



PGS HERITAGE

HERITAGE MANAGEMENT PLAN FOR THE KHANGELA EMOYENI WIND ENERGY FACILITY AND ASSOCIATED INFRASTRUCTURE, NEAR MURRAYSBURG, WESTERN AND NORTHERN CAPE PROVINCES.

Heritage Management Plan

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REVISION HISTORY

Version	Issue Date	Description of Changes
1.0	25 May 2022	First draft
2.0	26 October 2022	Second draft - The final project layout and description was amended, and the report was updated accordingly.
3.0	9 November 2022	Third draft – Amended report after client review.

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Declaration of Independence

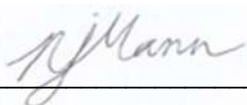
- I, Nikki Mann, declare that –
- General declaration:
- I act as the independent heritage practitioner in this application
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting heritage impact assessments, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I will take into account, to the extent possible, the matters listed in section 38 of the NHRA when preparing the application and any report relating to the application;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
- I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not
- All the particulars furnished by me in this form are true and correct;
- I will perform all other obligations as expected from a heritage practitioner in terms of the Act and the constitutions of my affiliated professional bodies; and
- I realise that a false declaration is an offence in terms of regulation 71 of the Regulations and is punishable in terms of section 24F of the NEMA.

Disclosure of Vested Interest

- I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Regulations;

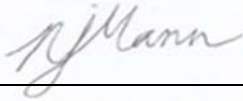

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ACKNOWLEDGEMENT OF RECEIPT


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Report Title	<i>Heritage Management Plan for the Khangela Emoyeni Wind Energy Facility and Associated Grid Infrastructure, Near Murraysburg, Western and Northern Cape Provinces.</i>		
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EXECUTIVE SUMMARY

Khangela Emoyeni Wind Farm (Pty) Ltd has appointed Nala Environmental (Nala) to undertake the ground truthing and subsequent finalisation of the EMPs in terms of NEMA EIA Regulations for the Khangela Emoyeni Wind Energy Facility and Associated Infrastructure (hereafter referred to as “Khangela WEF”) located near Murraysburg, Western and Northern Cape Provinces. PGS Heritage (Pty) Ltd (PGS) was appointed by Nala to develop a Heritage Management Plan (HMP) for the heritage resources identified during the pre-construction walkdown for the proposed infrastructure footprints. Heritage Western Cape (HWC) will be the commenting authority for the Western Cape Province on the HMP developed from the walkdown. Whilst the South African Heritage Resources Agency (SAHRA) will be the commenting authority for the Northern Cape Province.

This document subsequently outlines the HMP for the identified heritage resources. The main aim of this document is the prevention and management of primary and secondary impacts on identified heritage resources before and after any construction. The development of an HMP is a legal requirement in terms of Section 47 of the National Heritage Act (No. 25 of 1999). The document provides guidance to the responsible person/organisation in terms of possible conservation methodologies that can be used for sensitive heritage resources identified during site surveys. As such, the HMP is aimed at providing Nala and the developer, with guidance in terms of the type of development/construction activities that are allowed at sites located close to identified significant heritage resources and how to manage such activities.

Site Name

The Khangela Emoyeni WEF.

Location

The WEF is located approximately 20km north-east of Murraysburg in the Western and Northern Cape Provinces. It is within the Beaufort West Local Municipality in the Central Karoo District Municipality, and the Ubuntu Municipality in the Pixley ka Seme District Municipality.

The following properties have been identified for the Khangela Emoyeni Wind Energy Facility and associated infrastructure:

- Portion 4 (a Portion of Portion 1) of Farm Driefontein No.26;
- Remainder of Farm Swavel Kranse No. 28;
- Portion 1 of Farm Houtkloof No. 29
- Remainder of Portion 1 of Farm De Hoop No.30
- Portion 2 of Farm De Hoop No.30;
- Portion 3 (a Portion of Portion 1) of the Farm De Hoop No.30

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- Portion 2 of Farm Swavel Kranse No.28;
- Portion 1 of Farm Klipplaat No.109;
- Portion 3 (a Portion of Portion 2) of Farm Klipplaat No. 109;
- Portion 4 (Portion of Portion 2) of Farm Klipplaat No.109;
- Portion 6 of Farm Klipplaat No. 109;
- Portion 7 of Farm Klipplaat No. 109;
- Remainder of Farm Klipplaat No.109;
- Remainder of Portion 2 of Farm Klipplaat No.109

Description of the Development

It should be noted that the final layout of the Khangela WEF has taken the results of the previous archaeological assessment reports into account.

The proposed development will have a maximum of thirty-three (33) Wind Turbine Generators (WTGs). The permanent hardstanding area will be up to 55m x 35m per turbine, the turbine foundations will be approximately 30m x 30m (depth of ~3-5m), the hub height from the ground level will be up to 160m and the rotor diameter will be up to 180m. There will be an onsite office compound, including site offices, parking, an operation and maintenance facility and a control room. Temporary construction site camps and laydown areas will be utilised during construction. There will be additional internal roads and existing farm access tracks and watercourse crossings will be upgraded.

The proposed infrastructure footprints assessed during the walkdown were as follows:

- Turbines hardstands/ crane pads/ turbine laydowns within a 150m radius of the turbine base.
- Roads & MV cables: 150m either side of centre line (i.e., 300m wide corridor).
- Substation: 300m radius around substation.
- Turbines: 200m radius around WTG.

Heritage Resources Identified

A pre-construction walk down survey of the layout was conducted in March 2022. Focus was placed on the areas identified for the placement of the proposed turbines and associated internal roads, laydown areas and substation sites within the larger assessment area.

The findings of this field assessment largely support the findings of Hart and Almond (2015) and the results of this walkdown found that the overall archaeological sensitivity is generally low. Through data analysis and a site investigation, the following issues were identified from a heritage perspective.

Archaeology, built environment and burial grounds and graves

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The walkdown of the layout was undertaken on foot and by a vehicle by three PGS archaeologists (Nikki Mann, Cherene De Bruyn and Henk Steyn) on 22nd to 25th March 2022. The fieldwork conducted for the evaluation of the possible impact of the Khangela WEF, has revealed the presence of fifteen (15) heritage sites.

Six (6) sites containing sandstone boundary markers (**K010 - K015**) were rated as having medium heritage significance (rating of IIIB).

Three (3) sites with rock engravings (**K002, K003, K006**) were rated as having medium-low heritage significance (rating of IIIB/IIIC).

Six (6) sites comprising Low Density Surface Scatters/Single finds were also identified (**K001, K004, K005, K007, K008, K009**) and were rated as having low heritage significance (rating of IIIC). These are primarily from the Middle Stone Age (MSA), although Later Stone Age (LSA) material was also identified. All of these artefact assemblages occur in heavily deflated and eroded areas, so their scientific potential and heritage significance is somewhat lowered. Based on findings from a range of other heritage reports in the area, these types of sites are to be expected in this region.

Mitigation Measures

The calculated impact as summarised in **Section 7** of this report confirms the impact of the Khangela Emoyeni WEF will be reduced with the implementation of the mitigation measures. This finding in addition to the implementation of a chance finds procedure, as part of the EMP, will mitigate possible impacts on unidentified heritage resources. The following mitigation measures are listed in **Table 1**.

Table 1 - Heritage management recommendations.

Heritage Resources	Mitigation measures
Archaeological and historical resources	<ul style="list-style-type: none"> ▪ Implement a 30-meter buffer around rock engravings sites (K002, K003, K006) with a rating of IIIB/IIIC. If the engravings cannot be avoided, then they should be photographed and traced as necessary to produce a clear record, prior to removal/ disturbance/ destruction thereof (suitable permits will be required for the latter). ▪ Implement a 30-meter buffer around sandstone boundary markers (K010 – K014). If the markers cannot be avoided, then a permit will be required to move the marker (before any construction) to the boundary of the footprint and reinserted at

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Heritage Resources	Mitigation measures
	<p>a later stage. The co-ordinates of the original and new locations need to be taken and photographed.</p> <ul style="list-style-type: none"> ▪ A management plan for the heritage resources has been compiled (this document) and needs to be submitted for approval by HWC for implementation during construction and operations. ▪ A chance finds protocol has been developed that includes the process of work stoppage, site protection, evaluation and informing HWC of such finds and a final process of mitigation implementation.

This HMP then expands on these mitigation measures by explaining and providing the processes to be followed for the implementation of the management of the heritage resources within the project area.

Final Proposed Layout

The final proposed layout areas took the specialist recommendations identified during the 2022 field assessment into consideration (Refer to **Appendix C**). From an archaeological and historical structure perspective, the proposed footprint areas will not change the impact on the identified heritage resources in the HMP.

As such the recommended mitigation measures as described in the HMP report remain.

There is no objection to the proposed final layout associated with the Khangela WEF project, under the condition that where the proposed footprint areas differ from the original layout, surveyed in the HMP report, those areas will need to be assessed prior to any construction activities.

Nikki Mann - Author (Heritage Impact Assessment)

- Professional Member (ASAPA)

Wouter Fourie – Project Coordinator and Co-Author (Heritage Impact Assessment)

- Accredited Professional Heritage Practitioner (APHP)
- Accredited Professional Archaeologist (ASAPA)

Refer to Appendix A for CVs specialist.

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TERMINOLOGY AND ABBREVIATIONS

Archaeological resources

This includes:

- material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years including artefacts, human and hominid remains and artificial features and structures;
- rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10m of such representation;
- wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the republic as defined in the Maritimes Zones Act, and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which the SAHRA considers to be worthy of conservation;
- features, structures and artefacts associated with military history which are older than 75 years and the site on which they are found.

Cultural significance

This means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance

Development

This means any physical intervention, excavation, or action, other than those caused by natural forces, which may in the opinion of the heritage authority in any way result in a change to the nature, appearance or physical nature of a place or influences its stability and future well-being, including:

- construction, alteration, demolition, removal or change in 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 boards;
- any change to the natural or existing condition or topography of land; and
- any removal or destruction of trees, or removal of vegetation or topsoil

Earlier Stone Age

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The archaeology of the Stone Age between ~300 000 and 3 300 000 years ago.

Fossil

Mineralised bones of animals, shellfish, plants and marine animals. A trace fossil is the track or footprint of a fossil animal that is preserved in stone or consolidated sediment.

Heritage

That which is inherited and forms part of the National Estate (historical places, objects, fossils as defined by the National Heritage Resources Act 25 of 1999).

Heritage resources

This means any place or object of cultural significance and can include (but not limited to) the following (as stated under Section 3 of the NHRA):

- 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, and
- sites of significance relating to the history of slavery in South Africa

Holocene

The most recent geological time period commenced 10 000 years ago.

Later Stone Age

The archaeology of the last 30 000 years is associated with fully modern people.

Late Iron Age (Early Farming Communities)

The archaeology of the last 1000 years up to the 1800s, is associated with iron-working and farming activities such as herding and agriculture.

Middle Stone Age

The archaeology of the Stone Age between 30 000-300 000 years ago, is associated with early modern humans.

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Palaeontology

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.

Site

Site in this context refers to an area place where a heritage resource is located and not a proclaimed heritage site as contemplated under s27 of the NHRA.

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Table 2 – List of abbreviations used in this report

Abbreviations	Description
AIA	Archaeological Impact Assessment
APHP	Association of Professional Heritage Practitioners
ASAPA	Association of South African Professional Archaeologists
CRM	Cultural Resource Management
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
EIAs practitioner	Environmental Impact Assessment Practitioner
ESA	Earlier Stone Age
GN	Government Notice
GPS	Global Positioning System
HIA	Heritage Impact Assessment
HMP	Heritage Management Plan
I&AP	Interested & Affected Party
IAIASA	International Association for Impact Assessment South Africa
LCTs	Large Cutting Tools
LSA	Late Stone Age
MSA	Middle Stone Age
Nala	Nala Environmental Consulting Firm
NEMA	National Environmental Management Act, 1998 (Act No 107 of 1998)
NHRA	National Heritage Resources Act, 1999 (Act No 25 of 1999)
NC HRA	Northern Cape Heritage Resources Authority
NCW	Not Conservation Worthy
PGS	PGS Heritage (Pty) Ltd
REIPPP	Renewable Energy Independent Power Producer Procurement Programme
PHRA	Provincial Heritage Resources Authority
PIA	Palaeontological Impact Assessment
PSSA	Palaeontological Society of South Africa
REDZ	Renewable Energy Development Zone
SADC	Southern African Development Community
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
VIA	Visual Impact Assessment
WEF	Wind Energy Facility
WTGs	Wind Turbine Generator

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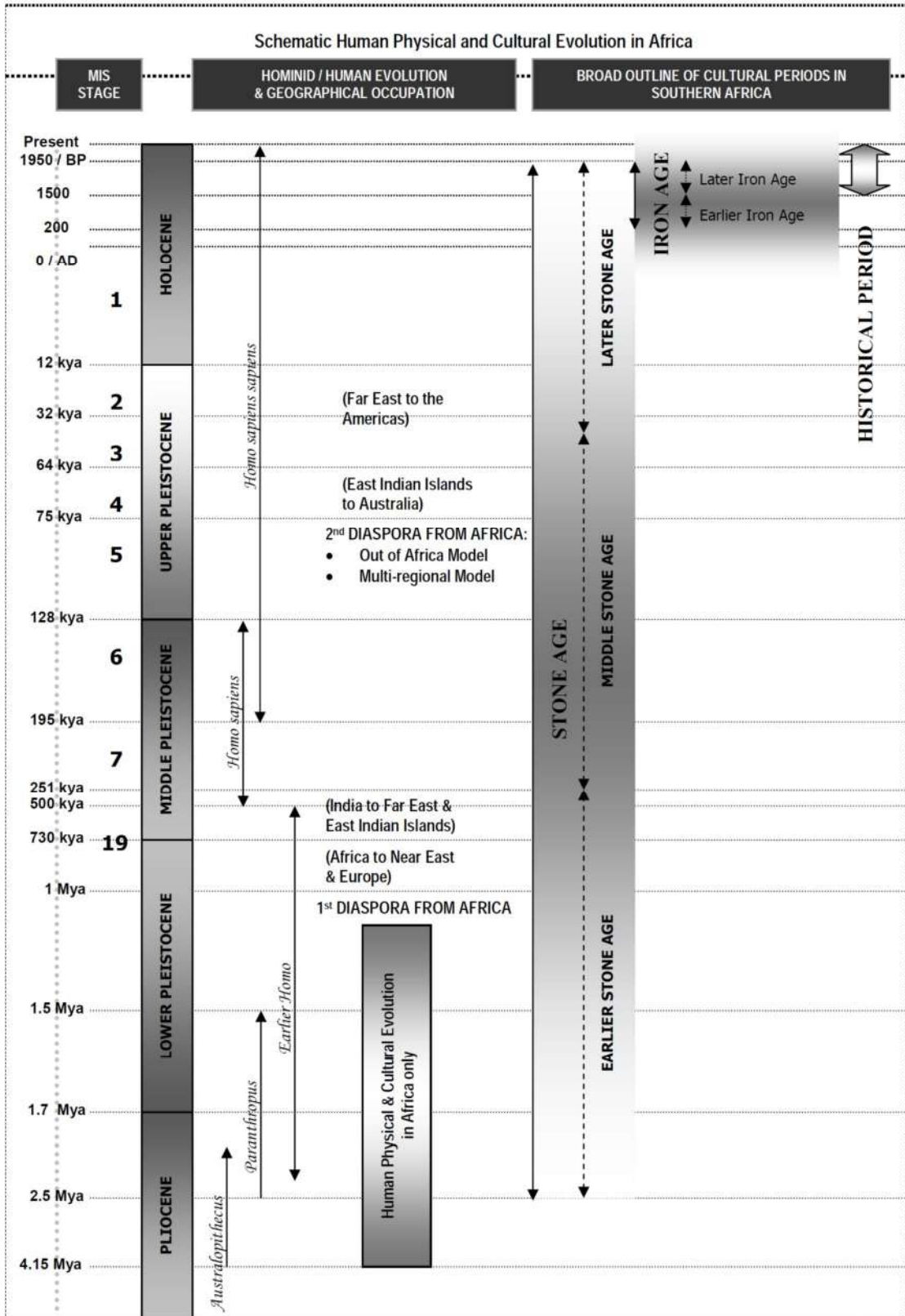


Figure 1 – Human and Cultural Timeline in Africa (Morris, 2008).

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1 INTRODUCTION

Khangela Emoyeni Wind Farm (Pty) Ltd has appointed Nala Environmental (Nala) to undertake final layouts, walkdowns and surveys for the Khangela Emoyeni Wind Energy Facility and Associated Infrastructure (hereafter referred to as “Khangela WEF”) located near Murraysburg, Western and Northern Cape Provinces. PGS Heritage (Pty) Ltd (PGS) was appointed by Nala to develop a Heritage Management Plan (HMP) for the heritage resources identified during the pre-construction walkdown for the proposed infrastructure footprints. Heritage Western Cape (HWC) will be the commenting authority for the Western Cape Province, whilst the South African Heritage Resources Agency (SAHRA) will be the commenting authority for the Northern Cape Province, on the HMP developed from the walkdown.

1.1 Scope of the Study

This document subsequently outlines the HMP for the identified heritage resources. The main aim of this document is the prevention and management of primary and secondary impacts on identified heritage resources before and after any construction. The development of an HMP is a legal requirement in terms of Section 47 of the National Heritage Act (No. 25 of 1999). The document provides guidance to the responsible person/organisation in terms of possible conservation methodologies that can be used for sensitive heritage resources identified during site surveys. As such, the HMP is aimed at providing Nala and the developer, with guidance in terms of the type of development/construction activities that are allowed at sites located close to identified significant heritage resources and how to manage such activities.

1.1.1 Aims of the HMP

The aims of an HMP include the following:

- Direct what needs to be done, how the site must be protected, who will be responsible, who will fund it and when this activity must be completed;
- Define the goals to be achieved and the type of activities;
- Guide any future construction-related activities;
- Determine the monitoring methodology;
- Assist with stakeholder engagement and identification of interested parties
- Explain the permitting procedure;
- Describe any professional requirements and clarify responsibilities;
- Identify the site value and provide guiding principles for activities on-site;
- Minimise loss or avoid adverse impacts on heritage resources;

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- Ensure that cultural heritage is incorporated in spatial planning and linked to social strategies;
- Improve the understanding of cultural heritage and the contribution it makes to the broader management processes; and
- Ensure that proper investigation, recording and stakeholder meetings take place.
- Includes the Chance Finds Procedure, which outlines the process to follow if any culturally significant heritage resources are found during construction/or operation related activities.

1.2 Specialist Qualifications

This study was compiled by PGS and its appointed specialists and is detailed below.

The staff at PGS have a combined experience of nearly 90 years in the heritage consulting industry. PGS and its staff have extensive experience in managing HIA processes. PGS will only undertake heritage assessment work where they have the relevant expertise and experience to undertake that work competently.

Wouter Fourie, the Project Coordinator, is registered with the ASAPA as a Professional Archaeologist and is accredited as a Principal Investigator; he is further an Accredited Professional Heritage Practitioner with the Association of Professional Heritage Practitioners (APHP).

Nikki Mann, the author of the report and field archaeologist, graduated with her Master's degree (MSc) in Archaeology and is registered as a Professional Archaeologist with ASAPA.

