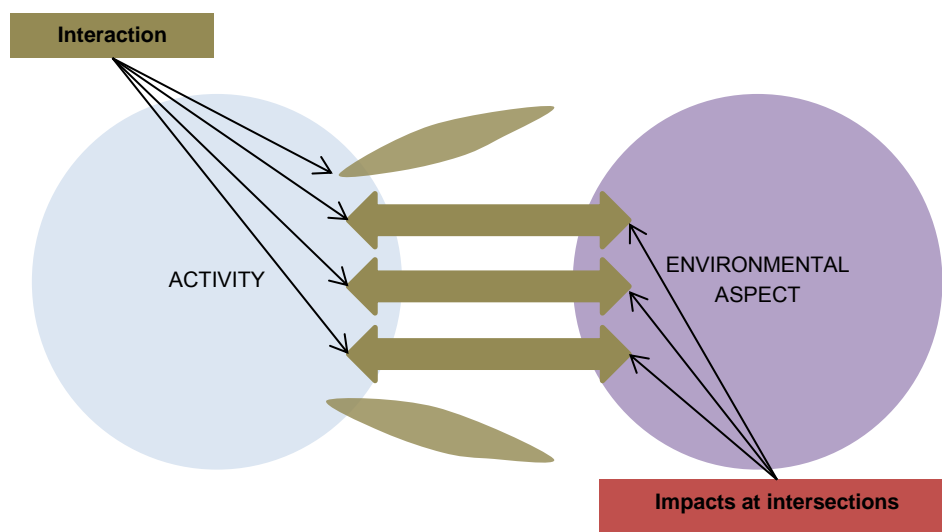


Figure 4-1: Graphical representation of impact assessment concept

The potential impacts were considered through an examination of the project phase and activity, the environmental aspect, the interdependencies between aspects, an assessment

and classification of categories, and consideration of the potential impact on heritage resources. An example of this process is presented in Figure 4-2