Cherene de Bruyn, an archaeological field assistant on the project, is registered with ASAPA as a Professional Archaeologist and is accredited as a Principal Investigator and Field Director, she is further also a member of the International Association for Impact Assessment South Africa (IAIASA). She holds a MA in Archaeology, BSc (Hons) in Physical Anthropology and a BA (Hons) in Archaeology

1.3 Assumptions and Limitations

Not detracting in any way from the comprehensiveness of the research undertaken, it is necessary to realise that the heritage resources located during the fieldwork do not necessarily represent all the possible heritage resources present within the area. Various factors account for this, including the subterranean nature of some archaeological sites. As such, should any heritage features and/or objects not included in the present inventory be located or observed, a heritage specialist must immediately be contacted.

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Such observed or located heritage features and/or objects may not be disturbed or removed in any way until such time that the heritage specialist has been able to make an assessment as to the significance of the site (or material) in question. This applies to graves and cemeteries as well. In the event that any graves or burial places are located during the development, the procedures and requirements pertaining to graves and burials will apply as set out below.

1.4 Legislative Context

1.4.1 Statutory Framework: *The National Heritage Resources (Act 25 of 1999)*

The NHRA has applicability, as the HIA is required in terms of the provisions of Section 34, 35, 36 and 38 of the NHRA. The study serves to identify key heritage resources, informants, and issues relating to the palaeontological, archaeological, built environment and cultural landscape.

The NHRA is utilized as the basis for the identification, evaluation and management of heritage resources and in the case of Cultural Resource Management (CRM), those resources are specifically impacted by development as stipulated in Section 38 of NHRA. This study falls under s38(8) and requires comment from the SAHRA.

1.4.2 Section 3 - National estate

3) Without limiting the generality of subsections (1) and (2), a place or object is to be considered part of the national estate if it has cultural significance or other special value because of—

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

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1.4.3 Section 34 – Structures

According to Section 34 of the NHRA, no person may alter, damage or destroy any structure, which forms part of the site built environment, that is older than 60 years without the necessary permits from the relevant provincial heritage authority.

1.4.4 Section 35 – Archaeology, Palaeontology and Meteorites

According to Section 35 (Archaeology, Palaeontology and Meteorites) and Section 38 (Heritage Resources Management) of the NHRA, Palaeontological Impact Assessments (PIA) is required by law in the case of developments in areas underlain by potentially fossiliferous (fossil-bearing) rocks, especially where substantial bedrock excavations are envisaged, and where human settlement is known to have occurred during prehistory and the historic period.

1.4.5 Section 36 – Burial Grounds & Graves

A section 36 permit application is made to the SAHRA or the competent provincial heritage authority which protects burial grounds and graves (BGG) that are older than 60 years and must conserve and generally care for BGG protected in terms of this section, and it may make such arrangements for their conservation as it sees fit. SAHRA must also identify and record the graves of victims of conflict and any other graves which it deems to be of cultural significance and may erect memorials associated with these graves and must maintain such memorials. A permit is required under the following conditions:

Permitting requirements for BGG older than 60 years to the SAHRA:

- a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves.
- b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or
- c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.
- d) SAHRA or a provincial heritage resources authority may not issue a permit for the destruction or damage of any burial ground or grave referred to in subsection (3)(a) unless it is satisfied that the applicant has made satisfactory arrangements for the exhumation and re-interment of the contents of such graves, at the cost of the applicant.

1.4.6 Section 38 HIA as a Specialist Study within the EIA in terms of Section 38(8)

The NHRA Section 38 (Heritage Impact Assessments) application to ECPHRA is required when the proposed development triggers one or more of the following activities:

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Permitting requirements for demolition of built environment features:

- a) the construction of a road, wall, power line, pipeline, canal or other similar forms of linear development or barrier exceeding 300m in length;
- b) the construction of a bridge or similar structure exceeding 50 m in length;
- c) any development or other activity which will change the character of a site,
 - i. exceeding 5 000 m² in extent; or
 - ii. involving three or more existing erven or subdivisions thereof; or
 - iii. involving three or more erven or divisions thereof which have been consolidated within the past five years; or
 - iv. the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
- d) the re-zoning of a site exceeding 10 000 m² in extent; or
- e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority

In this instance, the heritage assessment for the property is to be undertaken as a component of the Basic Assessment (BA) process for the project. Provision is made for this in terms of Section 38(8) of the NHRA, which states that:

An HIA report is required to identify, and assess archaeological resources as defined by the Act, assess the impact of the proposal on the said archaeological resources, review alternatives and recommend mitigation (see methodology above).

Section 38 (3) Impact Assessments are required, in terms of the statutory framework to conform to basic requirements as laid out in Section 38(3) of the NHRA. These are:

- The identification and mapping of heritage resources in the area affected
- The assessment of the significance of such resources
- The assessment of the impact of the development on the heritage resources
- An evaluation of the impact on the heritage resources relative to sustainable socio/economic benefits
- Consideration of alternatives if heritage resources are adversely impacted by the proposed development
- Consideration of alternatives

It should be noted that an impact assessment report (Hart and Almond, 2015), in terms of Section 38 of the NHRA (Act 25 of 1999), and several amendment reports (Hart, 2018; Gribble, 2020) have already been undertaken and submitted for the proposed project. The competent authority for this is HWC.

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1.4.7 Renewable Energy Development Zone

It should be noted that the proposed development is largely a renewable energy facility and falls entirely within Renewable Energy Development Zone (REDZ) 11 (namely the Beaufort-West REDZ), which was formally gazetted on 16 February 2018 by the Minister of Environmental Affairs (GN 114).

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2 GENERAL SITE DESCRIPTION

The proposed development area is located approximately 20km north-east of the town of Murraysburg in the Western Cape and Northern Cape Provinces. The study area is located within an arid and sparsely to moderately vegetated region of the Karoo.

The study area can be accessed via the R63 and informal roads. Portions of the study area, have been disturbed by the construction of farm roads, grazing and natural erosion (incl. sheet erosion and animal burrows). Existing infrastructure includes fences, windmills and dams. Radio masts, telecommunication towers and trigonometric beacons were also observed.

The study area is in a rural area where much of the farmland is used for grazing by sheep, goats, cattle and game. The general landscape of the proposed development area comprised of ridges, hills, rock outcrops, gullies and flat flood plains that were mostly covered in moderate to sparse vegetation. The hilly terrain and flat plains have undergone extensive erosion with the development of scree slopes and rocky gullies. The low lying flat sandy plains with areas of sheet wash are frequently cut by ephemeral streams. The soils were predominately sandy with gravel and large rock fragments. In terms of the climate, the region experiences summers that are hot and winters that are cold and windy. The yearly rainfall in the region differs from as high as 500mm in the eastern mountain regions (Sneeuberge) to as little as 200mm in the western parts. Snow occurs on the mountains in the wintertime.

Given the diverse topography of the study area, the vegetation varies from “unpalatable” sour grass and fynbos in the mountains to typical Karoo vegetation (karooveld) across most of the region. Thorn trees (*Acacia karoo*) and other scrubs grow along watercourses. The Vegetation type is classified as Upper Karoo Hardeveld and Eastern Upper Karoo (Mucina & Rutherford, 2006; Sanbi, 2022).

Upper Karoo Hardeveld vegetation is characterised by “*Steep slopes of Koppies, butts, mesas and parts of the Great Escarpment covered with large boulders and stones supporting sparse dwarf Karoo scrub with drought-tolerant grasses of genera such as Aristida, Eragrostis and Stipagrostis*” (Mucina & Rutherford, 2006).

Eastern Upper Karoo vegetation is characterised by “*Flats and gently sloping plains (interspersed with hills and rocky areas of Upper Karoo Hardeveld in the west, Besemkaree Koppies Shrubland in the northeast and Tarkastad Montane Shrubland in the southeast), dominated by dwarf microphyllous shrubs, with ‘white’ grasses of the genera Aristida and Eragrostis (these become prominent especially in the early autumn months after good summer rains). The grass cover increases along a gradient from southwest to northeast*” (Mucina & Rutherford, 2006; Sanbi, 2022).

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In terms of geology and soils, the area is characterised by Karoo Dolerite Suite (Dolerite and minor ultrabasic rocks) and Balfour Formation (greenish- to bluish- grey and greyish-red mudstone, siltstone and subordinate sandstone) (Council of Geoscience, 2022). The photographs below provide general views and landscape features of the proposed development area.

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Figure 2 – Typical moderately vegetated area.



Figure 3 – View of an overgrazed area observed within the study area.



Figure 4 – Dense grass growth as observed within the area demarcated for the construction camp.



Figure 5 - Deflation zone observed within the south-western portion of study area.



Figure 6 – View of a typical gully.



Figure 7 - View of a typical scree slope.

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Figure 8 - T View of typical ephemeral streams.



Figure 9 - View of hillock observed within the south-western portion of study area.



Figure 10 – View of boulder strewn land surface within the study area.



Figure 11 – Views of rock outcrops observed within the study area.

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Figure 12 – Herd of springboks observed in the south-eastern portion of study area.

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3 SITE LOCATION AND DESCRIPTION

The following section details the layout area that was originally surveyed during the walkdown.

3.1 Locality

Table 3 - Table with Locality and Property Information

Study Area Coordinates	WEF	Northern Point S -31.779195° E 23.948717°	Eastern Point S -31.812261° E 24.006643°
		Southern Point S -31.839738° E 23.992277°	Western Point S -31.816315° E 23.893966°
Location	The proposed WEF is located approximately 20km north-east of Murraysburg, in the Western and Northern Cape Provinces. It is within the Beaufort West Local Municipality in the Central Karoo District Municipality and the Ubuntu Municipality in the Pixley ka Seme District Municipality (Figure 13, Figure 14).		
Property	<p>The following properties have been identified for the Khangela Emoyeni Wind Energy Facility and associated infrastructure:</p> <ul style="list-style-type: none"> ▪ Portion 4 (a Portion of Portion 1) of Farm Driefontein No.26; ▪ Remainder of Farm Swavel Kranse No. 28; ▪ Portion 1 of Farm Houtkloof No. 29 ▪ Remainder of Portion 1 of Farm De Hoop No.30 ▪ Portion 2 of Farm De Hoop No.30; ▪ Portion 3 (a Portion of Portion 1) of the Farm De Hoop No.30 ▪ Portion 2 of Farm Swavel Kranse No.28; ▪ Portion 1 of Farm Klipplaat No.109; ▪ Portion 3 (a Portion of Portion 2) of Farm Klipplaat No. 109; ▪ Portion 4 (Portion of Portion 2) of Farm Klipplaat No.109; ▪ Portion 6 of Farm Klipplaat No. 109; ▪ Portion 7 of Farm Klipplaat No. 109; ▪ Remainder of Farm Klipplaat No.109; ▪ Remainder of Portion 2 of Farm Klipplaat No.109 		
Topographic Map	WEF: 3123DD MURRAYSBURG and 3124CC WINTERHOEK		

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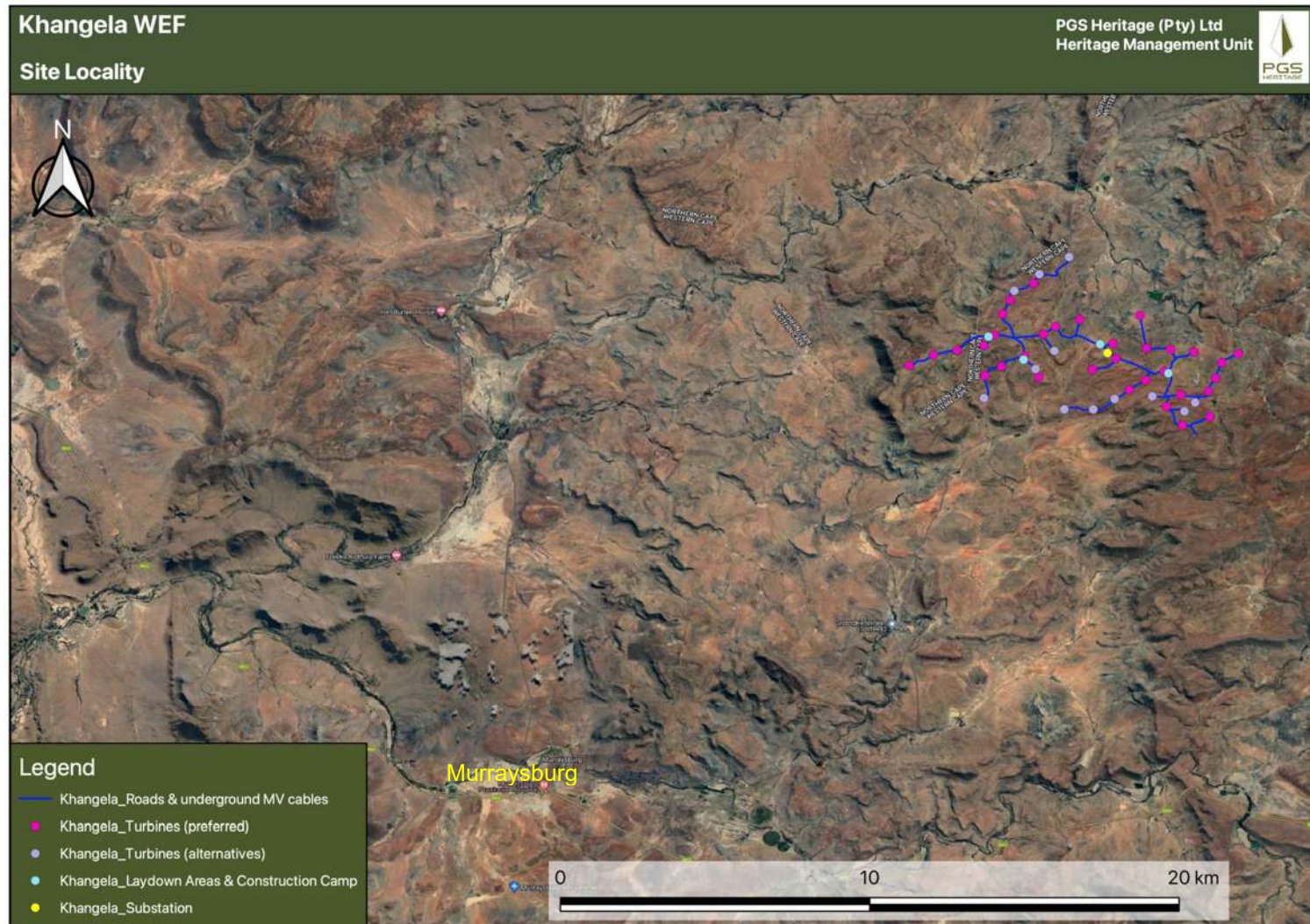


Figure 13 – Site locality map of the Khangela WEF that was originally surveyed during the walkdown.

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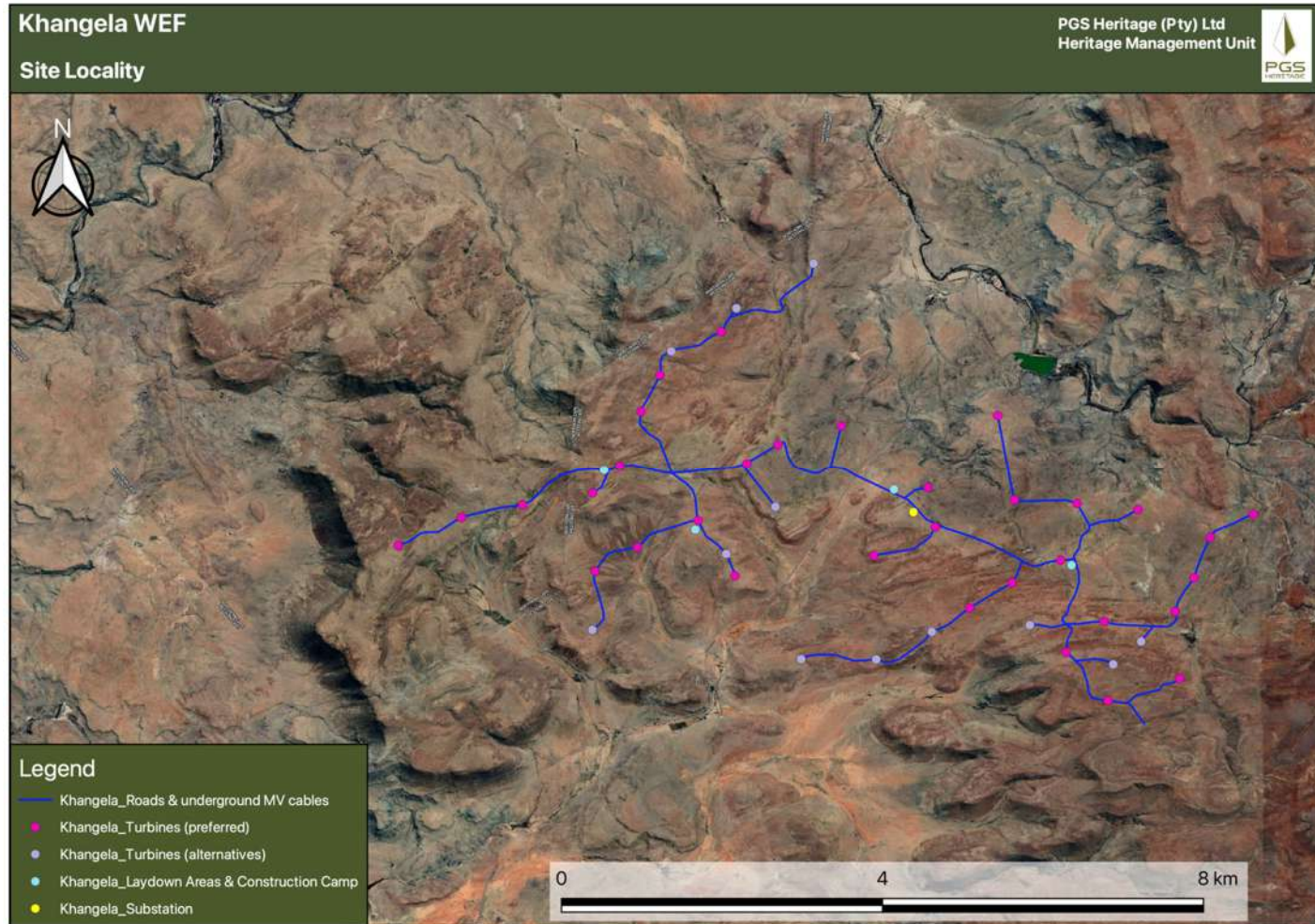


Figure 14 – Map of the Khangela WEF layout that was originally surveyed during the walkdown.

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3.2 Technical Project Description

3.2.1 Project Description

Khangela Emoyeni Wind Farm (Pty) Ltd is proposing to establish the 147 MW Khangela Emoyeni Wind Energy Facility and associated infrastructure (refer to **Appendix C** for final layout maps). The Environmental Authorisation (DFFE Ref: 14/12/16/3/3/2/687) for the proposed wind energy facility was granted on 06 September 2018 and amended on 30 March 2021 and the latest amendment on the 07 June 2022. The Khangela Emoyeni Wind Energy Facility and associated infrastructure is located near the town of Murraysburg in the Beaufort West Local Municipality and Ubuntu Local Municipality in the Western Cape and Northern Cape Provinces. The proposed wind energy facility is located within the Beaufort West Renewable Energy Development Zone (REDZ).

The project will include the following infrastructure as authorised:

- Up to 33 wind turbines (capped at 147MW total capacity) with a hub height of up to 160m, blade length of 90m and rotor diameter of up to 180m;
- Permanent Hard standing area of up to 55m by 35m per turbine;
- Temporary Laydown areas of up to 150m by 60m each;
- Temporary turbine laydown areas;
- Electrical cabling and on-site substation;
- Existing farm access tracks and watercourse crossings will be upgraded;
- Internal access roads;
- On-site office compound, including site offices, parking and an operation and maintenance facility including a control room;
- Anemometer masts;
- Security fencing
- CCTV monitoring towers

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4 ASSESSMENT METHODOLOGY

This HMP document was compiled by PGS for the Khangela WEF.

Physical Survey and Assessment:

The walkdown of the layout was conducted from 22nd to 25th March 2022. The fieldwork team consisted of three archaeologists, Nikki Mann, Cherene De Bruyn and Henk Steyn. Throughout the fieldwork, hand-held GPS devices were used to record the tracklogs showing the routes followed by the archaeological fieldwork team. All sites identified during the fieldwork were photographically and qualitatively recorded, and their respective localities were documented using a hand-held GPS device. The identified heritage resources were mapped and assessed to determine their heritage significance.

An HMP report has been compiled and includes the mapping of the heritage resources identified as well as the relevant mitigation measures and management processes to be followed. The HMP includes recommendations on how heritage resources will be assessed, documented, and managed, as well as identify who the responsible person/organization is for the management of these resources during the different project phases.

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5 AFFECTED PARTIES

5.1 South African Heritage Resources Agency (SAHRA)

The SAHRA is responsible for provincial and national heritage resources of significance that are inclusive of archaeological and palaeontological resources within the Northern Cape Province. They are responsible for commenting on the heritage resources of provincial and national value. The heritage practitioner must engage with the SAHRA to ensure that the relevant comments have been made and that their heritage management requirements are adhered to during construction. The SAHRA contact details are as follows:

SAHRA

South African Heritage Resources Agency,

111 Harrington Street,

Cape Town

Tel: 021 462 4502

Email: info@sahra.org.za

5.2 Heritage Western Cape (HWC)

The HWC is responsible for provincial heritage resources of significance that are inclusive of historical structures, gravesites and living heritage resources within the Western Cape. They are responsible for commenting on the heritage resources of provincial value. The heritage practitioner must engage with the HWC to ensure that the relevant comments have been made and that their heritage management requirements are adhered to during construction. The HWC contact details are as follows:

Heritage Western Cape

3rd floor Protea Assurance Building, 142 Longmarket St,

Cape Town City Centre, Cape Town, 8000

Tel: 021 483 5959

Email: ceoheritage@westerncape.gov.za

5.3 Other parties

Those groups and individuals that have a strong and special link to heritage resources in the area are deemed of major importance to the management of the heritage resources of the project. For example, local residents and communities will need to be consulted in the case of any graves having to be relocated, as well as impacts on any religious (living heritage) sites.

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6 ARCHAEOLOGICAL AND HISTORICAL RESOURCES IDENTIFIED

6.1 Findings from the pre-construction walkdown

A walkdown of the WEF layout was undertaken on foot and by a vehicle by three PGS archaeologists (Nikki Mann, Cherene De Bruyn and Henk Steyn) on 22nd to 25th March 2022. In general, the archaeological visibility of the area was ideal for surveying due to limited vegetation cover. The field assessment focused almost exclusively on the proposed turbine footprints, internal roads, substation, and laydown areas. The locations of finds were recorded using a GPS device and photographs were taken of the identified finds and general landscape of the proposed development area. The recorded track logs show the routes followed by the fieldwork team on site (yellow tracks) (**Figure 15**).

The fieldwork has revealed the presence of fifteen (15) heritage resources (**Figure 17, Figure 18**).

These consist of six (6) sites containing sandstone boundary markers (**K010 - K015**), three (3) sites with rock engravings (**K002, K003, K006**) and six (6) sites comprising Low Density Surface Scatters/Single finds (**K001, K004, K005, K007, K008, K009**). These lithic surface scatters are primarily from the Middle Stone Age (MSA), although Later Stone Age (LSA) material was also identified. All these artefact assemblages occur in heavily deflated and eroded areas, so their scientific potential and heritage significance is somewhat lowered.

See **Section 9** for a discussion regarding the site-specific mitigation measures and the Guidelines for the Management Plan

Refer to Appendix C for full site descriptions (incl. photographs).

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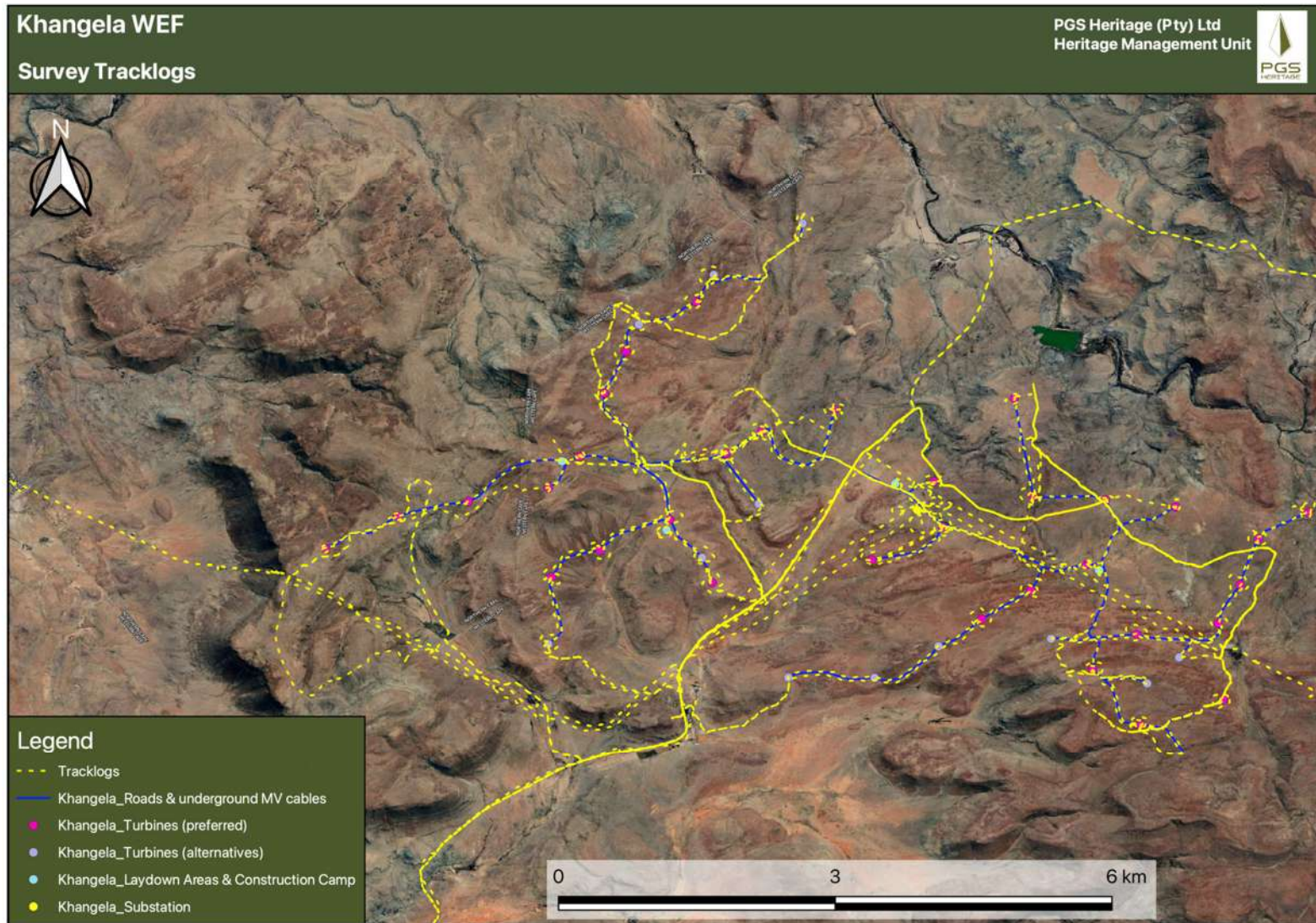


Figure 15 – Satellite Image showing the tracklog (yellow lines) of the walkdown.

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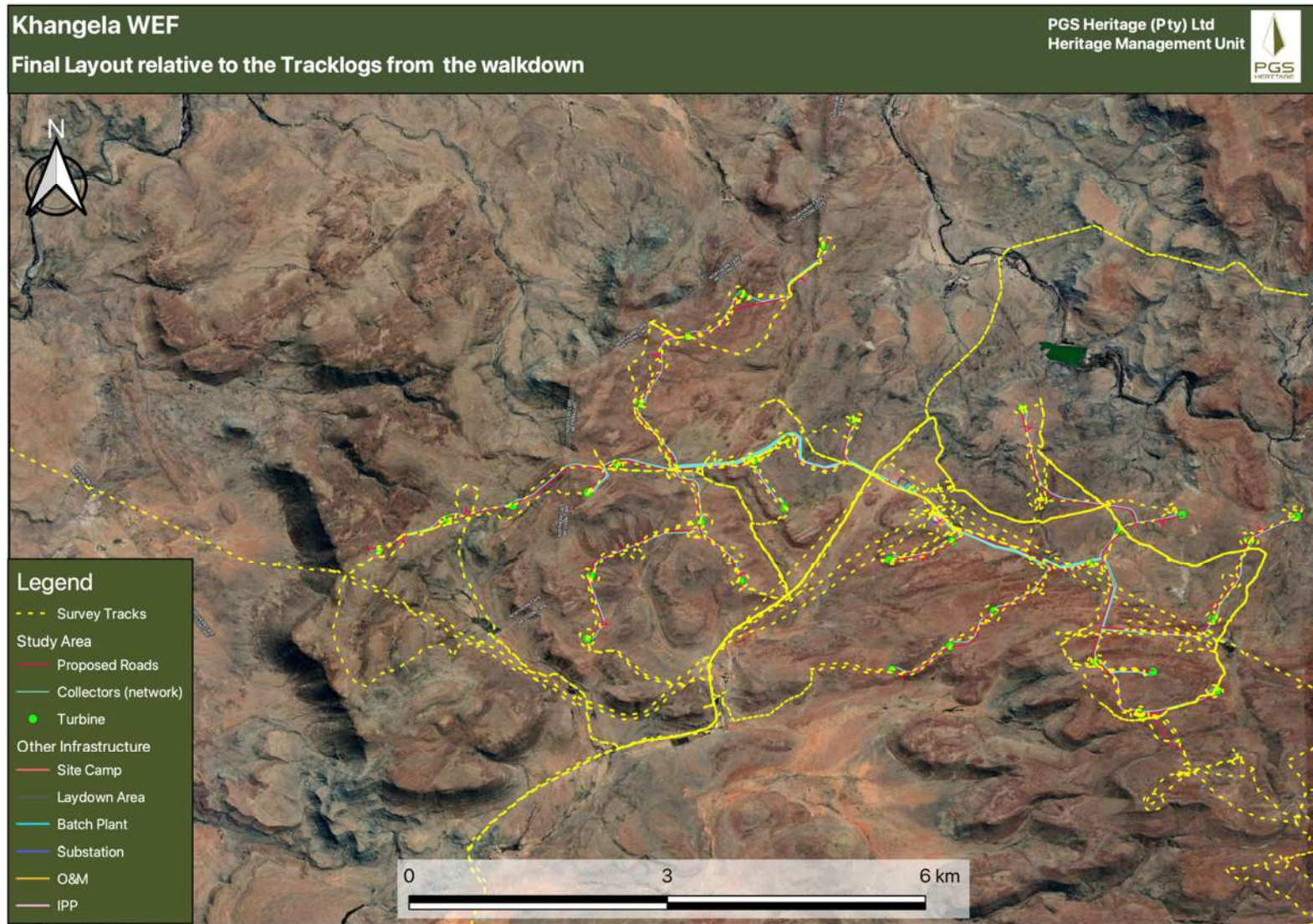


Figure 16 - Track log recordings from the walkdown relative to the final proposed layout.

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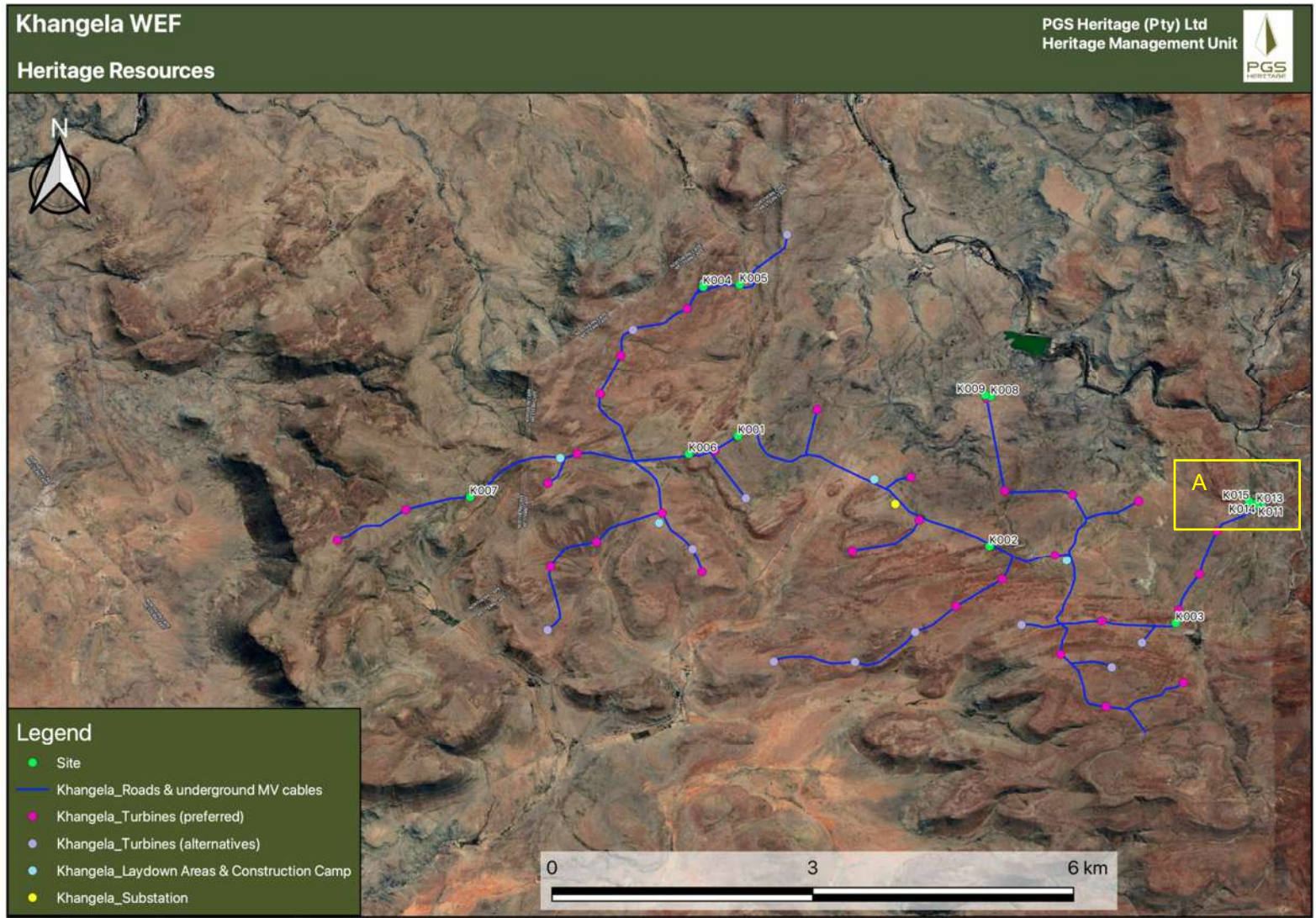


Figure 17 – Satellite Image showing the finds identified during the fieldwork. See inset A below.

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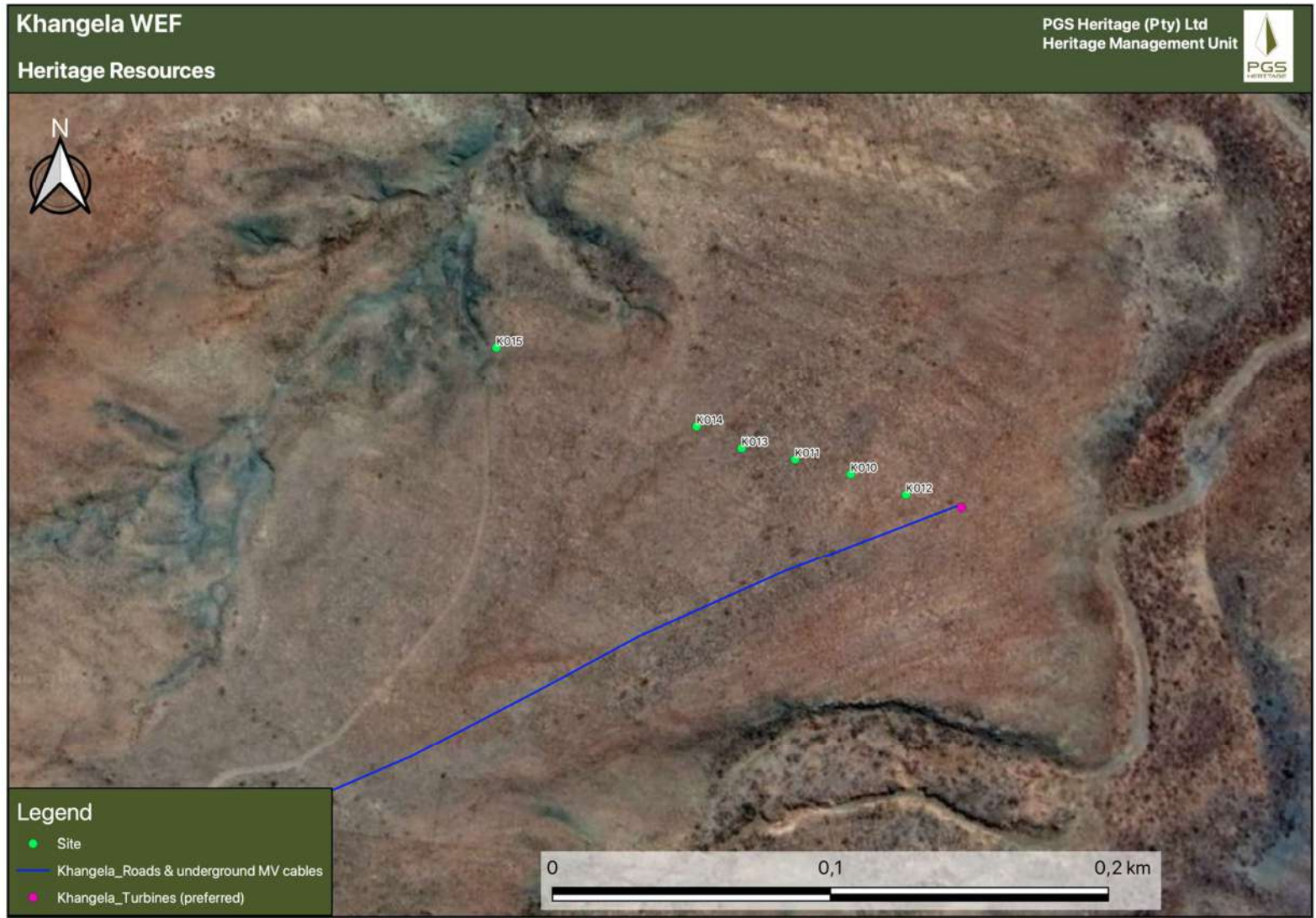


Figure 18 – Stone slab boundary markers identified in the study area. Inset A.