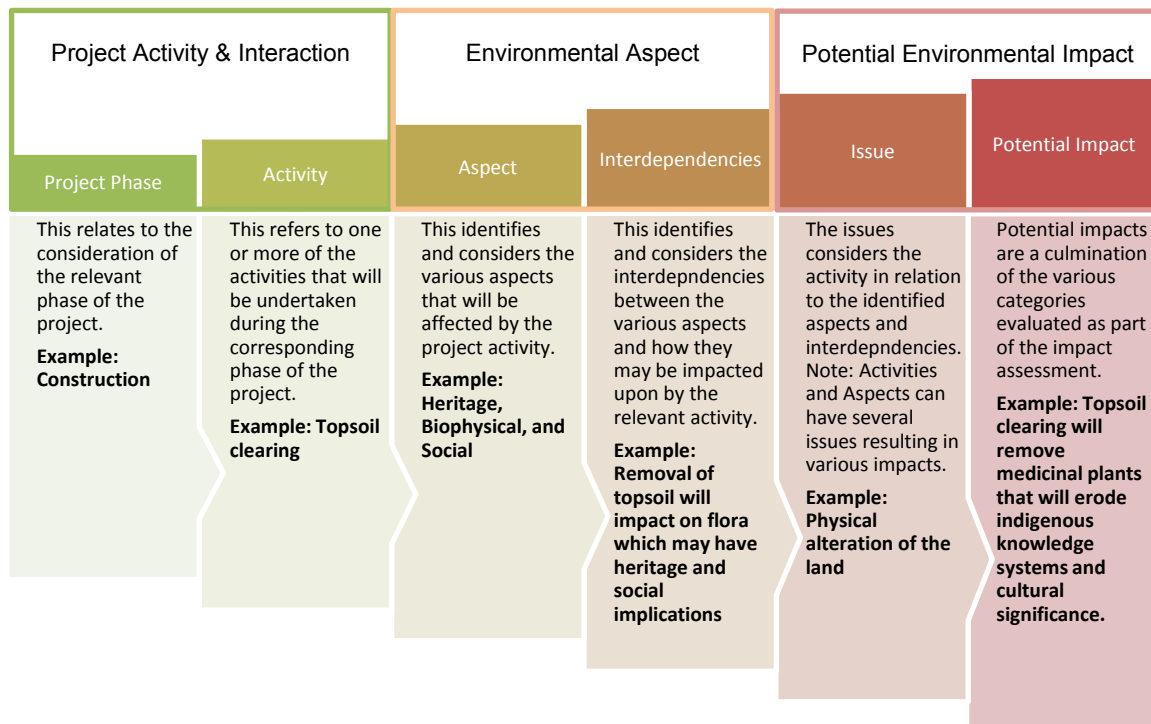


Figure 4-2: Example of how potential impacts were considered

4.1 Defining Heritage Impacts

Different heritage impacts may manifest in different geographical areas and diverse communities. For instance, heritage impacts can simultaneously affect the physical resource and have social repercussions: this is compounded when the intensity of physical impacts and social repercussions differ significantly. In addition, heritage impacts can influence the cultural significance of heritage resources without any actual physical impact on the resources taking place. Heritage impacts can, therefore, generally be placed into three broad categories (adapted from Winter & Bauman 2005: 36):

- **Direct or primary heritage impacts** affect the fabric or physical integrity of the heritage resource, for example destruction of an archaeological site or historical building. Direct or primary impacts may be the most immediate and noticeable. Such impacts are usually ranked as the most intense, but can often be erroneously assessed as high-ranking.
- **Indirect, induced or secondary heritage impacts** can occur later in time or at a different place from the causal activity, or as a result of a complex pathway. For example, restricted access to a heritage resource resulting in the gradual erosion of its cultural significance that may be dependent on ritual patterns of access. Although



the physical fabric of the resource is not affected through any primary impact, its significance is affected that can ultimately result in the loss of the resource itself.

- **Cumulative heritage impacts** result from in-combination effects on heritage resources acting within a host of processes that are insignificant when seen in isolation, but which collectively have a significant effect. Cumulative effects can be:
 - **Additive:** the simple sum of all the effects, e.g. the total number of development activities that will occur within the study area.
 - **Synergistic:** effects interact to produce a total effect greater than the sum of the individual effects, e.g. the effect of each different activity on the archaeological landscape in the study area.
 - **Time crowding:** frequent, repetitive impacts on a particular resource at the same time, e.g. the effect of regular blasting activities on a nearby rock art site or protected historical building high.
 - **Neutralizing:** where the effects may counteract each other to reduce the overall effect, e.g. the effect of changes in land use could reduce the overall impact on sites within the archaeological landscape of the study area.
 - **Space crowding:** high spatial density of impacts on a heritage resource, e.g. density of new buildings resulting in suburbanisation of a historical rural landscape.



The relevance of the distinction to defining the study areas arises from the fact that heritage resources do not exist in isolation to the wider natural, social, cultural and heritage landscape: cultural significance is therefore also linked to rarity / uniqueness, physical integrity and importance to diverse communities.

In addition, the NHRA requires that heritage resources are graded in terms of national, provincial and local concern based on their importance and consequent official (i.e. State) management effort required. The type and level of baseline information required to adequately predict heritage impacts varies between these categories.

4.2 Impact Assessment

The impact rating process is designed to provide a numerical rating of the identified heritage impacts. The significance rating follows an established impact/risk assessment formula is shown in Box 5.

The weight assigned to the various parameters for positive and negative impacts in the formula is presented in Table 4-2 below.

Project-related impacts on heritage resources have taken into account the inherent value of heritage resources, described above, and only applied to resources with values above negligible. As a result, the impact assessment did not consider individual resources, but was applied to diverse resources grouped in terms of similar values.

The magnitude was then applied to pre- and post-mitigation scenarios with the intention of removing all impacts on heritage resources. Where project related mitigation will not avoid or sufficiently reduce negative changes/impacts on heritage resources with high values, mitigation of these resources may be required.

This may include alteration, restoration or demolition of structures under a permit issued by the HRAs.

Impacts were rated prior to mitigation and again after consideration of the proposed mitigation measures. Impacts were then categories into one of eight categories listed in Table 4-2. The relationship between the consequence, probability and significance ratings is also graphically depicted in Table 4-2.