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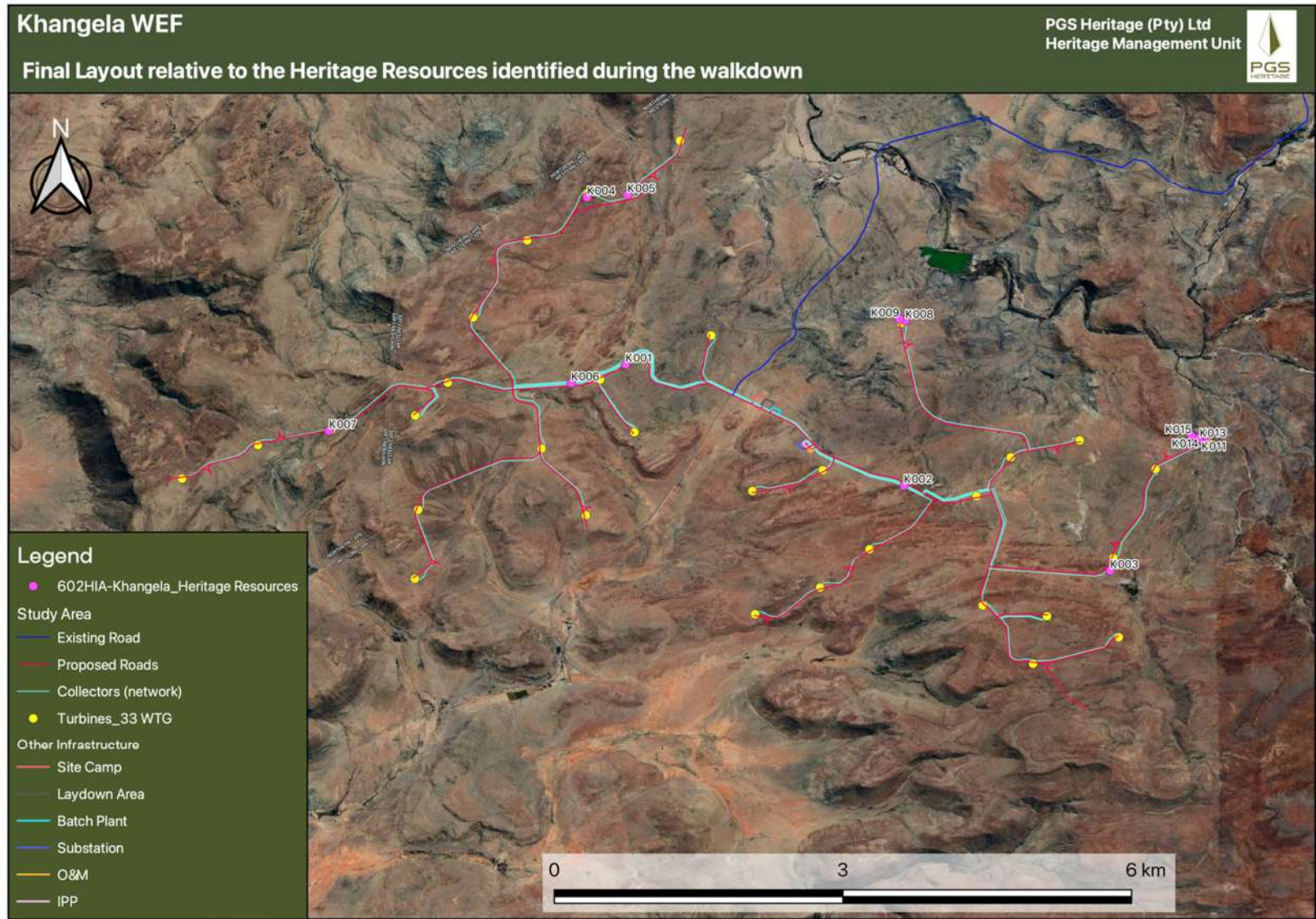


Figure 19 – Final proposed layout relative to the locality of the heritage resources identified during the walkdown.

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Table 4 - Heritage Resources identified during the walkdown

Site Nr	Site Co-ordinates		Time Period	Brief Site Description	Grading	Heritage Significance
	x	y				
K001	23.94273083	-31.80372977	Stone Age	Low Density Surface Scatter of MSA and LSA Lithics located on a scree slope. Silcrete and hornfels flakes.	Grade 3 - C (IIIC)	Low
K002	23.97331525	-31.81708619	Historical Period	Rock engravings (cross-hatching) on several dolerite boulders in a mountainous region.	Grade 3 - B (IIIB) – Grade 3 - C (IIIC)	Medium - Low
K003	23.99597427	-31.82651667	Historical Period	Rock engravings (parallel lines) on several dolerite boulders in a flat-lying region.	Grade 3 - B (IIIB) – Grade 3 - C (IIIC)	Medium - Low
K004	23.9384989	-31.7855069	Stone Age	Low Density Surface Scatter of MSA Lithics located on a scree slope. Hornfels core and flakes.	Grade 3 - C (IIIC)	Low
K005	23.9429361	-31.7852408	Stone Age	Low Density Surface Scatter of MSA Lithics located on a plain. Hornfels and silcrete flakes.	Grade 3 - C (IIIC)	Low
K006	23.9367587	-31.8059047	Historical Period	Rock engravings (parallel lines and scratches) on a dolerite boulder in a mountainous region.	Grade 3 - B (IIIB) – Grade 3 - C (IIIC)	Medium - Low
K007	23.91016737	-31.81111362	Stone Age	Single find - Possible grinding Stone located on the top of a small koppie.	Grade 3 - C (IIIC)	Low
K008	23.9734623	-31.7989563	Stone Age	Low Density Surface Scatter of LSA Lithics located on a plain. Hornfels core and flakes.	Grade 3 - C (IIIC)	Low
K009	23.97279696	-31.79879062	Stone Age	Low Density Surface Scatter of MSA and LSA Lithics located on a plain. Hornfels core and large flake.	Grade 3 - C (IIIC)	Low
K010	23.00622495	-31.81214181	Historical Period	Sandstone boundary marker located in a flat lying area.	Grade 3 – B (IIIB)	Medium
K011	23.0060135	-31.812086	Historical Period	Sandstone boundary marker located in a flat lying area.	Grade 3 – B (IIIB)	Medium
K012	24.00643562	-31.81221928	Historical Period	Sandstone boundary marker located in a flat lying area.	Grade 3 – B (IIIB)	Medium
K013	24.00581046	-31.81204375	Historical Period	Sandstone boundary marker located in a flat lying area.	Grade 3 – B (IIIB)	Medium
K014	24.00563917	-31.811961	Historical Period	Sandstone boundary marker located in a flat lying area.	Grade 3 – B (IIIB)	Medium
K015	24.0048782	-31.81165851	Historical Period	Sandstone boundary marker located in a flat lying area.	Grade 3 – B (IIIB)	Medium

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7 IMPACT ASSESSMENT

7.1 General Observations

In this section, an assessment will be made of the impact of the proposed development on the identified heritage sites. An overlay of all the heritage sites identified during the fieldwork over the proposed development footprint areas was made to assess the impact of the proposed development on these identified heritage sites. This overlay resulted in the following observations:

The following general observations will apply for the impact assessment undertaken in this report:

- Heritage sites assessed to have a low heritage significance are not included in these impact risk assessment calculations. The reason for this is that sites of low significance will not require mitigation. These sites are the stone tool surface scatters/single find spots (**K001, K004, K005, K007, K008, K009**).
- The stone slab boundary marker (**K015**) is located more than 100m away from a proposed turbine site. As a result, no impact is expected from the proposed development on this site. This means that no impact assessment will be undertaken for the site.
- It is necessary to realise that the heritage resources located during the fieldwork do not necessarily represent all the possible heritage resources present within the area. Various factors account for this, including the size of the study area and the subterranean nature of some heritage sites. The impact assessment conducted for heritage sites assumes the possibility of finding heritage resources during the project life and has been conducted as such.

Archaeological remains are rare objects, often preserved due to unusual circumstances and are non-renewable resources. When a development is proposed, and specialist studies are undertaken as part of the wider evaluation of heritage resources, desktop/field studies, as well as excavation, they furnish “windows” of opportunity into a depository that would not otherwise exist. In this sense, the impact is **POSITIVE** for palaeontology, archaeology and the cultural landscape provided that efforts are made to preserve or mitigate heritage resources in the study footprint, prior to and during the construction phase of the development.

The impact on the identified archaeological and historical heritage resources are predicted to be confined to the areas around the sites as identified. The pre-construction and construction phase of the proposed WEF will entail extensive surface clearance as well as excavations into the superficial sediment cover and underlying bedrock (e.g. for widened or new access roads, wind turbine foundations, hardstanding areas, on-site substation, underground cables, construction laydown area, O&M building and associated infrastructure). The possible pre-construction impacts calculated on the tangible cultural heritage resources is overall **MODERATE NEGATIVE** rating but with the implementation of the recommended buffers and management guidelines will be reduced to a **LOW NEGATIVE** impact.

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This assessment applies to the turbines, construction laydown areas, access roads, on-site substation and associated infrastructure within the energy facility project area.

A summary of the impact rating for the heritage resources identified is provided below in **Table 5**.

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7.2 Impact Rating Tables

The following impact rating tables are based on the proposed development layout within the region.

Table 5 – Impact rating of the Khangela WEF development on archaeological and historical resources

ENVIRONMENTAL PARAMETER	ISSUE/IMPACT/ENVIRONMENTAL EFFECT/NATURE	IMPACT SIGNIFICANCE BEFORE MITIGATION	RECOMMENDED MITIGATION MEASURES	IMPACT SIGNIFICANCE
Construction				
Rock Engravings (K002, K003, K006)	Construction activities close to these identified sites can damage and cause irreparable damage or destroy the resource.	Medium	<ul style="list-style-type: none"> ▪ The sites should be demarcated with a 30-meter buffer and should be avoided if any construction is to happen close to it. ▪ If the engravings cannot be avoided, then they should be photographed and traced (catalogued) as necessary to produce a clear record, prior to removal/disturbance/destruction. 	Low
Historical sandstone boundary markers (K010 - K014)	Construction activities close to these identified sites can damage and cause irreparable damage or destroy the resource.	Medium	<ul style="list-style-type: none"> ▪ The sites should be demarcated with a 30-meter buffer and should be avoided if any construction is to happen close to it. ▪ If the markers cannot be avoided, then they should be moved (before any construction) to the boundary of the footprint and reinserted. This will require a permit. 	Low
Chance finds	Destruction or damage to previously unidentified archaeological or historical resources	High	<ul style="list-style-type: none"> ▪ This management plan for the heritage resources needs to be approved for implementation during construction and operations. 	Low
Operational				

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Rock Engravings (K002, k003, k006)	Uncontrolled access to such finds could result in damage (graffiti) that cannot be reversed	Medium	<ul style="list-style-type: none"> This management plan for the heritage resources needs to be approved for implementation during construction and operations. Identify as no-go areas (unless feature was removed/destroyed). 	Low
Historical sandstone boundary markers (K010 - K014)	Construction activities close to these identified sites can damage and cause irreparable damage or destroy the resource.	Medium	<ul style="list-style-type: none"> This management plan for the heritage resources needs to be approved for implementation during construction and operations. Identify as no-go areas. 	Low
Decommissioning				
Rock Engravings (K002, K003, K006)	A reduction in the population density after decommissioning can reduce the possibility of human impact on such resources	Medium	<ul style="list-style-type: none"> This management plan for the heritage resources needs to be approved for implementation during construction and operations. Identify as no-go areas. 	Low
Historical sandstone boundary markers (K010 - K014)	Construction activities close to these identified sites can damage and cause irreparable damage or destroy the resource.	Medium	<ul style="list-style-type: none"> This management plan for the heritage resources needs to be approved for implementation during construction and operations. Identify as no-go areas. 	Low

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8 KEY ISSUES

8.1 Guiding Principles of a Heritage Management Plan

- Minimum intervention: Any action that changes the physical aspect of the heritage site should be guided by the concept of achieving the required result through the least disturbance of the heritage site. Interventions may only be undertaken once a permit to do so has been granted by the relevant heritage authority.
- Reversibility: Whatever conservation measures have been applied should be reversible.
- Consideration of authenticity – where new materials have been used, this should be disclosed and should be clearly discernible by visitors.
- Bear in mind that preventive conservation measures are preferable to remedial measures since they involve less direct disturbance of a site, are often more cost-effective and easier to implement.

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9 MANAGEMENT OBJECTIVES

9.1 Plan Development

A Plan relating to the management and conservation of heritage resources is developed in consultation with the client and all relevant role players. This Plan is based on the IFC Performance Standard¹ and includes:

The protection of irreplaceable cultural heritage and to guide clients on protecting cultural heritage in the course of their business operations.

9.2 Objectives

- To protect cultural heritage resources from the adverse impacts of construction-related activities and support their preservation.
- To promote the equitable sharing of benefits from the use of cultural heritage in business activities.

This Plan covers all cultural heritage resources referring to tangible forms of cultural heritage, such as tangible property and sites having archaeological (prehistoric), palaeontological, historical, cultural, artistic, and religious values.

The Plan adheres to:

1. Protection of Cultural Heritage in Project Design and Execution
2. Internationally Recognised Practices
3. The objectives of the IFC Performance Standard

In addition to complying with relevant national law on the protection of cultural heritage, including national law implementing South Africa's obligations under the Convention Concerning the Protection of the World Cultural and Natural Heritage and other relevant international law, the client will protect and support cultural heritage resources by undertaking internationally-recognized practices for the protection, field-based study, and documentation of cultural heritage.

9.3 General Management Guideline

The NHRA (Act 25 of 1999), section 38 states that, any person who intends to undertake a development categorised as -

¹ International Finance Corporation. 2012. Performance Standard 8. Cultural Heritage.

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- (a) the construction of a road, wall, power line, pipeline, canal or other similar forms of linear development or barrier exceeding 300m in length;
- (b) the construction of a bridge or similar structure exceeding 50m in length;
- (c) any development or other activity which will change the character of a site-
 - (i) exceeding 5 000 m² in extent; or
 - (ii) involving three or more existing erven or subdivisions thereof; or
 - (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or
 - (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
- (d) the re-zoning of a site exceeding 10 000 m² in extent; or
- (e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

In the event that an area previously not included in an archaeological or cultural resources survey, is to be disturbed, SAHRA and HWC needs to be contacted. An enquiry must be lodged with them into the necessity for an HIA.

2. In the event that a heritage assessment is required it is advisable to utilise a qualified heritage practitioner preferably registered with the CRM Section ASAPA.

This survey and evaluation must include:

- (a) The identification and mapping of all heritage resources in the area affected;
 - (b) An assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6 (2) or prescribed under section 7 of the NHRA;
 - (c) an assessment of the impact of the development on such heritage resources;
 - (d) an evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;
 - (e) the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;
 - (f) if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and
 - (g) plans for mitigation of any adverse effects during and after the completion of the proposed development.
3. In the event that a possible find is discovered during construction, all activities must be halted in the area of the discovery and a qualified archaeologist contacted.
 4. The archaeologist needs to evaluate the finds on site and make recommendations towards possible mitigation measures.
 5. If mitigation is necessary, an application for a rescue permit must be lodged with HWC.

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6. After mitigation, an application must be lodged with HWC for a destruction permit. This application must be supported by the mitigation report generated during the rescue excavation. Only after the permit is issued may such a site be destroyed.
7. If during the initial heritage audit survey sites of heritage significance are discovered, it will be necessary to develop a management plan for the preservation, documentation or destruction of such sites. Such a program must include a watching brief, timeframe and agreed upon schedule of actions between the company and the heritage specialist.
8. In the event that human remains are uncovered or previously unknown graves are discovered a qualified heritage specialist needs to be contacted and an evaluation of the finds made.
9. If the remains are to be exhumed and relocated, the relocation procedures as accepted by HWC need to be followed. This includes an extensive social consultation process.

9.3.1 General Operational Activities/Pre-Construction or other related activity

Based on the findings of the assessment, all key on-site personnel should undergo a heritage and cultural awareness induction. Induction courses generally form part of the employees' overall training and the heritage component can easily be integrated into these training sessions.

All key personnel should be made aware of the HMP and be required to familiarise themselves with the types of heritage resources existing in their area of responsibility in order to incorporate the management of such resources into their Operations planning and activities. This should assist with preventing unnecessary delays or incidents resulting in damage to or destruction of heritage resources that are protected under the NHRA (No 25 of 1999).

The heritage induction course should aim to:

- Provide information related to the relevant legislation for the protection of heritage sites (NHRA 25 of 1999) and the penalties which may arise if sites/items are disturbed/destroyed.
- Raise awareness of the types and significance of the heritage resources found within the proposed development site.
- Provide an explanation of the process to follow when cultural heritage finds are identified, as per the Chance Find Procedures.

Evidence of training of all personnel should be submitted to HWC and SAHRA as part of the Yearly progress Reports by the project.

Furthermore, the Environmental Control Officer (ECO) and/or Environmental Site Officer should implement regular cultural awareness talks before the day-to-day construction activities start on-site to remind personnel of the No-Go-Zones and the process to follow during the discovery of Chance finds.

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9.3.2 Construction Phase

Any planned activity could encompass a range of activities during the construction phase, including ground clearance, access road construction and excavations. It is possible that cultural material will be exposed during operations and feasibly may be recoverable, but this is the high-cost front of the operation, and so any delays should be minimised.

- Development surrounding infrastructure and construction of facilities results in significant disturbance, but construction trenches do offer a window into the past and it may be possible to rescue some of these data and materials.
- It is also possible that substantial alterations are implemented during this phase of the project and these must be catered for.
- Temporary roads and construction camps are often overlooked during the planning and implementation phases, with regards to archaeological and heritage assessments, causing some unmitigated environmental damage.
- Temporary infrastructure is often changed or added to the subsequent history of the project. In general, these are low impact developments as they are superficial, resulting in a little alteration of the land surface, but still, need to be catered for.
- Similarly, the construction of transmission lines are low impact developments in heritage terms, but excavation holes still may expose artefacts.
- During any construction activities, it is important to recognize any significant material being unearthed, making the correct judgment on which actions should be taken.
- The ECO is responsible for the day-to-day implementation of the HMP, and the heritage specialist will need to be consulted when/if a chance find is encountered.
- A heritage specialist must be appointed for this commission. This person does not have to be a permanent employee but needs to sit in at relevant meetings, for example, when changes in design are discussed, and notify HWC of these changes.
- In addition, feedback reports can be submitted by the heritage specialist to the client, HWC to ensure effective monitoring.
- Should a significant site or significant cultural material be discovered during construction (or operation), for example, burials, the project needs to be able to call on a qualified expert to make an expert decision on what is required and if necessary to carry out emergency recovery.
- HWC/SAHRA would need to be informed and may give advice on procedure.
- The client thus should have some sort of contingency plans so that operations could move elsewhere temporarily while the material and data are recovered.
- The project thus needs to have a heritage specialist available to do such work.
- The purpose of the monitoring programme is to provide general information to the developer with regards to management recommendations and cost estimates for the heritage resources component.
- Such a monitoring programme is planned for observation and investigation conducted during any operation carried out for non-archaeological reasons. This will be within a specified area

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or site on land where there is a possibility that heritage resources may be disturbed or destroyed.

9.3.3 Possible finds during Construction and Operation

The study area occurs within a greater historical and the archaeological site as identified during the desktop and fieldwork phase. Soil clearance for infrastructure as well as the proposed reclamation activities could uncover the following:

- High density concentrations of stone artefacts
- Unmarked graves

In this case, a chance finds protocol should be implemented.

9.4 TIMEFRAMES

It must be kept in mind that mitigation and monitoring of heritage resources discovered during construction activity will require permitting for collection or excavation of heritage resources and lead times must be worked into the construction time frames. **Table 6** gives guidelines for lead times on permitting. If any graves are identified during the construction or the operational phases of the project, the below-mentioned timeframes and processes will apply.

Table 6 - Lead times for permitting and mobilisation

ACTION	RESPONSIBILITY	TIMEFRAME
Preparation for field monitoring and finalisation of contracts	The contractor and service provider	1 MONTH
Application for permits to do necessary mitigation work	Service provider – Archaeologist and SAHRA	3 MONTHS
Documentation, excavation and archaeological report on the relevant site	Service provider – Archaeologist	3 MONTHS
Handling of chance finds – Graves/Human Remains	Service provider – Archaeologist and SAHRA	2 WEEKS
Relocation of burial grounds or graves in the way of construction	Service provider – Archaeologist, SAHRA, local government and provincial government	6 MONTHS

9.5 Specific Management Guidelines

See **Table 7** below for specific management and mitigation guidelines according to the type of heritage resource identified.

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9.6 HERITAGE MANAGEMENT PLAN FOR EMPR IMPLEMENTATION

Table 7 - Heritage Management Plan for EMPr implementation

ISSUE	IMPACT	STAGE OF PROJECT	TIMEFRAME
	Potential Impact On Archaeological Resources (i.e. rock engravings)	Construction, Operation	During, planning construction and operation
DISCUSSION	As noted in Section 6, several rock engravings have been identified which will require management and mitigation if any of these resources will be impacted upon by any construction-related activities.		
EXISTING IMPACT	Most of these resources are relatively unimpacted.		
PREDICTED IMPACT	<p>Potential destruction or damage of such resources requires a permit from the responsible heritage authority (NHRA, section 35).</p> <p>The HMP document provides a record of the location of such resources and enable the timeous management of such resources through various mitigation measures, including the adjustment of the construction activities, if necessary.</p>	Destruction or damage during construction.	
WHEN IS MITIGATION REQUIRED	During the design and before construction, No-Go Areas must be demarcated. Alternatively, mitigation measures such as the recording (e.g. photographs) and tracing of sites must be planned and scheduled to fit within the timing of the activity phases.		
RESPONSIBLE PARTY FOR IMPLEMENTATION	Applicant ECO Heritage Specialist		
MONITORING PARTY (FREQUENCY)	ECO (Monthly reports during construction/ as or when required) ECO (Yearly Report during Operation/ as or when required)		
TARGET	Ensure compliance with relevant legislation and recommendations from HWC under Section 36 and 38 of NHRA		
PERFORMANCE INDICATORS (MONITORING TOOL AND OUTCOMES)	ECO (Monthly reports during Construction / as or when required) Yearly Report to be submitted to HWC		
WHAT MITIGATION IS REQUIRED	<p>General:</p> <ul style="list-style-type: none"> When archaeological sites are accidentally discovered a chance finds protocol must be implemented that includes the process of work stoppage, site protection, evaluation and informing HWC of such finds and a final process of mitigation implementation. If development occurs within the vicinity of the identified sites, the construction team should be informed. ECO should implement cultural awareness talks before construction activities commence to induct personnel in: 		

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	<ul style="list-style-type: none"> ○ The types of cultural heritage sites that exist within the disturbance areas and that trigger the implementation of the Chance Finds Procedure, which includes measures for dealing with archaeological finds, palaeontological resources and burial ground and graves. ○ Locations of known cultural heritage sites and requirement to avoid all site, as they are No-Go-Zones (unless permits have been obtained for their removal/destruction). <p>Site-Specific:</p> <ul style="list-style-type: none"> • The sites should be demarcated with a 30-meter buffer and should be avoided if any construction is to happen close to it. • If the engravings cannot be avoided, then they should be photographed and traced (catalogued) as necessary to produce a clear record, prior to removal/destruction (suitable permits will be required from HWC). • A management plan for the heritage resources has been compiled and needs to be submitted for approval by HWC for implementation during construction and operations. • A chance finds protocol has been developed that includes the process of work stoppage, site protection, evaluation and informing HWC of such finds and a final process of mitigation implementation. • This HMP needs then to be implemented during construction and operations as part of the EMP.
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ISSUE	IMPACT	STAGE OF PROJECT	TIMEFRAME
	Potential Impact on Historical Sandstone boundary markers	Construction, Operation	During planning, construction and operation
DISCUSSION	As noted in Section 6, several historical boundary markers have been identified which will require management and mitigation if any of these resources will be affected by any construction-related activities.		
EXISTING IMPACT	Several of these resources may have already collapsed at some time in the past.		
PREDICTED IMPACT	<p>Damage/destruction by construction-related activities on identified sites. Potential destruction or damage of such sites requires a permit from the responsible provincial heritage authority (NHRA, section 34).</p> <p>The HMP provides a record of the location of such resources and enable the timeous management of such resources through various mitigation measures, including the adjustment of the construction activities, if necessary.</p>	Destruction or damage during construction.	
WHEN IS MITIGATION REQUIRED	During the design and before construction:		

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	<p>No-Go Areas must be demarcated. Alternatively, mitigation measures such as the mapping of sites must be planned and scheduled to fit within the timing of the activity phases.</p> <p>Operational: Evaluation of sites during construction and operation against baseline data (Done Yearly)</p>
RESPONSIBLE PARTY FOR IMPLEMENTATION	<p>Applicant ECO Heritage Specialist</p>
MONITORING PARTY (FREQUENCY)	<p>ECO (Monthly reports / as or when required)</p>
TARGET	<p>Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA</p>
PERFORMANCE INDICATORS (MONITORING TOOL AND OUTCOMES)	<p>ECO (Monthly reports during Construction / as or when required) Yearly Report to be submitted to HWC</p>
WHAT MITIGATION IS REQUIRED	<p>General:</p> <ul style="list-style-type: none"> • When historical structures are accidentally discovered a chance finds protocol must be implemented that includes the process of work stoppage, site protection, evaluation and informing HWC of such finds and a final process of mitigation implementation. • If development occurs within the vicinity of the identified heritage resources, the construction team should be informed. ECO should implement cultural awareness talks before construction activities commence to induct personnel in: <ul style="list-style-type: none"> ○ The types of cultural heritage sites that exist within the disturbance areas and that trigger the implementation of the Chance Finds Procedure, which includes measures for dealing with archaeological finds, palaeontological resources and burial ground and graves. ○ Locations of known cultural heritage sites and requirement to avoid all site, as they are No-Go-Zones (unless permits have been obtained for their removal/destruction). <p>Site-Specific:</p> <ul style="list-style-type: none"> • The sites should be demarcated with a 30-meter buffer and should be avoided if any construction is to happen close to it. • If the markers cannot be avoided, then they should be moved (before any construction) to the boundary of the footprint and reinserted. This will require a permit from HWC. • A management plan for the heritage resources has been compiled and needs to be submitted for approval by HWC for implementation during construction and operations. • A chance finds protocol has been developed that includes the process of work stoppage, site protection, evaluation and informing HWC of such finds and a final process of mitigation implementation. • This HMP needs then to be implemented during construction and operations as part of the EMPr.

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10 GUIDELINES FOR MITIGATION: CHANCE FINDS PROCEDURE AND MITIGATION EXCAVATION STRATEGY

The following section delineates the Chance Finds procedure and the Mitigation Excavation Strategy that should be followed for accidentally discovered archaeological and heritage resources during the construction activities and operation phase. Chance Finds are defined as potential cultural heritage objects (archaeological and historical resources, palaeontology as well as burial ground and graves) that are unexpectedly unearthed. The chance finds protocol describes the process to be followed including work stoppage, site protection, evaluation and informing HWC of such finds and a final process of mitigation implementation.

10.1 Chance finds of Archaeological and Historical Material

The following procedure is to be executed in the event that archaeological material is discovered:

- Should an archaeological site or cultural material be discovered during construction (or operation), the area should be demarcated, and construction activities halted in vicinity of the find.
- Record the type of archaeological materials encountered, including their location in a Report and take photos and GPS Coordinates of the find *in situ*;
- Report the discovery to the site supervisor as well as the project ECO.
- The ECO will then report the find to the Site Manager who will promptly notify the project archaeologist and HWC.
- Delineate the discovered find/ feature/ site and provide a suitable (e.g., 30m) buffer zone.
- Secure the area to prevent any damage or loss of removable objects. The site should be treated as a No- Go-Zone until further notification.
- An appropriately qualified heritage practitioner/archaeologist must be identified to be called upon in the event that any possible heritage resources or artefacts are identified.
- If required, the qualified heritage practitioner/archaeologist will then need to come out to the site and evaluate the extent and importance of the heritage resources and make the necessary recommendations for mitigating the find and the impact on the heritage resource.
- The contractor therefore should have some sort of contingency plan so that operations could move elsewhere temporarily while the materials and data are recovered.
- Construction can commence as soon as the site has been cleared and signed off by the heritage practitioner/archaeologist and HWC.

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10.2 Chance Find Procedure for Burial Grounds and Graves (BGG)

The process to be followed is as follows:

1. Discovery, Notify, Site protection and Identification
2. Investigation and reporting
3. Exhumation of graves and Re-internment

10.2.1 Discover and Notify

In the event of a Company employee, consultant, contractor or subcontractor discovering, exposing or unearthing human remains/graves/tombstones/traditional stone cairns/heritage site whilst undertaking work on behalf of the Company either on land owned or leased by the Company, the steps set out below must be followed immediately:

Table 8 - Critical steps when uncovering human remains

Action	Responsible person
Step 1: Immediately, upon the identification of the human remains or graves, all work in the relevant site must cease immediately to avoid desecration of the BGG or any other further damage.	Company employee, subsidiary, managed joint ventures, contractor, subcontractor, consultant exposing the remains or his/her supervisor
Step 2: The discovery must be immediately reported to ECO	Company employee, subsidiary, managed joint ventures, contractor, subcontractor, consultant exposing the remains or his/her supervisor
Step 3: ECO must immediately notify: <ul style="list-style-type: none"> • The General Manager (GM) • HWC 	ECO

10.2.2 Site Protection and Identification

After the operations where the BGG were accidentally disturbed or exposed were ceased immediately and the ECO was notified of the situation the site need to be protected from further damage and exposure and the area should be identified by using the following steps:

Table 9 - Steps to ensure Protection and Identification

Action	Responsible person
Step 1: ECO to appoint persons to watch over the gravesite.	ECO
Step 2: The ECO and appointed persons to visit the site immediately to ensure that the area is clearly marked, cordoned off and secured to prevent unauthorised access and further potential damage.	ECO
Step 3: ECO to notify: <ul style="list-style-type: none"> • South African Police Service to ascertain whether or not a crime has been committed • HWC official to investigate the circumstance around the exposed remains • The relevant local government authorities to ensure compliance with by-laws. 	ECO
Step 4: ECO to set up a multidisciplinary team, usually comprising of: <ul style="list-style-type: none"> ○ Community Engagement and Stakeholder Relations Manager ○ Safety Health and Environment, ○ and any other relevant department. <ul style="list-style-type: none"> ▪ The Team will urgently appoint an experienced and qualified archaeologist as required by HWC ▪ Communicate the outcome of the investigation to HWC 	ECO

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10.2.3 Investigating and Reporting

The ECO and the archaeologist will follow these two steps to ensure that the correct procedures are followed and that all the necessary information is available to continue with the exhumation and re-internment process:

Table 10 - Steps to ensure investigation and reporting

Action	Responsible person
Step 1: The ECO along with the archaeologist to visit the site to: <ul style="list-style-type: none"> Take pictures of the gravesite and surrounding area 	ECO and archaeologist
Step 2: The archaeologist will <ul style="list-style-type: none"> Investigate the site and make a preliminary determination as to the nature and age of the remains (authentic BGG – informal or older than 60 years/archaeological – older than 100 years) Survey affected area to establish GPS coordinates and if there are any other graves or cultural heritage site Assist in the identification of the extent of the affected area and the demarcation thereof. Identify, count and number the graves/remains/cultural heritage to create or add onto an existing grave register Start the grave exhumation and re-internment process. 	ECO and archaeologist

As soon as the above steps are completed the formal process for the relocation of BGG as documented in section 10 of this document must be followed.

10.3 Mitigation Excavation Strategy

If any heritage or palaeontological resources are to be impacted on by construction-related activities, they will require mitigation measures as noted above in Section 9 and in the Chance Finds Procedure. The following process will be required in the event that any of the sites cannot be avoided through the proposed mitigation measures and construction-related activities will impact directly on them:

Table 11 - Process to be followed as part of the Mitigation Excavations Strategy

Action	Responsibility	Outcome
Meeting on Site to identify final mitigation measures	Developer ECO Archaeologist/ Heritage specialist HWC/SAHRA	To determine whether sites can be mitigated or if the Mitigation Excavations Strategy should be implemented.
Application for permit to conduct mitigation excavations	Archaeologist / Heritage specialist HWC Developer	Application submitted to HWC for review including : Heritage specialist report and documentation of site as well as a Letter of agreement from the Developer on work to be done and appointment of archaeologist

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Action	Responsibility	Outcome
Physical Surveying of site layout in the development area	Archaeologist / Heritage specialist	The project archaeologist will complete a report on the findings as part of the permit application process.
Obtaining of mitigation permit from HWC	Archaeologist / Heritage specialist Client	Mitigation permit from HWC
Physical mitigation excavations involve:	Archaeologist, with a team of field assistants	Conduct excavations of the site (recording of all archaeological finds)
Lab Analysis and Documentation completion – Reporting	Archaeologist, with a team of field assistants	<ul style="list-style-type: none"> All investigation of archaeological soils will be undertaken by hand, all finds, remains and samples will be kept and submitted to a Museum/Repository as required by the heritage legislation. In the event that any artefacts need to be conserved, the relevant permit will be sought from the HWC. An on-site office and finds storage area will be provided, allowing storage of any artefacts or other archaeological material recovered during the monitoring process.
Application for destruction Permit	Archaeologist / Heritage specialist HWC– Review and final authorisation	<ul style="list-style-type: none"> The project archaeologist will complete a final site report on the findings and submit to HWC for review and apply for a destruction Permit. Once authorisation has been given by HWC, the Applicant will be informed when construction activities can resume.
Commencement of construction	Client HWC Archaeologist / Heritage specialist	Destruction permit received. Archaeologist / Heritage specialist to monitor site.

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11 MANAGEMENT OBJECTIVES SUMMARY

This section set out a summary of the steps to be taken to implement the HMP aims, covering all aspects of managing the heritage resources identified as well as the Contractor Roles and Responsibilities. This table should be read in conjunction with the Mitigation measures and Chance Finds Procedures identified in Section 9 and Section 10.

Table 12 - Relevant Management Measures, Monitoring criteria and Responsibility

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Objectives	Threats or Risks	Management Measures	Time frame	Responsibility	Monitoring criteria	Monitoring frequency
Assess impacts before construction	Potential damage to <i>in situ</i> deposits	Appoint an independent heritage specialist to identify and assess site significance (The previously conducted HIA, and this HMP report are sufficient).	As soon as possible, before construction	Client ECO	HWC to review report	On receipt
Appoint experienced contractor	Inexperienced contractors may damage sites	Advertise for tenders and draw up terms of reference and detailed plan	To comply with project time frames	Client	Evaluate applicants according to previous experience	N/A
Appoint Professional Archaeologist / Heritage specialist	Inexperience can damage sites or lead to unnecessary removal of deposits	Archaeologist/heritage specialist to develop heritage Plan (This HMP report fulfils this requirement)	Necessary Appoint before implementing mitigation measures	Client ECO	Appoint an experienced person	As required
Co-ordinate project planning	Un-coordinated rehabilitation and conservation work is inefficient	Planning and co-ordination must be done in conjunction with a development company, Officer (ECO) and Archaeologist/heritage specialist	During the planning, construction and operational phases	Client ECO Archaeologist/heritage specialist	All parties to report to Client	Monthly, or as required

Objectives	Threats or Risks	Management Measures	Time frame	Responsibility	Monitoring criteria	Monitoring frequency
HMP Training for workers	Workers are not aware of the significance and sensitivity of sites Theft and damage leads to loss of information and site integrity	Ensure that all on-site personnel are familiar with the aims of the HMP and the statement of significance. No artefacts or other material may be moved, picked up or removed from the site without a permit.	At the start of construction Training by Client	All parties involved in the archaeological / heritage mitigation project. The contractor shall familiarise all employees with the HMP contents, either in writing or verbally.	ECO shall require written proof or confirmation from the contractor that HMP training has been done. Proof of Cultural Awareness Training should be submitted to HWC. Spot checks to ensure personnel are not removing artefacts.	Start of contract

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Objectives	Threats or Risks	Management Measures	Time frame	Responsibility	Monitoring criteria	Monitoring frequency
Disseminate information to heritage resources authorities	Loss of information through inadequate recording	Any archaeological or historical material found accidentally must be reported to responsible Archaeologist/heritage specialist or HWC	Necessary Reports to be submitted to HWC	Client, ECO Archaeologist/h eritage specialist, HWC	Check sites are recorded and photographs are taken.	As required
Delimit contract areas	Impact beyond areas requiring mitigation	Client and ECO must indicate to contractors the area of work for the duration of the contract, including the access road to be used, construction lay-down areas, materials storage and delivery requirements, work stations, pedestrian routes and operational demarcation, etc.	During the planning, construction and operational phases	Client ECO	Maps to be signed off at the start of each contract Check contractor works within demarcated areas	Before start of construction
		Boundaries of the sites and conservation areas shall be demarcated by the Contractor, as instructed by the Client and the ECO (informed by the findings of this heritage walkthrough), prior to any work commencing on the site. Any changes must be recorded in writing.	During the planning, construction and operational phases	Client ECO	No encroachment beyond the demarcated boundaries is to be permitted. The contractor must ensure all labour and materials remain within the boundaries of the site.	Monthly, or as required
Demarcate sensitive areas	Damage to heritage resources sites	Sensitive areas identified by Client and/or Archaeologist / Heritage Specialist to be demarcated.	During the planning, construction and operational phases	Client ECO	Check that danger fencing or other appropriate demarcation is in the correct place	Monthly, or as required
Indicate access roads	Damage to sites and deposits if correct access routes not used	Only those roads agreed to between Client, Archaeologist/ Heritage Specialist and Contractor, as described in the current layout, may be used during maintenance activities and day to day activities	During the planning, construction and operational phases	Contractor, ECO, Client	ECO and site manager to check access roads regularly	Weekly
		Access roads must be planned to deviate around trees or other natural features marked out in an approved manner by Client	During the planning, construction and	Client, ECO and Contractor	ECO to check access roads regularly	Weekly

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Objectives	Threats or Risks	Management Measures	Time frame	Responsibility	Monitoring criteria	Monitoring frequency
			operational phases			
Provide access for Construction vehicles	Temporary roads and off-road access can damage sites and interfere with the integrity of the cultural landscape	No off-road driving allowed; temporary access roads must be rehabilitated after usage and width of temporary roads restricted to a maximum of 3 metres.	During the planning, construction and operational phases	Contractor and Client	Check rehabilitation of temporary access roads against those agreed to satisfaction of Client	As required
Demarcate areas for construction personnel	Un-coordinated movement can lead to damage of sites and landscape	The contractor must ensure that all construction personnel, labourers and equipment remain within demarcated restoration sites at all times. Movement outside boundaries may be done only with permission from the ECO	Necessary	Contractor and ECO	Check that all work is done within demarcated areas.	Weekly
	Constant use of paths causes erosion	Confine pedestrian routes to paths.	Necessary	Contractor		As required

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12 CONCLUSION

In conclusion, the HMP is a document that guides proposed activities and behaviour that are expected to take place during the course of operations and related activities. The document should be used as part of a management and monitoring system to ensure that heritage resources that have been identified in the Khangela WEF or are located immediately adjacent to those properties are conserved and protected.