Significance = consequence of an event x probability of the event occurring

where:

Consequence = type of impact x (Intensity + Spatial Scale + Duration)

and

Probability = Likelihood of an impact occurring

In the formula for calculating consequence:

Type of impact = +1 (positive) or -1 (negative)

Box 5: Impact assessment formula

Table 4-1: Description of duration, extent, intensity and probability ratings used in impact assessment

Value	DURATION RATING - A measure of the lifespan of the impact		EXTENT RATING A measure of how wide the impact would occur		INTENSITY RATING- A measure of the degree of harm, injury or loss.		PROBABILITY RATING - A measure of the chance that consequences of that selected level of severity could occur during the exposure window.	
	Probability	Description	Exposure	Description	Intensity	Description	Probability	Description
7	Permanent	Impact will permanently alter or change the heritage resource and/or value (Complete loss of information)	International	Impacts on heritage resources will have international repercussions, issues or effects, i.e. in context of international cultural significance, legislation, associations, etc.	Extremely high	Major change to Heritage Resource with High-Very High Value	Certain/Definite	Happens frequently. The impact will occur regardless of the implementation of any preventative or corrective actions.
6	Beyond Project Life	Impact will reduce over time after project life (Mainly renewable resources and indirect impacts)	National	Impacts on heritage resources will have national repercussions, issues or effects, i.e. in context of national cultural significance, legislation, associations, etc.	Very high	Moderate change to Heritage Resource with High-Very High Value	High probability	Happens often. It is most likely that the impact will occur.
5	Project Life	The impact will cease after project life.	Region	Impacts on heritage resources will have provincial repercussions, issues or effects, i.e. in context of provincial cultural significance, legislation, associations, etc.	High	Minor change to Heritage Resource with High-Very High Value	Likely	Could easily happen. The impact may occur.
4	Long Term	Impact will remain for >50% - Project Life	Municipal area	Impacts on heritage resources will have regional repercussions, issues or effects, i.e. in context of the regional study area.	Moderately high	Major change to Heritage Resource with Medium-Medium High Value	Probable	Could happen. Has occurred here or elsewhere
3	Medium Term	Impact will remain for >10% - 50% of Project Life	Local	Impacts on heritage resources will have local repercussions, issues or effects, i.e. in context of the local study area.	Moderate	Moderate change to Heritage Resource with Medium - Medium High Value	Unlikely / Low probability	Has not happened yet, but could happen once in a lifetime of the project. There is a possibility that the impact will occur.
2	Short Term	Impact will remain for <10% of Project Life	Limited	Impacts on heritage resources will have site specific repercussions, issues or effects, i.e. in context of the site specific study area.	Low	Minor change to Heritage Resource with Medium - Medium High Value	Rare / Improbable	Conceivable, but only in extreme circumstances. Have not happened during the lifetime of the project, but has happened elsewhere. The possibility of the impact materialising is very low as a result of design, historic experience or implementation of adequate mitigation measures
1	Transient	Impact may be sporadic/limited duration and can occur at any time. E.g. Only during specific times of operation, and not affecting heritage value.	Very Limited	Impacts on heritage resources will be limited to the identified resource and its immediate surroundings, i.e. in context of the specific heritage site.	Very low	No change to Heritage Resource with values medium or higher, or Any change to Heritage Resource with Low Value	Highly Unlikely /None	Expected never to happen. Impact will not occur.

Table 4-2: Impact significance ratings, categories and relationship between consequence, probability and significance

Score	Description	Rating
109 to 147	A very beneficial impact which may be sufficient by itself to justify implementation of the project. The impact may result in permanent positive change.	Major (positive)
73 to 108	A beneficial impact which may help to justify the implementation of the project. These impacts would be considered by society as constituting a major and usually a long-term positive change to the heritage resources.	Moderate (positive)
36 to 72	An important positive impact. The impact is insufficient by itself to justify the implementation of the project. These impacts will usually result in positive medium to long-term effect on the heritage resources.	Minor (positive)
3 to 35	A small positive impact. The impact will result in medium to short term effects on the heritage resources.	Negligible (positive)
-3 to -35	An acceptable negative impact for which mitigation is desirable but not essential. The impact by itself is insufficient even in combination with other low impacts to prevent the development being approved. These impacts will result in negative medium to short term effects on the heritage resources.	Negligible (negative)
-36 to -72	An important negative impact which requires mitigation. The impact is insufficient by itself to prevent the implementation of the project but which in conjunction with other impacts may prevent its implementation. These impacts will usually result in negative medium to long-term effect on the heritage resources.	Minor (negative)
-73 to -108	A serious negative impact which may prevent the implementation of the project. These impacts would be considered by society as constituting a major and usually a long-term change to the heritage resources and result in severe effects.	Moderate (negative)
-109 to -147	A very serious negative impact which may be sufficient by itself to prevent implementation of the project. The impact may result in permanent change. Very often these impacts are immitigable and usually result in very severe effects.	Major (negative)