This document needs to be implemented from the design phase onwards to comply with the legislative requirements for the management of identified heritage resources and Plan formulation that will ensure their protection from threats. The management guidelines and recommend mitigation measures of heritage resources identified in this HMP meets the objectives of the IFC Performance Standard and complies with the management of heritage and archaeological resources as described in the NHRA 25 of 1999.

The document and associated sub-documents (i.e. the Site Inventory database document) must be reviewed on an annual basis.

12.1 Final Proposed Layout

The final proposed layout areas took the specialist recommendations identified during the 2022 field assessment into consideration (**Figure 20**). From an archaeological and historical structure perspective, the proposed footprint areas will not change the impact on the identified heritage resources in the HMP.

As such the recommended mitigation measures as described in the HMP report remain (**Figure 21-Figure 23**).

There is no objection to the proposed final layout associated with the Khangela WEF project, under the condition that where the proposed footprint areas differ from the layout, surveyed in the HMP report, those areas will need to be assessed prior to any construction activities.

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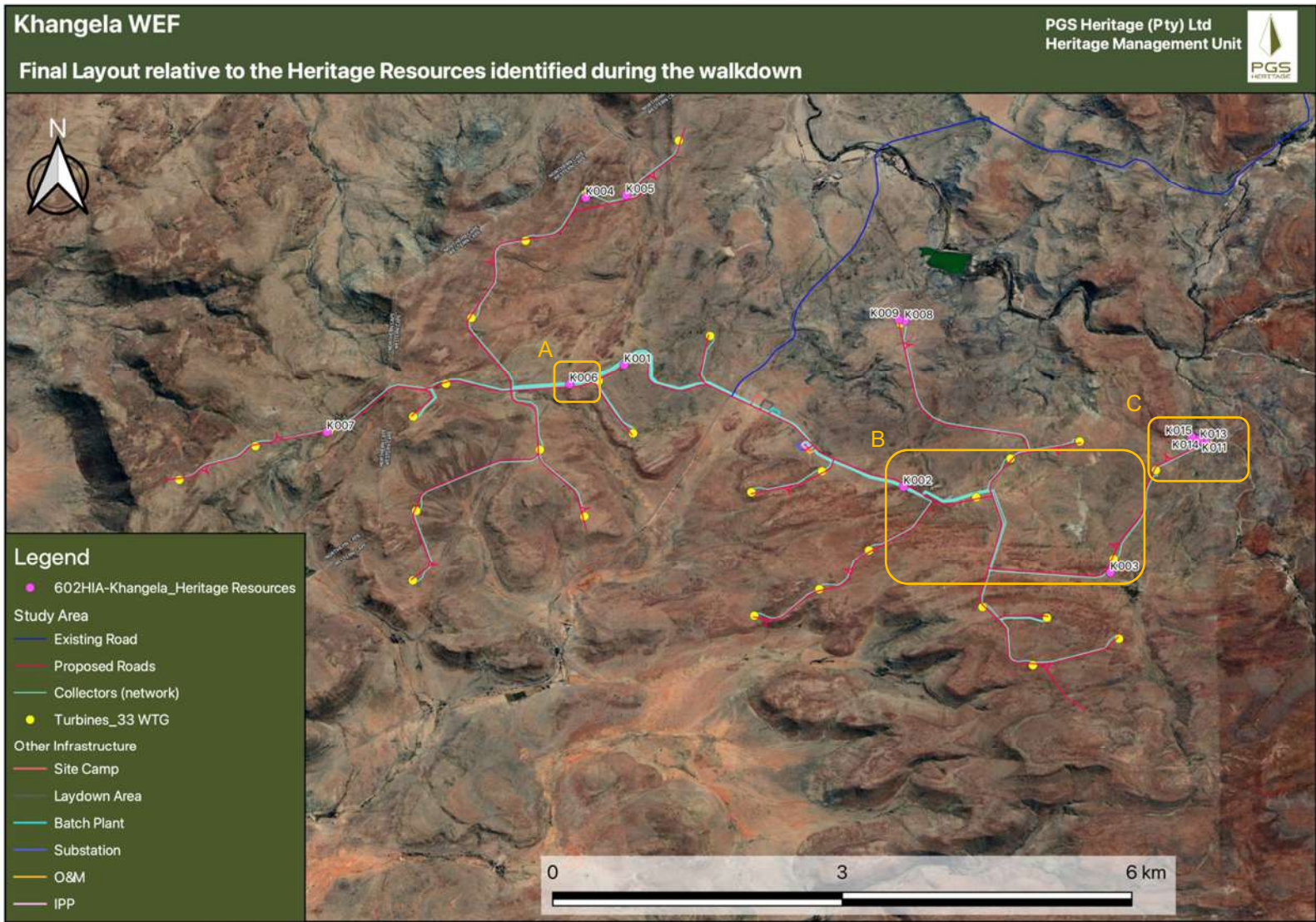


Figure 20 – Final proposed layout relative to the locality of the heritage resources identified during the walkdown. See inset A - C below.

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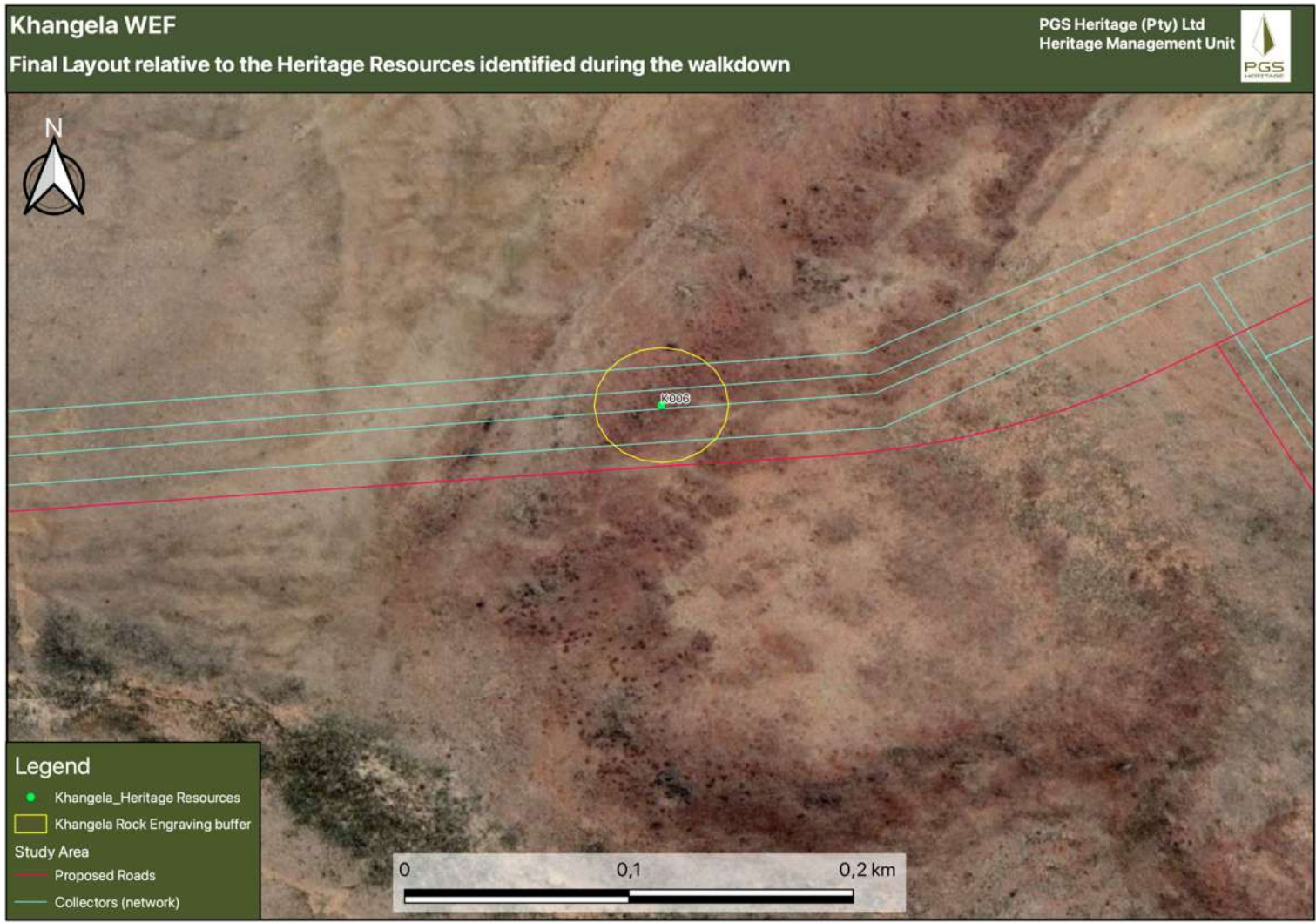


Figure 21 - Inset A illustrates the recommended 30m buffer around rock engraving site K006.

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Figure 22 - Inset B illustrates the recommended 30m buffer around rock engraving sites K002 and K003.

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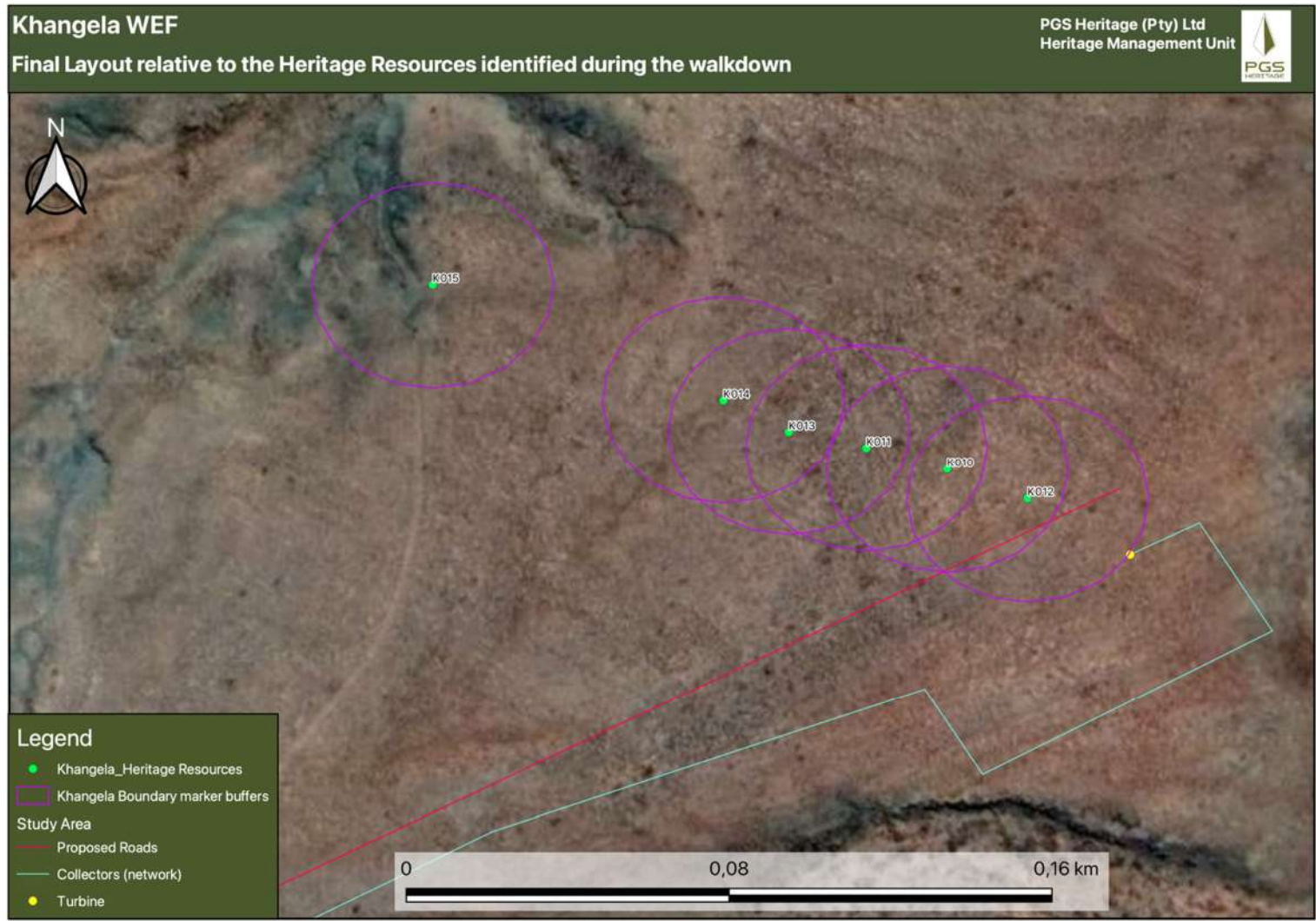


Figure 23 - Inset C illustrates the recommended 30m buffer around the stone boundary markers K010 - K015.

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13 REFERENCES

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APPENDIX A – Project team CVs

WOUTER FOURIE

Professional Heritage Specialist and Professional Archaeologist and Director PGS Heritage

Summary of Experience

Specialised expertise in Archaeological Mitigation and excavations, Cultural Resource Management and Heritage Impact Assessment Management, Archaeology, Anthropology, Applicable survey methods, Fieldwork and project management, Geographic Information Systems, including *inter alia* -

Involvement in various grave relocation projects (some of which relocated up to 1000 graves) and grave “rescue” excavations in the various provinces of South Africa

Involvement with various Heritage Impact Assessments, within South Africa, including -

- Archaeological Walkdowns for various projects
- Phase 2 Heritage Impact Assessments and EMPs for various projects
- Heritage Impact Assessments for various projects
 - Iron Age Mitigation Work for various projects, including archaeological excavations and monitoring
 - Involvement with various Heritage Impact Assessments, outside South Africa, including -
- Archaeological Studies in Democratic Republic of Congo
- Heritage Impact Assessments in Mozambique, Botswana and DRC
- Grave Relocation project in DRC

Key Qualifications

BA [Hons] (Cum laude) - Archaeology and Geography - 1997

BA - Archaeology, Geography and Anthropology - 1996

Professional Archaeologist - Association of Southern African Professional Archaeologists (ASAPA) - Professional Member

Accredited Professional Heritage Specialist – Association of Professional Heritage Practitioners (APHP) CRM Accreditation (ASAPA) -

- Principal Investigator - Grave Relocations
- Field Director – Iron Age
- Field Supervisor – Colonial Period and Stone Age
- Accredited with Amafa KZN

Key Work Experience

2003- current - Director – Professional Grave Solutions (Pty) Ltd

2007 – 2008 - Project Manager – Matakoma-ARM, Heritage Contracts Unit, University of the Witwatersrand

2005-2007 - Director – Matakoma Heritage Consultants (Pty) Ltd

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2000-2004 - CEO– Matakoma Consultants

1998-2000 - Environmental Coordinator – Randfontein Estates Limited. Randfontein, Gauteng

1997-1998 - Environmental Officer – Department of Minerals and Energy. Johannesburg, Gauteng

Worked on various heritage projects in the SADC region including, Botswana, Mozambique, Malawi, Mauritius, Zimbabwe and the Democratic Republic of the Congo

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PROFESSIONAL CURRICULUM VITAE FOR NIKKI MANN

Professional Archaeologist for PGS Heritage

Name: Nikki Mann
Profession: Archaeologist
Date of birth: 1992-10-13
Parent Firm: PGS Heritage (Pty) Ltd
Position at Firm: Archaeologist
Years with firm: 2
Years of experience: 7
Nationality: South African
HDI Status: White

EDUCATION:

Name of University or Institution : University of Cape Town
Degree obtained : BSc
Major subjects : Archaeology, Environmental and
 Geographical Sciences
Year : 2013

Name of University or Institution : University of Cape Town
Degree obtained : BSc [Hons]
Major subjects : Archaeology
Year : 2014

Name of University or Institution : University of Cape Town
Certificate obtained : MSc – Archaeology (phytolith analysis)
Year : 2017

Professional Qualifications:

Professional Archaeologist - Association of Southern African Professional Archaeologists -
 Professional Member – No 472

Languages:

English
 French

KEY QUALIFICATIONS

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- 3 years of work in the heritage consulting field;
- 7 years working experience in archaeological excavations;
- Proven experience in report writing and report deliverables;

HERITAGE IMPACT ASSESSMENTS

South African

10MW Chelsea Solar PV. Gqeberha, Eastern Cape. SLR. **Position:** Heritage Specialist.

Koup 1 and Koup 2 WEF. Beaufort West, Western Cape. SiVEST. **Position:** Heritage Specialist.

Victoria West Pipelines. Victoria West, Northern Cape. iXEng. – **Position:** Heritage Specialist.

East Orchards Poultry Farm Project. Delmas, Mpumalanga. EcoSphere. – **Position:** Heritage Specialist.

Gunstfontein WEF and OHL. Sutherland, Northern Cape. Savannah– **Position:** Heritage Specialist.

Overhead power line for Oya PV Facility. Sutherland, Northern Cape. SiVEST– **Position:** Heritage Specialist.

Infrastructure for Kudusberg WEF. Sutherland, Northern Cape. SiVEST– **Position:** Heritage Specialist.

Proposed SKA fibre optic cable, between Beaufort West and Carnarvon, Northern and Western Cape. **Position:** Heritage Specialist.

Proposed SANSA Space Operations. Matjiesfontein, Western Cape. **Position:** Heritage Specialist

Pienaarspoort WEF 1 and 2. North-west of Matjiesfontein, Western Cape. Savannah- **Position:** Heritage Specialist.

Swellendam WEF. Swellendam, Western Cape. – **Position:** Heritage Specialist.

Matjiesfontein Road Extension Project. Matjiesfontein, Western Cape. **Position:** Heritage Specialist.

MITIGATION WORK

2020 – Coega Zone 10, Coega IDZ, Eastern Cape Province. Colonial Period Phase 2 Mitigation Archaeological Excavation. **Archaeologist.**

2019 – 2020 - **Lesotho Highland Development Authority – Polihali Dam Project - Heritage Management Plan development and Implementation.** Mokhotlong, Kingdom of Lesotho. **Archaeologist.**

2018- Proposed development of boreholes and associated pipelines for the Langebaan Aquifer within the Hopefield Private Nature Reserve, Hopefield, Western Cape. **Archaeologist.**

POSITIONS HELD

2021 – current: Archaeologist - PGS (Pty) Ltd

2019 – 2020: Archaeologist - PGS (Pty) Ltd Lesotho

2018 – 2020: Contract Archaeologist – CTS Heritage

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REFERENCES

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CTS Heritage

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Email:

nic.wiltshire@ctsheritage.com

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PROFESSIONAL CURRICULUM FOR CHERENE DE BRUYN

Professional Archaeologist for PGS Heritage

2016-2017	MA in Archaeology University College London, United Kingdom
2015	BSC Honours in Physical Anthropology, University of Pretoria, South Africa
2013	BA Honours in Archaeology University of Pretoria, South Africa
2010-2012	BA (General) University of Pretoria, South Africa Major subjects: Archaeology and Anthropology

PROFESSIONAL QUALIFICATIONS:

- Association of Southern African Professional Archaeologists - Professional Member (#432)
- International Association for Impact Assessment South Africa - Member (#6082)
- Association of Southern African Professional Archaeologists - CRM Accreditation
 - Principal Investigator: Grave relocation
 - Field Director: Colonial period archaeology, Iron Age archaeology
 - Field Supervisor: Rock art, Stone Age archaeology
 - Laboratory Specialist: Human Skeletal Remains
- KZN Amafa and Research Institute - Accredited Professional Heritage Practitioner

Languages:

Afrikaans & English

SUMMARY OF EXPERIENCE

Expertise in Heritage Impact Assessment Management, Historical and Archival Research, Archaeology, Physical Anthropology, Grave Relocations, Fieldwork, Geographic Information Systems and Project Management including *inter alia* -

Involvement in various grave relocation projects

- Grave exhumation, test excavations and grave “rescue” excavations in the various provinces of South Africa.
- Permit applications with SAHRA BGG and AMAFA, including relevant Munciplaities and Authorities for grave relocation projects.