Relationship between consequence, probability and significance ratings																																						
Probability	Significance																																					
	7	-147	-140	-133	-126	-119	-112	-105	-98	-91	-84	-77	-70	-63	-56	-49	-42	-35	-28	-21	21	28	35	42	49	56	63	70	77	84	91	98	105	112	119	126	133	140
6	-126	-120	-114	-108	-102	-96	-90	-84	-78	-72	-66	-60	-54	-48	-42	-36	-30	-24	-18	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120	126
5	-105	-100	-95	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105
4	-84	-80	-76	-72	-68	-64	-60	-56	-52	-48	-44	-40	-36	-32	-28	-24	-20	-16	-12	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84
3	-63	-60	-57	-54	-51	-48	-45	-42	-39	-36	-33	-30	-27	-24	-21	-18	-15	-12	-9	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63
2	-42	-40	-38	-36	-34	-32	-30	-28	-26	-24	-22	-20	-18	-16	-14	-12	-10	-8	-6	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42
1	-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	Consequence																																					



5 Mitigation Measures and Recommendations

The desired outcome of an impact assessment is the removal of negative impacts on heritage resources through the implementation of feasible mitigation measures. The mitigation and management measures recommended in this section comply with the General Principles set out under section 5 of the NHRA. The recommendations further considered the cultural significance of heritage resources and the recommended minimum level of mitigation as published in SAHRA Minimum Standards² (See Box 4).

Designation	Recommended mitigation
Negligible	Sufficiently recorded, no mitigation required
Low	Resource must be recorded before destruction, including detailed site mapping, surface sampling may be required
Medium	Mitigation of resource to include detailed recording and mapping, and limited sampling, e.g. STPs.
Medium High	Project design should aim to reduce or remove changes; Mitigation of resource to include extensive sampling and recording, e.g. test excavation, analyses, etc.
High	Project design must aim to avoid change to resource; Partly conserved, Conservation Management Plan (CMP)
Very High	Project design must change to avoid all change to resource; Conserved in entirety, CMP

Box 4: Recommended minimum level of required mitigation

Recommended mitigation is therefore divided into two categories: *project related* and *mitigation of heritage resources* defined below.

- Project-related mitigation requires changes or amendments to project design, planning and siting of infrastructure to avoid or reduce physical impacts on heritage resources. Project-related mitigation measures are always the preferred option, especially where heritage resources with higher cultural significance will be impacted on. Project-related mitigation may include:
 - In situ preservation (i.e. no-development) of heritage resources for which Conservation Management Plans (CMPs) are required; and
 - Conservation of heritage resources through, for example, incorporating the resources into project design and planning, for which CMPs are also required.
- Mitigation of heritage resources may be necessary where project-related mitigation will not sufficiently conserve or preserve heritage resources, thus resulting in partial or complete changes (including destruction) to a resource. Such resources need to be mitigated to ensure that they are fully recorded, documented and researched before any negative change occurs. This may require mitigation such as:
 - Intensive detailed recording of sites through various non-intrusive techniques to create a documentary record of the site – “preservation by record”;

² It must be noted that these minimum standards serve as a guide, and the recommendations provided in this HIA are project specific.



- Intrusive recording and sampling such as shovel test pits (STPs) and excavations, relocation (usually burial grounds and graves, but certain types of sites may be relocated), restoration and alteration. Any form of intrusive mitigation is a regulated permitted activity for which permits need to be issued by the relevant heritage authorities. Such mitigation may result in a reassessment of the value of a resource that could require conservation measures to be implemented. Alternatively, an application for a destruction permit may be made if the resource has been sufficiently sampled; and
- Where resources have negligible significance the specialist may recommend that no further mitigation is required and the site may be destroyed, for which a destruction permit must be applied for.

Appropriate mitigation measures were identified for each impact, and the procedure discussed above was to assess the possible consequence, probability and significance of each impact post-mitigation.

The post-mitigation rating provided an indication of the significance of residual impacts, while the difference between an impact's pre- and post-mitigation ratings represents the degree to which the recommended mitigation measures are expected to be effective in reducing or ameliorating that impact.

Heritage Basic Assessment Report

Basic Assessment Report: Environmental Management Plan in support of the Prospecting Rights Application for Mooihoek 255KT and Driekop 253KT, near Steelpoort, Limpopo Province

MMC3745



DIGBY WELLS
ENVIRONMENTAL

Appendix C: Site List

Map ID	Site ID	Latitude	Longitude	Cultural Affinities	Description	Reference
2430AC1	2430AC1	-24.498333	30.001944	Farming Community	LIA (Dsiate)	WITS Archaeological Site Database
2430AC2	2430AC2	-24.466667	30.038611	Farming Community	LIA (Hackney)	WITS Archaeological Site Database
2430AC3	2430AC3	-24.466667	30.042222	Farming Community	LSA shelter (Hackney)	WITS Archaeological Site Database
2430AC4	2430AC4	-24.480833	30.029722	Historic	Sekwati's grave	WITS Archaeological Site Database
2430AC5	MAPID_02318_Site1	-24.481528	30.112694	Farming Community	Stone features, grinding stones, pottery and grain bin foundations (Matadi 1)	Huffman and Schoeman 2001
2430AC6	MAPID_02318_Site2	-24.48325	30.111778	Farming Community	Stone features, grinding stones, pottery and grain bin foundations (Matadi 2)	Huffman and Schoeman 2001
2430CA3	MAPID_02318_Site3	-24.503333	30.084611	Farming Community	Stone features, grinding stones, pottery and grain bin foundations (Clapham 1)	Huffman and Schoeman 2001
2430CA4	MAPID_02318_Site4	-24.505167	30.081778	Farming Community and Burial Grounds and Graves	Stone features, grinding stones, pottery and grain bin foundations with several graves (Clapham 2)	Huffman and Schoeman 2001
2430CA5	2430CA5	-24.569481	30.159583	Farming Community	EFC storage pits containing pottery, ash and cattle dung	WITS Archaeological Site Database
GHK001	MAPID_02254_GHK001	-24.507583	30.168889	Burial Grounds and Graves	Possible grave	Hutten, 2008
GHK002	MAPID_02254_GHK002	-24.520389	30.152861	Farming Community	Lower grinding stone and undiagnostic potsherds	Hutten, 2008
GHK003	MAPID_02254_GHK003	-24.517806	30.158833	Farming Community	Dilapidated stone structure	Hutten, 2008
GHK004	MAPID_02254_GHK004	-24.517861	30.15975	Farming Community	Dilapidated stone structure	Hutten, 2008
GHK005	MAPID_02254_GHK005	-24.518417	30.161667	Farming Community	Dilapidated stone structure	Hutten, 2008
GHK006	MAPID_02254_GHK006	-24.518333	30.163806	Farming Community	Dilapidated stone structure with lower grinding stone	Hutten, 2008
GHK007	MAPID_02254_GHK007	-24.517778	30.164861	Farming Community	Dilapidated stone structure	Hutten, 2008
GHK008	MAPID_02254_GHK008	-24.520139	30.143306	Farming Community	Dilapidated stone structure	Hutten, 2008
GHK009	MAPID_02254_GHK009	-24.518722	30.144222	Farming Community and Burial Grounds and Graves	Dilapidated stone structure with three possible graves	Hutten, 2008
GHK010	MAPID_02254_GHK010	-24.51925	30.141444	Farming Community	Dilapidated stone structure	Hutten, 2008
GHK011	MAPID_02254_GHK011	-24.519778	30.142806	Farming Community	Dilapidated stone structure	Hutten, 2008