Involvement with various Heritage Impact Assessments,

- Heritage Impact Assessments and Management for various projects within Eastern Cape, Free State, Gauteng, KwaZulu-Natal, Limpopo, Mpumalanga, Northern Cape, North West and Western Cape Province.
- Archaeological Walkdowns and Mitigation Reports for various projects.
- Instrument Survey and recording for various projects.
- Desktop, archival and heritage screening for projects.

INFORMATION TECHNOLOGY EXPERIENCE:

- MS Office – Word, Excel, Publisher & Powerpoint
- Google Earth

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- *QGIS, ArcGIS Online, ArcGIS Collector*
- *Inkscape*

Heritage Assessment Projects

Below is a selected list of Heritage Impact Assessments (HIA) Projects involvement:

- Heritage Management Plan for the proposed development of the 305MW Oya solar photovoltaic (PV) facility and associated infrastructure near Matjiesfontein, Western Cape.
- Heritage Impact Assessment for the Proposed Township Establishment on the Remainder of Portion 8 of the Farm Boschoek 103 JQ, near Boschoek, North West Province.
- HIA for the proposed Aeolus Wind Farm, between Makhanda and Somerset East, Eastern Cape.
- HIA for the proposed Redding Wind Farm, between Makhanda and Somerset East, Eastern Cape.
- HIA for the proposed Ripponn Wind Farm, between Makhanda and Somerset East, Eastern Cape.
- HIA for the proposed Hamlett Wind Farm, between Makhanda and Somerset East, Eastern Cape.
- HIA for the proposed Wind Garden Wind Farm, between Makhanda and Somerset East, Eastern Cape.
- HIA for the proposed Hamlett Wind Farm, between Makhanda and Somerset East, Eastern Cape.
- The Proposed Irenedale Water Pipeline Between Bosjesspruit Colliery And A Local Reservoir, Located In The Lekwa Local Municipality And The Govan Mbeki Local Municipality, Gert Sibande District Municipality, Mpumalanga Province.
- Heritage Impact Assessment for the proposed development of the Msobo Coal Tselentis Colliery: Albion Opencast project, Near Breyten, Mpumalanga Province.
- Heritage Impact Assessment for the proposed development of an Airport For Kolomela Mine In Postmasburg, Northern Cape.
- Heritage Impact Assessment for the Proposed South African Coal Estates (SACE) Clydesdale Pit Project, near Emalaheni, Mpumalanga Province.
- Heritage Impact Assessment for the Amendment of the Mogalakwena Mine Expansion Project, near Mokopane, Limpopo Province.
- Heritage Impact Assessment for the Mogalakwena Mine Integrated Permitting Project near Mokopane, Limpopo Province.
- Heritage Impact Assessment for the Proposed Solar PV Plant at Armoede, near Mokopane, Limpopo Province.
- Heritage Impact Assessment for the Proposed New Cargo Precinct For The O.R. Tambo International Airport On The Farm Witkoppie 64, Gauteng Province.
- Heritage Impact Assessment for the upgrade of road d4407 between Hluvukani and Timbavati, road d4409 at Welverdiend and road d4416/2 between Welverdiend and road P194/1 in the Bohlabela region of the Mpumalanga Province.
- Heritage Impact Assessment for the proposed Piggery on Portion 46 of the farm Brakkefontien 416, within the Nelson Mandela Bay Municipality, Eastern Cape.
- Heritage Impact Assessment for proposed development On Erf 30, Letamo Town, Farm Honingklip 178 Iq, Mogale Local Municipality, Gauteng Province.
- Heritage Impact Assessment for the proposed Prospecting Right Application on the Farm Reserve No 4 15823 And 7638/1, near St Lucia, within the jurisdiction of the Mfolozi Local Municipality in the King Cetshwayo District Municipality, KwaZulu-Natal Province.

Grave Relocation Projects

Below, a selection of grave relocation projects involvement:

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- Report On Test Excavations. Ivn_078 Maruma Graves, Farm Turfspruit 241 Kr, Mokopane, Limpopo Province. Test Excavation Of Possible Burial Ground As Identified By The Maruma Family.
- Relocation Of Two Infant Graves From The Farm Wonderfontein 428 Js, Belfast, Mpumalanga Province.
- Relocation Of Approximately 4 Stillborn Graves From Farm Wonderfontein 428 Js, Umsimbithi Mining (Pty) Ltd, Belfast, Chief Albert Luthuli Local Municipality, Mpumalanga Province.

EMPLOYMENT SUMMARY:

Positions Held

- 2020 – to date: Archaeologist - PGS Heritage (Pty) Ltd
- 2018 – 2019: Manager of the NGT ESHS Heritage Department – NGT Holdings (Pty) Ltd
Archaeologist and Heritage Consultant – NGT Holdings (Pty) Ltd
- 2015-2016: Archaeological Contractor - BA3G, University of Pretoria
- 2014 – 2015: DST-NRF Archaeological Intern, Forensic Anthropological Research Centre

APPENDIX B – Site Descriptions (incl. photographs)

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Site Nr

K001

Location

S -31.80372977°

E 23.94273083°

General Landscape Characteristics

Near foot of Mountain

Site Conditions

Erosion observed

Time Period

Stone Age

Site Type

Lithics: Low Density Surface Scatter/Single Find Spot

Site Extent

10m x 10m

Additional Site Notes

A low density surface scatter of MSA and LSA artefacts was identified at this location. The scatter is situated on scree slope. It is unlikely that these artefacts were observed in their primary context due to the nature of the environment. The artefacts consist mostly of flakes which were produced from silcrete and hornfels.

NHRA Site Rating

Grade 3 - C (IIIC)

Site Photos

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Figure 24 - View of K001.



Figure 25 - Stone tools identified at K001.

Site Nr
K002

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Location

S -31.81708619°

E 23.97331525°

General Landscape Characteristics

Mountainous

Site Conditions

Clear

Time Period

Historical Period

Site Type

Rock Engravings

Site Extent

10m x 10m

Additional Site Notes

The rock outcrop with patina has been abraded by human activity. In terms of the engraving, there is cross-hatching or possible sharpening marks on several dolerite boulders.

NHRA Site Rating

Grade 3 - B (IIIB) – Grade 3 - C (IIIC)

Site Photos

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Figure 26 – View of dolerite outcrop with scattered boulders at K002.



Figure 27 – Sample of engravings recorded at K002.

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Site Nr

K003

Location

S -31.82651667°

E 23.99597427°

General Landscape Characteristics

Flat lying area

Site Conditions

Clear

Time Period

Historical Period

Site Type

Rock Engravings

Site Extent

5m x 5m

Additional Site Notes

The rock outcrop with patina has been abraded by human activity. In terms of the engraving, there are lines or possible sharpening marks on several dolerite boulders.

NHRA Site Rating

Grade 3 - B (IIIB) – Grade 3 - C (IIIC)

Site Photos

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Figure 28 - View of dolerite outcrop with scattered boulders at K003.



Figure 29 – Views of an engraved boulder at K003.

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Site Nr

K004

Location

S -31.7855069°

E 23.9384989°

General Landscape Characteristics

Slope of Mountain

Site Conditions

Overgrown/ limited visibility

Time Period

Stone Age

Site Type

Lithics: Low Density Surface Scatter/Single Find Spot

Site Extent

5m x 5m

Additional Site Notes

A low density surface scatter of MSA artefacts was identified at this location. The scatter is situated on a scree slope. It is unlikely that these artefacts were observed in their primary context due to the nature of the environment. The artefacts consist mostly of flakes and a core which were produced from hornfels.

NHRA Site Rating

Grade 3 - C (IIC)

Site Photos

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Figure 30 - Views of K004.



Figure 31 - Stone tools identified at K004.

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Site Nr

K005

Location

S -31.7852408°

E 23.9429361°

General Landscape Characteristics

Flat lying area; Near foot of Mountain

Site Conditions

Clear

Time Period

Stone Age

Site Type

Lithics: Low Density Surface Scatter/Single Find Spot

Site Extent

10m x 10m

Additional Site Notes

A low density surface scatter of MSA artefacts was identified at this location. The scatter is situated on a plain. The artefacts consist mostly of flakes which were produced from hornfels and silcrete.

NHRA Site Rating

Grade 3 - C (IIC)

Site Photos

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Figure 32 - View of K005.



Figure 33 - Stone tools identified at K005.

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Site Nr

K006

Location

S -31.8059047°

E 23.9367587°

General Landscape Characteristics

Top of ridge

Site Conditions

Clear

Time Period

Historical Period

Site Type

Rock Engravings

Site Extent

5m x 5m

Additional Site Notes

The rock outcrop with patina has been abraded by human activity. In terms of the engraving, there are “scratches” and parallel lines (possible sharpening marks) on a dolerite boulder.

NHRA Site Rating

Grade 3 - B (IIIB) – Grade 3 - C (IIIC)

Site Photos

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Figure 34 - Views of dolerite outcrop with scattered boulders at K006.



Figure 35 - View of an engraved boulder at K006.

Site Nr

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K007

Location

S -31.81111362°

E 23.91016737°

General Landscape Characteristics

Mountainous

Site Conditions

Clear

Time Period

Stone Age

Site Type

Single find: Grinding Stones

Site Extent

5m x 5m

Additional Site Notes

The embedded rock has a possible grinding surface, although it may be a natural erosional process that has led to the “worn” surface. The site is located on the top of a small koppie and near a proposed turbine. No other cultural material was identified.

NHRA Site Rating

Grade 3 - C (IIC)

Site Photos

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Figure 36 - View of the possible lower grindstone at K007.



Figure 37 - Closer view of the possible grinding surface at K007.

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Site Nr

K008

Location

S -31.7989563°

E 23.9734623°

General Landscape Characteristics

Flat lying area; Bushy/Shrubby vegetation

Site Conditions

Clear

Time Period

Stone Age

Site Type

Lithics: Low Density Surface Scatter/Single Find Spot

Site Extent

15m x 15m

Additional Site Notes

A low density surface scatter of LSA artefacts was identified at this location. The scatter is situated on a flat plain. The artefacts consist mostly of flakes (unretouched) and a core which were produced from hornfels.

NHRA Site Rating

Grade 3 - C (IIIC)

Site Photos

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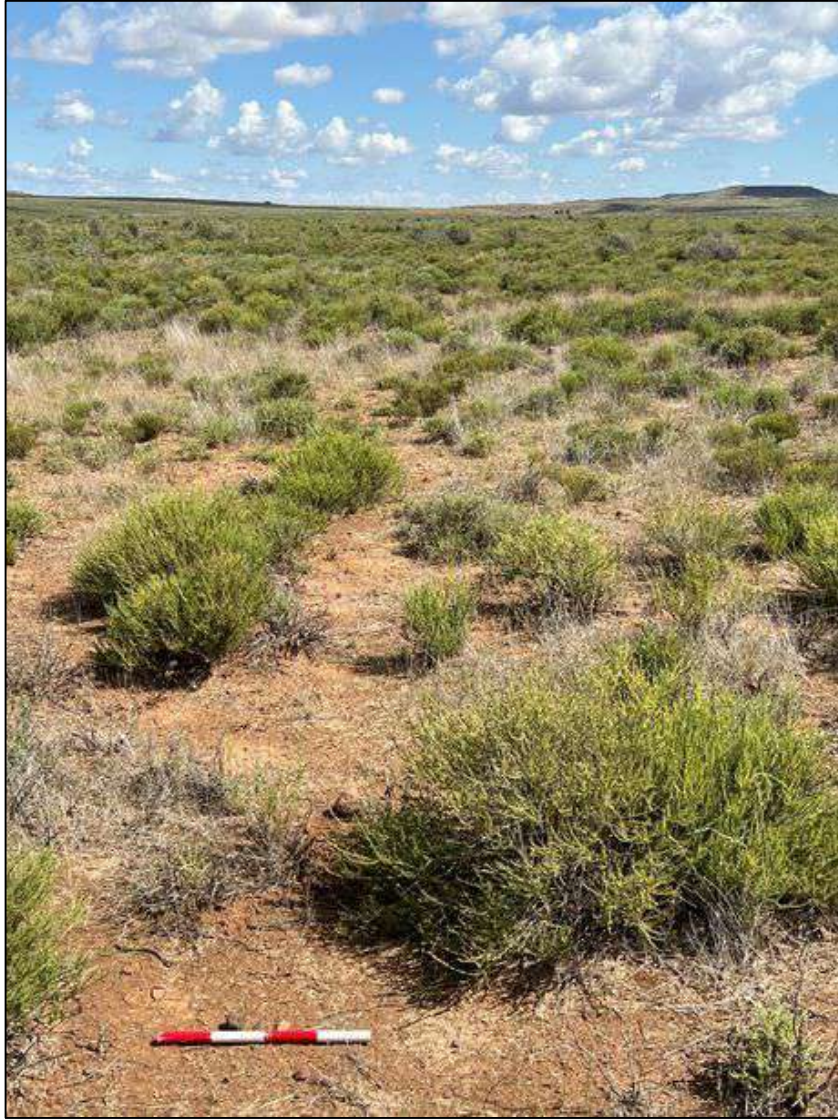


Figure 38 - View of K008.



Figure 39 - Stone tools identified at K008.

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Site Nr

K009

Location

S -31.79879062°

E 23.97279696°

General Landscape Characteristics

Flat lying area; Bushy/Shrubby vegetation

Site Conditions

Clear

Time Period

Stone Age

Site Type

Lithics: Low Density Surface Scatter/Single Find Spot

Site Extent

5m x 5m

Additional Site Notes

A low density surface scatter of MSA and LSA artefacts was identified at this location. The scatter is situated on a flat plain. The artefacts consisted of a large flake (worked) and a core which were produced from hornfels.

NHRA Site Rating

Grade 3 - C (IIIC)

Site Photos

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Figure 40 - View of K009.



Figure 41 - Stone tools identified at K009.

***Note that the following sites (K010- K015) are all associated (same linear site).**

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Site Nr

K010

Location

S -31.81214181°

E 23.00622495°

General Landscape Characteristics

Flat lying area

Site Conditions

Clear

Time Period

Historical Period

Site Type

Stone slab boundary markers

Site Extent

Linear site: Approx. 100m long

Additional Site Notes

The sandstone boundary marker (also referred to as *stellae*) records the original farm boundaries.

Upright stone boundary markers x 8. The *stellae* form part of the cultural landscape and are protected by NHRA.

NHRA Site Rating

Grade 3 - B (IIIB)

Site Photos

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Figure 42 - View of the area surrounding K010 (facing additional farm boundary markers).

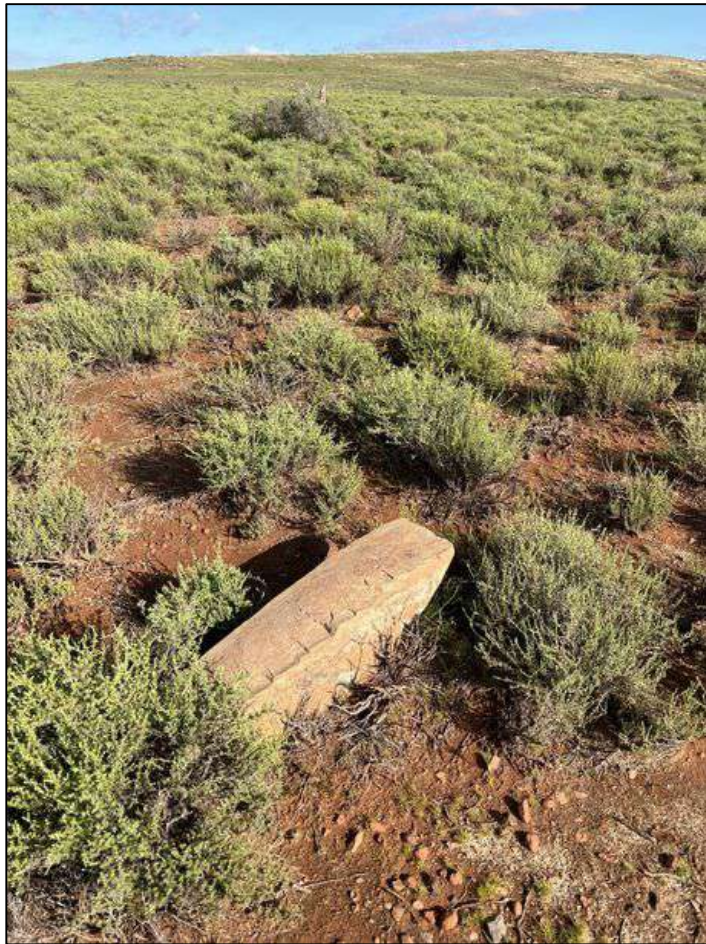


Figure 43 - View of the stone slab boundary marker at K010.

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Site Nr

K011

Location

S -31.812086°

E 23.0060135°

General Landscape Characteristics

Flat lying area

Site Conditions

Clear

Time Period

Historical Period

Site Type

Stone slab boundary markers

Site Extent

Linear site: Approx. 100m long

Additional Site Notes

The sandstone boundary marker (also referred to as *stellae*) records the original farm boundaries.

Upright stone boundary markers x 8. The *stellae* form part of the cultural landscape and are protected by NHRA.

NHRA Site Rating

Grade 3 - B (IIIB)

Site Photos

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Figure 44 – Views of the stone lab boundary marker at K011.

Site Nr

K012

Location

S -31.81221928°

E 24.00643562°

General Landscape Characteristics

Flat lying area

Site Conditions

Clear

Time Period

Historical Period

Site Type

Stone slab boundary markers

Site Extent

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Linear site: Approx. 100m long

Additional Site Notes

The sandstone boundary marker (also referred to as *stellae*) records the original farm boundaries. Upright stone boundary markers x 8. The *stellae* form part of the cultural landscape and are protected by NHRA.