GHK012	MAPID_02254_GHK012	-24.519611	30.145444	Farming Community	Dilapidated stone structure	Hutten, 2008
GHK013	MAPID_02254_GHK013	-24.520083	30.147056	Farming Community	Dilapidated stone structure	Hutten, 2008
GHK014	MAPID_02254_GHK014	-24.52025	30.1465	Farming Community	Dilapidated stone structure	Hutten, 2008
GHK015	MAPID_02254_GHK015	-24.520389	30.14575	Farming Community	Dilapidated stone structure	Hutten, 2008
2429BD25	MAPID_02317	-24.291667	29.844444	Middle Stone Age	Surface occurrence of flakes and cores	Van Schalkwyk, 2001
LEB1	2005-SAHRA-0260/LEB1	-24.96467	30.10324	Farming Community	Middle Iron Age ceramics, decorated and undecorated, located in a badly eroded area	Birkholtz and Steyn, 2005
LEB2	2005-SAHRA-0260/LEB2	-24.95968	30.09995	Farming Community	Iron Age ceramic surface scatter, mostly undecorated. Site is situated on the bank of a non-perennial stream.	Birkholtz and Steyn, 2005
LEB3	2005-SAHRA-0260/LEB3	-24.96084	30.10077	Farming Community	Lower grinding stone situated on the bank of a non-perennial stream	Birkholtz and Steyn, 2005
LEB4	2005-SAHRA-0260/LEB4	-24.96167	30.10134	Farming Community	Undecorated Iron Age ceramics near the bank of a non-perennial stream.	Birkholtz and Steyn, 2005
LEB5	2005-SAHRA-0260/LEB5	-24.96418	30.10232	Farming Community	Middle Iron Age ceramics, decorated and undecorated, located in a badly eroded area	Birkholtz and Steyn, 2005
LEB6	2005-SAHRA-0260/LEB6	-24.96498	30.10288	Middle Stone Age	Two Stone Age lithics located in a badly eroded area.	Birkholtz and Steyn, 2005
LEB7	2005-SAHRA-0260/LEB7	-24.96437	30.10239	Middle Stone Age	Single Stone Age artifact located in a badly eroded area.	Birkholtz and Steyn, 2005
LEB8	2005-SAHRA-0260/LEB8	-24.96307	30.10151	Middle Stone Age	Two Stone Age flakes, one broken grinding stone as well as undecorated and decorated Middle Iron Age ceramics	Birkholtz and Steyn, 2005
Site 2	2003-SAHRA-0009/Site 2	-25.034722	30.095694	Farming Community	Metal slag and tuyère fragments in association with Eiland pottery	Roodt, January 2003
Site 11	2003-SAHRA-0009/Site 11	-25.035778	30.095361	Farming Community	Pedi style pottery fragments	Roodt, January 2003
Site 14	2003-SAHRA-0009/Site 14	-25.038111	30.094917	Farming Community	Terracing with high concentrations of pottery fragments	Roodt, January 2003
Site 15	2003-SAHRA-0009/Site 15	-25.039444	30.095528	Farming Community	Concentration of pottery fragments	Roodt, January 2003
Site 20	2003-SAHRA-0009/Site 20	-25.039861	30.088778	Farming Community	Eiland pottery concentration	Roodt, January 2003
Site 21	2003-SAHRA-0009/Site 21	-25.039583	30.088472	Farming Community	Half a bored stone and pottery concentration	Roodt, January 2003
Site 25	2003-SAHRA-0009/Site 25	-25.034278	30.086417	Farming Community	Concentration of pottery, hut rubble, metal working debris and terracing	Roodt, January 2003
Site 26	2003-SAHRA-0009/Site 26	-25.033194	30.087583	Farming Community	Pottery and tyuere fragments	Roodt, January 2003
Site 27	2003-SAHRA-0009/Site 27	-25.036667	30.087278	Farming Community	Concentration of pottery	Roodt, January 2003
Site 28	2003-SAHRA-0009/Site 28	-25.035528	30.086389	Farming Community	Pottery, hut rubble, metal working debris and terracing	Roodt, January 2003
MHC001	2430CA-MHC001	-24.5771832	30.1476753	Burial Grounds and Graves	One grave	Fourie, 2008