NHRA Site Rating

Grade 3 - B (IIIB)

Site Photos

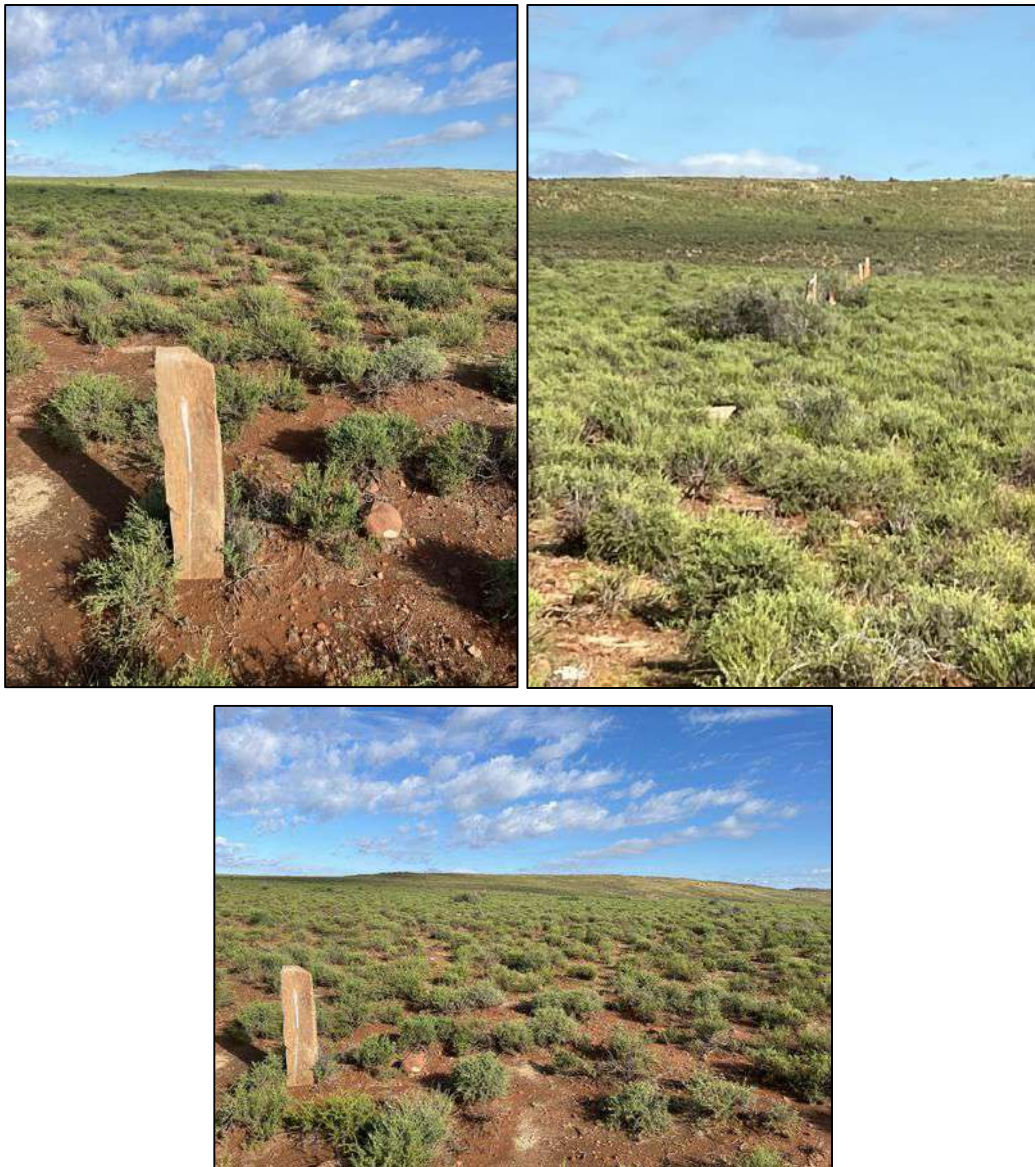


Figure 45 – Views of the stone lab boundary marker at K012.

Site Nr

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K013

Location

S -31.81204375°

E 24.00581046°

General Landscape Characteristics

Flat lying area

Site Conditions

Clear

Time Period

Historical Period

Site Type

Stone slab boundary markers

Site Extent

Linear site: Approx. 100m long

Additional Site Notes

The sandstone boundary marker (also referred to as *stellae*) records the original farm boundaries. Upright stone boundary markers x 8. The *stellae* form part of the cultural landscape and are protected by NHRA.

NHRA Site Rating

Grade 3 - B (IIIB)

Site Photos

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Figure 46 - Views of the stone lab boundary marker at K013.

Site Nr

K014

Location

S -31.811961°

E 24.00563917°

General Landscape Characteristics

Flat lying area

Site Conditions

Clear

Time Period

Historical Period

Site Type

Stone slab boundary markers

Site Extent

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Linear site: Approx. 100m long

Additional Site Notes

The sandstone boundary marker (also referred to as *stellae*) records the original farm boundaries. Upright stone boundary markers x 8. The *stellae* form part of the cultural landscape and are protected by NHRA.

NHRA Site Rating

Grade 3 - B (IIIB)

Site Photos



Figure 47 - Views of the stone slab boundary marker at K014.

Site Nr

K015

Location

S -31.81165851°

E 24.0048782°

General Landscape Characteristics

Flat lying area

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Site Conditions

Clear

Time Period

Historical Period

Site Type

Stone slab boundary markers

Site Extent

Linear site: Approx. 100m long

Additional Site Notes

The sandstone boundary marker (also referred to as *stellae*) records the original farm boundaries. Upright stone boundary markers x 8. The *stellae* form part of the cultural landscape and are protected by NHRA.

NHRA Site Rating

Grade 3 - B (IIIB)

Site Photos



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Figure 48 - Views of the stone slab boundary marker at K015.

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APPENDIX C – Final Layout Maps

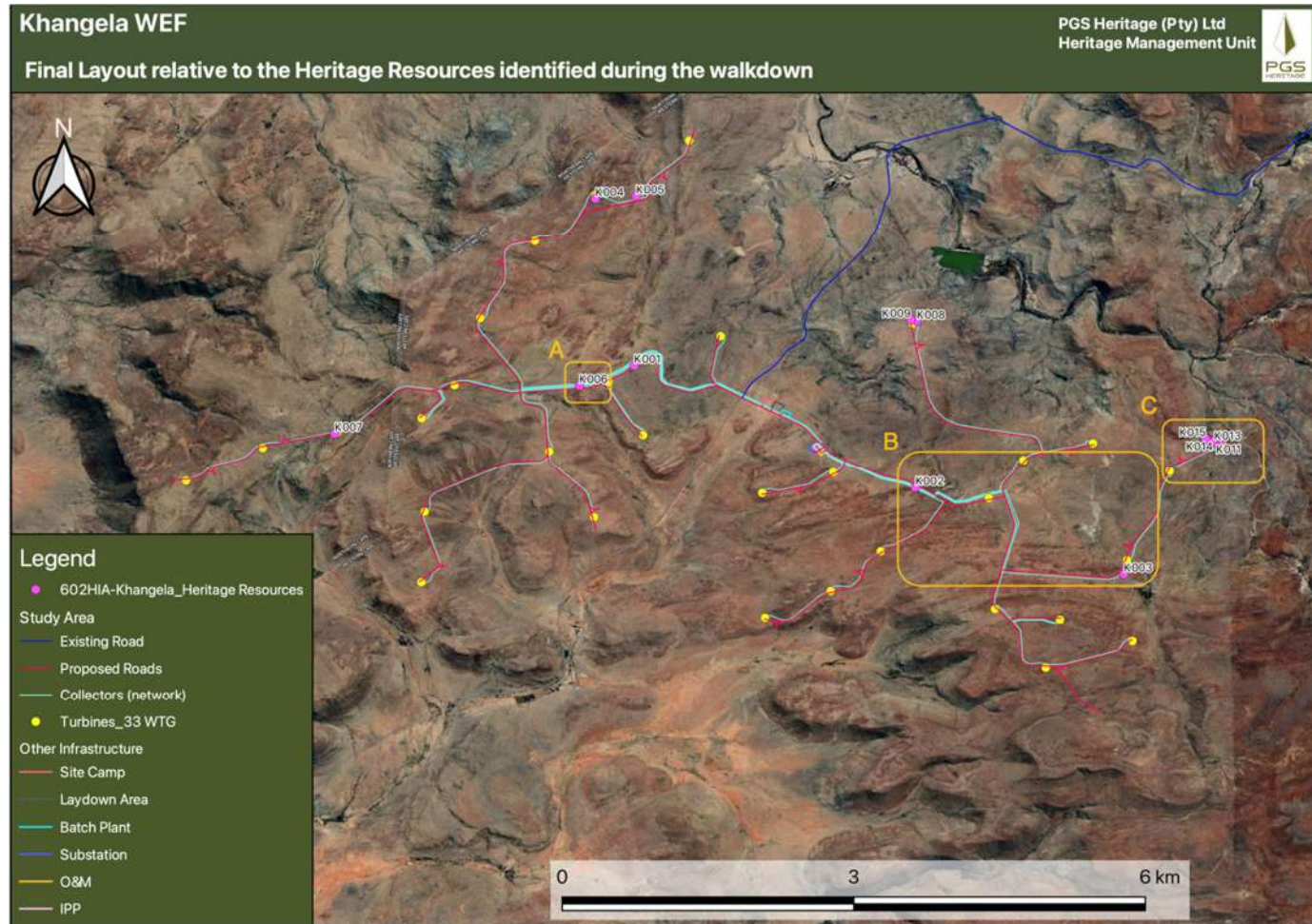


Figure 49 – Final proposed layout relative to the locality of the heritage resources identified during the walkdown. Refer to insets A-C below.

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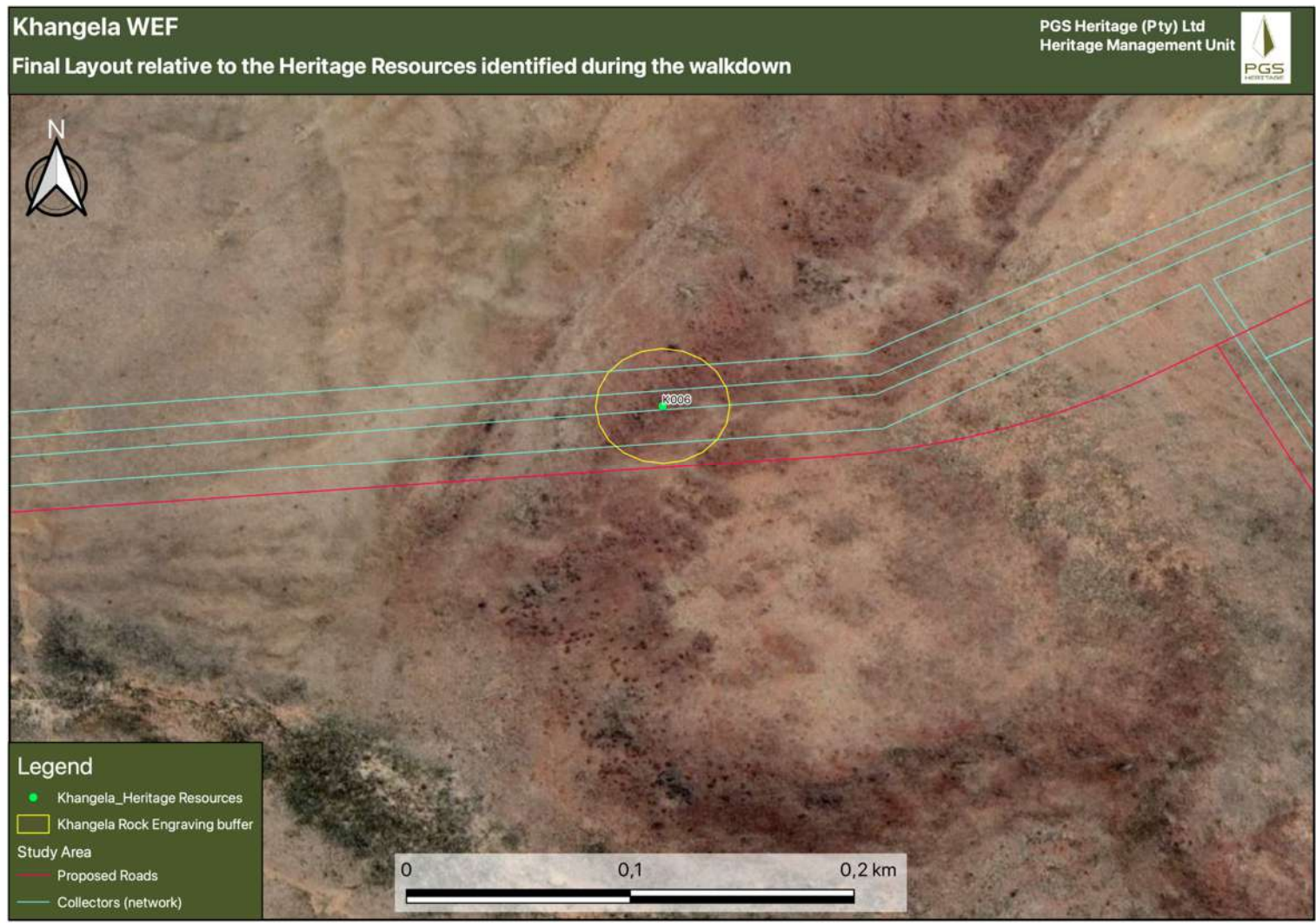


Figure 50 - Inset A illustrates the recommended 30m buffer around rock engraving site K006.

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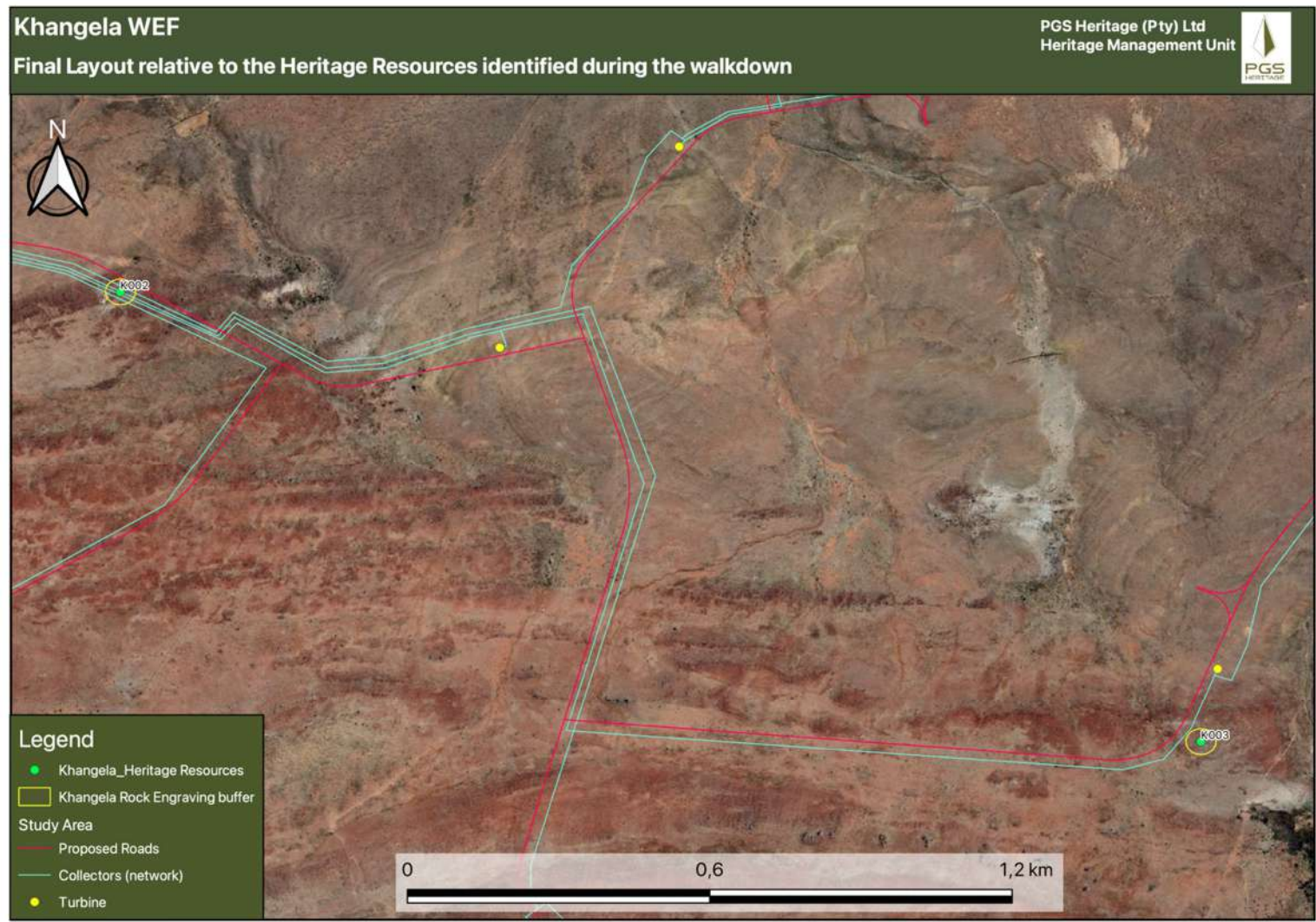


Figure 51 - Inset B illustrates the recommended 30m buffer around rock engraving sites K002 and K003.

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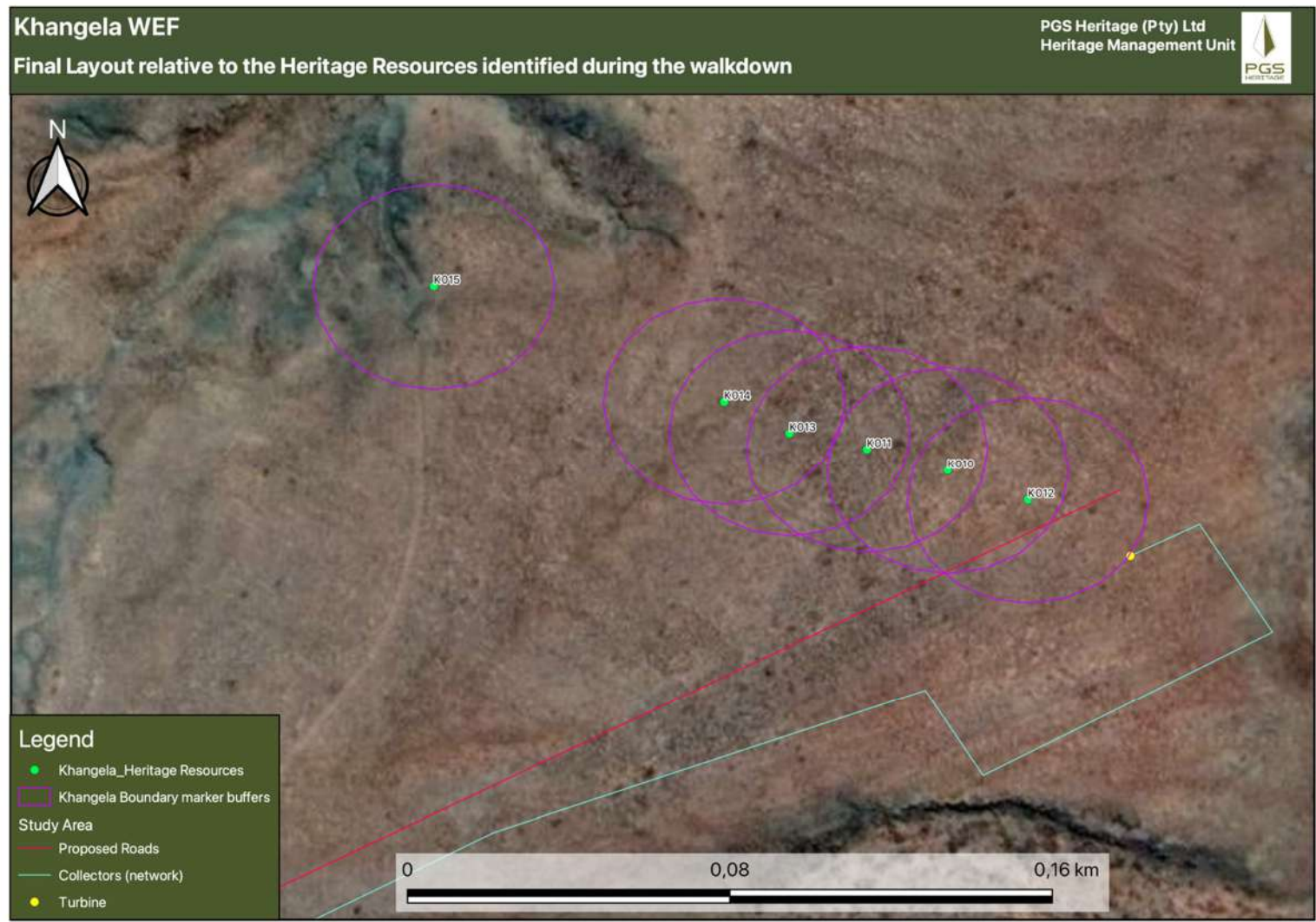


Figure 52 - Inset C illustrates the recommended 30m buffer around the stone boundary markers K010 - K015.